Volume 97, Number 1, January–February 1992
Journal of Research of the National Institute of Standards and Technology

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Volume 97, Number 1, January-February 1992
Journal of Research of the National Institute of Standards and Technology

[J. Res. Natl. Inst. Stand. Technol. 97, 1 (1992)]

Atlas of the Spectrum of a Platinum/Neon Hollow-Cathode Reference Lamp in the Region 1130–4330 Å

Volume 97 | Number 1 | January-February 1992

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The spectrum of a platinum hollow-cathode lamp containing neon carrier gas was recorded photographically and photoelectrically with a 10.7 m normal-incidence vacuum spectrograph. Wavelengths and intensities were determined for about 5600 lines in the region 1130–4330 Å. An atlas of the spectrum is given, with the spectral lines marked and their intensities, wavelengths, and classifications listed. Lines of impurity species are also identified. The uncertainty of the photographically measured wavelengths is estimated to be ±0.0020 Å. The uncertainty of lines measured in the photoelectric scans is 0.01 Å for wavelengths shorter than 2030 Å and 0.02 Å for longer wavelengths. Ritz-type wavelengths are given for many of the classified lines of Pt II with uncertainties varying from ±0.0004 to ±0.0025 Å. The uncertainty of the relative intensities is estimated to be about 20%.

Key words: hollow-cathode lamp; neon; platinum; spectral atlas; spectrum; wavelength.

Accepted: November 21, 1991

1. Introduction

The deployment of the Hubble Space Telescope (HST) on April 24, 1990, launched a new era in astronomy. With the HST, stars and other astronomical objects are being observed with unprecedented clarity. The improvement over ground-based telescopes is most significant in the ultraviolet region of the spectrum, where the earth's atmosphere absorbs most of the radiation. Although the much-publicized spherical aberration in the HST's primary mirror [1] greatly reduces the quality of star images, many experiments of a spectroscopic nature are not severely affected because they do not require high spatial resolution. For example, for the Goddard High Resolution Spectrograph (GHRS), the highest resolution spectrograph on HST, the spherical aberration in the primary mirror does not degrade the spectral resolution noticeably when the small science aperture is used [2]. However, because of enlargement of the point spread function, the exposure time must be increased by a factor of about 5 to produce the signal-to-noise ratio of prelaunch expectations [2]. Nevertheless, spectra of very high quality have been obtained [2].

The region of observation of GHRS is 1100–3200 Å. In its echelle mode it has a resolving power of 90,000 and a wavelength accuracy of a few parts in 10^6. Line-of-sight velocities of stellar objects can thus be determined to an accuracy of about 1 km/s. In order to achieve this accuracy, of course, an accurate wavelength scale must be established. This is accomplished by illuminating the spectrograph with an onboard platinum/neon hollow-cathode lamp during periods in which stellar observations are not being made [3]. The use of a Pt/Ne lamp for this purpose and its space-qualified design are due to Mount, Yamasaki, Fowler, and Fastie [4], who originally suggested it for wavelength calibration of the International Ultraviolet Explorer (IUE) satellite.

To achieve the accuracy for which GHRS was designed, the calibration wavelengths must be accurate to about 0.002 Å. However, tests carried out in our laboratory in 1983 indicated that the best available wavelengths for Pt [5] had errors ranging to about 0.015 Å. We thus began a program to measure the spectra emitted by a Pt/Ne hollow-cathode lamp similar to the one to be used with GHRS. This work was carried out with our high resolution 10.7 m normal-incidence vacuum spectrograph at NIST. At about the same time Engleman [6] recorded the spectrum of a Pt hollow-cathode lamp with a Fourier-transform spectrometer. He obtained accurate wavelengths for 320 lines of Pt I in the region 2200–7220 Å, optimized the energy level values, and calculated accurate Ritz-type wavelengths for 81 lines in the region 1724–2250 Å. Many of these lines were used in calibrating our grating measurements.

Some of the results of our work have appeared in two previous papers. In the first [7] we determined accurate values for 100 energy levels of Pt II by combining our new grating measurements for over 500 Pt II lines in the ultraviolet with measurements of lines at longer wavelengths made by Engleman by Fourier transform spectroscopy. In the second [8] we reported wavelengths with accuracies of 0.002 Å or better for some 3000 lines emitted by a Pt/Ne lamp in the region 1032–4100 Å. In this second report we also provided relative intensities of the spectral lines of the Pt/Ne lamp that were determined by recording the spectra photoelectrically with the same spectrograph used for the wavelength measurements.

Our wavelengths for the Pt/Ne lamp are currently being used for calibration of GHRS as well as for wavelength calibration of the Faint Object Spectrograph on HST, which uses a Pt-Cr/Ne hollow-cathode lamp for both wavelength and radiometric calibration [9]. Our data are also being used for revised calibrations of spectra from the IUE satellite [10], and for calibration of spectra obtained with sounding rockets, which also use onboard Pt/Ne hollow cathode lamps [11]. In a different type of application, the data are being used to interpret the spectra of stars that contain Pt in anomalously high abundances [12].

In the present paper we present a comprehensive report of our observations of the Pt/Ne hollow-cathode lamp. For completeness we give a full account of the experimental work and data analysis. Some of this information has been given in our previous papers.

Our results are presented in the form of an atlas of the spectrum emitted by a Pt/Ne hollow-cathode lamp in the region 1130–4330 Å. The atlas consists of plots of the spectrum accompanied by tables that include the wavelengths, wave numbers, intensities, and identifications or classifications where known for more than 5600 lines. We have attempted to provide the best available wavelength data, substituting values from the literature or calculated Ritz-type wavelengths where these are more accurate than our measurements.

The line list developed in this work was communicated to J. Blaise and J.-F. Wyart of the Laboratoire Aimé Cotton, Orsay, France, who have used it to substantially extend the energy level analysis of Pt II. Based on our measurements they have located nearly 150 new Pt II levels. Their report on the analysis appears as a companion paper in the same issue of this journal [13]. Blaise and Wyart have also located about 100 new levels of Pt I. The new line identifications for Pt I and II have been provided to us and are incorporated in the atlas.

The data included in this atlas should be of use not only for astronomical spectroscopy but also for the calibration of general laboratory spectra obtained with medium to high resolution diffraction grating spectrographs. No other source provides such a dense and complete coverage of this spectral region with lines suitable for use as reference wavelengths. The Pt/Ne hollow cathode is easy to operate and is commercially available at moderate cost.

2. Photographic Observations

Our observations were made with the 10.7 m normal-incidence vacuum spectrograph at the National Institute of Standards and Technology. Two different gratings were used, the first blazed at 1200 Å in first order and the second blazed at 3000 Å in first order. Both gratings were ruled with 1200 lines/mm. All measurements were made in the first order, the plate factor being 0.78 Å/mm. The slit width was 0.023 mm. With this slit width the resolving limit throughout the region of observation was about 0.020 Å. Photographic exposures were made on Kodak SWR plates.[1]

[1] Certain commercial equipment, instruments, or materials are identified in this paper to specify adequately the experimental procedure. Such identification does not imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the materials or equipment identified are necessarily the best available for the purpose.

Two different light sources were used. The first was a windowless, demountable hollow-cathode lamp having a solid copper cathode containing a helical platinum wire and some chips of silicon and germanium. The general design of the lamp was similar to that of Reader and Davis [14]. In the version used in the present work the O-ring assembly at the front of the lamp was replaced by a large ball joint by which the lamp could be connected directly to the spectrograph. The lamp was operated in series with a 300 Ω ballast resistor at a dc voltage of 250 V and a current of 90 mA. The cathode was cooled with flowing water. The carrier gas consisted of flowing helium with a trace of neon at a total pressure of approximately 266 Pa (2 Torr). With this gas mixture the spectra of both Cu and Pt could be excited simultaneously. This could not be accomplished when only a single gas was used. Exposure times for this lamp were about 15 min.

The second source was a sealed hollow-cathode lamp similar to the one used by GHRS. It has a platinum hollow cathode with neon carrier gas and is sealed with a magnesium fluoride window. The lamp was manufactured by the Westinghouse Corporation (Model WL34045). It was connected to the spectrograph by a quick-disconnect flange. The cathode was located 215 mm from the slit. The lamp was operated with a 5000 Ω ballast resistor at a dc voltage of 310 V and a current of 20 mA. Exposure times ranged from 2 to 150 min.

In the first phase of the wavelength reductions of the photographic data, the spectra of Pt observed with the demountable Pt-Cu lamp were measured with respect to lines of Cu II, Si I, Si II, Ge I, Ge II, Ne I, and Ne II to determine accurate wavelengths for a select group of Pt lines. Wavelengths for Cu II were Ritz values derived from the level values of Ross [15]. Wavelengths for most Ne I and II lines above 2780 Å were taken from the Fourier-transform measurements of Palmer and Engleman [16]. Wavelengths for other Ne II lines above 2780 Å and all Ne II lines below this wavelength were Ritz values given by Persson [17]. Ne I, Si, and Ge wavelengths were taken from the compilation of reference wavelengths by Kaufman and Edlén [18]. The measurements made with the demountable Pt-Cu lamp provided accurate values for about 1500 lines of Pt I and II extending from 1032 to 2885 Å.

In the second phase of the reductions the spectra of all lines observed with the sealed Pt/Ne lamp were measured with respect to the above group of Pt lines, lines of Ne I and II, and lines of Pt I reported by Engleman [6]. In the region above 2885 Å, our reference spectra consisted solely of lines of Ne I, Ne II, and Pt I with wavelengths taken from the sources cited above.

Next, our values for lines of Pt II with known classifications were combined with values for classified lines of Pt II measured by Engleman by means of Fourier-transform spectroscopy to determine accurate values for 28 even and 72 odd energy levels of Pt II [7]. Using these level values we calculated Ritz-type wavelengths for almost all of the classified lines of Pt II. For some of these levels the energy or J value has been revised as a result of the work of Blaise and Wyart [13]. For those levels that have not been changed, the Ritz values have been substituted for the measured values in the final list of wavelengths.

3. Photoelectric Observations

To determine the relative intensities of lines emitted by the Pt/Ne lamp and to observe lines weaker than those recorded on the photographic plates, we recorded the spectrum by translating an exit slit and photomultiplier tube along the focal curve of the 10.7 m vacuum spectrograph. The entrance and exit slit widths were 0.050 mm. The line intensities were measured by photon counting. Signals from the photomultiplier were amplified and processed by a discriminator and logarithmic ratemeter. The analog output signal from the ratemeter was sampled at 1 Hz by a computer, which digitized and stored the data. This acquisition rate corresponded to a wavelength interval of 0.0086 Å per sample. Prior to each scan the analog response of the ratemeter was calibrated by using a pulse generator to simulate the amplified pulse signal from the photomultiplier tube. The response of the ratemeter was digitized and recorded for pulse frequencies ranging from 10/s to 10^6/s by decades.

The resolution limit for the scans was about 0.07 Å. The spectrum was scanned in overlapping 650 Å segments, each segment corresponding to a different rotational setting of the grating. Each scan lasted 20 h. Two scans were made for each region above 1685 Å, the first a normal scan and the second a scan at reduced sensitivity to record very intense lines that were saturated at normal recording conditions. The sensitivity was reduced by introducing a one decade offset in the logarithmic ratemeter. In addition, for the region above 2000 Å, the source intensity was attenuated by reflecting the lamp from an uncoated glass plate.

Four different Pt/Ne lamps were used in the course of the experiments. Two lamps were used for the photographic exposures. One of these and two additional ones were used for the photoelectric scans. The longest use of any lamp was during the photoelectric scans, where one of the lamps was run for about 250 h. After this time the cavity of the cathode had become noticeably enlarged.

The position and intensity of each spectral line in the photoelectric scans was determined by using a computer line-finding algorithm. First, the recorded signal at each point in the spectrum was converted to absolute counts/s by using the calibration information mentioned above. Then these data were scanned by the computer to locate peaks in the spectrum. The position of each peak was determined by calculating the quadratically smoothed first derivative of the data in the vicinity of the maximum intensity point and linearly interpolating the zero crossing of the derivative. The wavelength was then calculated by making a linear fit of wavelength versus position for the local spectral region, using as standards four lines accurately measured from the photographic observations on either side of the line to be determined.

The intensities derived from the raw data for each scan were adjusted to produce a consistent set of values over the whole spectral region. First, using the measured intensities for lines of moderate strength in the overlapping regions of the various scans, a set of multiplicative factors was determined to bring the separate scans onto the same relative scale. Then the spectral response of the spectrograph/detector combination as a function of wavelength was calibrated by using accurate radiance values for about 80 lines of platinum measured by Klose [19] in a similar Pt/Ne hollow-cathode lamp. All of the spectral data were corrected for this instrumental response. Thus the intensities plotted in the atlas are on a true relative scale.

The number of lines observed by photon counting was much greater than observed photographically. Whereas the weakest photographic lines produced count rates of about 500 photons/s, lines having signals as low as about 10 photons/s could be observed photoelectrically. The most intense lines produced counts of about 2,000,000 photons/s. In all scans we observed a residual background count in excess of the photomultiplier dark count. This background was only a few counts/s at low wavelengths but increased to about 60 counts/s at the highest wavelengths. This increasing background is apparent in the atlas plots. The background count has been subtracted from the measured line intensities printed in the table so that the value reported accurately reflects the count rate due to the spectral line.

4. Description of the Atlas

The atlas is a series of tables and plots that provides a comprehensive description of the spectrum of the Pt/Ne hollow-cathode lamp in the region 1128–4333 Å. Each page of plots depicts a 32 Å section of the spectrum. Every spectral line for which a wavelength and intensity have been determined is indicated with a tic mark at the bottom of the plot. The wavelengths, wave numbers, and relative intensities for these lines are listed in the table on the page facing the plot.

The wavelengths and intensities of Rowland ghosts (spurious lines caused by imperfections in the ruling of the grating) were predicted from the known properties of the gratings. Ghost lines are marked on the plots with a carat instead of a tic mark to distinguish them from true spectral lines. They are not listed in the table.

Wavelengths of lines measured on our photographic plates, taken from the literature, or calculated from optimized Pt II energy levels are given to four decimal places. Lines measured in the photoelectric data only are given to two decimal places. Wavelengths below 2000 Å are given in vacuum; wavelengths above 2000 Å are given in air. For lines originally observed in vacuum, conversion of the wavelengths from vacuum to standard air was carried out by using the three-term formula of Peck and Reeder [20] for the index of refraction of air.

Also listed in the table under the column heading CODE are the sources for wavelengths of various lines emitted by the Pt/Ne lamp that we have taken from the literature, mainly Pt I, Ne I, and Ne II. Most of these lines were used as wavelength standards. Literature values were also substituted for lines of impurity species such as H I, C I, O I, Si I, Al I, and Al II. The presence of additional impurity lines of Mg I, Mg II, Fe I, Cr I, Pd I, Rh I, Au I, Ag I, Ni I, Ca I, and Ca II were subsequently pointed out by J. Blaise. These lines are identified in the table. Literature values for their wavelengths have been substituted only for Ca II and Fe I.

The intensity of impurity lines varies greatly from lamp to lamp. For example, we did not observe the intense Al I lines at 3944 and 3961 Å on our photographic plates. However, in a lower wavelength exposure using a different lamp the normally less intense lines at 3082 and 3092 Å did appear. For this reason we have given no intensities for the impurity lines.

The energy level designations for classified lines of Pt I and II correspond to the integer parts of the level energies and are given with the even parity level first. Classifications and wavelengths for Pt I lines with CODES D and E were taken from Engleman [6]. Pt I lines with CODE N and Pt II lines with CODE K are newly classified by Blaise and Wyart [13]; the wavelengths are from the present work. Classifications for other Pt II lines were taken from Shenstone [5], with level values given by Reader, Acquista, Sansonetti, and Engleman [7]; a number given in the CODE column is the wavelength uncertainty of the Ritz wavelength in units of 0.0001 Å (see Sec. 5).

The intensities in the atlas are a uniform set of relative values covering the entire region of observation. For lines that were blended on the photoelectric scans but resolved or nearly resolved on the photographic exposures, the intensities were estimated visually from the photographic plates by comparison with nearby well-resolved lines. In a few places a real spectral line is blended with a grating ghost. This is noted with an M in the CODE column in the table. The intensities measured for such lines are probably affected by the presence of the ghost. As mentioned, the spectral sensitivity of the spectrometer and detector combination was taken into account by using the accurate radiance values of Klose [19] for about 80 of the lines to normalize the observations. From the reproducibility of our measurements and comparisons with the data of Klose we estimate the relative intensities for a given species (element and stage of ionization) to be accurate to about 20%. A prime factor in possible variation of the relative intensities is the length of time that a particular lamp has been used. Over many hours of use the intensities of the Ne lines are observed to change relative to the Pt lines. However, for a given atom and ionization stage the relative intensities should be reliable within our estimated uncertainty. For most lines the present intensities are identical to those given by Reader, Acquista, Sansonetti, and Sansonetti [8]. The intensities of a few lines have been slightly revised in the present work.

Our relative intensities for lines emitted by the Pt/Ne lamp are potentially useful for calibration of the spectral response of spectrographic systems in other laboratories. In general, the values are sufficiently reliable to provide a good semi-quantitative calibration. Of course the accuracy that can be obtained is limited by the degree to which other Pt/Ne lamps might vary from those we used. We found only small variations in the relative intensities of lines in our lamps, all of which were purchased separately over a 5 year period. Nevertheless, it is not certain that other lamps would exhibit identical properties. In particular, comparison of lines in the 1130–1300 Å region with lines in higher wavelength regions could be affected by variation in the low wavelength transmission of the magnesium fluoride windows of different lamps. Since we used only a small number of lamps and did not scan each lamp over the entire spectral region, we can make no definitive statement regarding lamp to lamp variation. Further investigation would be needed to evaluate the importance of such systematic variations.

5. Accuracy of Wavelengths

Our estimate of the uncertainty of the photographically measured wavelengths is based on several considerations:

a. The standard deviation of our polynomial fits for the Cu II reference lines in the Pt/Cu lamp was typically 0.0010 Å.
b. The standard deviation of our polynomial fits for the Pt lines used as internal standards for measurements in the Pt/Ne lamp was typically 0.0015 Å.
c. A comparison of a group of about 100 lines measured by different operators on different plates and taken with different grating rotations in the region 1470–1520 Å showed an average deviation of 0.0001 Å and an rms difference of 0.0014 Å. In general, our separate measurements of the wavelengths of individual lines agreed to about this level of accuracy.
d. A comparison of the wavelengths of 37 lines of Pt II in the region 2247–3700 Å that were measured in this work and independently by Engleman [7] shows an average deviation of 0.0003 Å and an rms difference of 0.0019 Å.
e. For the 508 lines of Pt II whose wavelengths can be calculated from the optimized level values, the rms difference between the calculated and observed wavelengths is about 0.0015 Å.
f. A comparison of our measured wavelengths for impurity lines appearing in the Pt/Ne lamp with standard wavelengths for these lines shows an average deviation of 0.0003 Å and an rms difference of 0.0015 Å.

Based on these comparisons we estimate an uncertainty of ± 0.0020 Å for the wavelengths measured photographically.

As mentioned above, the wavelengths of classified lines of Pt II in the atlas which have numbers in the CODE column are those derived from the optimized level values. The uncertainties of these wavelengths are taken to be the square root of the sum of the squares of the uncertainties of the combining levels as given by Reader, Acquista, Sansonetti, and Engleman [7]. They are listed in the far right column under the heading CODE in units of 0.0001 Å.

The uncertainties of the photoelectrically measured lines were estimated by comparing the measured wavelengths of Pt II lines observed only in the photoelectric scans with calculated Ritz wavelengths for the same lines. The standard deviation of the differences was about 0.006 Å for lines below 2030 Å and about 0.015 Å for lines at longer wavelengths. Based on these comparisons we estimate the uncertainty to be ±0.01 Å for lines below 2030 Å and ±0.02 Å for lines above 2030 Å.

The uncertainties of lines whose wavelengths have been taken from the literature are discussed in some detail in the notes to the atlas. Most of these uncertainties are less than 0.001 Å and virtually all are less than 0.002 Å.

The cathodes of the lamps used in this work and with GHRS contain isotopes of Pt in their natural abundances. Some lines of Pt I and II show appreciable isotope and magnetic hyperfine structure (hfs). At the resolution of our spectrograph (and also GHRS) almost all Pt lines appear sharp and symmetric. A few lines show evidence of unresolved structure and appear wide, hazy, or asymmetric on the photographic plates. These lines are noted (W, H, L, or S) adjacent to their intensities in the atlas. Lines showing partially resolved structure are noted in the atlas as being complex (C). A few hyperfine patterns occurred in the photographic data as three fully resolved features and were measured as separate lines.

For GHRS and other instruments with resolving power of 10^5 or less, the existence of hfs in some lines should present no problem in using the present list of Pt lines for wavelength calibration. To achieve the highest accuracy, lines with notations indicating detectable unresolved structure should not be used. For instruments with resolving limits significantly below 0.02 Å, structure may be observed in many additional Pt lines, and our present wavelength list may not be adequate for calibration purposes. Thus, for calibration of spectrographs having much higher resolution, it may be desirable to develop calibration wavelengths based on a lamp whose cathode contains a single even isotope of Pt.

Acknowledgments

This investigation was undertaken at the suggestion of William C. Martin, who realized that the hollow-cathode spectrum of platinum would probably have to be newly measured in order for the Goddard High Resolution Spectrograph to meet its design goals. His encouragement and suggestions throughout the work are gratefully acknowledged. Our photoelectric scans of the Pt/Ne lamp on the 10.7 m spectrograph owe much of their success to suggestions of Richard Deslattes regarding photon counting techniques. We thank him for lending us his expertise as well as much of the equipment required to carry out the experiment. Many of the impurity lines in our list were identified by Jean Blaise. We thank him and Jean-François Wyart for making available their new classifications in Pt I and Pt II for inclusion in the atlas. This work was supported in part by the National Aeronautics and Space Administration.

6. References

[1] C. J. Burrows, J. A. Holtzman, S. M. Faber, P. Y. Bely, H. Hasan, C. R. Lynds, and D. Schroeder, Astrophys. J. **369**, L21 (1991).

[2] G. M. Wahlgren, D. S. Leckrone, S. N. Shore, D. J. Lindler, R. L. Gilliland, and D. C. Ebbets, Astrophys. J. **377**, L41 (1991).

[3] S. R. Heap, B. Altner, D. Ebbets, I. Hubeny, J. B. Hutchings, R. P. Kudritzki, S. A. Voels, S. Haser, A. Pauldrach, J. Puls, and K. Butler, Astrophys. J. **377**, L29 (1991).

[4] G. H. Mount, G. Yamasaki, W. Fowler, and W. G. Fastie, Appl. Opt. **16**, 591 (1977).

[5] A. G. Shenstone, Philos. Trans. R. Soc. London Ser. A **237**, 453 (1938).

[6] R. Engleman, Jr., J. Opt. Soc. Am. B **2**, 1934 (1985).

[7] J. Reader, N. Acquista, C. J. Sansonetti, and R. Engleman, Jr., J. Opt. Soc. Am. B **5**, 2106 (1988).

[8] J. Reader, N. Acquista, C. J. Sansonetti, and J. E. Sansonetti, Astrophys. J. Suppl. **72**, 831 (1990).

[9] G. A. Kriss, G. F. Hartig, L. Armus, W. P. Blair, S. Caganoff, and L. Dressel, Astrophys. J. **377**, L13 (1991).

[10] T. R. Ayres, E. Jensen, and O. Engvold, Astrophys. J. Suppl. **66**, 51 (1988).

[11] D. M. Hassler, G. J. Rottman, and F. Q. Orrall, Astrophys. J. **372**, 710 (1991).

[12] D. S. Leckrone, G. M. Wahlgren, and S. G. Johansson, Astrophys. J. **377**, L37 (1991).

[13] J. Blaise and J.-F. Wyart, J. Res. Natl. Inst. Stand. Technol. **97**, 217 (1992) and private communication.

[14] J. Reader and S. P. Davis, J. Opt. Soc. Am. **53**, 431 (1963).

[15] C. B. Ross, Los Alamos Scientific Laboratory Rep. 4498, National Technical Information Service, Springfield, VA (1970).

[16] B. A. Palmer and R. Engleman, Jr., Los Alamos National Laboratory Rep. 9615, National Technical Information Service, Springfield, VA (1983).
[17] W. Persson, Phys. Scr. **3**, 133 (1971).
[18] V. Kaufman and B. Edlén, J. Phys. Chem. Ref. Data **3**, 825 (1974).
[19] J. Klose, Appl. Opt. **29**, 2951 (1990).
[20] E. R. Peck and K. Reeder, J. Opt. Soc. Am. **62**, 958 (1972).

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Spectral Atlas of a Platinum/Neon Hollow-Cathode Reference Lamp

Explanatory Notes

Wavelengths are given in Å. Wave numbers are given in cm^{-1}. Energy level designations for the classified lines of Pt I and II correspond to the integer parts of the level energies and are given with the even parity level first. A letter appearing in the CODE column indicates the source of a literature value reported for the wavelength or a note pertaining to the line. A number appearing in the CODE column is the uncertainty of the Pt II wavelength determined from the optimized Pt II energy levels (Ritz wavelength) in units of 0.0001 Å.

The following protocols were used in substituting literature values for our measured wavelengths. For each spectrum the various literature sources are listed in order of preference. For all doubly-classified lines our experimental wavelength is given.

Pt I

1) Ritz wavelength from Table 4 of R. Engleman, Jr., J. Opt. Soc. Am. B **2**, 1934 (1985).
2) Measured wavelength from Table 1 of R. Engleman, Jr., J. Opt. Soc. Am. B **2**, 1934 (1985).

Pt II

1) Wavelength calculated from the optimized level values given by J. Reader, N. Acquista, C. J. Sansonetti, and R. J. Engleman, Jr., J. Opt. Soc. Am. B **5**, 2106 (1988) except where the energy or *J* value of one of the combining levels was changed by J. Blaise and J.-F. Wyart, J. Res. Natl. Inst. Stand. Technol. **97**, 217 (1992).

Ne I

1) B. A. Palmer and R. Engleman, Jr., Los Alamos National Laboratory Rep. 9615, National Technical Information Service, Springfield, VA (1983) except for a few lines that may be blended with lines of thorium.
2) V. Kaufman and B. Edlén, J. Phys. Chem. Ref. Data **3**, 825 (1974).
3) K. Burns, K. Adams, and J. Longwell, J. Opt. Soc. Am. **40**, 6 (1950).

Ne II

1) B. A. Palmer and R. Engleman, Jr., Los Alamos National Laboratory Rep. 9615, National Technical Information Service, Springfield, VA (1983) except for a few lines that may be blended with lines of thorium.
2) Ritz wavelength from W. Persson, Phys. Scr. **3**, 133 (1971).

Fe I

1) R. C. M. Learner and A. P. Thorne, J. Opt. Soc. Am. B **5**, 2045 (1988).
2) T. R. O'Brian, M. E. Wickliffe, J. E. Lawler, W. Whaling, and J. W. Brault, J. Opt. Soc. Am. B **8**, 1185 (1991).
3) H. M. Crosswhite, J. Res. Natl. Bur. Stand. (U.S.) **79A**, 17 (1975).

Line character descriptors (appear to right of intensity):

C – Complex
D – Double; central position of two close lines not resolved on the measuring comparator
H – Hazy
L – Asymmetric, tail toward longer wavelengths
P – Perturbed by close line
S – Asymmetric, tail toward shorter wavelengths
U – Unresolved from close line; shoulder on stronger line
W – Wide

CODES:

A – Doubly classified line. The wavelength is the present experimental value.
B – V. Kaufman and B. Edlén, J. Phys. Chem. Ref. Data **3**, 825 (1974). Uncertainty is less than 0.002 Å.
C – Value determined from optimized Ne II level values; W. Persson, Phys. Scr. **3**, 133 (1971). For lines below 2000 Å the uncertainty in wavelength corresponds to a wave number uncertainty of about 0.03 cm^{-1}, which is 0.0004 Å at 1200 Å and 0.001 Å at 2000 Å. The uncertainty for lines above 2000 Å appears to be about 0.002 Å.
D – Value determined from optimized Pt I level values; R. Engleman, Jr., J. Opt. Soc. Am. B **2**, 1934 (1985). The wavelength uncertainty is 0.0005 Å.
E – R. Engleman, Jr., J. Opt. Soc. Am. B **2**, 1934 (1985). The wavelength uncertainty corresponds to a wave number uncertainty of 0.01 cm^{-1}, which is 0.0005 Å at 2250 Å and 0.0017 Å at 4095 Å.
F – Value determined from optimized Al I level values; K. B. S. Eriksson and H. B. S. Isberg, Ark. Fys. **23**, 527 (1963). Uncertainty is less than 0.002 Å.
G – B. A. Palmer and R. Engleman, Jr., Los Alamos National Laboratory Rep. 9615, National Technical Information Service, Springfield, VA (1983). The wavelength uncertainty is 0.0001 Å.
H – Measured component of hyperfine pattern of a Pt I line.
I – K. Burns, K. Adams, and J. Longwell, J. Opt. Soc. Am. **40**, 6 (1950). The wavelength uncertainty is 0.0004 Å.
J – Measured component of the incomplete hyperfine pattern of the Pt II line 36484–61190.
K – Newly identified Pt II line. J. Blaise and J.-F. Wyart, J. Res. Natl. Inst. Stand. Technol. **97**, 217 (1992). For photographically measured lines the wavelength uncertainty is ±0.002 Å. For lines found only in the photoelectric scans (two decimal digits) the uncertainty is ±0.01 Å below 2030 Å and ±0.02 Å above 2030 Å.
L – W. Persson, C.-G. Wahlström, L. Jönsson, and H. O. DiRocco, Phys. Rev. A **43**, 4791 (1991). The wavelength is the experimental value from the present work.
M – Probably blended with a grating ghost; the intensity may be affected.
N – Newly identified Pt I line. J. Blaise, private communication (1990). For photographically measured lines the wavelength uncertainty is ±0.002 Å. For lines found only in the photoelectric scans the uncertainty is ±0.01 Å below 2030 Å and ±0.02 Å above 2030 Å.
P – Pt II line for which a Ritz wavelength was given in J. Reader, N. Acquista, C. J. Sansonetti, and J. E. Sansonetti, Astrophys. J. Suppl. **72**, 831 (1990). The experimental value is given here because the energy or *J* value of a combining level was changed in the analysis of J. Blaise and J.-F. Wyart, J. Res. Natl. Inst. Stand. Technol. **97**, 217 (1992).
Q – R. C. M. Learner and A. P. Thorne, J. Opt. Soc. Am. B **5**, 2045 (1988).
R – T. R. O'Brian, M. E. Wickliffe, J. E. Lawler, W. Whaling, and J. W. Brault, J. Opt. Soc. Am. B **8**, 1185 (1991). Some additional measured wavelengths not included in this reference were communicated privately by the authors.
S – H. M. Crosswhite, J. Res. Natl. Bur. Stand. (U.S.) **79A**, 17 (1975).
T – N. E. Wagman, U. Pitt. Bull. **34**, 1 (1937).

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1131.87	88349.4	41			
1132.8322	88274.326	2300	Pt II	9356- 97630	05
1134.66	88132.1	22	Pt II	18097-106229	K
1135.4782	88068.623	2400	Pt II	13329-101397	05
1136.06	88023.5	35	Pt II	8419- 96443	K
1136.2004	88012.640	22	Pt II	13329-101341	05
1138.39	87843.4	120			
1138.83	87809.4	330			
1139.62	87748.5	99			
1139.75	87738.5	140			
1140.6146	87672.034	53	Pt II	15791-103463	07
1140.65	87669.3	53			
1140.79	87658.6	39			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1141.17	87629.4	91	Pt II	15791-103421	K
1141.8885	87574.227	1400	Pt II	13329-100903	06
1143.2957	87466.439	5800	Pt II	13329-100795	06
1144.60	87366.8	93			
1145.00	87336.2	49	Pt II	16820-104158	K
1145.7055	87282.468	800	Pt II	13329-100611	05
1145.87	87269.9	310	Pt II	16820-104092	K
1147.62	87136.9	120	Pt II	8419- 95557	K
1150.1564	86944.697	1500	Pt II	18097-105042	K
1150.6130	86910.194	7200	Pt II	13329-100239	05
1150.9198	86887.027	1700	Pt II	15791-102678	K
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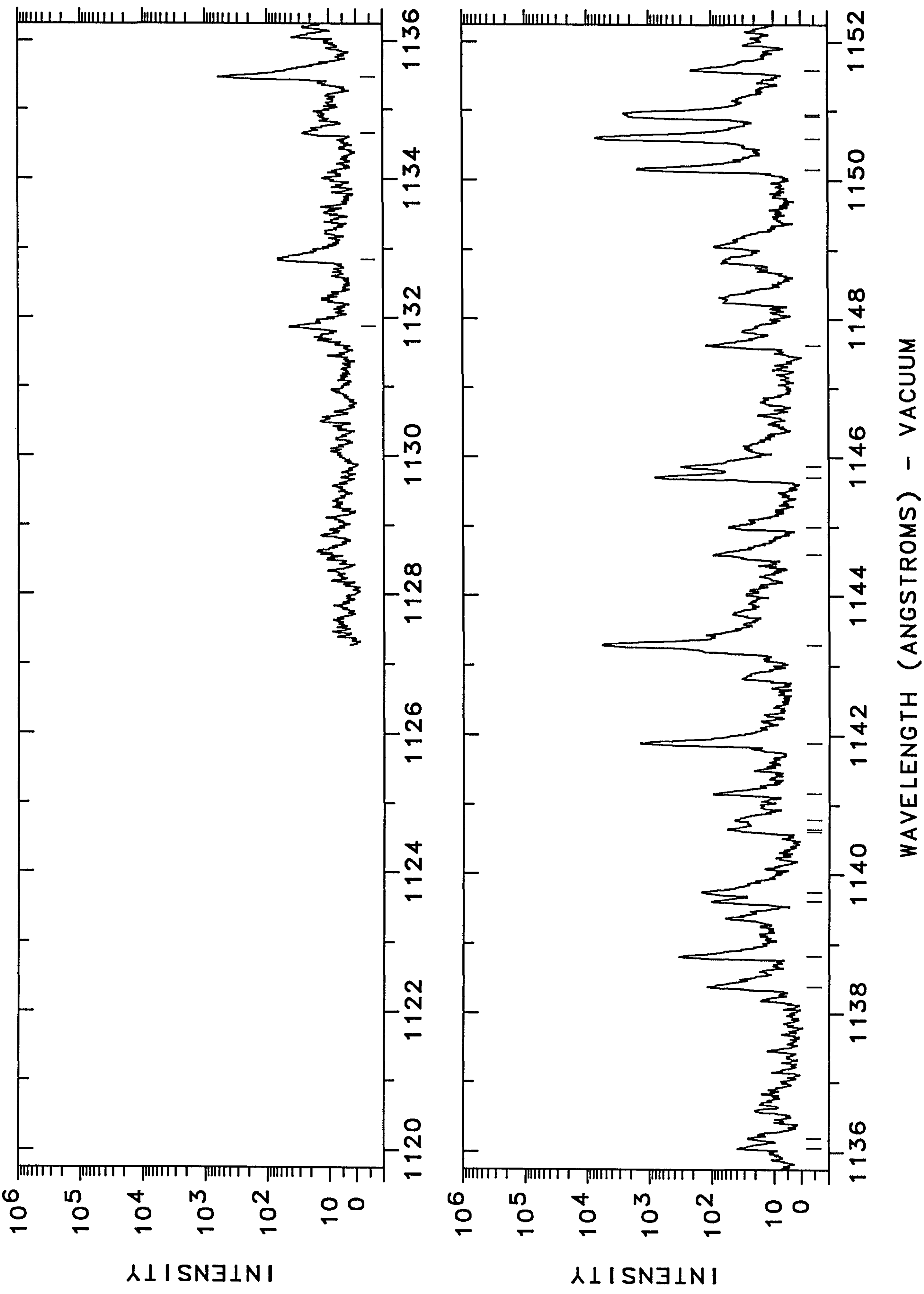
1151.59	86836.5	200	Pt II	24879-111716	K



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WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
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1152.58	86761.9	500	Pt II	23875-110638	K
1152.86	86740.8	600	Pt II	23461-110202	K
1153.4526	86696.238	1500	Pt II	16820-103517	08
1154.03	86652.9	150			
1154.1691	86642.416	50	Pt II	16820-103463	07
1154.4201	86623.581	230	Pt II	15791-102414	06
1155.69	86528.4	240			
1156.4898	86468.551	990	Pt II	13329- 99797	05
1156.89	86438.6	77	Pt II	21717-108155	K
1157.13	86420.7	300			
1157.26	86411.0	83			
1157.43	86398.3	470	Pt II	9356- 95754	K
1157.84	86367.7	61			
1158.48	86320.0	110	Pt II	23875-110196	AK
1158.48	86320.0	110	Pt II	21717-108038	AK
1159.03	86279.0	180			
1159.1308	86271.541	860	Pt II	23461-109733	K
1159.2760	86260.735	1700	Pt II	9356- 95617	K
1159.40	86251.5	180			
1159.96	86209.9	570	Pt II	23875-110085	K
1160.87	86142.3	39			
1161.90	86065.9	450	Pt II	23461-109528	K
1161.9681	86060.882	1700	Pt II	18097-104158	K
1162.15	86047.4	360			
1162.30	86036.3	66			
1162.50	86021.5	28			
1162.95	85988.2	110			
1164.4184	85879.784	11000	Pt II	13329- 99209	06
1164.5543	85869.762	3100	Pt II	9356- 95226	K
1164.7198	85857.560	1000	Pt II	16820-102678	K
1164.8721	85846.335	1000	Pt II	23461-109307	K
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1166.32	85739.8	480	Pt II	13329- 99068	K
1166.47	85728.7	52			
1166.8635	85699.827	12000	Pt II	16820-102520	K
1167.0766	85684.179	1500	Pt II	21168-106852	K
1167.52	85651.6	110	Pt II	23875-109528	K
1168.1346	85606.574	2400	Pt II	15791-101397	05
1168.1882	85602.645	2100	Pt II	15791-101394	K
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1168.3067	85593.963	8000	Pt II	16820-102414	06
1169.58	85500.8	630			
1169.7477	85488.517	37000	Pt II	13329- 98817	06
1170.6940	85419.418	130	Pt II	18097-103517	08
1171.15	85386.2	72	Pt II	4786- 90173	K
1171.4321	85365.595	840	Pt II	18097-103463	07
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1172.80	85266.0	60	Pt II	23461-108727	K
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1173.89	85186.9	250	Pt II	24879-110066	K
1174.59	85136.1	430	Pt II	21717-106852	K
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1178.4428	84857.744	4300	Pt II	13329- 98186	06
1178.9614	84820.419	31000	Pt II	15791-100611	06
1179.30	84796.1	210	Pt II	23875-108672	K
1179.5986	84774.600	530	Pt II	18097-102872	K
1180.2490	84727.884	2400	Pt II	21168-105896	K
1180.7195	84694.121	2000	Pt II	23461-108155	K
1181.1100	84666.119	4600	Pt II	9356- 94022	P
1182.07	84597.4	110			
1182.3552	84576.956	11000	Pt II	16820-101397	05
1182.6276	84557.472	1300	Pt II	21168-105726	K
1183.1383	84520.973	240	Pt II	16820-101341	06
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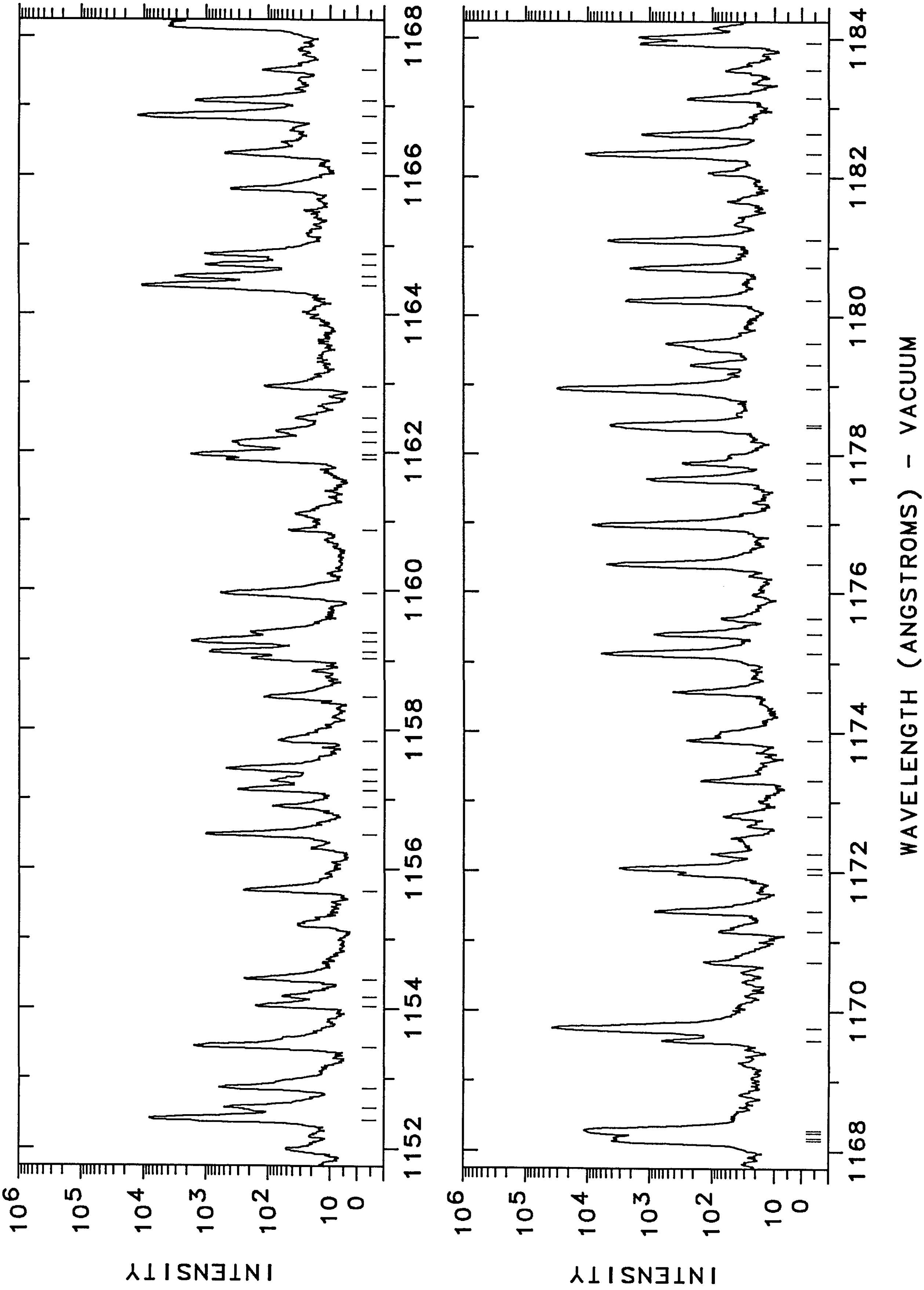
1183.9423	84463.576	1400	Pt II	13329- 97792	K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WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
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1184.51	84423.1	300	Pt II	18097-102520	K
1184.9977	84388.349	740			
1185.48	84354.0	67			
1185.57	84347.6	200	Pt II	8419- 92767	K
1185.9985	84317.142	1200	Pt II	18097-102414	06
1186.2203	84301.373	25000	Pt II	13329- 97630	06
1186.57	84276.5	200			
1187.57	84205.6	25			
1187.95	84178.6	89	Pt II	21717-105896	K
1188.1761	84162.609	1100	Pt II	23875-108038	K
1188.6968	84125.739	3200	Pt II	9356- 93482	07
1188.95	84107.8	340			
1189.3073	84082.560	4700	Pt II	16820-100903	06
1189.93	84038.6	130			
1190.3840	84006.502	490	Pt II	15791- 99797	05
1190.6418	83988.319	3800	Pt II	18097-102086	08
1190.7595	83980.013	2000	Pt II	9356- 93336	06
1191.5733	83922.659	980	Pt II	24879-108802	K
1191.99	83893.3	45			
1192.2690	83873.690	2400	Pt II	21168-105042	K
1192.62	83849.0	250	Pt II	21168-105018	AK
1192.62	83849.0	250	Pt II	24879-108727	AK
1193.05	83818.8	350	Pt II	18097-101916	K
1193.22	83806.8	230			
1193.28	83802.6	290	Pt II	4786- 88589	K
1193.4484	83790.801	24000	Pt II	16820-100611	06
1194.32	83729.7	120	Pt II	23461-107191	K
1194.58	83711.4	63			
1195.05	83678.5	560			
1196.5616	83572.797	3100			
1197.12	83533.8	68	Pt II	23461-106996	K
1197.26	83524.0	69			
1197.65	83496.8	120			
1197.92	83478.0	250			
1198.1623	83461.147	1700			
1198.3009	83451.494	860	Pt II	18097-101549	P
1198.65	83427.2	180			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
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1199.34	83379.2	240	Pt II	21168-104548	K
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1199.7276	83352.251	330	Pt II	0- 83352	07
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1200.4693	83300.756	520	Pt II	21717-105018	K
1200.8040	83277.537	4500	Pt II	15791- 99068	K
1201.2856	83244.152	6500	Pt II	18097-101341	06
1201.68	83216.8	270	Pt II	29030-112247	K
1201.89	83202.3	31			
1202.80	83139.3	75			
1203.7443	83074.121	2900	Pt II	13329- 96403	K
1205.0270	82985.692	610	Pt II	29261-112247	K
1205.1569	82976.748	1100	Pt II	16820- 99797	A
1205.1569	82976.748	1100	Pt II	23875-106852	AK
1205.84	82929.7	32	Ne III		L
1206.59	82878.2	350			
1206.99	82850.7	78			
1207.2890	82830.209	510	Pt II	21717-104548	AK
1207.2890	82830.209	510	Pt II	27255-110085	AK
1207.37	82824.7	250	Pt II	0- 82824	K
1207.49	82816.4	500			
1207.6458	82805.739	5000	Pt II	18097-100903	06
1208.1902	82768.425	1400	Pt II	23461-106229	K
1210.6999	82596.852	630	Pt II	8419- 91016	K
1212.04	82505.5	130			
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1212.7905	82454.472	890	Pt II	29261-111716	K
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1214.13	82363.5	61			
1214.7092	82324.230	2100	Pt II	29030-111354	K
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1215.2467	82287.819	4400	Pt II	13329- 95617	K
1215.6701	82259.159	H	H I		B
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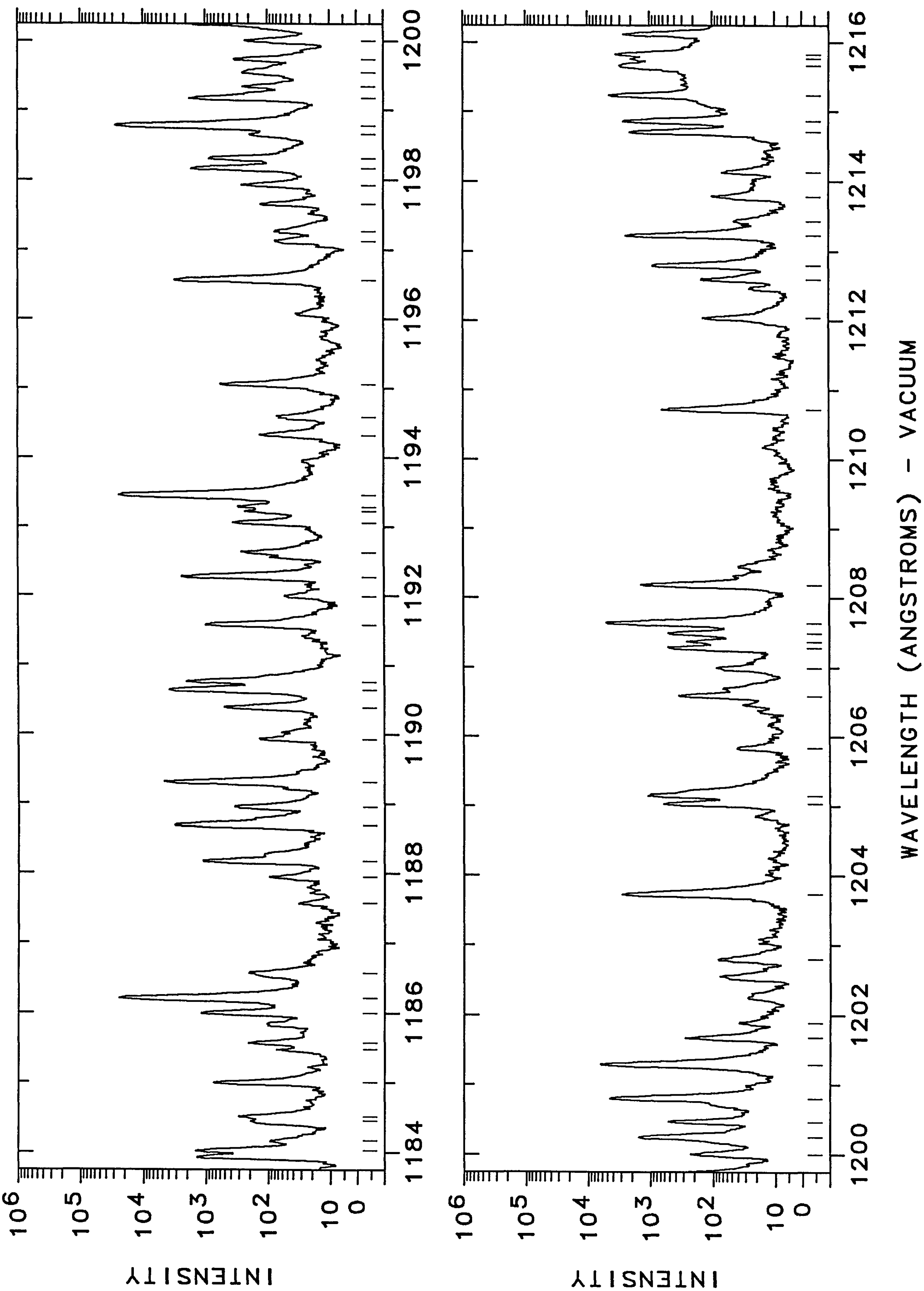
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WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
1216.1236	82228.484	2600	Pt II 13329- 95557	K
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1217.4951	82135.854	2200	Pt II 23461-105597	K
1217.7927	82115.782	1500	Pt II 24879-106995	K
1218.15	82091.7	230		
1219.00	82034.5	51		
1219.4931	82001.284	43000	Pt II 15791- 97792	K
1219.5786	81995.535	900	Pt II 15791- 97786	K
1220.09	81961.2	130		
1220.47	81935.6	240		
1220.7795	81914.875	3900	Pt II 9356- 91271	K
1221.04	81897.4	150		
1221.7369	81850.683	760	Pt II 23875-105726	K
1223.1214	81758.033	1200		
1223.5053	81732.380	1600	Pt II 29030-110762	K
1223.6648	81721.726	530	Pt II 23875-105597	K
1223.98	81700.7	240		
1224.1006	81692.632	380		
1224.43	81670.7	170		
1225.39	81606.7	56	Pt II 29030-110638	K
1225.82	81578.0	360	Pt II 29030-110609	K
1226.7936	81513.304	1000	Pt II 13329- 94842	K
1226.9816	81500.815	860	Pt II 29261-110762	K
1228.5930	81393.920	400 L		
1228.6470	81390.342	1300	Pt II 9356- 90746	K
1229.0134	81366.077	17000	Pt II 16820- 98186	06
1229.2515	81350.318	1500	Pt II 24879-106229	K
1229.3001	81347.102	4500	Pt II 29261-110609	K
1229.6873	81321.49	510	Ne II	C
1229.8367	81311.61	2400	Ne II	C
1229.9505	81304.085	630	Pt II 13329- 94633	K
1230.8272	81246.173	130	Pt II 21168-102414	07
1231.64	81192.6	97	Ne III	L
1231.82	81180.7	67	Ne III	L

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
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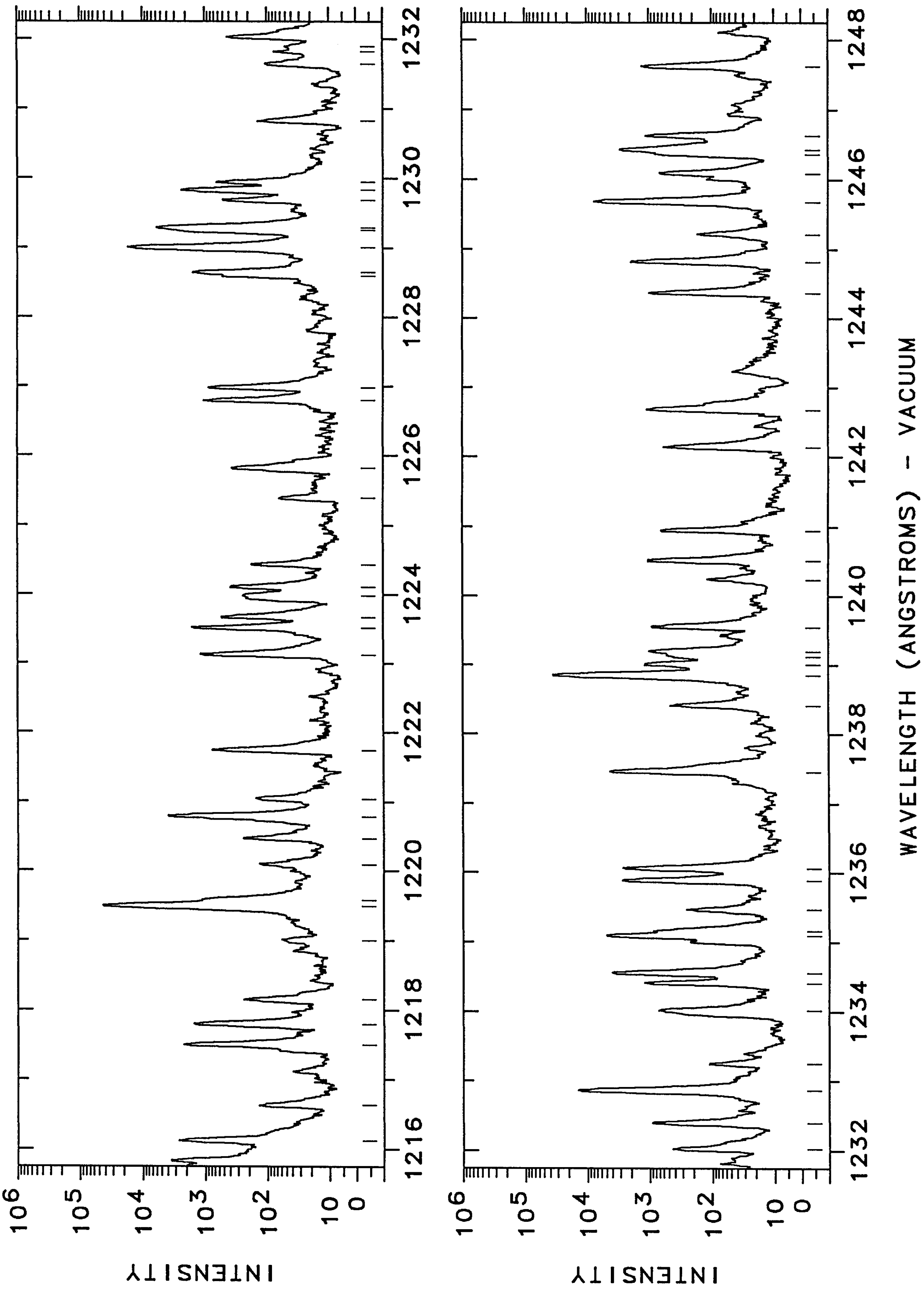
1232.3983	81142.598	910	Pt II 23875-105018	K
1232.8739	81111.296	14000	Pt II 18097- 99209	06
1233.25	81086.6	100	Pt II 23461-104548	K
1234.0154	81036.266	720	Pt II 29030-110066	K
1234.4019	81010.893	1200		
1234.5580	81000.650	4000		
1235.0916	80965.655	4900	Pt II 16820- 97786	K
1235.1607	80961.125	600	Pt II 21717-102678	K
1235.47	80940.9	250		
1235.8863	80913.592	2700	Pt II 4786- 85700	P
1236.0630	80902.025	2700		
1237.4751	80809.706	4300	Pt II 16820- 97630	06
1238.4170	80748.246	450	Pt II 21168-101916	06
1238.8499	80720.029	36000	Pt II 18097- 98817	07
1239.0156	80709.23	1200	Ne II	C
1239.1184	80702.538	350	Pt II 29030-109733	K
1239.2011	80697.152	990	Pt II 23461-104158	K
1239.5438	80674.842	890	Pt II 24879-105554	K
1240.24	80629.6	110		
1240.5098	80612.019	1000	Pt II 15791- 96403	K
1240.9502	80583.411	620		
1242.1331	80506.670	580	Pt II 9356- 89863	P
1242.6815	80471.142	1100	Pt II 29261-109733	K
1244.3623	80362.448	980	Pt II 16820- 97183	K
1244.8278	80332.396	2000	Pt II 27255-107588	K
1245.21	80307.7	160		
1245.6812	80277.362	7500	Pt II 29030-109307	K
1246.0801	80251.662	670	Pt II 9356- 89607	07
1246.3668	80233.203	650	Pt II 34647-114880	K
1246.4295	80229.166	2900	Pt II 21168-101397	06
1246.6262	80216.508	1100	Pt II 23875-104092	K
1247.6173	80152.786	1300	Pt II 13329- 93482	08



INTENSITY
INTENSITY
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
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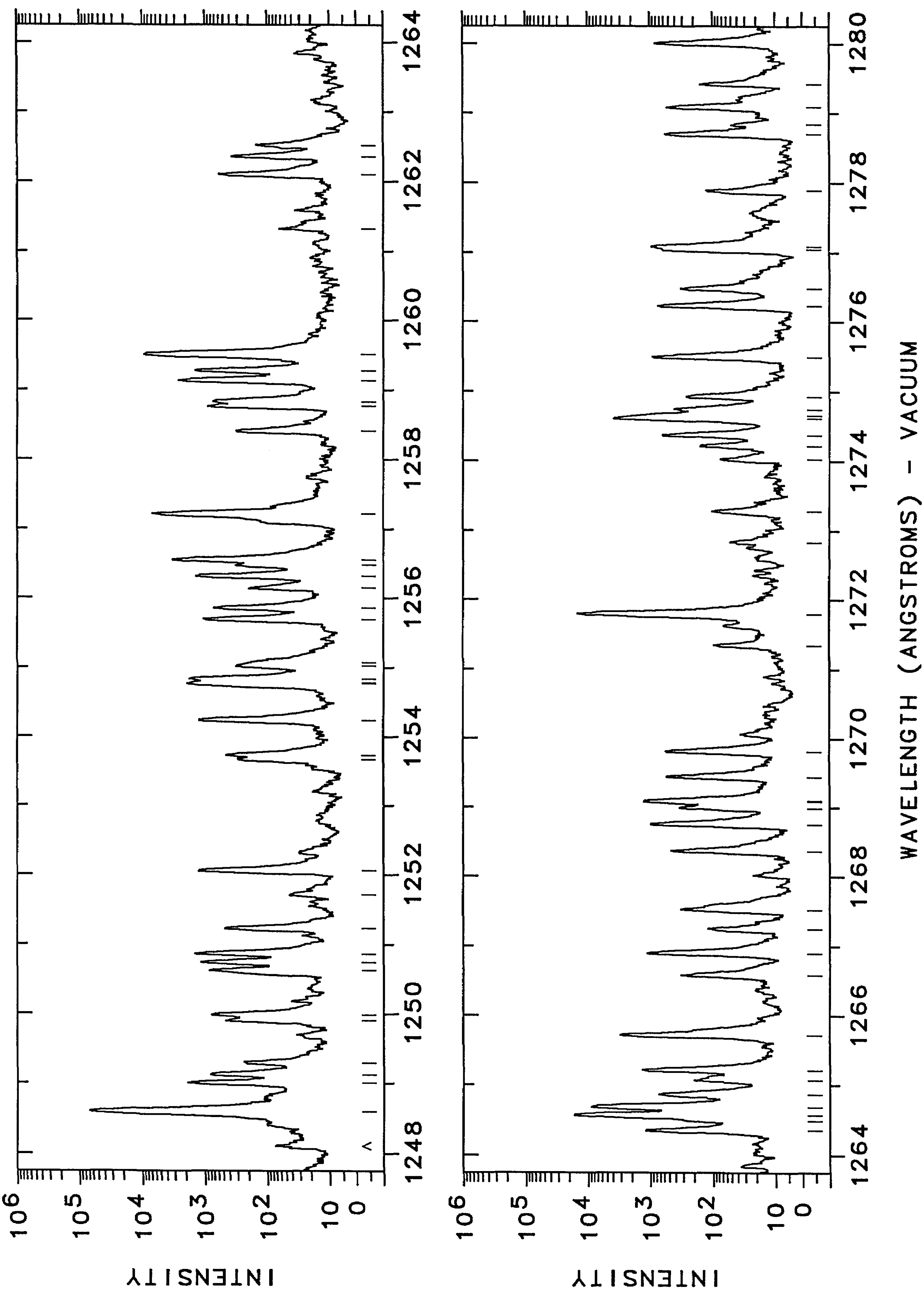
1249.29	80045.5	230	Pt II	29261-109307	K
1249.8897	80007.060	440	Pt II	13329- 93336	06
1249.9718	80001.807	770	Pt II	23461-103463	08
1250.6310	79959.636	840	Pt II	23461-103421	K
1250.7471	79952.214	1100	Pt II	24879-104831	K
1250.8692	79944.410	1400	Pt II	21168-101113	K
1251.2230	79921.805	470			
1251.72	79890.1	37			
1252.0617	79868.269	1300	Pt II	13329- 93197	K
1253.6619	79766.323	350	Pt II	15791- 95557	K
1253.7338	79761.749	400	Pt II	23875-103637	K
1254.2439	79729.309	1200			
1254.7526	79696.986	800	Pt II	29030-108727	K
1254.7815	79695.150	1700	Pt II	18097- 97792	K
1254.8469	79690.997	1800			
1255.0214	79679.916	310	Ne III		L
1255.0721	79676.698	150	Pt II	21717-101394	K
1255.6911	79637.420	1100	Ne III		L
1255.8557	79626.982	710	Pt II	21168-100795	07
1256.1477	79608.473	190	Pt II	29030-108639	K
1256.3246	79597.263	1400	Pt II	27255-106852	K
1256.4747	79587.757	130	Pt II	23875-103463	09
1256.5583	79582.460	3300	Pt II	16820- 96403	K
1257.2214	79540.485	6800	Pt II	29261-108802	K
1258.4063	79465.591	290	Pt II	29261-108727	K
1258.7640	79443.011	880	Pt II	21168-100611	07
1258.8332	79438.642	600	Pt II	13329- 92767	K
1259.1328	79419.740	2600	Pt II	13329- 92749	K
1259.2740	79410.835	1400	Pt II	23461-102872	K
1259.5111	79395.886	9300	Pt II	4786- 84182	A
1259.5111	79395.886	9300	Pt II	21717-101113	AK
1261.32	79282.0	55			
1262.0962	79233.263	590	Pt II	9356- 88589	K
1262.3591	79216.762	370	Pt II	23461-102678	K
1262.5104	79207.268	140			
1264.3492	79092.074	1200	Pt II	0- 79092	K

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1264.4898	79083.279	130	Pt II	32237-111320	K
1264.5677	79078.406	17000	Pt II	21717-100795	07
1264.6904	79070.737	8800	Pt II	21168-100239	06
1264.8691	79059.564	720 D	Pt II	23461-102520	K
1265.07	79047.0	190			
1265.2074	79038.425	1400	Pt II	15791- 94829	K
1265.7145	79006.759	3100	Pt II	29030-108037	K
1266.5706	78953.354	310	Pt II	23461-102414	07
1266.8932	78933.252	1100	Pt II	16820- 95754	P
1267.25	78911.0	110			
1267.5165	78894.435	310	Pt II	21717-100611	07
1268.3599	78841.975	450	Pt II	15791- 94633	K
1268.7589	78817.181	970	Pt II	9356- 88173	K
1268.9912	78802.753	270	Pt II	23875-102678	K
1269.0742	78797.599	520 P	Pt II	32918-111716	K
1269.0973	78796.165	700	Pt II	16820- 95617	K
1269.4345	78775.234	530	Pt II	29261-108037	K
1269.8121	78751.809	540	Pt II	4786- 83538	K
1271.34	78657.2	87			
1271.7939	78629.094	15000	Pt II	21168- 99797	06
1272.83	78565.1	44			
1273.28	78537.3	94			
1274.03	78491.1	66			
1274.2091	78480.055	150	Pt II	15791- 94271	K
1274.3665	78470.362	620	Pt II	27255-105726	K
1274.6091	78455.427	3800	Pt II	23461-101916	07
1274.6566	78452.502	900	Pt II	0- 78452	K
1274.7362	78447.604	300	Pt II	32237-110684	K
1274.9222	78436.159	250	Pt II	32918-111354	K
1275.4940	78400.996	890	Pt II	32237-110638	K
1276.2289	78355.850	730	Pt II	29030-107386	K
1276.4754	78340.719	320	Pt II	13329- 91669	K
1277.0472	78305.641	700	Pt II	18097- 96403	K
1277.1026	78302.245	800	Pt II	21168- 99471	K
1277.89	78254.0	120			
1278.6998	78204.439	560			
1278.84	78195.9	40			
1279.0832	78180.997	510	Pt II	24879-103060	K
1279.42	78160.4	150			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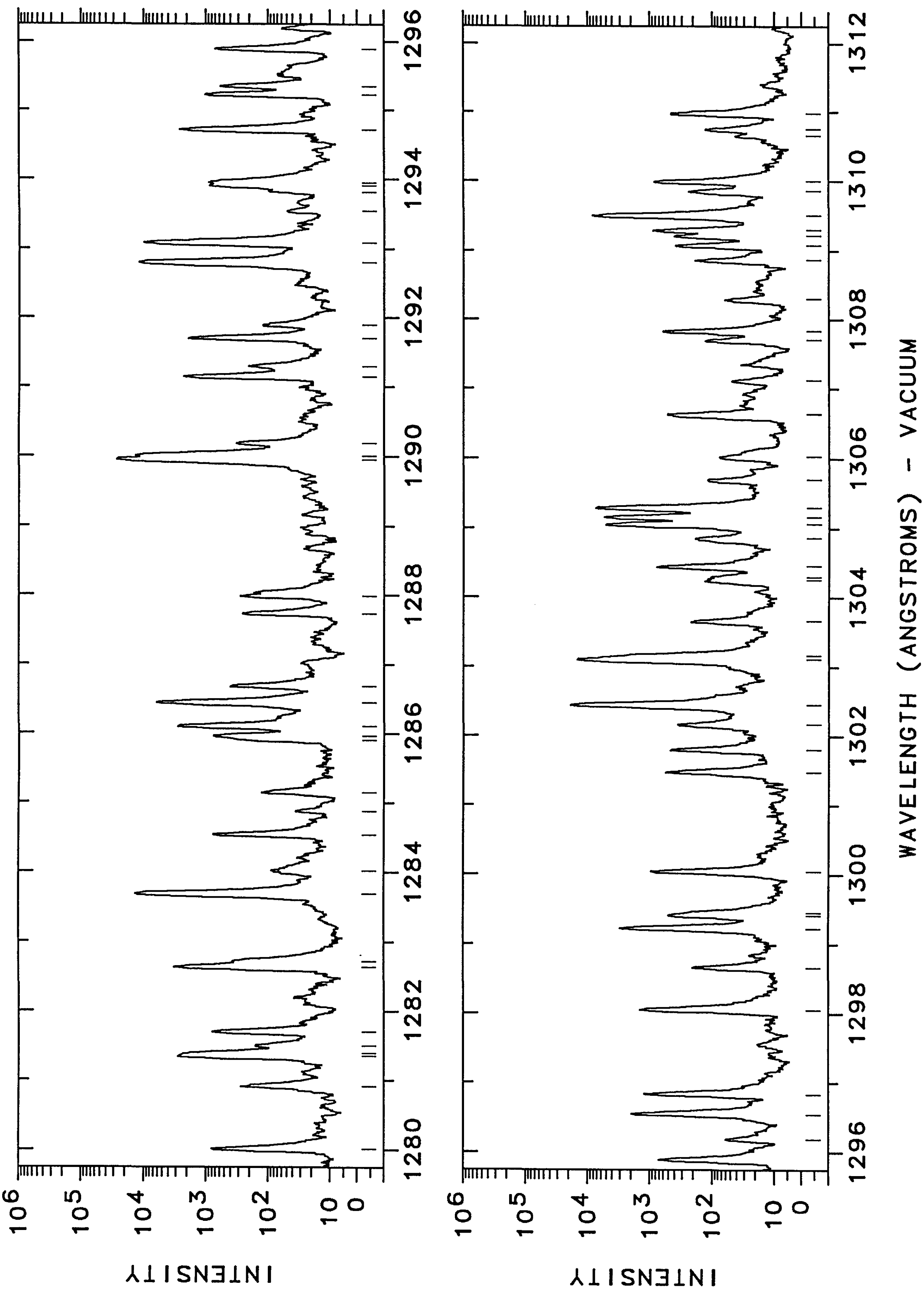
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1280.0116	78124.292	800	Pt II	29261-107386	K
1280.9032	78069.912	270	Pt II	8419- 86489	K
1281.3463	78042.915	2200	Pt II	0- 78043	P
1281.3888	78040.327	1200	Pt II	21168- 99209	07
1281.5008	78033.506	450	Pt II	18097- 96131	K
1281.6965	78021.591	770	Pt II	16820- 94842	K
1282.6318	77964.697	3200	Pt II	29030-106995	K
1282.7174	77959.494	400	Pt II	32237-110196	K
1283.6978	77899.954	13000	Pt II	21168- 99068	K
1284.0207	77880.364	79	Pt II	23461-101341	07
1284.5438	77848.650	750	Pt II	32237-110085	K
1284.88	77828.3	28			
1285.15	77811.9	120	Pt II	16820- 94633	K
1285.9115	77765.849	400	Pt II	32918-110684	K
1285.9670	77762.493	700	Pt II	27255-105018	K
1286.1117	77753.744	2800	Pt II	21717- 99471	K
1286.4510	77733.237	6100	Pt II	29261-106995	K
1286.6796	77719.426	390	Pt II	32918-110638	K
1287.7253	77656.314	250	Pt II	18097- 95754	P
1287.9733	77641.361	270 W	Pt II	24879-102520	K
1289.9515	77522.297	27000	Pt II	23875-101397	07
1290.0131	77518.593	13000	Pt II	23875-101394	AK
1290.0131	77518.593	13000	Pt II	18097- 95617	AK
1290.1699	77509.172	310			
1291.1450	77450.635	2300	Pt II	16820- 94271	K
1291.2898	77441.951	200	Pt II	23461-100903	07
1291.7007	77417.315	1900	Pt II	13329- 90746	K
1291.89	77406.0	120	Pt II	15791- 93197	K
1292.7998	77351.497	12000	Pt II	21717- 99068	K
1293.0896	77334.163	9900	Pt II	23461-100795	07
1293.54	77307.2	42			
1293.8099	77291.107	160	Pt II	32237-109528	K
1293.9021	77285.60	650	Ne II		C
1293.9679	77281.670	650			
1294.7073	77237.535	2600	Pt II	23875-101113	K
1295.2268	77206.554	1000	Pt II	24879-102086	09
1295.3461	77199.445	580	Pt II	29030-106229	K
1295.8881	77167.157	700	Pt II	32918-110085	K
1296.1731	77150.192	51	Pt II	23461-100611	07
1296.5416	77128.262	1900	Pt II	18097- 95226	K

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1296.8298	77111.121	1200	Pt II	4786- 81897	P
1298.0460	77038.87	1400	Ne II		C
1298.6562	77002.674	200	Pt II	37877-114880	K
1299.2423	76967.937	3000	Pt II	29261-106229	K
1299.4141	76957.761	320	Pt II	15791- 92749	K
1299.4590	76955.102	150			
1300.0501	76920.113	940	Pt II	23875-100795	08
1301.4882	76835.118	540	Pt II	32918-109753	K
1301.8075	76816.273	460			
1302.1685	76794.977		O I		B
1302.4578	76777.918	19000	Pt II	23461-100239	06
1303.1187	76738.979	15000	Pt II	24879-101618	14
1303.1669	76736.142	2300 P	Pt II	23875-100611	07
1303.6558	76707.364	210	Pt II	34647-111354	K
1304.2331	76673.411	120	Pt II	34647-111320	K
1304.2955	76669.742	100	Pt II	24879-101549	P
1304.4422	76661.119	750	Pt II	16820- 93482	09
1304.8576	76636.715		O I		B
1305.0718	76624.137	5100	Pt II	21168- 97792	K
1305.1778	76617.914	5400	Pt II	21168- 97786	K
1305.3118	76610.046	7400	Pt II	0- 76610	04
1305.6955	76587.535	110			
1306.0286	76568.002		O I		B
1306.6087	76534.008	150 L			
1306.6389	76532.239	380			
1307.0999	76505.247	40			
1307.6962	76470.361	120	Pt II	9356- 85826	K
1307.8326	76462.387	610	Pt II	24879-101341	07
1308.3006	76435.033	54	Pt II	32237-108672	K
1308.8604	76402.342	180	Pt II	32237-108639	K
1309.0824	76389.385	380	Pt II	32918-109307	K
1309.2150	76381.649	340	Pt II	27255-103637	K
1309.3000	76376.690	890	Pt II	16820- 93197	K
1309.5198	76363.868	8300	Pt II	23875-100239	07
1309.8568	76344.223	230 D	Pt II	9356- 85700	P
1309.9932	76336.275	830	Pt II	23461- 99797	06
1310.66	76297.4	33	Pt II	4786- 81083	K
1310.7472	76292.362	120	Pt II	29261-105554	K
1310.9818	76278.709	440	Pt II	13329- 89607	08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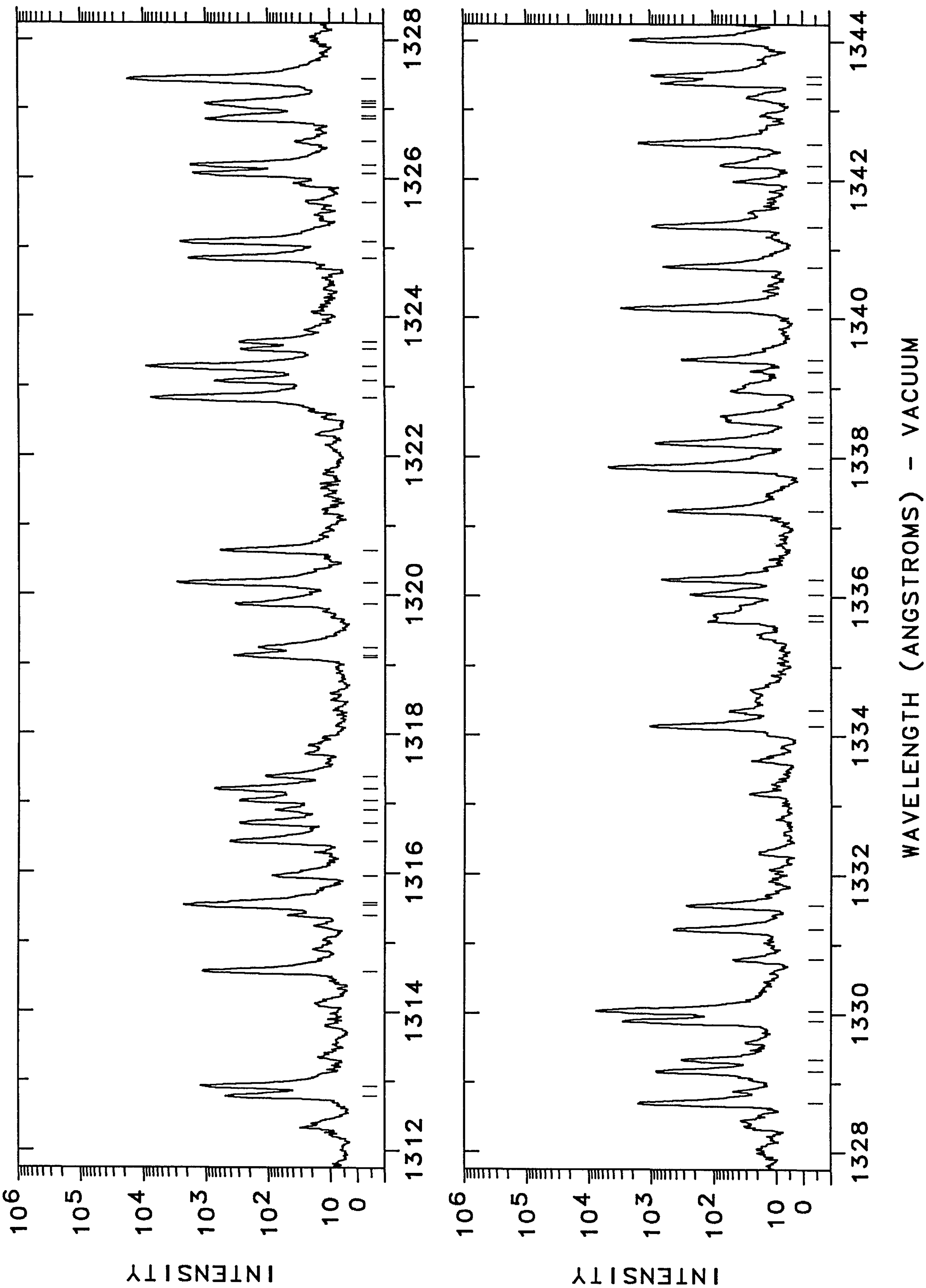
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1312.7858	76173.889	480	Pt II	18097- 94271	K
1312.9308	76165.477	1200	Pt II	27255-103421	K
1314.5907	76069.304	1100	Pt II	21717- 97786	K
1315.40	76022.5	42			
1315.5348	76014.713	2300	Pt II	21168- 97183	K
1315.5810	76012.043	270 P	Pt II	29030-105042	K
1315.9505	75990.700	80	Pt II	34647-110638	K
1316.4501	75961.861	410	Pt II	34647-110609	K
1316.7058	75947.110	290	Pt II	16820- 92767	K
1316.8913	75936.412	71			
1317.0348	75928.138	290	Pt II	16820- 92749	K
1317.2032	75918.431	740	Pt II	32237-108155	K
1317.3856	75907.919	100	Pt II	37877-113785	K
1319.1080	75808.804	84 U	Pt II	32918-108727	K
1319.1412	75806.896	270			
1319.2429	75801.052	140	Pt II	29030-104831	AK
1319.2429	75801.052	140	Pt II	32237-108038	AK
1319.8553	75765.881	340	Pt II	13329- 89095	K
1320.1754	75747.508	3000	Pt II	23461- 99209	07
1320.6427	75720.708	590	Pt II	32918-108639	K
1322.8372	75595.092	7500	Pt II	23875- 99471	AK
1322.8372	75595.092	7500	Pt II	29030-104625	AK
1323.0765	75581.422	710	Pt II	0- 75581	06
1323.2831	75569.619	8900	Pt II	29261-104831	K
1323.5388	75555.020	260	Pt II	34647-110202	K
1323.6402	75549.232	280	Pt II	34647-110196	K
1324.8562	75479.890	1900	Pt II	15791- 91271	K
1325.0971	75466.168	2500	Pt II	21717- 97183	K
1325.6560	75434.351	32			
1326.0723	75410.670	1600	Pt II	4786- 80197	K
1326.1916	75403.886	1700	Pt II	32918-108322	K
1326.5362	75384.299	30	Pt II	18097- 93482	09
1326.8620	75365.788	810	Pt II	0- 75365	K
1326.9041	75363.397	250	Pt II	29261-104625	K
1327.0301	75356.241	250	Pt II	23461- 98817	08

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1327.0833	75353.220	800	Pt II	24879-100232	K
1327.1146	75351.443	44 U	Pt II	32237-107588	K
1327.4314	75333.458	18000	Pt II	23875- 99209	08
1328.7227	75260.248	1600	Pt II	13329- 88589	K
1329.1748	75234.649	830	Pt II	21168- 96403	K
1329.3385	75225.385	320	Pt II	15791- 91016	K
1329.9067	75193.245	2900	Pt II	23875- 99068	K
1330.0547	75184.880	7700	Pt II	0- 75184	04
1330.79	75143.3	42			
1331.2263	75118.708	440	Pt II	32918-108037	K
1331.5606	75099.849	270	Pt II	18097- 93197	K
1334.1414	74954.574	1100	Pt II	32237-107191	K
1334.37	74941.7	49			
1335.6420	74870.362	120			
1335.7277	74865.558		C II		
1336.0355	74848.311	230			
1336.2452	74836.564	670	Pt II	36484-111320	K
1337.2361	74781.110	530	Pt II	13329- 88110	K
1337.8657	74745.916	4900	Pt II	0- 74745	05
1338.2103	74726.670	850	Pt II	21717- 96443	K
1338.5127	74709.788	54			
1338.5821	74705.915	64			
1338.95	74685.4	46			
1339.2328	74669.617	31	Pt II	32918-107588	K
1339.3918	74660.753	320	Pt II	34647-109307	K
1340.1393	74619.107	3000	Pt II	0- 74619	05
1340.7443	74585.437	610	Pt II	21168- 95754	P
1341.3300	74552.869	920	Pt II	8419- 82972	P
1341.9630	74517.703	40			
1342.2101	74503.984	68			
1342.5224	74486.653	1500	Pt II	29030-103517	11
1343.18	74450.2	21	Pt II	16820- 91271	K
1343.3742	74439.423	650	Pt II	18097- 92537	K
1343.4932	74432.831	930	Pt II	29030-103463	09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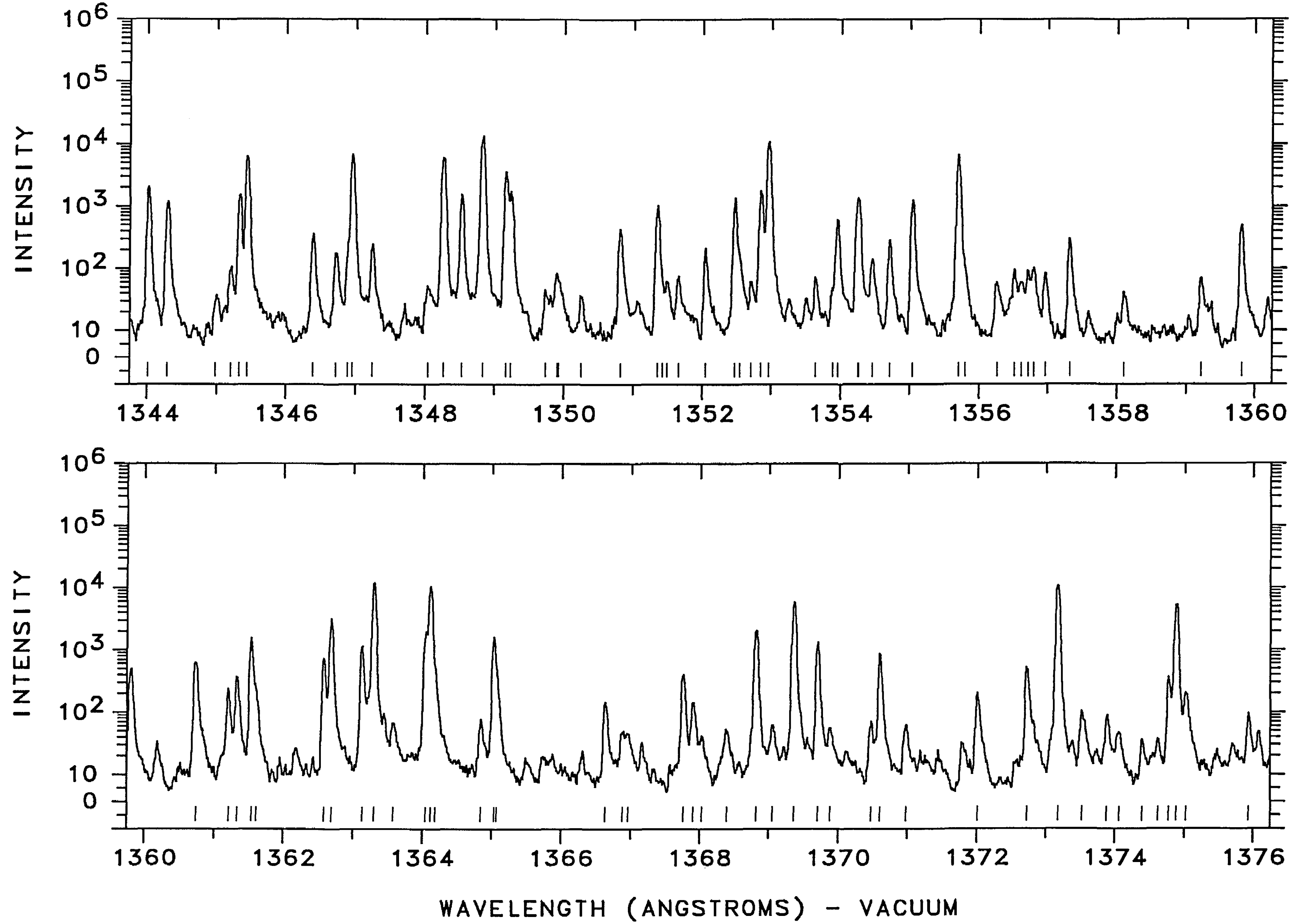
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1344.0117	74404.114	2100	Pt II	8419- 82824	K
1344.2837	74389.059	1200	Pt II	21168- 95557	K
1344.9807	74350.509	41			
1345.1936	74338.742	98			
1345.3272	74331.360	1500	Pt II	23461- 97792	K
1345.4403	74325.111	6300	Pt II	23461- 97786	K
1346.3867	74272.867	350	Pt II	32918-107191	K
1346.7077	74255.165	170	Pt II	29261-103517	11
1346.8846	74245.411	100			
1346.9559	74241.479	6800	Pt II	0- 74241	05
1347.2391	74225.874	240			
1348.0380	74181.885	43			
1348.2704	74169.097	5900	Pt II	23461- 97630	08
1348.5261	74155.035	1500	Pt II	34647-108802	K
1348.8300	74138.327	14000	Pt II	27255-101394	K
1349.1657	74119.881	3600	Pt II	4786- 78906	07
1349.2366	74115.985	1700	Pt II	8419- 82535	P
1349.7353	74088.601	37			
1349.8865	74080.302	53	Pt II	34647-108727	K
1349.9301	74077.910	33	Pt II	32918-106996	K
1350.2453	74060.617	29			
1350.8008	74030.161	420	Pt II	29030-103060	K
1351.3531	73999.904	1000	Pt II	0- 73999	P
1351.4248	73995.977	33	Pt II	9356- 83352	08
1351.4965	73992.053	63	Pt II	34647-108639	K
1351.6578	73983.223	66			
1352.0463	73961.964	200			
1352.4797	73938.264	1400	Pt II	24879- 98817	08
1352.5501	73934.415	93	Pt II	32918-106852	K
1352.7067	73925.856	53	Pt II	16820- 90746	K
1352.8623	73917.353	1800	Pt II	23875- 97792	K
1352.9768	73911.097	11000	Pt II	23875- 97786	K
1353.6358	73875.115	63	Pt II	13329- 87204	K
1353.8865	73861.435	33			
1353.9613	73857.355	600	Pt II	27255-101113	K
1354.2487	73841.681	700 P	Pt II	29030-102872	K
1354.2620	73840.955	650 P	Pt II	21717- 95557	K
1354.4510	73830.652	130 W			
1354.7077	73816.660	280	Pt II	15791- 89607	08
1355.0378	73798.679	1300	Pt II	29261-103060	K
1355.7164	73761.739	6600	Pt II	0- 73761	06
1355.8015	73757.110	43			
1356.26	73732.2	51			
1356.5142	73718.358	86	Pt II	36484-110202	K
1356.6240	73712.392	50	Pt II	36484-110196	K
1356.7144	73707.480	83	Ne III		L
1356.7905	73703.346	93			
1356.9559	73694.363	74 W	Ne III		L

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1357.3073	73675.283	290	Pt II	34647-108322	K
1358.10	73632.3	33			
1359.2060	73572.365	63	Pt II	18097- 91669	K
1359.8046	73539.979	490	Pt II	27255-100795	09
1360.7247	73490.251	400 P	Pt II	29030-102520	K
1360.7364	73489.619	250 U	Pt II	32237-105726	K
1361.2009	73464.542	230	Pt II	21168- 94633	K
1361.3317	73457.483	360			
1361.5367	73446.423	1500	Pt II	41434-114880	K
1361.6039	73442.798	240	Pt II	37877-111320	K
1362.5820	73390.079	730	Pt II	34647-108037	K
1362.6878	73384.378	3200	Pt II	29030-102414	08
1363.1360	73360.252	1200	Pt II	32237-105597	K
1363.3059	73351.109	12000	Pt II	29261-102613	K
1363.58	73336.4	59			
1364.0463	73311.295	2000	Pt II	32918-106229	K
1364.1171	73307.491	11000	Pt II	24879- 98186	08
1364.1837	73303.911	300 U	Pt II	15791- 89095	K
1364.84	73268.7	68			
1365.0223	73258.876	1300	Pt II	29261-102520	K
1365.0673	73256.461	350	Pt II	4786- 78043	K
1366.6169	73173.396	140	Pt II	18097- 91271	K
1366.88	73159.3	41			
1366.96	73155.0	38			
1367.7548	73112.520	390	Pt II	21717- 94829	K
1367.8880	73105.400	130			
1368.03	73097.8	33			
1368.39	73078.6	45			
1368.8213	73055.555	2100	Pt II	29030-102086	11
1369.05	73043.4	53			
1369.3682	73026.380	5900	Pt II	0- 73026	05
1369.7039	73008.480	1300			
1369.88	72999.1	47			
1370.47	72967.7	62			
1370.5971	72960.902	870			
1370.98	72940.5	53			
1371.9971	72886.451	190	Pt II	29030-101916	08
1372.7084	72848.684	520	Pt II	42031-114880	K
1373.1724	72824.067	11000	Pt II	29261-102086	11
1373.52	72805.6	95	Pt II	32237-105042	K
1373.88	72786.6	80			
1374.06	72777.0	38			
1374.39	72759.6	27			
1374.62	72747.4	28			
1374.7784	72738.996	110	Pt II	34647-107386	K
1374.8896	72733.113	5300	Pt II	4786- 77519	06
1375.0230	72726.056	190	Ne III		L
1375.9177	72678.766	85	Pt II	32918-105597	K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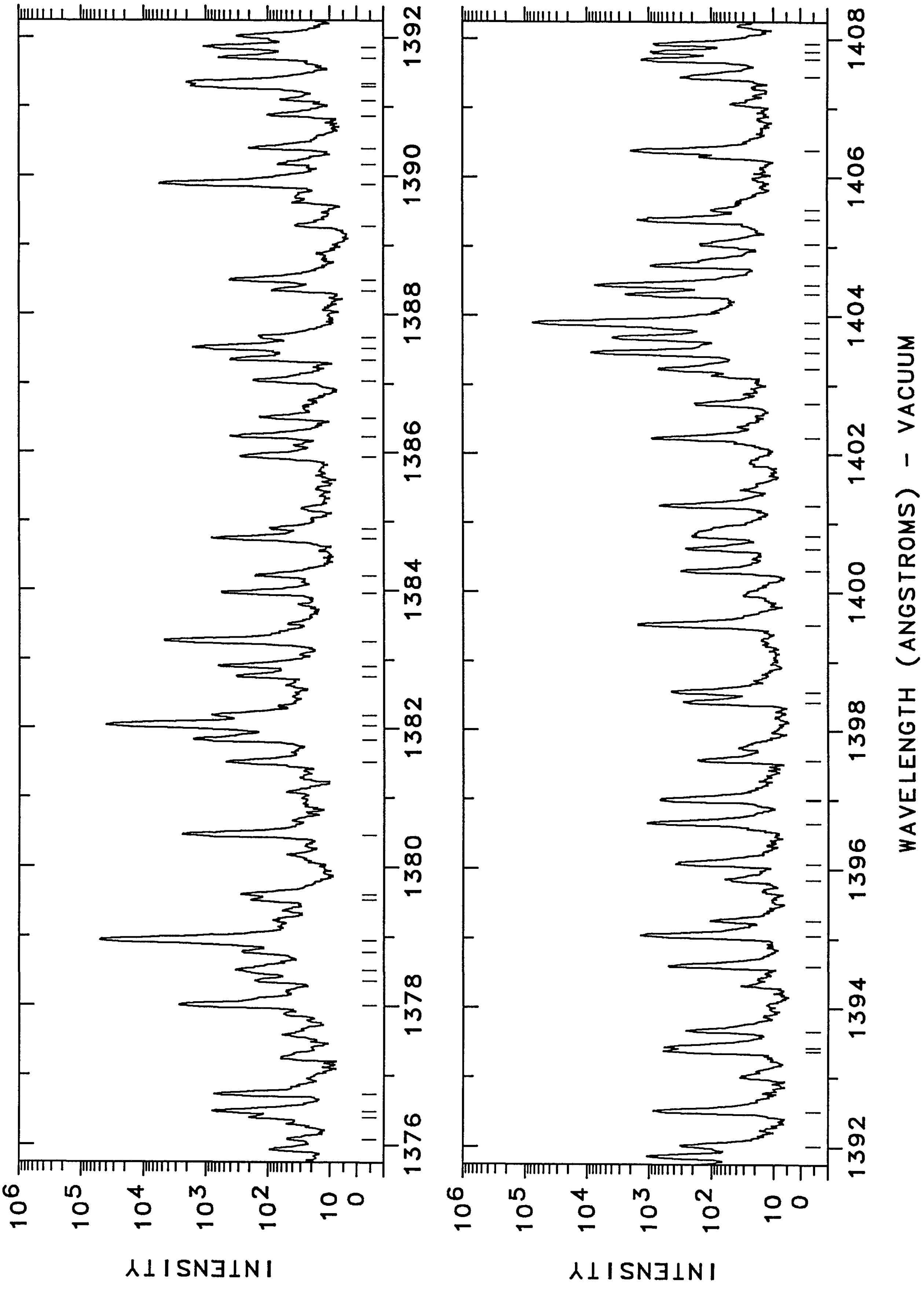
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1376.08	72670.2	40			
1376.3946	72653.584	150			
1376.4844	72648.844	780	Pt II	18097- 90746	K
1376.7307	72635.847	730	Pt II	32918-105554	K
1378.0080	72568.519	2700	Pt II	23875- 96443	K
1378.36	72550.0	150			
1378.5216	72541.482	320	Pt II	9356- 81897	P
1378.7824	72527.761	250	Pt II	23875- 96403	K
1378.9572	72518.567	50000	Pt II	29030-101549	P
1379.5267	72488.630	160			
1379.6093	72484.290	260			
1380.4782	72438.666	2400	Pt II	8419- 80858	08
1381.5073	72384.71	470	Ne II		C
1381.8382	72367.371	1600	Pt II	29030-101397	07
1382.0460	72356.492	41000	Pt II	29261-101618	16
1382.1820	72349.372	800	Pt II	34647-106996	K
1382.7626	72318.994	320	Pt II	15791- 88110	K
1382.9080	72311.388	620	Pt II	29030-101341	08
1383.2676	72292.592	4700	Pt II	23461- 95754	P
1383.9627	72256.283	550			
1384.2063	72243.567	150	Pt II	36484-108727	K
1384.7471	72215.353	800	Pt II	27255- 99471	K
1384.89	72207.9	85	Pt II	37877-110085	K
1385.9355	72153.43	270	Ne II		C
1386.2265	72138.283	390			
1386.50	72124.1	130	Pt II	32918-105042	K
1387.0350	72096.234	160	Pt II	23461- 95557	K
1387.3493	72079.900	390	Pt II	29261-101341	08
1387.5158	72071.25	1600	Ne II		C
1387.6616	72063.68	130	Ne II		C
1388.34	72028.5	77	Pt II	21168- 93197	K
1388.4901	72020.68	400	Ne II		C
1389.27	71980.2	27			
1389.8750	71948.916	5400	Pt II	0- 71948	05
1390.17	71933.6	59			
1390.3982	71921.842	190	Pt II	32237-104158	K
1390.87	71897.4	91			
1391.09	71886.1	53			
1391.2877	71875.860	1300 P	Pt II	37877-109753	K
1391.3435	71872.975	1600 P	Pt II	29030-100903	09
1391.7029	71854.42	610	Ne II		C
1391.8544	71846.59	1100	Ne II		C
1392.0143	71838.343	310	Pt II	36484-108322	K
1392.5021	71813.177	840	Pt II	27255- 99068	K
1393.3666	71768.621	500	Pt II	16820- 88589	K
1393.4258	71765.572	400	Pt II	18097- 89863	P
1393.6526	71753.893	240	Pt II	42031-113785	K
1394.6032	71704.984	480			
1395.0473	71682.157	1400	Pt II	23875- 95557	K
1395.26	71671.2	95	Pt II	36484-108155	K
1395.8393	71641.487	51	Pt II	29261-100903	09
1396.0709	71629.600	370	Pt II	32918-104548	K
1396.6602	71599.377	1100	Pt II	21168- 92767	K
1396.9879	71582.581	450 P	Pt II	34647-106229	K
1397.0043	71581.741	250 U			
1397.5451	71554.041	160	Pt II	36484-108037	AK
1397.5451	71554.041	160	Pt II	36484-108038	AK
1398.4015	71510.221	270	Pt II	18097- 89607	09
1398.5581	71502.214	430	Pt II	9356- 80858	07
1399.5333	71452.39	1500	Ne II		C
1400.3043	71413.049	300	Pt II	15791- 87204	K
1400.6222	71396.841	250			
1400.8097	71387.28	200	Ne II		C
1401.2517	71364.766	660	Pt II	0- 71364	K
1402.2375	71314.594	880	Pt II	0- 71314	05
1402.7326	71289.425	170	Pt II	16820- 88110	K
1403.2407	71263.611	680	Pt II	8419- 79683	K
1403.4752	71251.704	8400	Pt II	24879- 96131	K
1403.6827	71241.17	3800	Ne II		C
1403.9006	71230.114	74000	Pt II	24879- 96109	K
1404.3180	71208.942	2300	Pt II	29030-100239	07
1404.4507	71202.215	7300	Pt II	29030-100232	K
1404.7383	71187.638	920	Pt II	8419- 79607	06
1405.04	71172.4	140			
1405.3752	71155.37	1500	Ne II		C
1405.53	71147.5	90			
1406.3906	71104.002	1900	Pt II	36484-107588	K
1407.4447	71050.749	290	Pt II	21717- 92767	K
1407.7103	71037.343	1300			
1407.8209	71031.763	910	Pt II	21717- 92749	K
1407.9315	71026.183	830			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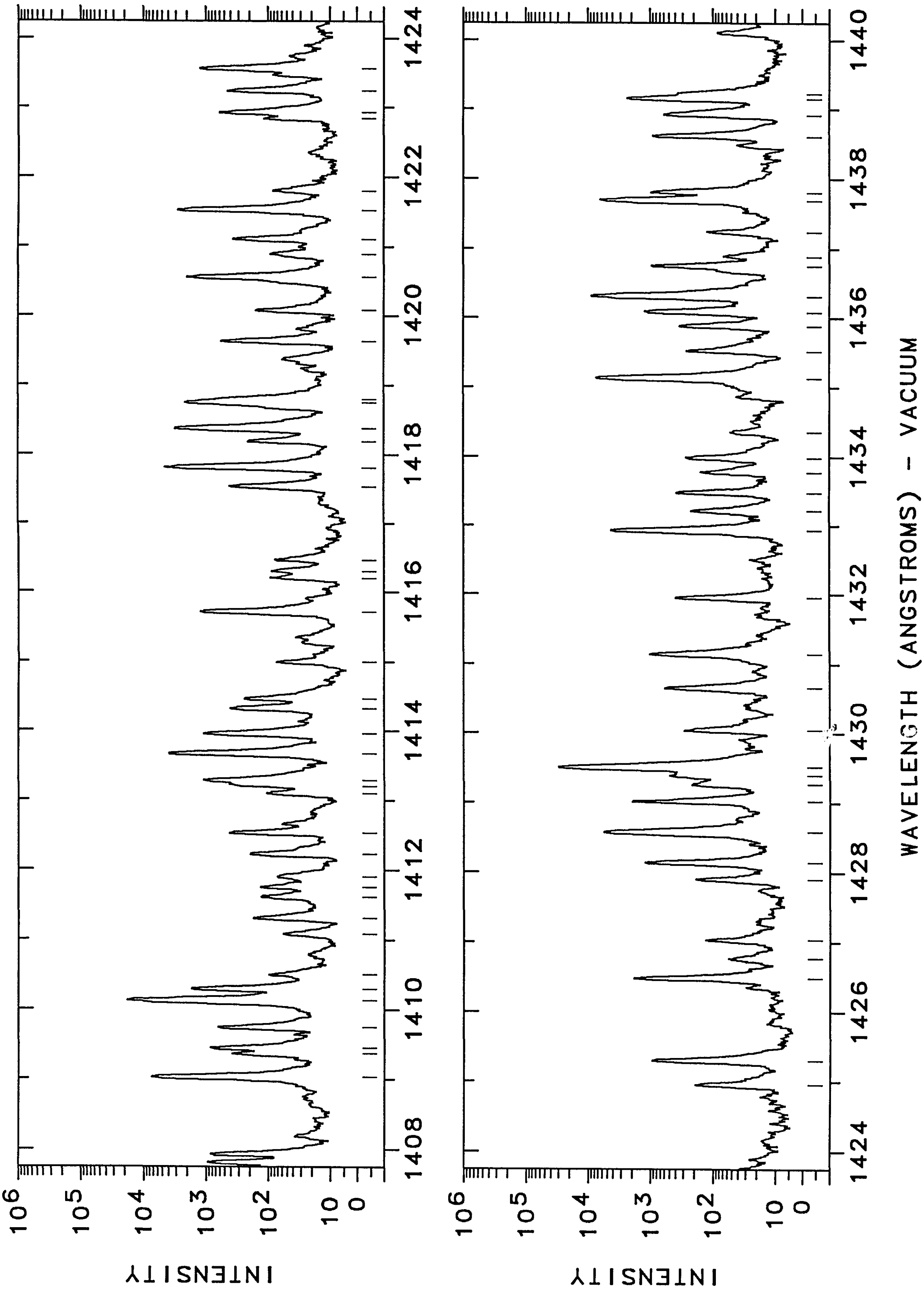
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1409.0315	70970.734	7400	Pt II	29261-100232	K
1409.3589	70954.247	300	Pt II	23875- 94829	K
1409.4407	70950.129	840	Pt II	34647-105597	K
1409.7467	70934.73	630	Ne II		C
1410.1346	70915.216	18000			
1410.2951	70907.146	1700	Pt II	34647-105554	K
1410.50	70896.8	87			
1411.09	70867.2	48			
1411.3059	70856.36	160	Ne II		C
1411.62	70840.6	120	Pt II	9356- 80197	K
1411.76	70833.6	120			
1411.91	70826.0	62			
1412.2278	70810.106	180	Pt II	23461- 94271	K
1412.5350	70794.706	410	Pt II	37877-108672	K
1413.10	70766.4	97			
1413.1988	70761.453	170	Pt II	37877-108639	K
1413.2736	70757.708	1100	Pt II	23875- 94633	K
1413.6768	70737.526	3800	Pt II	24879- 95617	K
1413.9570	70723.51	1100	Ne II		C
1414.3241	70705.152	390			
1414.4573	70698.493	230	Pt II	15791- 86489	K
1415.00	70671.4	64			
1415.7144	70635.71	1200	Ne II		C
1416.20	70611.5	82			
1416.30	70606.5	78			
1416.4593	70598.571	69	Pt II	32918-103517	12
1417.5400	70544.749	400	Pt II	32918-103463	11
1417.8186	70530.885	4400	Pt II	27255- 97786	K
1418.1875	70512.538	200	Pt II	36484-106996	K
1418.3779	70503.08	3100	Ne II		C
1418.7471	70484.72	2100	Ne II		C
1418.7967	70482.262	300 P			
1419.6208	70441.346	550	Pt II	32237-102678	K
1420.08	70418.6	150			
1420.5511	70395.215	2000	Pt II	34647-105042	K
1420.89	70378.4	82			
1421.0852	70368.758	350	Pt II	36484-106852	K
1421.5372	70346.383	2800			
1421.80	70333.4	74			
1422.84	70282.0	110			
1422.9252	70277.763	580	Pt II	37877-108155	K
1423.2414	70262.150	440			
1423.5645	70246.20	1200	Ne II		C
1424.9510	70177.850	180	Pt II	32237-102414	09
1425.3086	70160.245	950	Pt II	37877-108038	K
1426.4824	70102.512	1800	Pt II	21168- 91271	K
1426.77	70088.4	48			
1427.04	70075.1	120			
1427.91	70032.4	180			
1428.1530	70020.510	1200	Pt II	23461- 93482	11
1428.5822	69999.47	5600	Ne II		C
1429.0200	69978.027	1900	Pt II	34647-104625	K
1429.27	69965.8	210			
1429.4024	69959.305	370	Pt II	4786- 74745	05
1429.5248	69953.317	30000	Pt II	0- 69953	05
1430.0503	69927.610	280	Pt II	27255- 97183	K
1430.6657	69897.531	570			
1431.1564	69873.565	1000			
1431.9499	69834.846	380	Pt II	8419- 78254	K
1432.9262	69787.265	4200	Pt II	29030- 98817	09
1433.22	69773.0	210			
1433.4820	69760.206	370			
1433.78	69745.7	140	Pt II	36484-106229	K
1433.9804	69735.960	250	Pt II	23461- 93197	K
1434.36	69717.5	42			
1435.1336	69679.923	7300	Pt II	32237-101916	08
1435.5171	69661.309	250			
1435.8839	69643.514	330	Pt II	13329- 82972	P
1436.0813	69633.94	1200	Ne II		C
1436.3096	69622.872	8800	Pt II	4786- 74409	K
1436.7340	69602.306	950	Pt II	32918-102520	K
1436.88	69595.2	57			
1437.24	69577.8	110	Pt II	21168- 90746	K
1437.6951	69555.777	6300	Pt II	29261- 98817	09
1437.8100	69550.218	970	Pt II	9356- 78906	06
1438.6113	69511.480	900	Pt II	34647-104158	K
1438.9256	69496.296	580	Pt II	32918-102414	09
1439.1596	69484.997	2300			
1439.2278	69481.704	350			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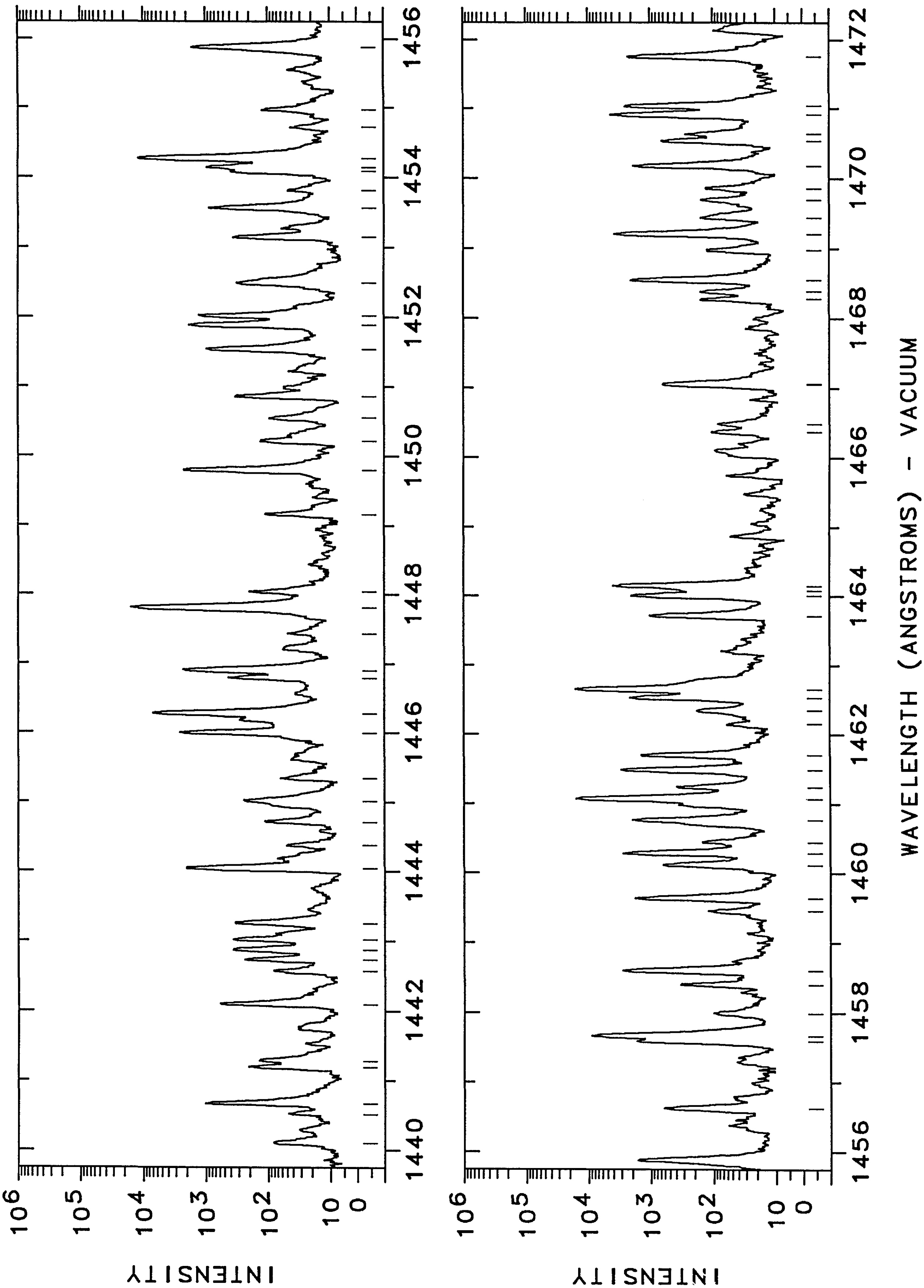
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1440.10	69439.6	72			
1440.51	69419.9	37			
1440.6635	69412.462	1000	Pt II	36484-105896	K
1441.1876	69387.22	200	Ne II		C
1441.28	69382.8	130			
1442.0911	69343.747	590	Pt II	8419- 77763	K
1442.57	69320.7	71			
1442.7150	69313.759	230	Pt II	37877-107191	K
1442.8676	69306.428	360	Pt II	23461- 92767	K
1443.0133	69299.431	360	Pt II	21717- 91016	K
1443.25	69288.1	330	Pt II	23461- 92749	K
1444.0351	69250.394	2100	Pt II	41434-110684	K
1444.38	69233.9	40			
1444.71	69218.0	100			
1445.01	69203.7	240	Pt II	41434-110638	K
1445.34	69187.9	53	Pt II	27255- 96443	K
1445.9958	69156.492	2600	Pt II	29030- 98186	09
1446.2820	69142.809	6900	Pt II	24879- 94022	P
1446.7921	69118.431	420	Pt II	8419- 77538	K
1446.9019	69113.186	2300	Pt II	36484-105597	K
1447.43	69088.0	37			
1447.8030	69070.171	16000	Pt II	36484-105554	K
1448.04	69058.9	190			
1449.16	69005.5	98	Pt II	16820- 85826	K
1449.8015	68974.960	2200	Pt II	4786- 73761	A
1449.8015	68974.960	2200	Pt II	37877-106852	AK
1450.22	68955.1	120			
1450.55	68939.4	83			
1450.8523	68925.004	320	Pt II	29261- 98186	09
1451.5382	68892.434	950	Pt II	23875- 92767	K
1451.8840	68876.026	1800	Pt II	32237-101113	K
1452.0129	68869.911	1300	Pt II	34647-103517	12
1452.49	68847.3	300			
1453.1486	68816.089	350	Pt II	34647-103463	11
1453.5678	68796.241	870			
1453.81	68784.8	36			
1454.0865	68771.700	350			
1454.1586	68768.290	940	Pt II	41434-110202	K
1454.2866	68762.237	12000	Pt II	29030- 97792	AK
1454.2866	68762.237	12000	Pt II	41434-110196	AK
1454.72	68741.8	32			
1454.97	68729.9	110			
1455.8872	68686.640	1600	Pt II	9356- 78043	P

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1456.6294	68651.642	620	Pt II	41434-110085	K
1457.5951	68606.158	1700	Pt II	42031-110638	K
1457.6721	68602.533	8900	Pt II	24879- 93482	11
1457.99	68587.6	89			
1458.3973	68568.421	330	Pt II	13329- 81897	P
1458.6050	68558.659	2800	Pt II	32237-100795	09
1459.46	68518.5	110	Ne III		L
1459.6348	68510.288	1800	Pt II	43737-112247	K
1460.1052	68488.216	620	Ne III		L
1460.2955	68479.289	2800	Pt II	32918-101397	08
1460.45	68472.0	140			
1460.7751	68456.807	1900	Pt II	24879- 93336	08
1461.0786	68442.588	16000	Pt II	24879- 93322	K
1461.24	68435.0	380	Ne III		L
1461.4903	68423.306	3000	Pt II	32918-101341	09
1461.7043	68413.290	1400	Pt II	34647-103060	K
1462.16	68392.0	49	Pt II	18097- 86489	K
1462.35	68383.1	170			
1462.5295	68374.688	2100	Pt II	32237-100611	09
1462.6591	68368.633	16000	Pt II	29261- 97630	09
1463.7090	68319.591	1000	Pt II	41434-109753	K
1464.0013	68305.950	2000			
1464.0855	68302.022	350	Pt II	27255- 95557	K
1464.1508	68298.976	3900	Pt II	41434-109733	K
1466.37	68195.6	94			
1466.4859	68190.223	71	Pt II	8419- 76610	05
1467.0387	68164.528	370 P	Pt II	42031-110196	K
1467.0619	68163.450	390 P	Pt II	9356- 77519	05
1468.28	68106.9	140			
1468.39	68101.8	140			
1468.5551	68094.142	2000	Pt II	41434-109528	K
1468.98	68074.4	110			
1469.2036	68064.086	3800	Pt II	36484-104548	K
1469.44	68053.1	140			
1469.70	68041.1	140			
1469.86	68033.7	120			
1470.1835	68018.720	1800	Pt II	37877-105896	K
1470.5360	68002.414	630	Pt II	32237-100239	08
1470.64	67997.6	260			
1470.9150	67984.893	4300	Pt II	32918-100903	10
1471.0423	67979.011	2500	Pt II	43737-111716	K
1471.7535	67946.161	2300			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WAVELENGTH (ANGSTROMS) - VACUUM

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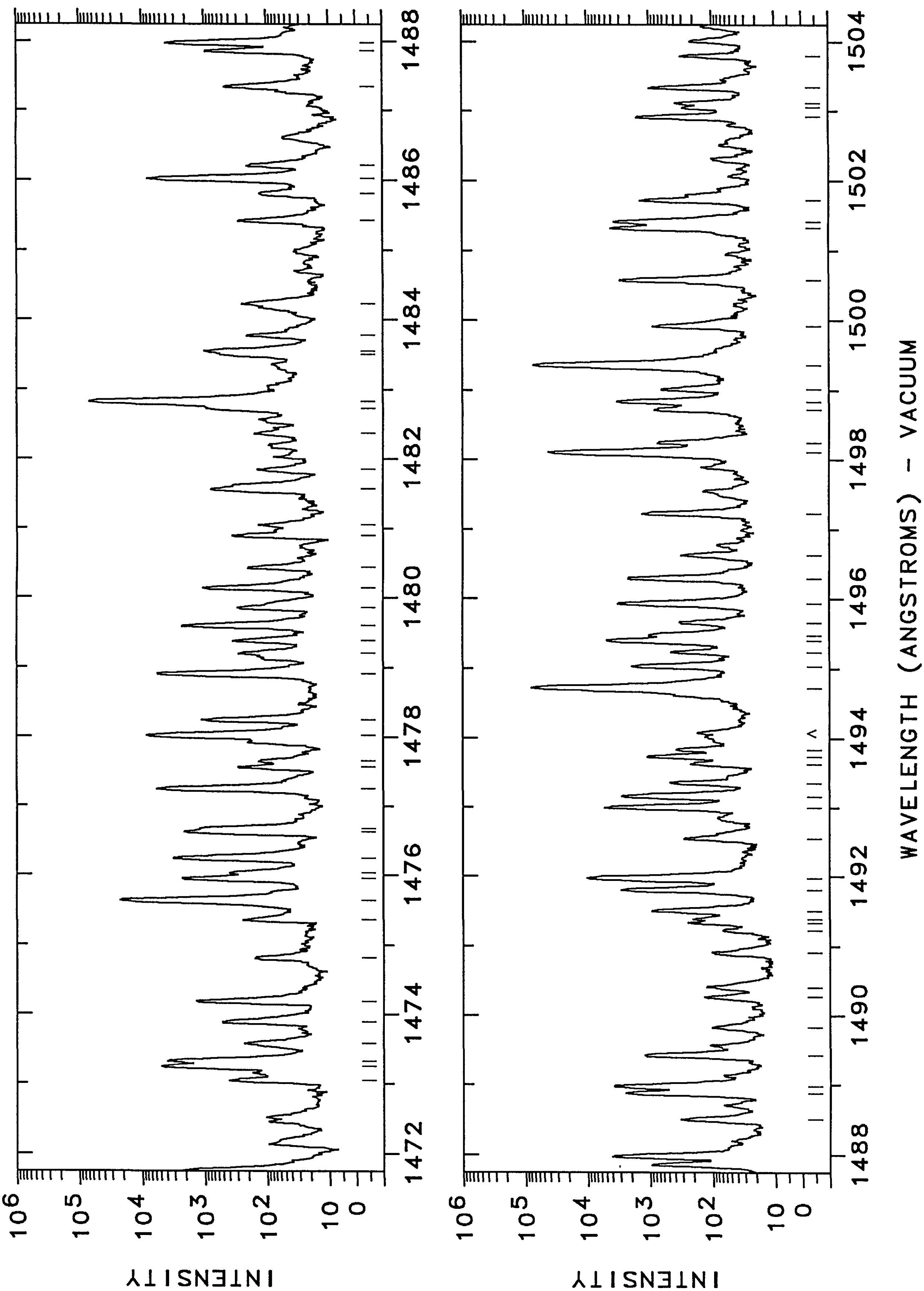
1473.0500	67886.358	390	Ne III		L
1473.2508	67877.105	4900	Pt II	32918-100795	10
1473.3251	67873.683	4000	Pt II	41434-109307	AK
1473.3251	67873.683	4000	Pt II	34647-102520	AK
1473.5757	67862.140	220			
1473.8839	67847.949	510 L	Pt II	37877-105726	K
1474.1931	67833.719	1300	Pt I	823- 68657	N
1474.82	67804.9	150			
1475.3526	67780.407	230	Pt II	0- 67780	K
1475.6306	67767.636	22000	Pt II	34647-102414	09
1475.9603	67752.50	2300	Ne II		C
1476.0474	67748.502	230			
1476.2492	67739.241	3100	Pt II	46046-113785	K
1476.6290	67721.818	2100	Pt II	42031-109753	K
1476.6796	67719.497	800	Pt II	37877-105597	K
1477.2547	67693.134	5700	Pt II	32918-100611	09
1477.5666	67678.844	270			
1477.66	67674.6	120	Pt II	36484-104158	K
1478.0338	67657.451	8400	Pt II	24879- 92537	K
1478.2534	67647.401	1100	Pt II	24879- 92526	K
1478.9117	67617.289	5700	Pt II	43737-111354	K
1479.21	67603.7	270			
1479.3896	67595.446	330			
1479.6034	67585.679	2300			
1479.8588	67574.015	280	Pt II	27255- 94829	K
1480.1489	67560.771	1000	Pt II	32237- 99797	08
1480.44	67547.5	190			
1480.8980	67526.595	350			
1481.05	67519.7	120	Pt I	823- 68343	N
1481.5602	67496.414	760	Pt II	42031-109528	K
1481.85	67483.2	130	Ne III		L
1482.3623	67459.892	140			
1482.7280	67443.253	450	Pt I	823- 68266	N
1482.8256	67438.813	68000	Pt II	34647-102086	13
1483.5029	67408.02	350	Ne II		C
1483.5530	67405.748	900			
1483.7704	67395.872	200	Pt II	23875- 91271	K
1484.2254	67375.211	240			
1485.4237	67320.860	270	Pt II	32918-100239	08
1485.81	67303.4	110			
1486.0308	67293.356	8000	Pt II	41434-108727	K
1486.2117	67285.165	190	Pt II	23461- 90746	K
1487.3425	67234.010	460	Pt II	32237- 99471	K
1487.8620	67210.534	940			
1487.9804	67205.186	4100	Pt II	41434-108639	K
1488.5058	67181.465	310	Pt II	15791- 82972	P
1488.8805	67164.558	2500	Pt II	37877-105042	K

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1488.9770	67160.205	3800			
1489.4179	67140.324	1200	Pt II	37877-105018	K
1489.83	67121.8	88	Pt I	0- 67121	N
1490.27	67101.9	120			
1490.41	67095.6	110			
1490.91	67073.1	89			
1491.23	67058.7	55	Ne III		L
1491.34	67053.8	230			
1491.39	67051.5	190			
1491.5097	67046.161	910			
1491.8030	67032.980	2900	Pt II	36484-103517	A
1491.8030	67032.980	2900	Pt II	15791- 82824	AK
1491.9735	67025.319	10000	Pt II	43737-110762	K
1492.55	66999.4	270			
1492.9990	66979.282	5300	Pt II	36484-103463	12
1493.1612	66972.004	2800	Pt II	32237- 99209	09
1493.3508	66963.503	460			
1493.6249	66951.214	210			
1493.7402	66946.046	1100	Pt II	8419- 75365	K
1493.8391	66941.614	360	Pt II	21168- 88110	K
1494.7256	66901.912	79000	Pt II	34647-101549	P
1495.0297	66888.303	2000	Pt II	41434-108322	K
1495.2328	66879.217	440	Pt II	32918- 99797	08
1495.4014	66871.677	4900	Pt II	43737-110609	K
1495.4796	66868.181	1000	Pt II	13329- 80197	K
1495.6544	66860.366	320			
1495.9363	66847.766	3300	Pt II	29261- 96109	K
1496.2958	66831.705	2200	Pt II	32237- 99068	K
1496.63	66816.8	300			
1497.2192	66790.487	1300	Pt II	24879- 91669	K
1498.1132	66750.629	42000	Pt II	34647-101397	09
1498.2508	66744.500	730	Pt II	15791- 82535	P
1498.7213	66723.546	830	Pt II	29030- 95754	P
1498.8389	66718.311	3300			
1499.0024	66711.04	630	Ne II		C
1499.3707	66694.646	73000	Pt II	34647-101341	09
1499.9177	66670.325	880	Pt II	37877-104548	K
1500.5854	66640.659	3000	Pt II	42031-108672	K
1501.3350	66607.386	4100	Pt II	42031-108639	K
1501.4245	66603.416	3600 D	Pt II	41434-108038	AK
1501.4245	66603.416	3600 D	Pt II	41434-108037	AK
1501.7275	66589.977	1400	Pt I	823- 67413	N
1502.9149	66537.367	1600			
1503.0507	66531.357	290	Pt II	16820- 83352	09
1503.1269	66527.983	300	Pt II	4786- 71314	06
1503.3439	66518.380	970			
1503.80	66498.2	300			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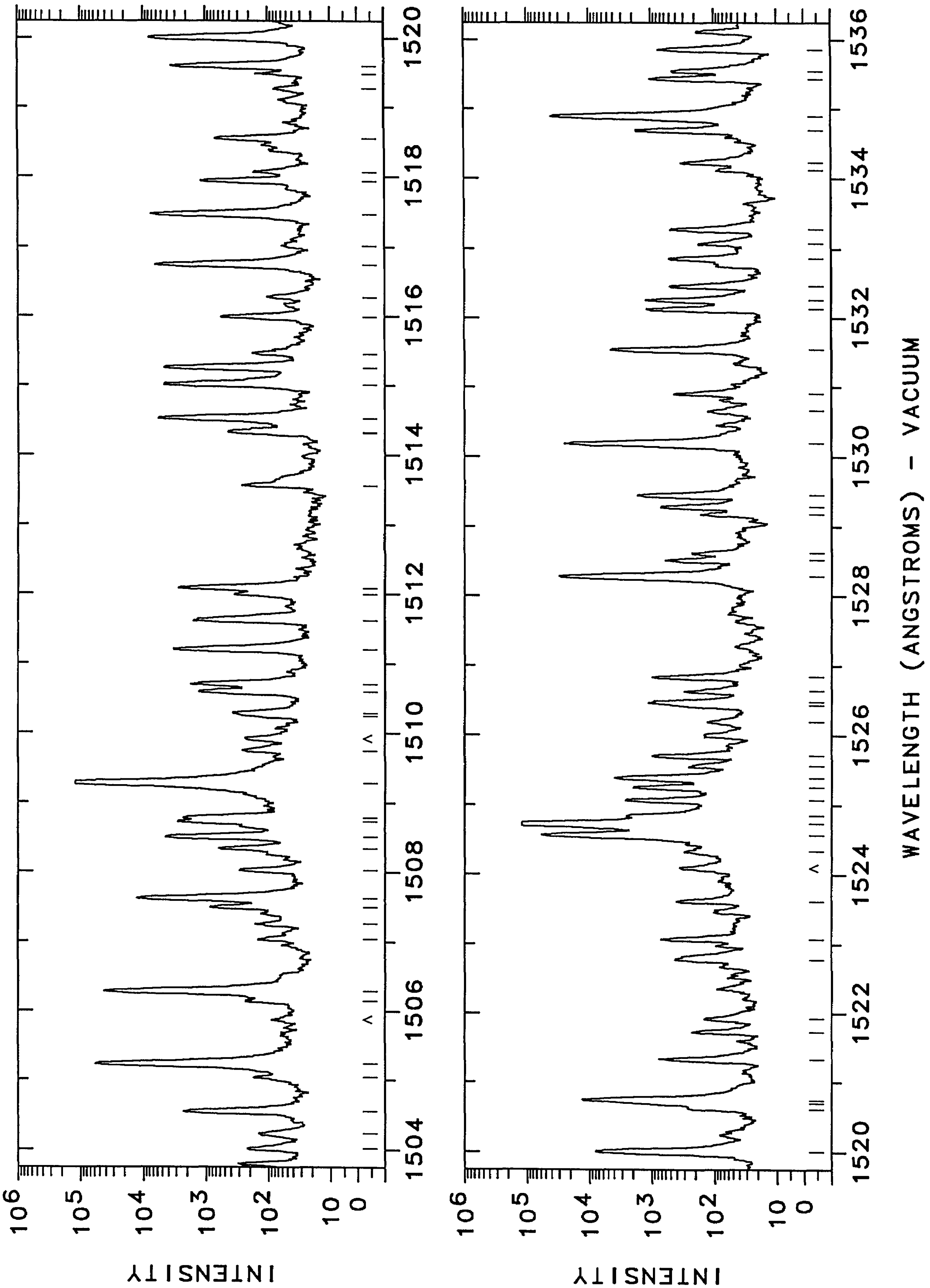
1504.02	66488.5	200			
1504.23	66479.2	130			
1504.5514	66464.994	2300	Pt II	43737-110202	K
1505.04	66443.4	160			
1505.2462	66434.315	58000	Pt II	0- 66434	06
1506.1480	66394.538	120			
1506.2923	66388.177	43000	Pt II	36484-102872	K
1507.04	66355.2	130	Pt II	29261- 95617	K
1507.26	66345.6	150	Pt I	775- 67121	N
1507.4998	66335.001	840	Pt II	8419- 74754	08
1507.6288	66329.325	13000	Pt II	43737-110066	K
1508.0257	66311.867	280			
1508.3427	66297.931	600	Pt I	823- 67121	N
1508.5129	66290.450	4400	Pt II	32918- 99209	10
1508.7309	66280.872	2500	Pt II	37877-104158	K
1508.7910	66278.233	2300	Pt II	13329- 79607	06
1509.2920	66256.233	260000	Pt II	34647-100903	10
1509.75	66236.1	240			
1510.2478	66214.299	180	Pt II	37877-104092	K
1510.2961	66212.182	200			
1510.5903	66199.285	1300	Pt II	8419- 74619	05
1510.7023	66194.379	1800	Pt II	36484-102678	K
1511.2021	66172.486	3300			
1511.6233	66154.048	1600	Pt II	41434-107588	K
1511.9871	66138.130	180			
1512.0895	66133.652	2800			
1513.56	66069.4	250			
1514.3107	66036.646	290 P	Pt II	36484-102520	K
1514.3325	66035.696	300 P	Pt II	21168- 87204	K
1514.5087	66028.014	5800	Pt II	0- 66028	06
1515.0089	66006.213	4600	Pt II	42031-108038	K
1515.2502	65995.702	4700	Pt II	43737-109733	K
1515.45	65987.0	170			
1515.9776	65964.035	560	Pt II	29261- 95226	K
1516.27	65951.3	90			
1516.7411	65930.829	6400	Pt II	36484-102414	10
1517.01	65919.1	46			
1517.4695	65899.183	7500	Pt II	32918- 98817	10
1517.9314	65879.130	1200			
1518.06	65873.5	160			
1518.5424	65852.623	690	Pt I	0- 65852	N
1519.27	65821.1	65			
1519.48	65812.0	140	Pt II	29030- 94842	K
1519.5970	65806.921	3500			
1520.0051	65789.253	7800			
1520.6130	65762.952	250	Pt II	13329- 79092	K
1520.6947	65759.419	1800	Pt II	37877-103637	K
1520.7414	65757.400	13000	Pt II	41434-107191	K
1521.3202	65732.383	760	Pt II	23875- 89607	11
1521.73	65714.7	210	Pt II	16820- 82535	K
1521.92	65706.5	130			
1522.7759	65669.545	410			
1523.0737	65656.705	690	Pt I	775- 66432	N
1523.6106	65633.568	390	Pt II	23461- 89095	K
1524.3266	65602.739	290	Pt II	29030- 94633	K
1524.5715	65592.200	59000	Pt II	34647-100239	09
1524.7295	65585.404	370000	Pt II	37877-103463	A
1524.7295	65585.404	370000	Pt II	34647-100232	AK
1524.8543	65580.036	2500	Pt II	8419- 73999	P
1525.0764	65570.486	2600	Pt II	43737-109307	K
1525.2635	65562.442	2000	Pt II	41434-106996	K
1525.3983	65556.648	4000 W			
1525.5656	65549.459	250	Pt II	32237- 97786	K
1525.7082	65543.333	980	Pt II	37877-103421	K
1526.20	65522.2	120			
1526.4320	65512.253	250	Pt II	27255- 92767	K
1526.4791	65510.232	1100	Pt I	0- 65510	N
1526.64	65503.3	290			
1526.8391	65494.786	970			
1528.2831	65432.902	31000	Pt II	36484-101916	10
1528.5153	65422.963	600	Pt I	775- 66198	N
1528.6138	65418.747	220	Pt II	41434-106852	K
1529.1766	65394.671	150	Pt II	4786- 70181	07
1529.2942	65389.642	700	Pt II	9356- 74745	04
1529.4582	65382.630	1700			
1530.1969	65351.069	25000	Pt II	0- 65351	06
1530.66	65331.3	110			
1530.9006	65321.027	420	Pt II	21168- 86489	K
1531.5395	65293.778	4500	Pt II	24879- 90173	K
1532.1348	65268.410	1200	Pt II	32918- 98186	10
1532.2657	65262.833	1200	Pt II	9356- 74619	04
1532.4605	65254.536	490	Pt II	18097- 83352	10
1532.8689	65237.151	510			
1533.08	65228.2	160			
1533.2843	65219.477	480	Pt II	23875- 89095	K
1534.12	65183.9	76			
1534.2271	65179.399	320			
1534.6947	65159.540	1700	Pt II	42031-107191	K
1534.9063	65150.557	40000	Pt II	34647- 99797	09
1535.4357	65128.094	1000	Pt II	23461- 88589	K
1535.5495	65123.267	450	Pt II	13329- 78452	K
1535.8589	65110.148	740			


INTENSITY
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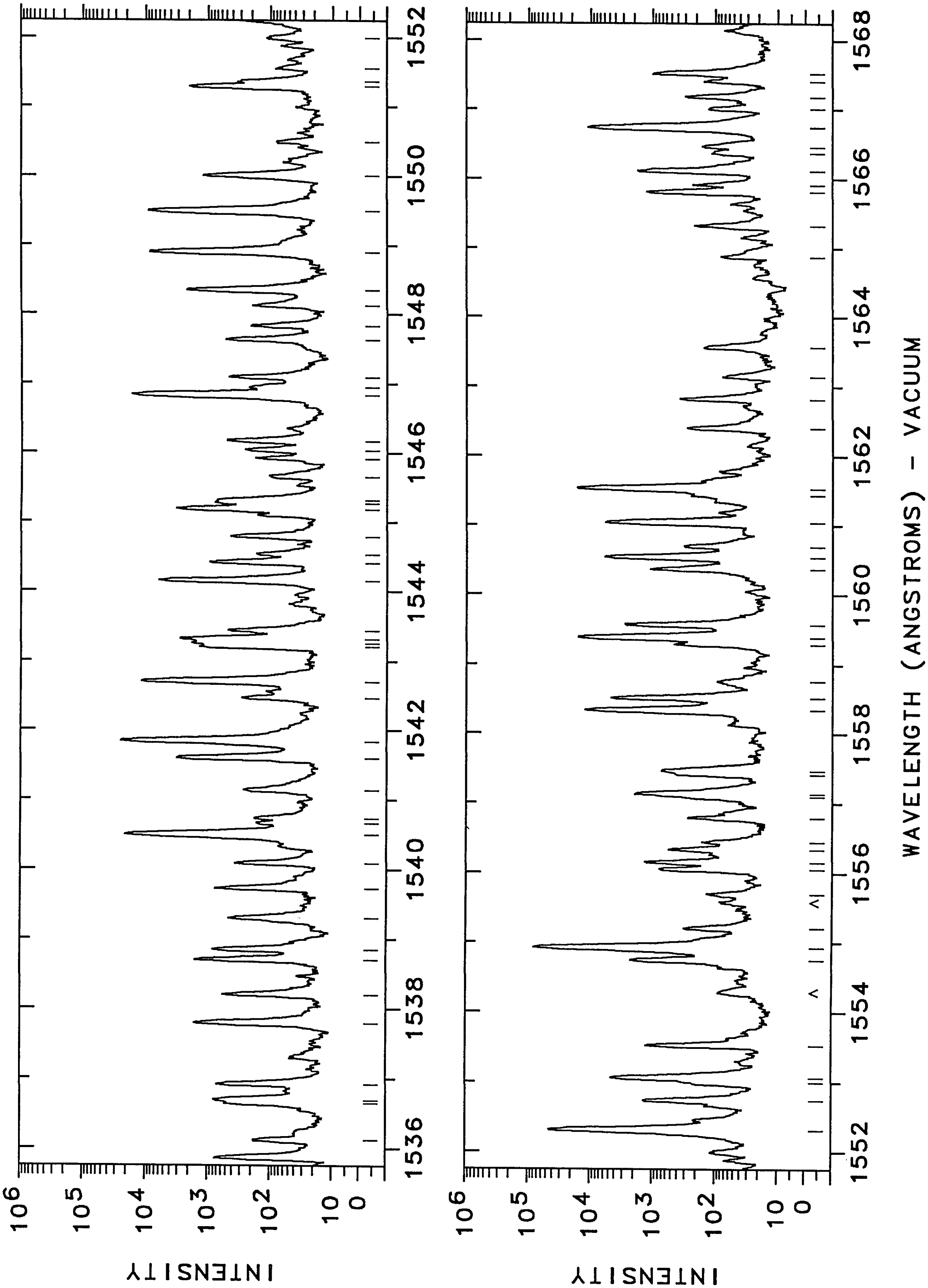
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1536.12	65099.1	170			
1536.6474	65076.738	550	Pt II	16820- 81897	K
1536.7059	65074.261	790	Pt I	775- 65850	N
1536.9303	65064.759	690	Pt II	43737-108802	K
1537.7781	65028.888	1600	Pt I	823- 65852	N
1538.1989	65011.098	560 W			
1538.6968	64990.062	1600	Pt II	43737-108727	K
1538.8457	64983.773	810	Pt II	24879- 89863	P
1539.2945	64964.826	450			
1539.7316	64946.384	760	Pt II	32237- 97183	K
1540.0916	64931.203	350			
1540.5040	64913.822	21000	Pt II	36484-101397	09
1540.6585	64907.311	110			
1540.73	64904.3	170	Pt I	0- 64904	N
1541.1327	64887.339	260			
1541.5940	64867.922	3200	Pt II	32918- 97786	K
1541.8337	64857.839	25000 L	Pt II	36484-101341	10
1542.4651	64831.289	270			
1542.7098	64821.005	12000	Pt II	42031-106852	K
1543.1986	64800.474	800	Pt II	37877-102678	K
1543.2521	64798.227	1500			
1543.3098	64795.804	2500	Pt II	41434-106229	K
1543.4274	64790.867	460 W			
1544.1529	64760.426	6200	Pt II	29261- 94022	P
1544.4116	64749.578	940			
1544.53	64744.6	160			
1544.7755	64734.326	420	Pt I	775- 65510	N
1545.1807	64717.350	3200			
1545.2656	64713.794	600	Pt II	13329- 78043	P
1545.3155	64711.705	400	Pt II	23461- 88173	K
1545.65	64697.7	93			
1545.9171	64686.522	160	Pt I	823- 65510	N
1546.0370	64681.505	240			
1546.1695	64675.962	490	Pt I	0- 64675	N
1546.8248	64648.563	17000	Pt II	23461- 88110	K
1546.9433	64643.610	200	Pt II	9356- 73999	K
1547.0765	64638.045	450	Pt II	46046-110684	K
1547.6250	64615.136	520			
1547.8305	64606.558	200	Pt II	8419- 73026	06
1548.12	64594.5	180	Pt II	18097- 82692	K
1548.3465	64585.027	2200	Pt II	43737-108322	K
1548.9038	64561.790	8700	Pt II	34647- 99209	10
1549.4972	64537.065	9100	Pt II	37877-102414	11
1550.0109	64515.675	1200	Pt I	0- 64515	N
1550.49	64495.7	67			
1551.2918	64462.405	2000	Pt II	41434-105896	K
1551.3635	64459.426	250			
1551.5534	64451.535	70	Pt II	29030- 93482	12
1551.99	64433.4	100			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1552.3268	64419.426	45000	Pt II	36484-100903	11
1552.7442	64402.108	1400			
1552.9982	64391.575	180			
1553.0689	64388.642	4500	Pt II	0- 64388	07
1553.5288	64369.582	1300			
1554.7412	64319.386	2200	Pt I	0- 64319	N
1554.9285	64311.638	80000	Pt II	36484-100795	11
1555.2133	64299.862	300	Pt II	43737-108037	K
1555.70	64279.7	120			
1556.0618	64264.800	780	Pt II	32918- 97183	K
1556.1592	64260.777	1300			
1556.3424	64253.213	540			
1556.45	64248.8	150	Pt I	0- 64248	N
1556.79	64234.7	260	Pt II	23875- 88110	K
1557.0904	64222.347	180			
1557.1462	64220.046	2000	Pt II	29261- 93482	13
1557.4129	64209.048	400	Pt II	13329- 77538	K
1557.4721	64206.608	450 D	Pt II	32237- 96443	K
1558.3479	64170.523	12000	Pt II	34647- 98817	11
1558.5216	64163.371	4700	Pt II	41434-105597	K
1558.76	64153.6	81			
1559.2806	64132.139	280			
1559.3893	64127.667	16000	Pt II	36484-100611	10
1559.5696	64120.255	2800	Pt II	41434-105554	K
1560.3614	64087.717	1100			
1560.5351	64080.584	6000	Pt I	823- 64904	N
1560.6822	64074.544		C I		B
1561.0312	64060.219	5800	Pt II	29261- 93322	K
1561.4384	64043.513		C I		B
1561.5450	64039.141	17000	Pt II	37877-101916	A
1561.5450	64039.141	17000	Pt II	46046-110085	AK
1562.3865	64004.649	270			
1562.8201	63986.891	360			
1563.14	63973.8	64			
1563.56	63956.6	140			
1564.87	63903.1	69			
1565.32	63884.7	210			
1565.8087	63864.762	1300	Pt II	42031-105896	K
1565.91	63860.6	220			
1566.1156	63852.247	1800	Pt I	823- 64675	N
1566.37	63841.9	100			
1566.46	63838.2	150			
1566.7334	63827.069	8000 P			
1566.7475	63826.494	5800 U	Pt I	0- 63826	N
1567.01	63815.8	120	Pt II	15791- 79607	K
1567.1682	63809.360	290			
1567.41	63799.5	140	Pt II	18097- 81897	K
1567.5248	63794.84	990	Ne II		C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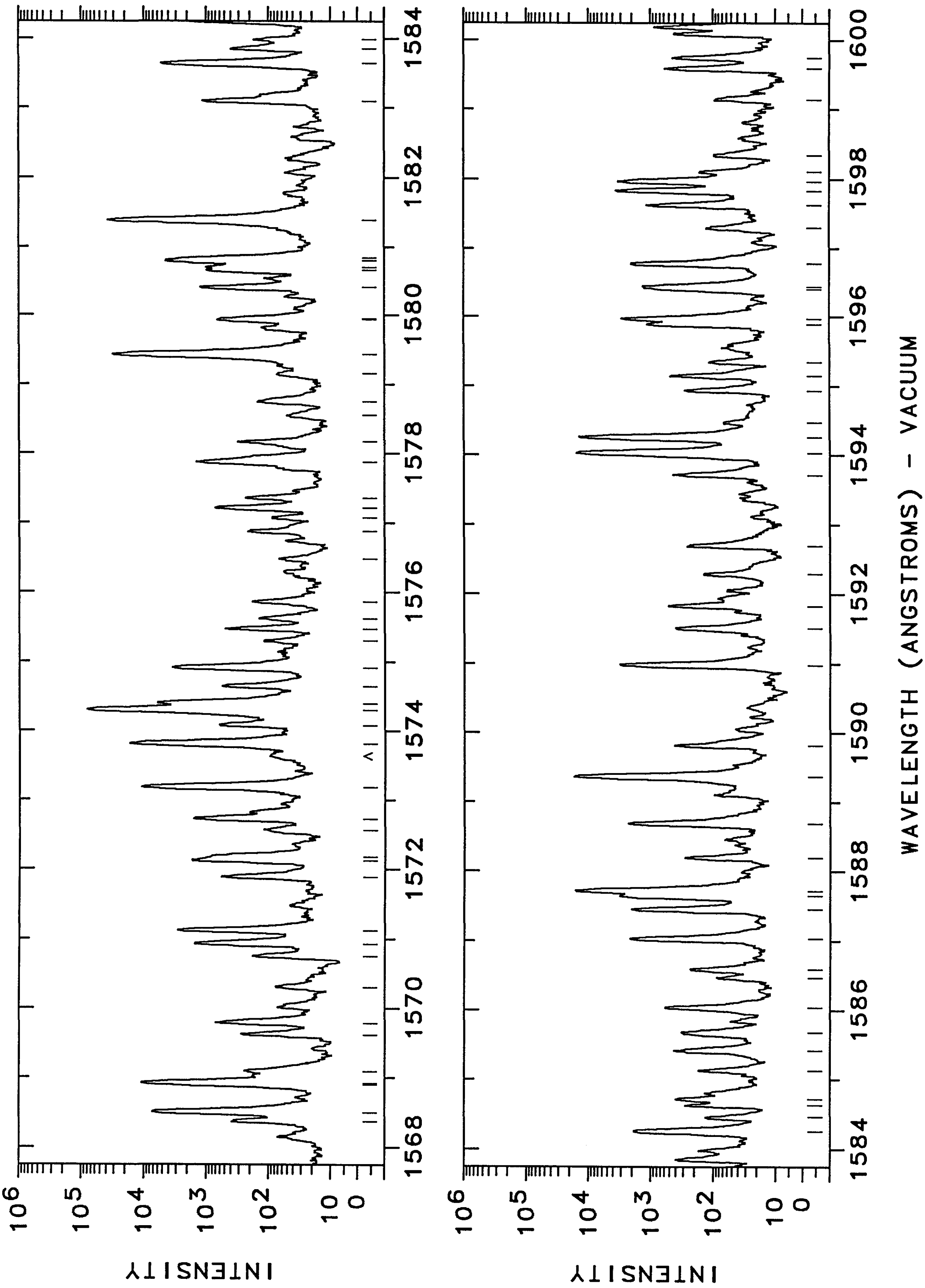
WAVELENGTH (ANGSTROMS) - VACUUM
INTENSITY

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1568.3594	63760.896	380	Pt II	27255- 91016	K
1568.4948	63755.393	7200	Pt II	36484-100239	09
1568.9021	63738.841	11000	Pt II	0- 63738	06
1568.92	63738.1	11000			
1569.09	63731.2	230			
1569.6106	63710.069	260	Pt II	24879- 88589	K
1569.7820	63703.113	710			
1570.30	63682.1	64			
1570.75	63663.9	170	Ne III		L
1570.9275	63656.661	1500	Pt II	48591-112247	K
1571.1196	63648.878	2900	Pt II	43737-107386	K
1571.8842	63617.918	570	Pt II	117493- 53875	K
1572.1223	63608.283	1700	Pt II	41434-105042	K
1572.1752	63606.143	1000			
1572.56	63590.6	110	Ne III		L
1572.7201	63584.105	1600	Pt II	41434-105018	K
1573.1802	63565.509	11000	Pt II	42031-105597	K
1573.8180	63539.750	17000	Pt II	34647- 98186	10
1574.0819	63529.094	610	Pt II	8419- 71948	06
1574.3059	63520.058	82000	Pt II	37877-101397	10
1574.4002	63516.252	5500	Pt II	37877-101394	K
1574.6393	63506.608	540	Pt II	29030- 92537	K
1574.9089	63495.736	3500	Pt I	823- 64319	N
1575.30	63480.0	110			
1575.4706	63473.098	490	Pt I	775- 64248	N
1575.62	63467.1	130			
1575.86	63457.4	170			
1576.48	63432.5	55			
1576.88	63416.4	200			
1577.07	63408.7	74			
1577.2202	63402.688	710			
1577.3573	63397.177	220			
1577.8723	63376.485	1400	Pt II	16820- 80197	K
1578.17	63364.5	300			
1578.55	63349.3	37			
1578.75	63341.3	140			
1579.15	63325.2	61			
1579.4357	63313.750	32000	Pt II	36484- 99797	09
1579.9278	63294.032	550 P	Pt II	24879- 88173	K
1579.9481	63293.218	300 U			
1580.4001	63275.116	1200	Pt II	29261- 92537	K
1580.6548	63264.920	700	Pt II	29261- 92526	K
1580.7121	63262.627	1000			
1580.8013	63259.057	3000 P	Pt II	43737-106996	K
1580.8322	63257.821	1800 P	Pt II	43737-106995	K
1581.3980	63235.188	37000	Pt II	37877-101113	K
1583.0953	63167.391	1100	Pt I	0- 63167	N
1583.6406	63145.641	5200	Pt II	34647- 97792	K

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1583.8462	63137.444	380			
1583.9753	63132.298	160	Pt II	13329- 76461	07
1584.2474	63121.454	1900	Pt I	823- 63945	N
1584.46	63113.0	120			
1584.6252	63106.405	280			
1584.7233	63102.499	380			
1585.13	63086.3	160			
1585.42	63074.8	410	Ne III		L
1585.68	63064.4	310	Ne III		L
1586.0312	63050.462	570	Pt I	775- 63826	N
1586.47	63033.0	75	Ne III		L
1586.59	63028.3	220	Pt II	23461- 86489	K
1587.0368	63010.511	2200	Pt II	42031-105042	K
1587.4559	62993.876	2000	Pt II	4786- 67780	K
1587.6482	62986.246	2500	Pt II	18097- 81083	AK
1587.6482	62986.246	2500	Pt II	42031-105018	AK
1587.7205	62983.379	16000	Pt II	34647- 97630	11
1588.1904	62964.743	270			
1588.6920	62944.863	2300	Pt II	8419- 71364	K
1589.3735	62917.874	17000	Pt II	37877-100795	12
1589.8128	62900.487	400			
1590.9851	62854.140	3100			
1591.5069	62833.532	390			
1591.8192	62821.205	500			
1592.29	62802.6	130			
1592.6974	62786.566	250	Pt II	16820- 79607	07
1593.7073	62746.779	420			
1594.0344	62733.903	15000	Pt II	37877-100611	11
1594.2611	62724.983	14000	Pt II	36484- 99209	11
1594.47	62716.8	54			
1594.9347	62698.492	270	Pt II	32918- 95617	K
1595.1388	62690.469	460	Pt I	775- 63466	N
1595.34	62682.6	100			
1595.8834	62661.220	1100	Pt II	15791- 78452	K
1595.9644	62658.039	2900	Pt II	41434-104092	K
1596.3988	62640.99	450	Ne II		C
1596.4379	62639.455	1100	Pt II	29030- 91669	K
1596.7767	62626.164	2000	Pt II	46046-108672	K
1597.30	62605.6	110	Pt II	32237- 94842	K
1597.6295	62592.735	1100	Pt II	9356- 71948	A
1597.6295	62592.735	1100	Pt II	32237- 94829	AK
1597.8343	62584.712	3500	Pt II	36484- 99068	K
1597.9705	62579.38	3300	Ne II		C
1598.11	62573.9	150			
1598.34	62564.9	82			
1599.14	62533.6	80			
1599.5835	62516.274	570	Pt II	42031-104548	K
1599.7339	62510.396	430	Pt I	0- 62510	N



INTENSITY
10⁶ 10⁵ 10⁴ 10³ 10² 10 0
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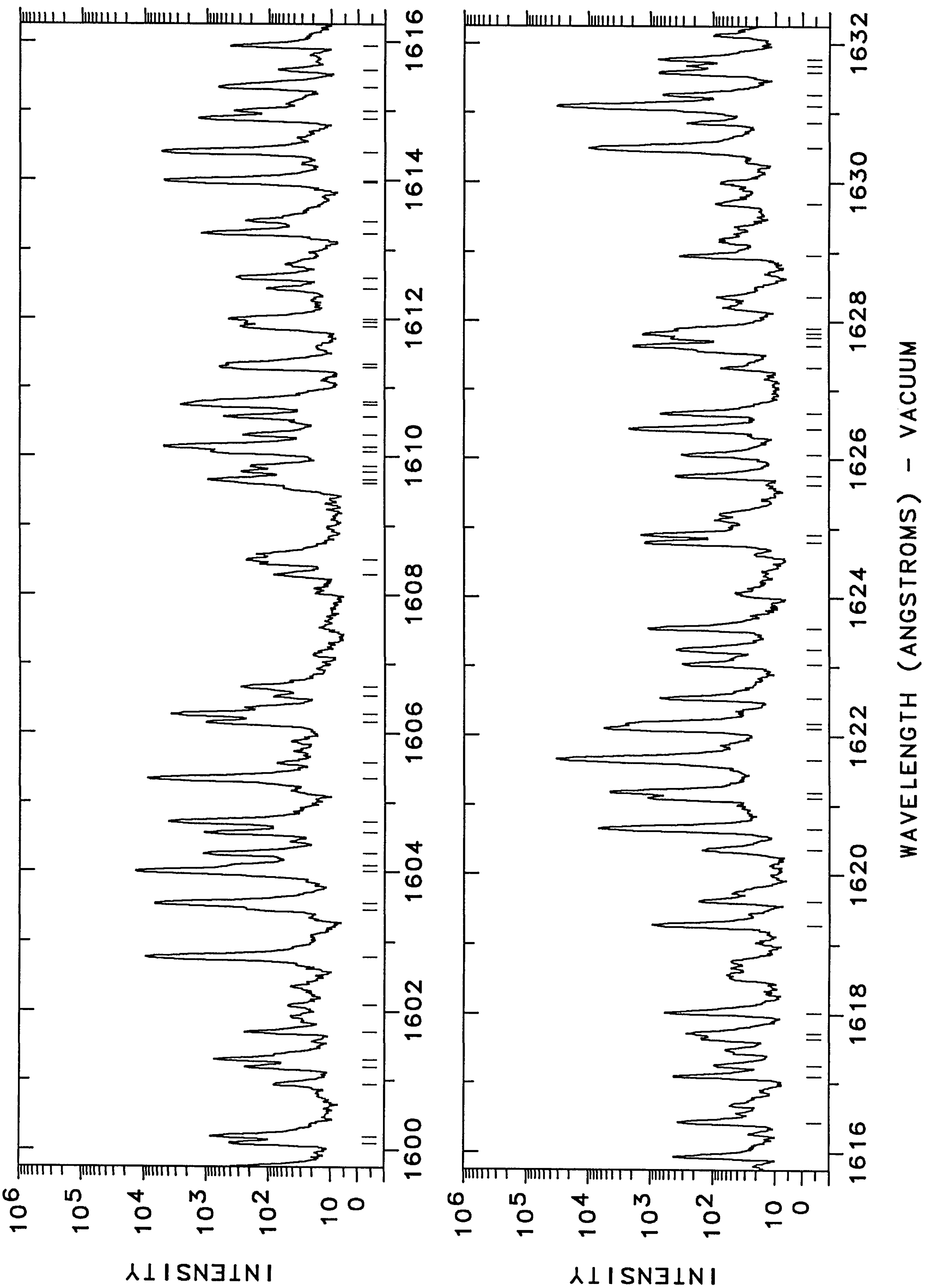
INTENSITY
10⁶ 10⁵ 10⁴ 10³ 10² 10 0
1584 1586 1588 1590 1592 1594 1596 1598 1600
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1600.0814	62496.82	400	Ne II		C
1600.1934	62492.446	850	Pt II	43737-106229	K
1600.94	62463.3	73	Pt II	15791- 78254	K
1601.1825	62453.843	230			
1601.2962	62449.408	750			
1601.70	62433.7	230			
1602.09	62418.5	40			
1602.7837	62391.451	9500	Pt I	775- 63167	N
1603.4612	62365.089	200	Pt II	23461- 85826	K
1603.5502	62361.629	6600	Pt II	37877-100239	10
1604.0102	62343.743	14000	Ne II		A
1604.0102	62343.743	14000	Pt I	823- 63167	AN
1604.0927	62340.54	300	Ne II		C
1604.2682	62333.716	1100	Pt II	36484- 98817	11
1604.5702	62321.985	1100	Pt I	0- 62321	N
1604.7337	62315.635	4100	Ne III		L
1605.3536	62291.572	8800	Pt I	775- 63067	N
1605.58	62282.8	63			
1606.1550	62260.492	1000			
1606.2741	62255.875	3700			
1606.54	62245.6	74			
1606.6658	62240.698	280	Pt II	29030- 91271	K
1608.30	62177.5	72			
1608.5173	62169.05	220	Ne II		C
1609.6117	62126.785	200	Pt II	42031-104158	K
1609.6647	62124.739	930			
1609.78	62120.3	270			
1609.8562	62117.349	190			
1610.0697	62109.112	800	Pt II	46046-108155	K
1610.1405	62106.381	4800	Pt I	0- 62106	N
1610.3173	62099.563	250	Pt II	18097- 80197	K
1610.5649	62090.016	520	Pt I	6567- 68657	N
1610.7448	62083.081	2600	Pt II	41434-103517	K
1610.7907	62081.312	1900			
1611.2844	62062.290	600	Pt I	0- 62062	N
1611.3397	62060.160	300	Pt II	42031-104092	K
1611.8840	62039.204	280	Pt I	6567- 68606	N
1611.9533	62036.537	250	Pt II	13329- 75365	K
1612.0071	62034.466	440	Pt II	32237- 94271	K
1612.44	62017.8	99	Pt II	48591-110609	K
1612.5934	62011.912	330	Pt I	823- 62835	N
1613.2389	61987.099	1200	Pt II	41434-103421	K
1613.41	61980.5	230			
1613.9653	61959.201	800	Pt II	8419- 70379	08
1613.9882	61958.320	4000	Pt II	9356- 71314	04
1614.4078	61942.218	5200	Pt I	0- 61942	N
1614.8843	61923.941	1300	Pt II	32918- 94842	K

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1614.9874	61919.986	350	Pt II	37877- 99797	10
1615.3211	61907.196	630			
1615.59	61896.9	61			
1615.9441	61883.329	410	Pt I	775- 62659	N
1616.43	61864.7	350			
1617.0934	61839.347	410	Pt II	27255- 89095	K
1617.25	61833.4	84			
1617.64	61818.5	140			
1617.7194	61815.417	250			
1618.0184	61803.994	580	Pt II	21168- 82972	P
1619.2728	61756.117	930	Pt II	34647- 96403	K
1619.62	61742.9	160			
1620.36	61714.7	140	Pt II	32918- 94633	K
1620.6682	61702.943	6800	Pt II	36484- 98186	11
1621.1049	61686.323	1100 D			
1621.1897	61683.096	4500	Pt II	50564-112247	K
1621.6590	61665.247	33000 L	Pt II	0- 61665	A
1621.6590	61665.247	33000 L	Pt II	9356- 71021	AK
1622.1204	61647.704	5500	Pt II	4786- 66434	07
1622.1824	61645.349	2000	Pt I	0- 61645	N
1622.5440	61631.611	690	Pt II	16820- 78452	K
1623.0259	61613.311	290			
1623.2360	61605.337	370	Pt II	42031-103637	K
1623.5577	61593.130	1100	Pt II	37877- 99471	K
1624.7988	61546.082	1200	Pt I	775- 62321	N
1624.9144	61541.703	1400	Pt II	46046-107588	K
1625.6270	61514.726		Al II		
1625.7587	61509.745	380	Pt II	18097- 79607	07
1626.0619	61498.274	300	Pt I	823- 62321	N
1626.4387	61484.026	2200	Pt II	34647- 96131	K
1626.6610	61475.624	670	Pt II	48591-110066	K
1627.33	61450.4	62			
1627.6535	61438.138	1900	Pt II	41434-102872	K
1627.7656	61433.907	450	Pt II	16820- 78254	K
1627.8299	61431.480	1300	Pt II	42031-103463	K
1627.9003	61428.823	350			
1628.36	61411.5	75			
1628.9482	61389.306	320	Pt II	42031-103421	K
1629.70	61361.0	79			
1630.4910	61331.219	6200 P	Pt II	37877- 99209	12
1630.5063	61330.643	4600 U	Pt I	775- 62106	N
1630.86	61317.3	240			
1631.0903	61308.684	32000	Pt II	36484- 97792	K
1631.2626	61302.209	610			
1631.5907	61289.880	710	Pt II	13329- 74619	04
1631.6826	61286.429	200	Pt I	775- 62062	N
1631.7814	61282.718	740	Pt I	823- 62106	N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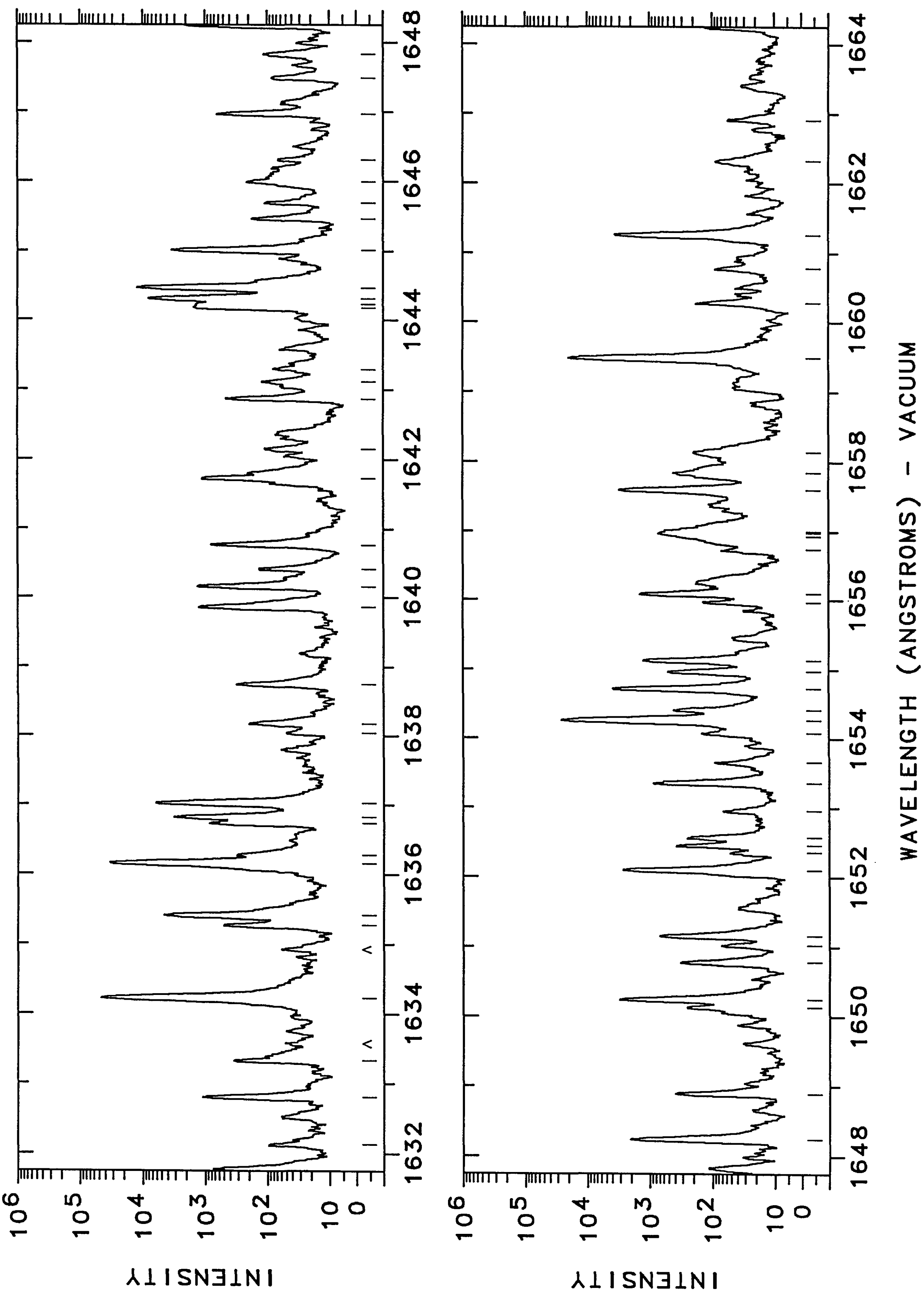
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1632.13	61269.6	87			
1632.8049	61244.304	1100	Pt II	41434-102678	K
1633.3302	61224.607	340			
1634.2337	61190.759	46000	Pt II	37877- 99068	K
1635.2734	61151.854	500	Pt II	50564-111716	K
1635.4147	61146.572	4600	Pt II	36484- 97630	11
1636.1647	61118.541	34000	Pt I	823- 61942	N
1636.28	61114.2	310			
1636.7302	61097.425	850	Pt I	0- 61097	N
1636.8152	61094.252	3200	Pt II	43737-104831	K
1637.0168	61086.728	6200	Pt II	41434-102520	K
1638.04	61048.6	40			
1638.18	61043.4	190	Ne III		L
1638.7331	61022.749	310	Pt II	9356- 70379	07
1639.8606	60980.793	1300	Pt II	41434-102414	K
1640.1553	60969.836	1300	Pt II	34647- 95617	K
1640.41	60960.4	130	Pt II	32237- 93197	K
1640.7691	60947.028	790	Pt II	24879- 85826	K
1641.7317	60911.293	1100	Pt II	29261- 90173	K
1642.15	60895.8	99	Pt II	24879- 85775	K
1642.8597	60869.471	450	Pt I	775- 61645	N
1643.11	60860.2	110			
1643.29	60853.5	70			
1644.1761	60820.736	1300	Pt II	24879- 85700	P
1644.2292	60818.770	1100	Pt II	15791- 76610	04
1644.3084	60815.843	7900	Pt II	8419- 69235	08
1644.4634	60810.110	12000	Pt I	823- 61633	N
1645.0044	60790.111	3400	Pt II	50564-111354	K
1645.46	60773.3	170			
1645.69	60764.8	100			
1645.99	60753.7	200			
1646.31	60741.9	56			
1646.9762	60717.332	640	Pt II	16820- 77538	K
1647.49	60698.4	75			
1647.83	60685.9	110			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1648.2494	60670.430	2100	Pt II	13329- 73999	P
1648.9010	60646.455	390	Pt II	42031-102678	K
1650.1301	60601.282	250	Pt II	29261- 89863	P
1650.2455	60597.043	3100	Pt II	9356- 69953	04
1650.7791	60577.457	320	Pt II	29030- 89607	12
1651.03	60568.3	61			
1651.1608	60563.452	680	Pt II	32918- 93482	14
1652.1112	60528.613	2700	Pt I	823- 61352	N
1652.36	60519.5	41			
1652.4522	60516.123	370			
1652.5631	60512.062	240	Pt II	32237- 92749	K
1652.96	60497.5	57			
1653.3618	60482.830	860	Pt II	41434-101916	K
1653.66	60471.9	81			
1654.08	60456.6	140			
1654.2659	60449.774	26000			
1654.4140	60444.363	400			
1654.7384	60432.512	3900	Pt II	13329- 73761	07
1654.9743	60423.899	500	Pt I	0- 60423	N
1655.1434	60417.726	1300	Pt II	32918- 93336	11
1655.97	60387.6	130			
1656.0959	60382.977	1400	Pt II	42031-102414	K
1656.74	60359.5	60	Pt I	6567- 66927	N
1656.9283	60352.641	U	C I		B
1656.9728	60351.021	400 U			
1657.0082	60349.732	P	C I		B
1657.6053	60327.992	3000	Pt I	0- 60328	N
1657.85	60319.1	400			
1658.14	60308.5	190			
1659.4860	60259.623	20000	Pt II	4786- 65046	K
1660.28	60230.8	170			
1660.78	60212.7	78			
1661.2608	60195.245	3500	Pt II	34647- 94842	K
1662.32	60156.9	76	Pt II	18097- 78254	K
1662.91	60135.5	46			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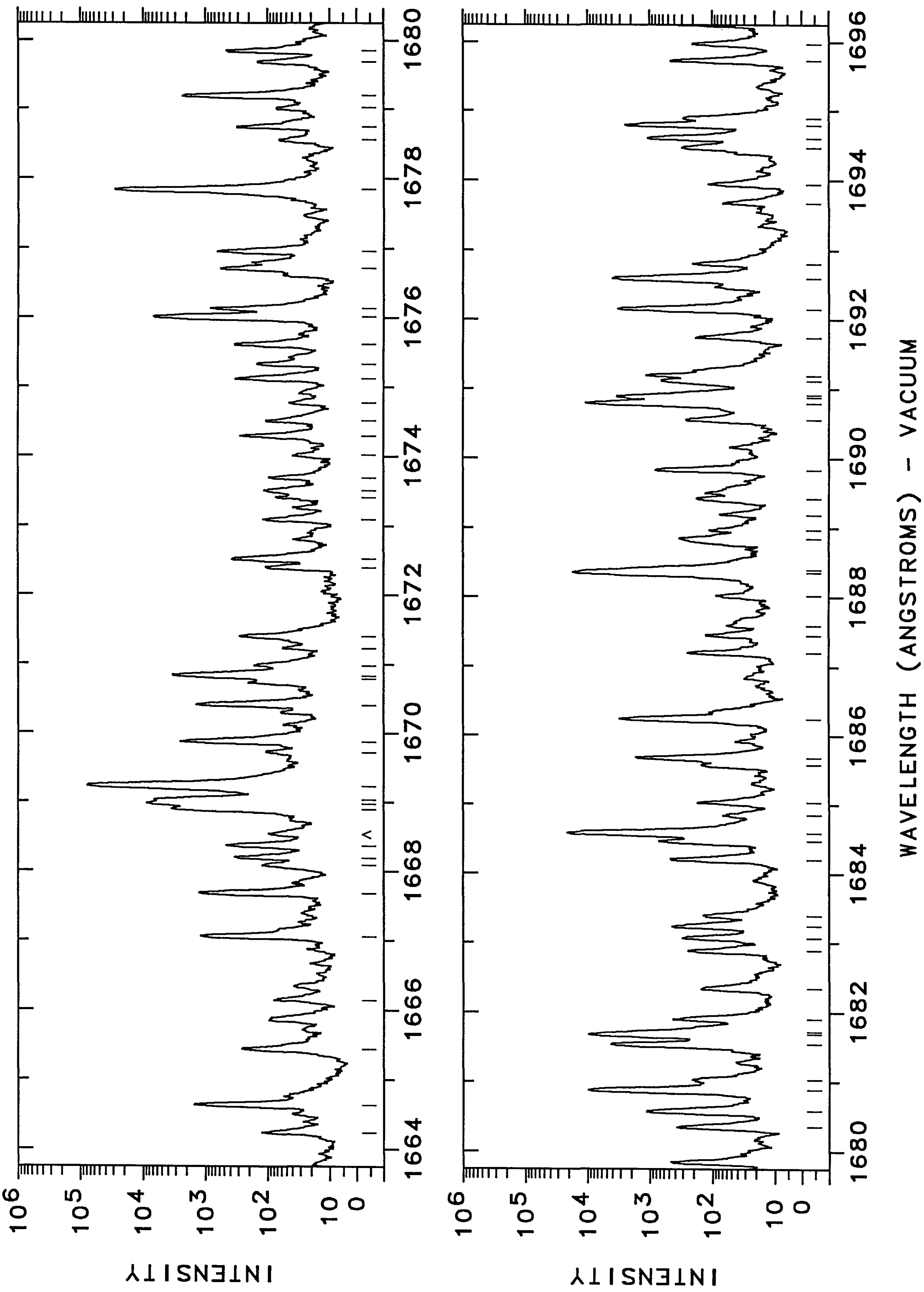
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
1664.23	60087.8	120		
1664.6312	60073.366	1500	Pt II 50564-110638	K
1665.4292	60044.582	250	Pt II 50564-110609	K
1666.14	60019.0	70		
1667.0557	59985.998	1200	Pt II 34647- 94633	K
1667.6740	59963.758	1300	Pt II 41434-101397	K
1668.09	59948.8	110	Pt II 27255- 87204	K
1668.1882	59945.275	330	Pt II 18097- 78043	P
1668.3644	59938.944	450		
1668.9014	59919.657	3500 D	Pt II 36484- 96403	AK
1668.9014	59919.657	3500 D	Pt I 0- 59920	A
1668.9782	59916.900	8000	Pt I 0- 59916	N
1669.0350	59914.861	6000	Pt II 37877- 97792	K
1669.2312	59907.819	77000	Pt II 41434-101341	K
1669.7070	59890.748	98	Pt II 23461- 83352	12
1669.8647	59885.091	2500	Pt II 42031-101916	K
1670.4235	59865.058	1400	Pt I 6567- 66432	N
1670.7878	59852.005		Al II	
1670.8423	59850.053	1300	Pt II 46046-105896	K
1670.98	59845.1	150		
1671.23	59836.2	47	Ne III	L
1671.40	59830.1	270	Ne III	L
1672.39	59794.7	99		
1672.5164	59790.146	370	Pt II 15791- 75581	07
1673.09	59769.6	110		
1673.41	59758.2	64		
1673.51	59754.6	100		
1673.69	59748.2	86		
1674.02	59736.4	29		
1674.2916	59726.75	260	Ne II	C
1674.51	59719.0	97		
1674.77	59709.7	35	Pt I 6140- 65850	N
1675.1218	59697.153	320	Pt II 13329- 73026	05
1675.3280	59689.804	140	Pt II 21168- 80858	10
1675.6133	59679.641	330	Pt II 46046-105726	K
1676.0154	59665.323	6700	Pt I 775- 60441	N
1676.1308	59661.215	820		
1676.7093	59640.632	560	Pt II 16820- 76461	07
1676.9604	59631.700	640	Pt II 50564-110196	K
1677.8443	59600.286	28000	Pt I 823- 60423	N
1678.56	59574.9	57		
1678.7493	59568.156	310		
1679.02	59558.6	62		
1679.2007	59552.143	2300	Pt I 775- 60328	N
1679.69	59534.8	130		
1679.8544	59528.969	450		
1680.3563	59511.188	360	Pt II 23461- 82972	P
1680.5783	59503.327	1100		
1680.8886	59492.342	9800	Pt I 0- 59492	N

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
1681.0350	59487.16	200	Ne II	C
1681.5384	59469.353	4200	Pt II 41434-100903	K
1681.6840	59464.21	9600	Ne II	C
1681.7207	59462.906	1300 U		
1681.9119	59456.146	420		
1682.34	59441.0	140		
1682.8781	59422.010	230	Pt II 18097- 77519	06
1683.07	59415.2	290		
1683.24	59409.2	430		
1683.39	59403.9	130		
1684.2054	59375.181	460	Pt II 34647- 94022	P
1684.4637	59366.076	710	Pt II 42031-101397	K
1684.5867	59361.741	21000	Pt II 41434-100795	AK
1684.5867	59361.741	21000	Pt II 42031-101394	AK
1684.85	59352.5	58		
1685.03	59346.1	160		
1685.58	59326.8	140		
1685.6828	59323.142	1700	Pt II 43737-103060	K
1686.2510	59303.153	3000	Pt II 24879- 84182	11
1687.20	59269.8	240	Pt II 36484- 95754	K
1687.45	59261.0	120		
1687.59	59256.1	48		
1688.02	59241.0	76	Ne III	L
1688.3553	59229.24	17000	Ne II	C
1688.3945	59227.864	2000 U		
1688.84	59212.2	330	Ne III	L
1688.97	59207.7	100		
1689.19	59200.0	66		
1689.42	59191.9	170	Ne III	L
1689.8288	59177.592	800	Pt II 41434-100611	K
1690.55	59152.3	250		
1690.7825	59144.213	11000	Pt I 775- 59920	N
1690.8699	59141.156	3400	Pt I 775- 59916	N
1690.9099	59139.757	300 U		
1691.1034	59132.990	400	Pt II 36484- 95617	K
1691.1787	59130.357	1100	Pt I 6567- 65697	N
1691.74	59110.7	170		
1692.1497	59096.426	3200	Pt I 823- 59920	N
1692.5845	59081.245	3900	Pt II 42031-101113	K
1692.80	59073.7	200	Pt II 36484- 95557	K
1693.67	59043.4	57		
1693.94	59034.0	100	Pt II 32237- 91271	K
1694.4440	59016.409	300	Pt I 775- 59792	N
1694.5987	59011.02	1100	Ne II	C
1694.7864	59004.49	2500	Ne II	C
1694.8828	59001.13	280	Ne II	C
1695.7265	58971.774	460	Pt II 46046-105018	K
1695.97	58963.3	200		



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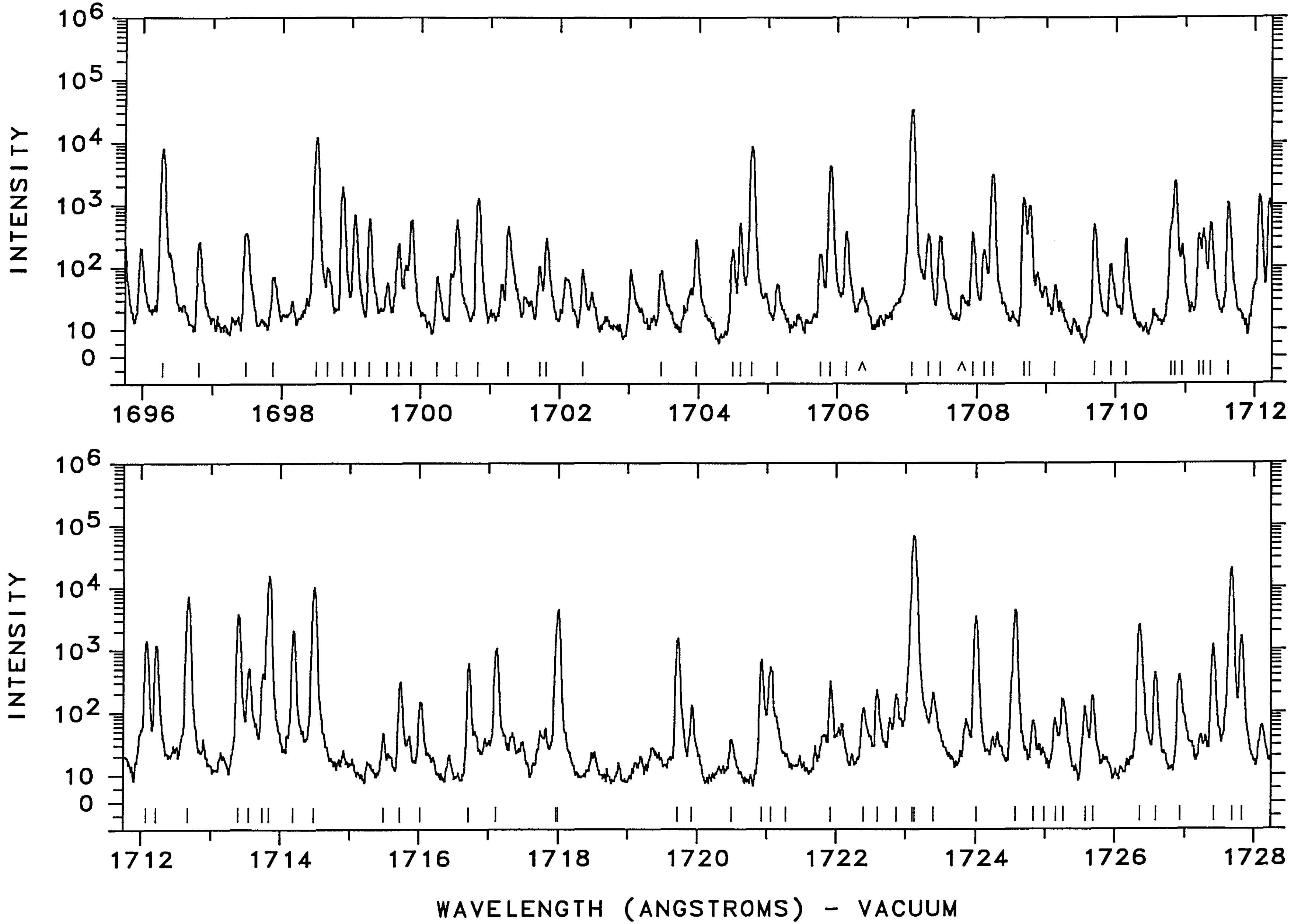
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1696.2887	58952.230	8100	Pt II	4786- 63738	07
1696.7990	58934.500	250			
1697.48	58910.9	340			
1697.87	58897.3	61	Ne III		L
1698.4958	58875.624	12000	Pt II	43737-102613	K
1698.66	58869.9	89			
1698.8732	58862.545	1900	Pt I	823- 59686	N
1699.0497	58856.430	680			
1699.2606	58849.125	600	Pt II	110257- 51408	K
1699.52	58840.1	47			
1699.6746	58834.792	230	Pt II	34647- 93482	15
1699.8757	58827.831	560	Pt II	15791- 74619	05
1700.24	58815.2	61			
1700.5245	58805.386	570	Pt II	41434-100239	K
1700.8188	58795.211	1300	Pt II	48591-107386	K
1701.2700	58779.618	450	Pt II	32237- 91016	K
1701.71	58764.4	94	Pt II	42031-100795	K
1701.8227	58760.528	280	Pt II	16820- 75581	07
1702.33	58743.0	82			
1703.46	58704.0	79			
1703.9703	58686.469	270	Pt I	775- 59462	N
1704.49	58668.6	180	Pt I	823- 59492	N
1704.5981	58664.855	500			
1704.7667	58659.053	8400	Pt II	24879- 83538	K
1705.13	58646.6	44			
1705.76	58624.9	150			
1705.9115	58619.689	4200	Pt II	13329- 71948	05
1706.1353	58611.999	360			
1707.0710	58579.872	33000	Pt II	42031-100611	K
1707.3021	58571.942	330			
1707.4716	58566.128	300	Pt II	37877- 96443	K
1707.9344	58550.258	350	Pt II	34647- 93197	K
1708.10	58544.6	180	Pt II	16820- 75365	K
1708.2132	58540.702	3100	Pt I	10116- 68657	N
1708.6568	58525.504	1300	Pt II	37877- 96403	K
1708.7393	58522.678	950	Pt I	823- 59346	N
1709.12	58509.6	41	Pt II	32237- 90746	K
1709.6984	58489.848	470	Pt I	10116- 68606	N
1709.93	58481.9	100	Pt I	0- 58482	N
1710.1391	58474.776	270	Pt I	10131- 68606	N
1710.7964	58452.309	350			
1710.8580	58450.203	2400	Pt II	15791- 74241	05
1710.9566	58446.836	250			
1711.1926	58438.776	320	Pt II	21168- 79607	08
1711.2670	58436.235	350	Pt II	23461- 81897	P
1711.3642	58432.916	490			
1711.6209	58424.152	1100	Pt II	9356- 67780	K
1712.0665	58408.946	1400			
1712.2098	58404.058	1200	Pt II	48591-106995	K
1712.6670	58388.467	7300	Pt I	0- 58388	N
1713.3934	58363.713	3700	Pt II	41434- 99797	AK
1713.3934	58363.713	3700	Pt II	18097- 76461	A
1713.3934	58363.713	3700	Pt II	16820- 75184	AK
1713.5477	58358.457	500	Pt II	36484- 94842	K
1713.7421	58351.837	400	Pt I	775- 59127	N
1713.8364	58348.627	16000	Pt II	43737-102086	K
1714.1842	58336.788	2100	Pt I	6567- 64904	N
1714.4801	58326.720	10000	Pt I	0- 58326	N
1715.49	58292.4	37			
1715.7210	58284.535	300			
1716.02	58274.4	140			
1716.7118	58250.896	600			
1717.1032	58237.618	1100	Pt II	50564-108802	K
1717.9693	58208.258	1200 U	Pt II	15791- 73999	P
1717.9888	58207.597	4400 P	Pt II	42031-100239	K
1719.7159	58149.140	1500	Pt II	36484- 94633	K
1719.92	58142.2	120			
1720.49	58123.0	26			
1720.9199	58108.457	680	Pt I	6567- 64675	N
1721.0604	58103.713	510 D			
1721.2723	58096.560		Al II		
1721.9209	58074.677	310	Pt II	50564-108639	K
1722.40	58058.5	110			
1722.60	58051.8	220	Pt I	6567- 64619	N
1722.87	58042.7	180	Pt II	115060- 57018	K
1723.0983	58034.994	3500			
1723.1314	58033.878	68000	Pt II	4786- 62820	07
1723.3891	58025.20	190	Ne II		C
1723.9935	58004.859	3400	Pt I	775- 58780	N
1724.5730	57985.367	4300	Pt II	13329- 71314	05
1724.83	57976.7	63			
1724.9840	57971.552		Al II		
1725.15	57966.0	69	Pt II	21717- 79683	K
1725.26	57962.3	150			
1725.58	57951.5	110			
1725.69	57947.8	170	Pt I	6567- 64515	N
1726.3697	57925.022	2500	Pt II	16820- 74745	05
1726.5970	57917.395	420			
1726.9376	57905.972	380			
1727.4189	57889.838	1200	Pt II	34647- 92537	K
1727.6799	57881.092	20000	Pt II	43737-101618	K
1727.8258	57876.205	1600	Pt II	37877- 95754	P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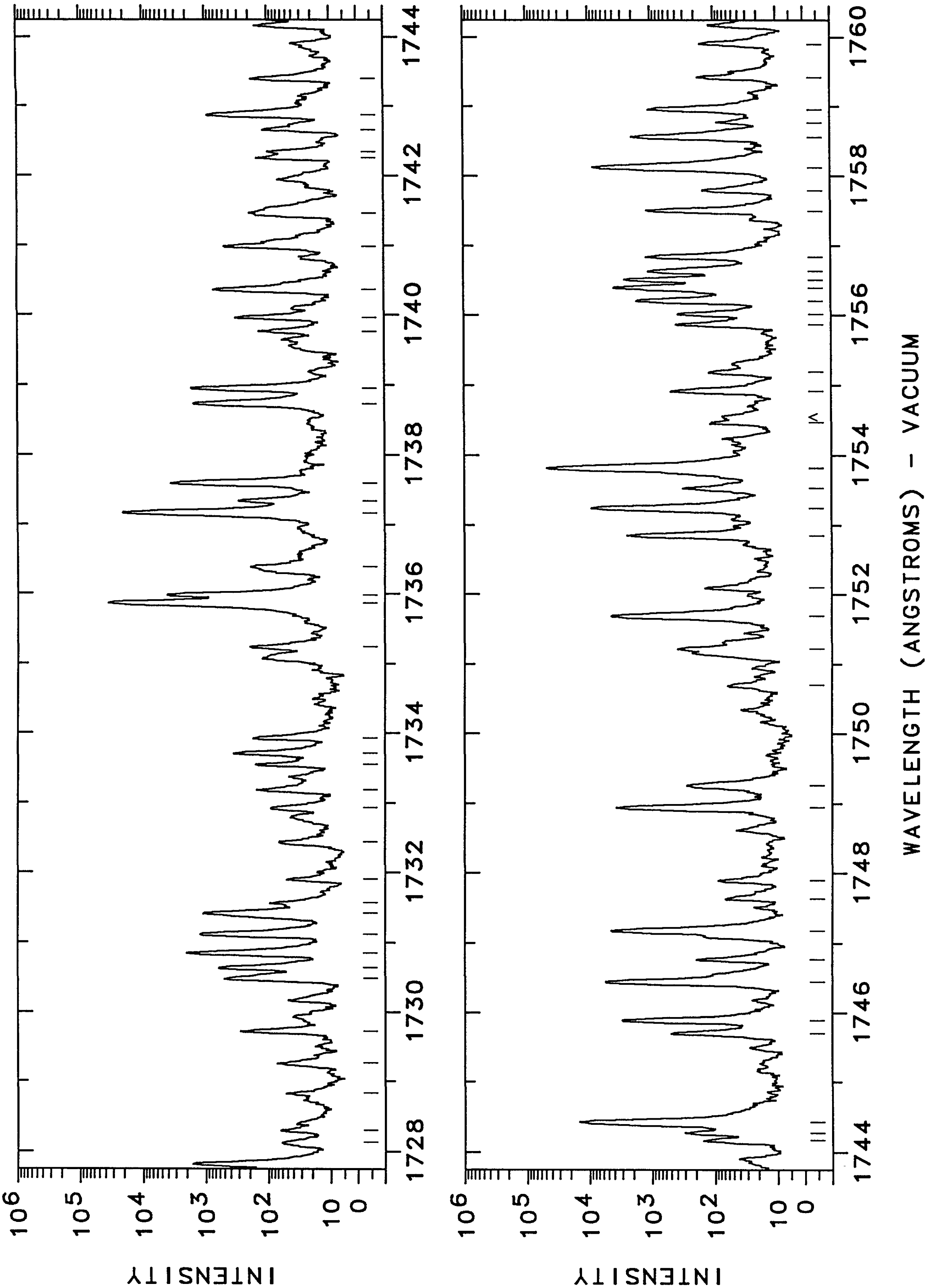
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1728.13	57866.0	52			
1728.30	57860.3	56			
1728.83	57842.6	44			
1729.26	57828.2	63	Pt II	32918- 90746	K
1729.7243	57812.682	270	Pt II	24879- 82692	K
1730.4798	57787.441	500	Pt II	36484- 94271	K
1730.6473	57781.85	620	Ne II		C
1730.8544	57774.935	2000	Pt II	41434- 99209	K
1731.1250	57765.904	1200	Pt II	42031- 99797	K
1731.4175	57756.145	1100			
1731.57	57751.1	85			
1731.91	57739.7	42			
1732.44	57722.1	58			
1732.93	57705.7	83	Pt I	775- 58482	N
1733.19	57697.1	150			
1733.5407	57685.407	150			
1733.7099	57679.777	350	Pt II	37877- 95557	K
1733.93	57672.5	170			
1735.24	57628.9	190			
1735.8642	57608.192	36000	Pt II	8419- 66028	06
1735.9774	57604.437	4100	Pt II	43737-101341	K
1736.39	57590.7	180	Pt II	46046-103637	K
1737.1732	57564.784	21000	Pt I	823- 58388	N
1737.3402	57559.25	290	Ne II		C
1737.5956	57550.790	3600	Pt I	775- 58326	N
1738.7356	57513.06	1600	Ne II		C
1738.9433	57506.187	1700	Pt I	0- 57506	D
1739.76	57479.2	130			
1739.9574	57472.672	320	Pt II	50564-108037	K
1740.3637	57459.254	720	Pt II	29030- 86489	K
1740.9739	57439.115	480	Pt II	42031- 99471	K
1741.46	57423.1	180			
1742.2518	57396.985	140	Pt II	23461- 80858	11
1742.34	57394.1	89			
1742.66	57383.5	110	Pt II	41434- 98817	K
1742.8712	57376.59	910	Ne II		C
1743.40	57359.2	170			
1744.17	57333.9	150			
1744.2756	57330.39	290	Ne II		C

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1744.4305	57325.299	15000	Pt I	775- 58101	N
1745.6949	57283.779	490	Pt II	21168- 78452	K
1745.8874	57277.463	3000	Pt I	823- 58101	N
1746.4563	57258.805	5600	Pt I	6567- 63826	N
1746.77	57248.5	190			
1747.1795	57235.104	4600	Pt II	15791- 73026	06
1747.64	57220.0	59			
1747.9003	57211.500	80	Pt I	775- 57987	D
1748.9496	57177.177	3700	Pt II	42031- 99209	K
1749.26	57167.0	270			
1750.70	57120.0	52			
1751.2164	57103.17	380	Ne II		C
1751.7022	57087.331	4500	Pt II	18097- 75184	A
1751.7022	57087.331	4500	Ne II		A
1752.10	57074.4	130			
1752.8546	57049.796	2500	Pt II	13329- 70379	08
1753.2526	57036.847	9200	Pt II	42031- 99068	K
1753.54	57027.5	300			
1753.8286	57018.115	48000	Pt II	0- 57018	A
1753.8286	57018.115	48000	Pt II	24879- 81897	AK
1754.47	56997.3	110			
1754.9114	56982.935	480	Pt II	23875- 80858	12
1755.19	56973.9	110			
1755.8673	56951.912	390	Pt II	37877- 94829	K
1756.0182	56947.018	370	Pt II	54373-111320	K
1756.2086	56940.845	1700	Pt II	16820- 73761	07
1756.3952	56934.795	4000	Pt II	53749-110684	K
1756.5046	56931.247	2600	Pt II	8419- 65351	07
1756.6264	56927.301	1100	Pt I	6140- 63067	N
1756.8363	56920.50	1200	Ne II		C
1757.5047	56898.852	1200	Pt I	6567- 63466	N
1757.79	56889.6	140			
1758.1220	56878.874	8400	Pt II	4786- 61665	07
1758.5549	56864.87	2000	Ne II		C
1758.77	56857.9	76	Pt II	32237- 89095	K
1758.9451	56852.259	1100	Pt II	36484- 93336	12
1759.42	56836.9	160			
1759.90	56821.4	150	Pt II	50564-107386	K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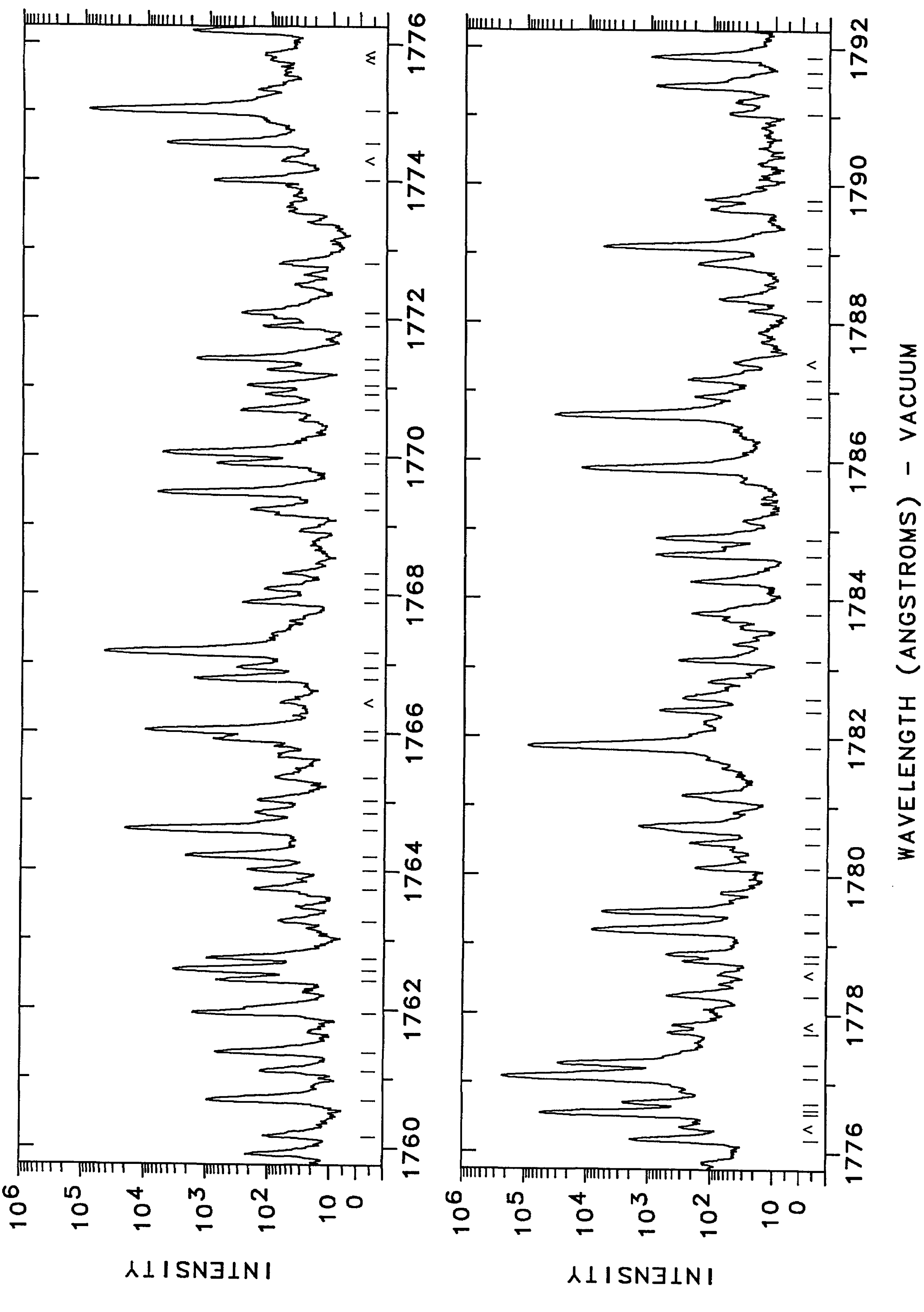
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1760.16	56813.0	110			
1760.6896	56795.928	960 D	Pt I	10131- 66927	AN
1760.6896	56795.928	960 D	Pt II	29030- 85826	AK
1761.11	56782.4	120			
1761.38	56773.7	710			
1761.9446	56755.474	1700	Pt II	37877- 94633	K
1762.4146	56740.338	680			
1762.5591	56735.686	3400 D	Pt II	23461- 80197	AK
1762.5591	56735.686	3400 D	Pt II	21717- 78452	AK
1762.7266	56730.295	1000	Pt I	775- 57506	D
1763.27	56712.8	61			
1763.7269	56698.12	160	Ne II		C
1764.01	56689.0	210			
1764.2127	56682.509	2200	Pt I	823- 57506	D
1764.5948	56670.234	21000	Pt I	0- 56670	N
1764.84	56662.4	160			
1765.0132	56656.80	150	Ne II		C
1765.35	56646.0	72			
1765.8981	56628.41	810	Ne II		C
1766.0328	56624.090	10000	Pt II	13329- 69953	04
1766.7883	56599.877	1700	Pt I	6567- 63167	N
1766.95	56594.7	330	Pt II	21168- 77763	K
1767.1612	56587.934	47000	Pt II	0- 56587	07
1767.89	56564.6	280	Pt II	29261- 85826	K
1768.0852	56558.36	120	Ne II		C
1768.31	56551.2	55			
1769.2416	56521.393	200	Pt II	18097- 74619	05
1769.4841	56513.647	6600	Pt II	29261- 85775	K
1769.9101	56500.045	730	Pt I	6567- 63067	N
1770.0610	56495.228	5600	Pt II	43737-100232	K
1770.68	56475.5	300			
1770.90	56468.5	110			
1771.03	56464.3	230			
1771.26	56457.0	110			
1771.4140	56452.077	1600			
1771.89	56436.9	130			
1772.0902	56430.536	290	Pt II	50564-106995	K
1772.80	56407.9	65			
1774.0082	56369.525	830	Pt II	21168- 77538	K
1774.5470	56352.410	4800	Pt II	41434- 97786	K

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1775.0160	56337.521	86000	Pt II	8419- 64757	07
1776.1777	56300.673	1900	Pt I	10131- 66432	N
1776.5571	56288.650	55000	Pt I	0- 56288	N
1776.6141	56286.844	360 U			
1776.7088	56283.844	2500	Pt II	36484- 92767	K
1777.0866	56271.879	230000	Pt II	4786- 61058	07
1777.2783	56265.808	28000	Pt I	775- 57041	N
1777.72	56251.8	480			
1778.2476	56235.139	490			
1778.7495	56219.27	270	Ne II		C
1778.85	56216.1	510			
1779.1858	56205.486	5500	Pt II	16820- 73026	06
1779.2172	56204.493	5500	Pt II	24879- 81083	K
1779.4723	56196.435	5700	Pt II	41434- 97630	K
1780.11	56176.3	170			
1780.47	56164.9	210			
1780.7016	56157.640	1500	Pt II	15791- 71948	05
1781.15	56143.5	290			
1781.8617	56121.077	93000	Pt II	4786- 60907	07
1782.3858	56104.576	690			
1782.57	56098.8	280			
1783.1027	56082.019	340	Pt I	10116- 66198	N
1783.7849	56060.57	200	Ne II		C
1784.24	56046.3	210	Pt II	21717- 77763	K
1784.6257	56034.159	810	Pt II	48591-104625	K
1784.8755	56026.317	790			
1785.8803	55994.795	13000	Pt II	9356- 65351	05
1786.6480	55970.734	36000	Pt I	823- 56794	N
1786.92	55962.2	180			
1787.17	55954.4	240			
1788.34	55917.8	70			
1788.85	55901.8	160			
1789.0922	55894.269	5800	Pt I	775- 56670	N
1789.64	55877.2	100			
1789.78	55872.8	130			
1791.04	55833.5	45			
1791.44	55821.0	820	Pt II	21717- 77538	K
1791.6462	55814.591	810			
1791.8624	55807.857	980	Pt II	23875- 79683	K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1776
INTENSITY
10^6
10^5
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10^2
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1776
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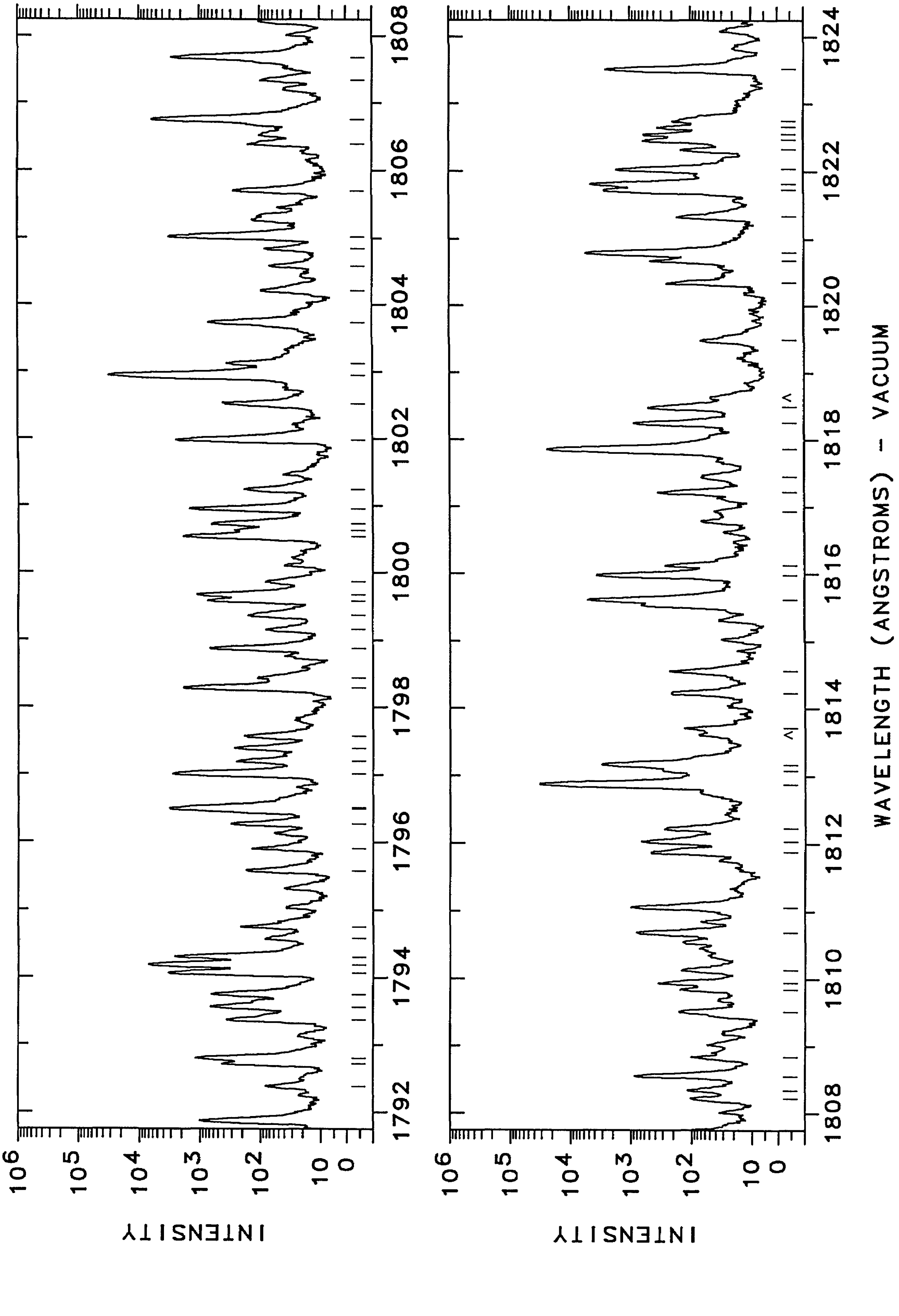
1792
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1792.38	55791.7	72			
1792.7132	55781.371	400	Pt II	116689- 60907	K
1792.8041	55778.543	1200	Pt II	53749-109528	K
1793.37	55760.9	350	Pt II	42031- 97792	K
1793.56	55755.0	660	Pt II	42031- 97786	K
1793.75	55749.1	640	Pt II	41434- 97183	K
1794.0655	55739.325	3300			
1794.1811	55735.734	7100	Pt I	10116- 65852	N
1794.3043	55731.907	2600	Pt II	23875- 79607	10
1794.58	55723.3	76	Pt II	58062-113785	K
1794.75	55718.1	200	Pt I	10131- 65850	N
1795.58	55692.3	160			
1795.91	55682.1	130			
1796.27	55670.9	290	Pt II	32918- 88589	K
1796.4925	55664.024	3200	Pt II	18097- 73761	08
1796.5171	55663.26	900 U	Ne II		C
1797.0175	55647.761	2800			
1797.1964	55642.22	240	Ne II		C
1797.39	55636.2	260			
1797.57	55630.7	180	Pt II	23461- 79092	AK
1797.57	55630.7	180	Pt II	116689- 61058	AK
1798.2814	55608.65	1900	Ne II		C
1798.44	55603.7	100			
1798.8757	55590.278	670			
1799.16	55581.5	71			
1799.37	55575.0	150			
1799.58	55568.5	730	Pt II	27255- 82824	K
1799.6692	55565.767	1100	Pt I	10131- 65697	N
1799.87	55559.6	72			
1800.5413	55538.854	1900	Pt I	6567- 62106	N
1800.6249	55536.276	200	Pt I	0- 55536	D
1800.7325	55532.96	620	Ne II		C
1800.9569	55526.037	1500	Pt II	34647- 90173	K
1801.24	55517.3	170			
1801.9716	55494.770	2400	Pt I	6567- 62062	N
1802.52	55477.9	400			
1802.9398	55464.969	31000	Pt I	823- 56288	N
1803.1160	55459.55	350	Ne II		C
1803.7301	55440.67	690	Ne II		C
1804.21	55425.9	85			
1804.58	55414.6	59			
1804.84	55406.6	74			
1805.0193	55401.069	3200	Pt II	9356- 64757	05
1805.70	55380.2	260	Pt II	54373-109753	K
1806.39	55359.0	150			
1806.7624	55347.621	6100	Pt II	46046-101394	K
1807.34	55329.9	88	Ne III		L
1807.6755	55319.663	2900	Pt II	37877- 93197	K
1808.22	55303.0	95			
1808.34	55299.3	110	Ne III		L
1808.5524	55292.842	870	Pt II	21168- 76461	09
1808.84	55284.0	93	Ne III		L
1809.51	55263.6	150			
1809.84	55253.5	150			
1809.94	55250.5	350			
1810.13	55244.7	140	Ne III		L
1810.69	55227.6	800			
1811.0524	55216.514	990	Pt II	23875- 79092	AK
1811.0524	55216.514	990	Pt II	34647- 89863	AK
1811.88	55191.3	460	Pt II	32918- 88110	K
1812.04	55186.4	670			
1812.23	55180.6	270	Ne III		L
1812.8819	55160.791	33000	Pt I	823- 55984	N
1813.0791	55154.792	300	Pt II	54373-109528	K
1813.1658	55152.154	3000	Pt II	29030- 84182	13
1813.71	55135.6	120			
1814.23	55119.8	210			
1814.56	55109.8	220			
1815.6120	55077.847	5100	Pt I	6567- 61645	N
1815.9818	55066.631	3600	Pt II	46046-101113	K
1816.13	55062.1	260			
1816.9290	55037.925		Si II		B
1817.22	55029.1	340			
1817.45	55022.1	59			
1817.8736	55009.325	24000	Pt I	0- 55009	N
1818.2536	54997.829	870			
1818.49	54990.7	500	Pt II	23461- 78452	K
1819.4814	54960.715	59	Pt II	34647- 89607	15
1820.35	54934.5	240	Pt II	54373-109307	K
1820.68	54924.5	460			
1820.8082	54920.666	5500	Pt II	29261- 84182	13
1821.34	54904.6	160			
1821.7330	54892.786	2700	Pt II	21717- 76610	05
1821.8212	54890.129	4400	Pt II	37877- 92767	K
1822.0375	54883.612	1700			
1822.33	54874.8	130			
1822.47	54870.6	590	Ne III		L
1822.55	54868.2	570	Ne III		L
1822.66	54864.9	340	Ne III		L
1822.75	54862.2	190	Ne III		L
1823.5129	54839.206	2600	Pt I	0- 54839	D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1808
INTENSITY
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10⁵
10⁴
10³
10²
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1808
1810
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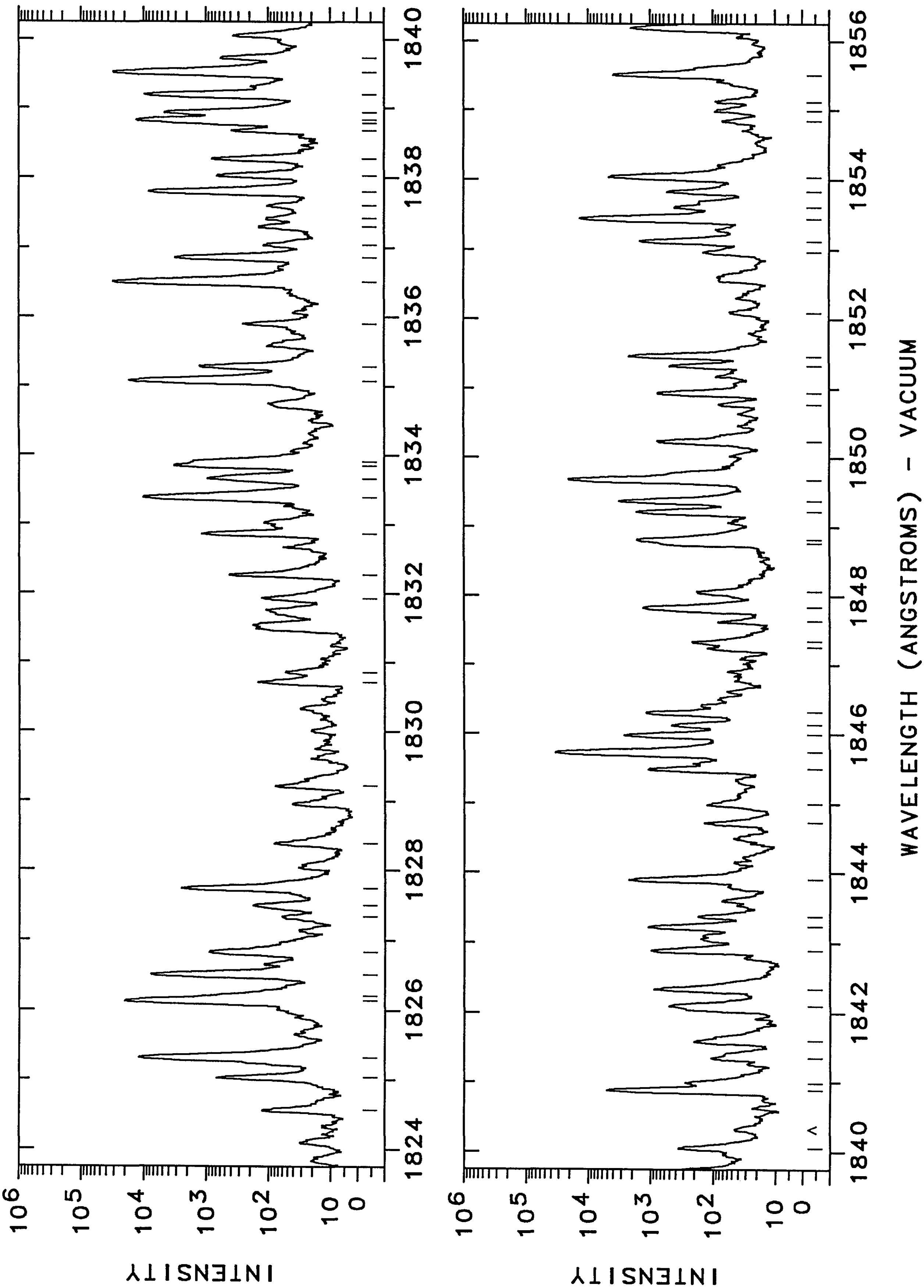
1820
1822
1824
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1824.56	54807.7	120			
1825.0397	54793.329	680	Pt II	23461- 78254	K
1825.3262	54784.728	12000	Pt I	6567- 61352	N
1826.1377	54760.384	20000	Pt I	775- 55536	D
1826.2024	54758.443	700			
1826.5063	54749.332	7800	Pt II	46046-100795	K
1826.8324	54739.56	910	Ne II		C
1827.34	54724.4	52			
1827.50	54719.6	170			
1827.7326	54712.599	2500	Pt I	823- 55536	D
1828.39	54692.9	74			
1829.22	54668.1	70	Pt II	119057- 64388	K
1830.71	54623.6	140			
1830.85	54619.4	45			
1831.93	54587.2	120			
1832.27	54577.1	420	Pt II	23875- 78452	K
1832.8733	54559.145	1200	Pt I	10116- 64675	N
1833.3875	54543.843	10000	Pt II	16820- 71364	K
1833.66	54535.7	940			
1833.8527	54530.007	3200	Pt I	6567- 61097	N
1833.9099	54528.31	1100	Ne II		C
1835.0745	54493.700	17000	Pt II	16820- 71314	05
1835.2748	54487.753	1300	Pt I	10131- 64619	N
1835.90	54469.2	240	Pt II	48591-103060	K
1836.5075	54451.180	30000	Pt II	13329- 67780	K
1836.8531	54440.936	3100	Pt I	775- 55216	D
1837.04	54435.4	110			
1837.30	54427.7	130			
1837.42	54424.1	98			
1837.60	54418.8	95			
1837.8050	54412.738	8100	Pt II	21168- 75581	08
1838.03	54406.1	660	Pt II	53749-108155	K
1838.2682	54399.026	780	Pt I	10116- 64515	N
1838.67	54387.1	380			
1838.7836	54383.779	1200	Pt I	10131- 64515	N
1838.8246	54382.567	13000	Pt II	9356- 63738	05
1838.9355	54379.286	4600	Pt II	23875- 78254	K
1839.1994	54371.484	9600	Pt II	42031- 96403	K
1839.5258	54361.836	31000	Pt II	8419- 62781	08
1839.73	54355.8	570	Ne III		L
1840.05	54346.3	350			
1840.8825	54321.772	5200	Pt II	29030- 83352	14
1840.99	54318.6	280			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1841.35	54308.0	100	Ne III		L
1841.60	54300.6	190	Ne III		L
1842.10	54285.9	500	Pt II	32918- 87204	AK
1842.10	54285.9	500	Ne III		AL
1842.3413	54278.76	880	Ne II		C
1842.8889	54262.631	970	Pt II	36484- 90746	K
1843.2224	54252.813	1100	Pt II	32237- 86489	K
1843.38	54248.2	160			
1843.9105	54232.57	2300	Ne II		C
1844.73	54208.5	130			
1845.00	54200.5	120			
1845.5046	54185.722	1100	Pt I	823- 55009	N
1845.7517	54178.468	34000	Pt I	0- 54178	N
1845.9968	54171.28	2600	Ne II		C
1846.14	54167.1	450			
1846.3115	54162.041	1200	Pt II	15791- 69953	04
1847.2454	54134.66	110	Ne II		C
1847.34	54131.9	200	Pt I	10116- 64248	N
1847.64	54123.1	74	Pt II	41434- 95557	K
1847.8453	54117.084	1300	Pt I	10131- 64248	N
1848.07	54110.5	170	Ne III		L
1848.7609	54090.284	400	Pt II	29261- 83352	14
1848.8229	54088.47	1300	Ne II		C
1849.2224	54076.784	1700	Pt II	23461- 77538	K
1849.3784	54072.22	3200	Ne II		C
1849.6831	54063.314	20000	Pt I	775- 54839	D
1850.2332	54047.241	770			
1850.77	54031.6	70			
1850.9260	54027.012	750	Pt II	24879- 78906	10
1851.3195	54015.528	480	Pt I	823- 54839	D
1851.4696	54011.150	2200	Pt I	0- 54011	D
1852.09	53993.1	45	Ne III		L
1852.96	53967.7	130	Ne III		L
1853.1147	53963.20	1500	Ne II		C
1853.4523	53953.373	14000	Pt I	0- 53953	A
1853.4523	53953.373	14000	Pt II	114861- 60907	K
1853.61	53948.8	400	Pt II	54373-108322	K
1853.83	53942.4	530	Pt II	34647- 88589	K
1854.0403	53936.26	4600	Ne II		C
1854.84	53913.0	60	Ne III		L
1854.99	53908.6	84			
1855.12	53904.9	81			
1855.5230	53893.161	4000	Pt II	43737- 97630	K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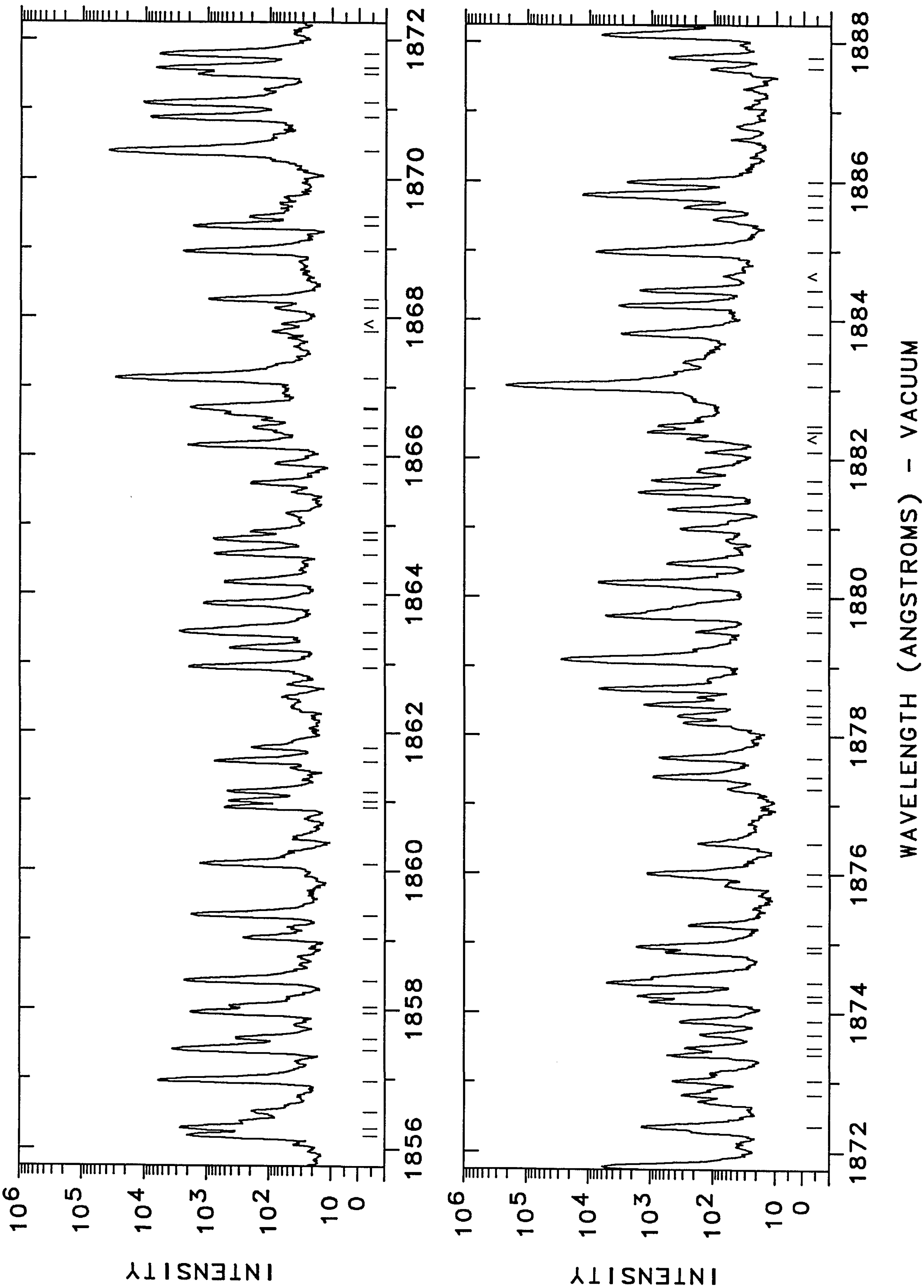
1840 1842 1844 1846 1848 1850 1852 1854 1856
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1856.1889	53873.827	2000	Pt I	6567- 60441	N
1856.2935	53870.791	2700	Pt II	115060- 61190	AK
1856.2935	53870.791	2700	Pt II	121651- 67780	AK
1856.5220	53864.162	180	Pt II	21717- 75581	09
1856.9688	53851.201	6000	Pt II	18097- 71948	06
1857.4069	53838.499	3500	Pt II	53749-107588	K
1857.5649	53833.92	320	Ne II		C
1857.9530	53822.68	1800	Ne II		C
1858.0389	53820.186	400	Pt II	110408- 56587	K
1858.4108	53809.42	2300	Ne II		C
1859.03	53791.5	250			
1859.3605	53781.93	1800	Ne II		C
1860.0984	53760.597	1300	Pt I	6567- 60328	N
1860.91	53737.2	510			
1861.00	53734.6	440			
1861.1355	53730.64	460	Ne II		C
1861.5815	53717.766	740			
1861.78	53712.0	180			
1862.9448	53678.456	1900	Pt II	105086- 51408	K
1863.22	53670.5	420	Pt II	110258- 56587	K
1863.4578	53663.678	2700 W	Pt II	54373-108037	K
1863.8611	53652.067	1100	Pt I	6140- 59792	N
1864.17	53643.2	510			
1864.5737	53631.562	740	Pt II	114539- 60907	K
1864.7909	53625.315	770	Pt I	13496- 67121	N
1864.90	53622.2	190			
1865.61	53601.8	190	Pt II	117340- 63738	K
1865.89	53593.7	69			
1866.1542	53586.139	2000	Pt II	21168- 74754	10
1866.41	53578.8	170			
1866.6789	53571.078	500 U	Pt II	32918- 86489	K
1866.7078	53570.248	1800	Pt II	110158- 56587	K
1867.1302	53558.129	30000	Pt II	16820- 70379	09
1867.80	53538.9	82			
1868.14	53529.2	73			
1868.2555	53525.870	940	Pt II	42031- 95557	K
1868.9754	53505.252	2400	Pt II	29030- 82535	K
1869.3336	53495.000	1700	Pt II	48591-102086	K
1869.46	53491.4	200	Ne III		L
1870.4100	53464.215	38000	Pt II	9356- 62820	05
1870.8926	53450.423	8300	Pt II	21168- 74619	06
1871.1038	53444.389	11000	Pt II	15791- 69235	08
1871.5054	53432.921	1400	Pt II	110020- 56587	K
1871.5965	53430.320	6700	Pt II	29261- 82692	K
1871.7979	53424.571	5900	Pt II	46046- 99471	K
1872.3638	53408.424	1400	Pt II	41434- 94842	K
1872.82	53395.4	300	Pt II	115060- 61665	K
1873.02	53389.7	430	Pt II	110408- 57018	K
1873.39	53379.2	520			
1873.4903	53376.31	270	Ne II		C
1873.6771	53370.99	150	Ne II		C
1873.8744	53365.37	330	Ne II		C
1874.1554	53357.368	1000	Pt I	775- 54133	N
1874.2481	53354.729	1600	Pt I	823- 54178	N
1874.4323	53349.486	5100	Pt I	6567- 59916	N
1874.88	53336.7	560			
1874.9624	53334.403	1700	Pt I	10131- 63466	N
1875.27	53325.7	230			
1875.84	53309.5	53	Pt I	823- 54133	N
1876.0029	53304.82	1100	Ne II		C
1876.44	53292.4	160	Pt II	58062-111354	K
1877.23	53270.0	47			
1877.4028	53265.075	900	Pt II	114455- 61190	K
1877.6777	53257.28	710	Ne II		C
1878.19	53242.7	280			
1878.29	53239.9	350	Pt II	110258- 57018	K
1878.4543	53235.258	1300	Pt I	775- 54011	D
1878.6919	53228.526	6700	Pt II	104636- 51408	K
1879.1031	53216.879	27000	Pt II	18097- 71314	06
1879.51	53205.4	170			
1879.7298	53199.135	5200	Pt II	41434- 94633	K
1879.7999	53197.152	930			
1880.1420	53187.472	200	Pt I	823- 54011	D
1880.2090	53185.577	6800	Ne III		L
1880.4950	53177.487	530	Pt I	775- 53953	D
1880.99	53163.5	320	Pt II	24879- 78043	K
1881.2704	53155.570	510	Pt I	15501- 68657	N
1881.5191	53148.543	1600	Pt II	23461- 76610	05
1881.6889	53143.75	940	Ne II		C
1882.0900	53132.423	120	Pt II	16820- 69953	04
1882.3916	53123.908	1100	Pt II	36484- 89607	16
1882.4792	53121.44	750	Ne II		C
1883.0587	53105.088	220000	Pt II	13329- 66434	06
1883.39	53095.7	290			
1883.7967	53084.28	3100	Ne II		C
1884.2045	53072.795	3300	Pt II	21168- 74241	06
1884.4354	53066.292	1500	Pt II	114256- 61190	K
1884.9927	53050.603	7700	Pt I	10116- 63167	N
1885.4562	53037.563	91	Pt II	21717- 74754	11
1885.64	53032.4	290			
1885.8171	53027.412	13000	Pt II	48591-101618	K
1885.9970	53022.354	2500	Pt II	46046- 99068	K
1887.62	52976.8	100			
1887.78	52972.3	520			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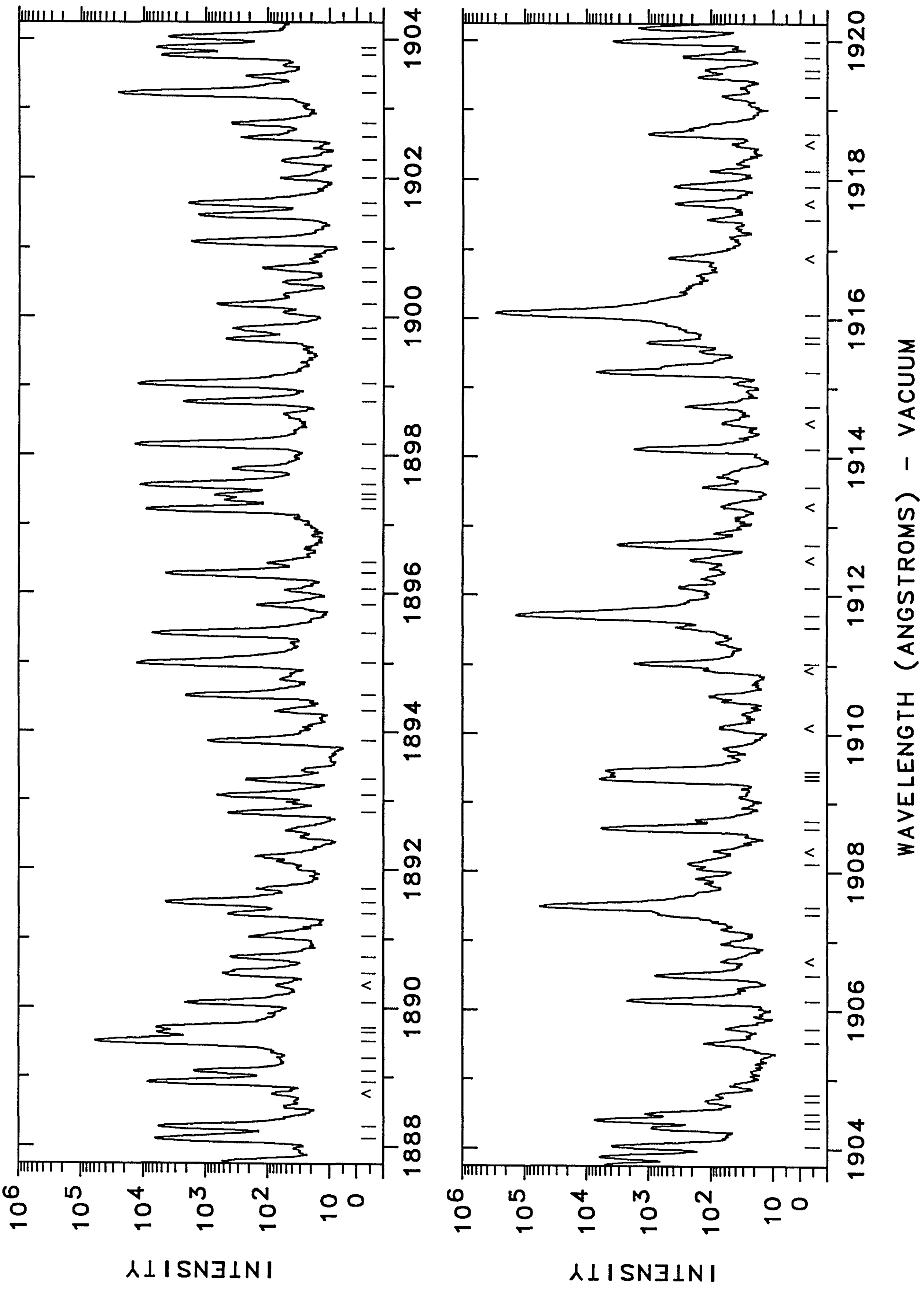
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1888.1064	52963.12	6400	Ne II		C
1888.2852	52958.102	5700	Pt II	48591-101549	K
1888.9330	52939.940	8500	Pt II	109527- 56587	K
1889.0888	52935.574	1500	Pt I	10131- 63067	N
1889.28	52930.2	59			
1889.5226	52923.421	58000	Pt II	18097- 71021	K
1889.6418	52920.083	6000	Pt II	109507- 56587	K
1889.7120	52918.12	6100	Ne II		C
1890.0718	52908.043	2100	Pt II	32918- 85826	K
1890.50	52896.1	510			
1890.74	52889.3	380	Pt I	775- 53665	N
1891.04	52881.0	190			
1891.3667	52871.82	420	Ne II		C
1891.5305	52867.242	4400	Pt II	29030- 81897	P
1891.73	52861.7	140			
1892.83	52830.9	420	Pt II	21168- 73999	K
1893.08	52824.0	650			
1893.31	52817.6	210			
1893.8750	52801.79	900	Ne II		C
1894.31	52789.7	65	Pt II	114455- 61665	K
1894.5483	52783.030	2000			
1895.0088	52770.204	12000	Pt II	8419- 61190	08
1895.4329	52758.396	7100	Pt II	109346- 56587	K
1895.84	52747.1	140			
1896.06	52740.9	42			
1896.2921	52734.493	4300	Pt II	23875- 76610	07
1896.45	52730.1	91			
1897.2321	52708.365	9000	Pt I	0- 52708	D
1897.37	52704.5	480			
1897.4417	52702.542	700	Pt I	13496- 66198	N
1897.5769	52698.787	11000	Pt II	13329- 66028	04
1897.8051	52692.45	360	Ne II		C
1898.1722	52682.259	14000	Pt II	104090- 51408	K
1898.7831	52665.310	2300			
1899.0445	52658.060	12000	Pt II	109676- 57018	K
1899.6717	52640.675	460	Pt I	6140- 58780	N
1899.84	52636.0	360	Pt II	29261- 81897	K
1900.1898	52626.32	650	Ne II		C
1900.51	52617.5	47			
1900.72	52611.6	110			
1901.0882	52601.452	1700	Pt II	42031- 94633	K
1901.4729	52590.810	1300	Pt II	114256- 61665	K
1901.6478	52585.973	1900	Pt II	23875- 76461	11
1902.01	52576.0	53	Pt II	58062-110638	K
1902.26	52569.0	50			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1902.59	52559.9	260	Pt I	6567- 59127	N
1902.79	52554.4	370			
1903.2186	52542.572	25000	Pt I	10116- 62659	N
1903.47	52535.6	210			
1903.7676	52527.420	5000	Pt I	10131- 62659	N
1903.8836	52524.219	6100	Pt II	21717- 74241	07
1904.0316	52520.137	3900	Pt I	0- 52520	N
1904.2996	52512.745	890			
1904.4085	52509.743	7500	Pt II	109527- 57018	K
1904.5068	52507.03	1100	Ne II		C
1904.6890	52502.01	110	Ne II		C
1904.78	52499.5	71			
1905.53	52478.8	120			
1905.73	52473.3	46			
1906.1365	52462.140	2200	Pt II	114127- 61665	K
1906.4987	52452.17	770	Ne II		C
1907.3879	52427.721	500	Pt II	27255- 79683	K
1907.4940	52424.80	57000	Ne II		C
1908.12	52407.6	220			
1908.6190	52393.904	5700	Pt II	43737- 96131	K
1908.74	52390.6	160			
1909.3386	52374.157	6200			
1909.4039	52372.366	4100	Pt II	43737- 96109	K
1909.4638	52370.723	4900			
1911.0142	52328.235	1700	Pt II	109346- 57018	K
1911.54	52313.8	350			
1911.7092	52309.211	140000	Pt II	9356- 61665	04
1912.11	52298.2	310			
1912.7295	52281.308	3100	Pt II	18097- 70379	10
1913.57	52258.3	130			
1914.1170	52243.411	1700	Pt I	775- 53019	D
1914.7283	52226.73	250	Ne II		C
1915.2183	52213.369	6900	Pt I	6567- 58780	N
1915.6543	52201.485	1100	Pt I	13496- 65697	N
1915.74	52199.2	150			
1916.0818	52189.84	300000	Ne II		C
1917.43	52153.1	100			
1917.90	52140.4	380	Pt II	58062-110202	K
1918.12	52134.4	92	Pt II	58062-110196	K
1918.6523	52119.919	980	Pt II	23461- 75581	09
1919.19	52105.3	55	Pt II	36484- 88589	K
1919.47	52097.7	150			
1919.57	52095.0	110			
1919.76	52089.8	270			
1919.9914	52083.566	3700	Pt II	18097- 70181	08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WAVELENGTH (ANGSTROMS) - VACUUM

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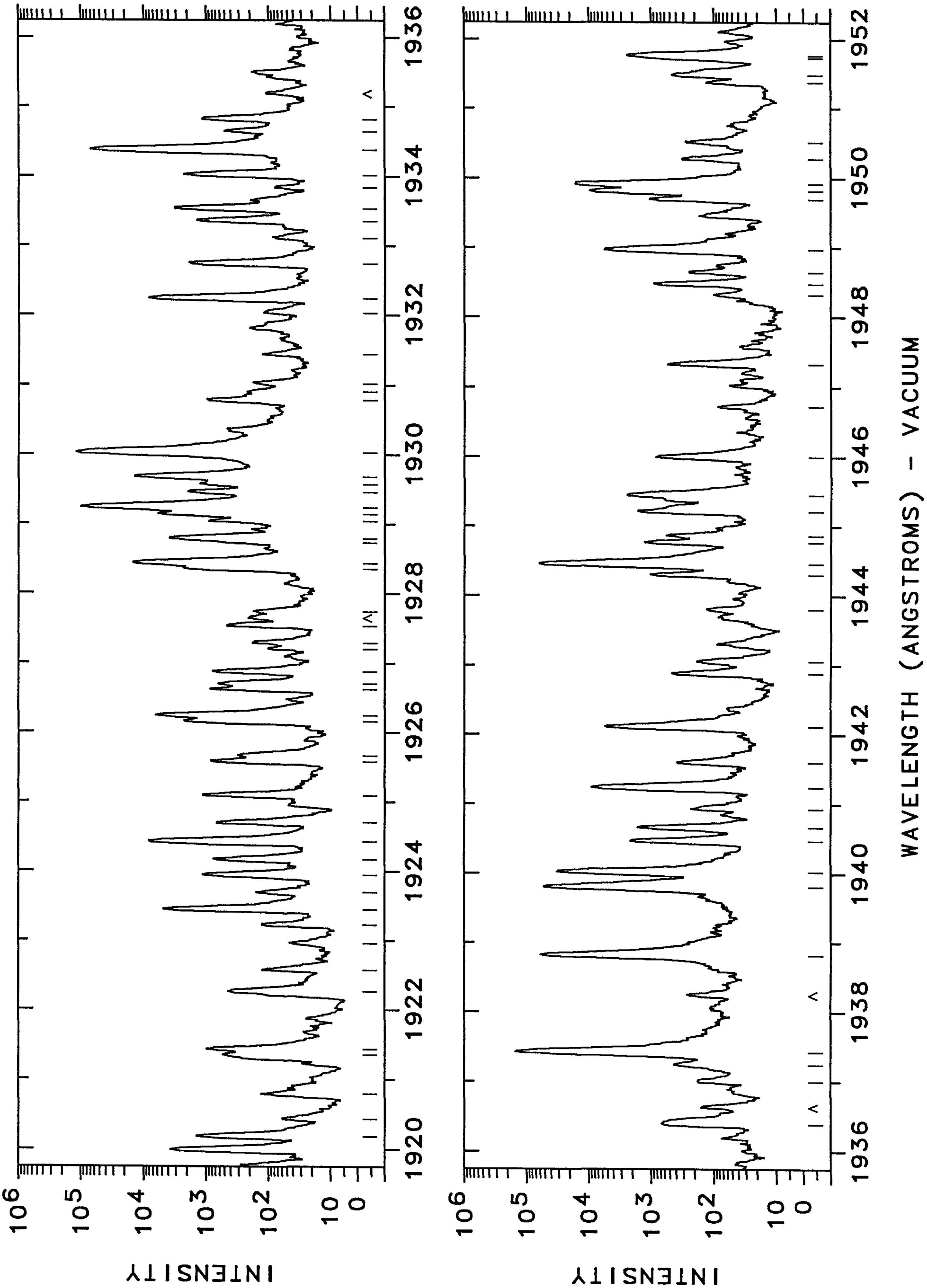
1920.1812	52078.42	1400	Ne II		C
1920.43	52071.7	50			
1920.79	52061.9	120			
1921.35	52046.7	530			
1921.43	52044.6	970			
1922.2695	52021.841	430	Pt II	13329- 65351	05
1922.57	52013.7	120	Pt I	13496- 65510	N
1922.96	52003.2	35			
1923.23	51995.9	120			
1923.4591	51989.668	4700	Pt I	10116- 62106	N
1923.70	51983.2	140			
1923.9493	51976.422	1100	Pt II	53749-105726	K
1924.1654	51970.58	740	Ne II		C
1924.4245	51963.587	8200			
1924.70	51956.1	670	Pt II	50564-102520	K
1925.0910	51945.596	1100	Pt I	10116- 62062	N
1925.5775	51932.473	820	Pt I	775- 52708	D
1925.66	51930.2	300	Pt I	10131- 62062	N
1926.1535	51916.942	2300			
1926.2370	51914.692	6400	Pt I	6567- 58482	N
1926.6198	51904.377	840	Pt II	23461- 75365	K
1926.70	51902.2	620	Pt II	41434- 93336	K
1926.88	51897.4	770			
1927.20	51888.8	91			
1927.29	51886.3	170			
1927.53	51879.9	450	Pt II	43737- 95617	K
1927.74	51874.2	160			
1928.3541	51857.696	1100	Pt II	21168- 73026	07
1928.4320	51855.602	15000	Pt II	18097- 69953	05
1928.7297	51847.597	740	Pt II	53749-105597	K
1928.7866	51846.07	3800	Ne II		C
1929.04	51839.3	880			
1929.1426	51836.500	5900	Pt II	27255- 79092	K
1929.2449	51833.752	100000	Pt II	9356- 61190	05
1929.4586	51828.009	1900	Pt II	29030- 80858	14
1929.5799	51824.752	750			
1929.6829	51821.986	14000	Pt II	29261- 81083	K
1930.0345	51812.55	120000	Ne II		C
1930.7617	51793.031	960 D			
1930.9056	51789.171		C I		B
1931.02	51786.1	170	Ne III		L
1931.44	51774.8	120	Ne III		L
1932.03	51759.0	110	Pt I	6567- 58326	N
1932.2433	51753.317	8200	Pt I	0- 51753	D
1932.7391	51740.041	1900	Pt II	46046- 97786	K
1933.1089	51730.144	75	Pt II	37877- 89607	18

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1933.3618	51723.377	1400	Pt II	23461- 75184	05
1933.5298	51718.88	3200	Ne II		C
1933.84	51710.6	67			
1934.0164	51705.869	2300	Pt II	23875- 75581	10
1934.3690	51696.445	70000	Pt I	823- 52520	N
1934.64	51689.2	490	Pt II	36484- 88173	K
1934.8150	51684.528	1100			
1936.3772	51642.831	670	Pt II	116689- 65046	K
1937.00	51626.2	170	Pt II	36484- 88110	K
1937.24	51619.8	410	Pt I	15501- 67121	N
1937.4245	51614.915	150000	Pt I	823- 52438	N
1938.8269	51577.58	60000	Ne II		C
1939.8110	51551.414	53000 L	Pt II	9356- 60907	05
1940.0319	51545.544	32000	Pt I	0- 51545	D
1940.4766	51533.732	2100	Pt I	6567- 58101	N
1940.6664	51528.691	1600	Pt I	10116- 61645	N
1940.93	51521.7	220	Pt II	50564-102086	K
1941.2409	51513.442	8900 L	Pt I	10131- 61645	N
1941.60	51503.9	380			
1942.1105	51490.376	5500	Pt II	23875- 75365	K
1942.8811	51469.954	460	Pt II	121651- 70181	K
1943.06	51465.2	180			
1943.81	51445.4	120			
1944.3026	51432.323	1000			
1944.4617	51428.116	63000	Pt II	13329- 64757	05
1944.7712	51419.931	1300	Pt I	6567- 57987	D
1944.8719	51417.27	560	Ne II		C
1945.2210	51408.041	1600	Pt I	13496- 64904	N
1945.4550	51401.857	2400	Ne II		A
1945.4550	51401.857	2400	Ne III		AL
1946.0018	51387.414	840	Ne III		L
1946.72	51368.5	76			
1947.33	51352.4	540	Pt II	50564-101916	K
1948.32	51326.3	88			
1948.4820	51322.004	890	Pt II	115060- 63738	K
1948.64	51317.8	240			
1948.9713	51309.120	5600	Pt II	21717- 73026	07
1949.6947	51290.08	1000	Ne II		C
1949.8139	51286.946	9700	Pt I	0- 51286	D
1949.9102	51284.413	16000	Pt II	23461- 74745	06
1950.2777	51274.75	300	Ne II		C
1950.51	51268.6	270	Pt II	53749-105018	K
1951.37	51246.0	120	Pt II	58062-109307	K
1951.4743	51243.309	450	Pt II	112433- 61190	K
1951.7297	51236.60	400 U	Ne II		C
1951.7701	51235.543	2400	Pt I	10116- 61352	N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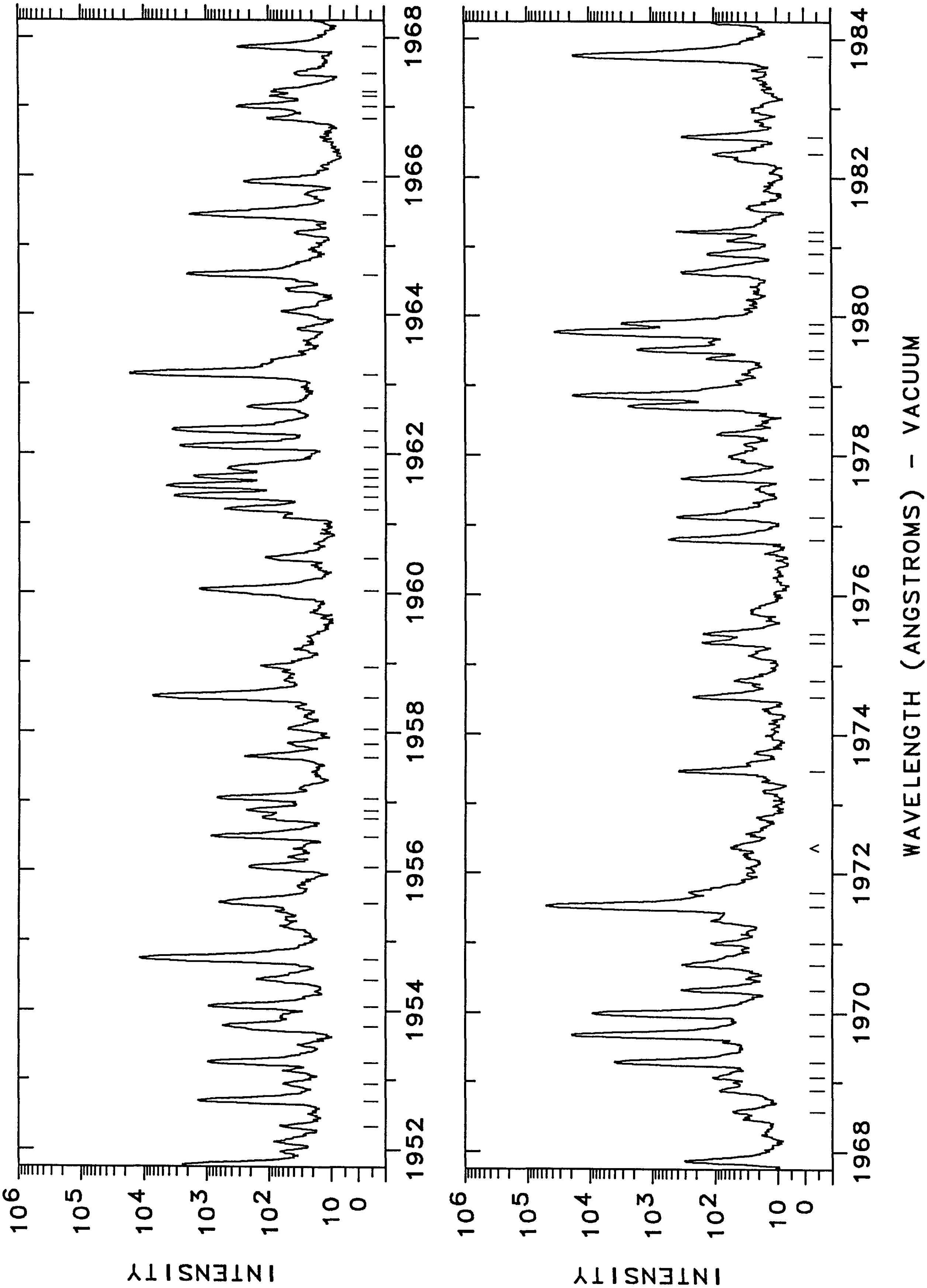
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1952.33	51220.8	59	Ne III		L
1952.6940	51211.301	1400	Pt II	105086- 53875	K
1952.94	51204.9	50			
1953.2467	51196.810	940	Pt II	27255- 78452	K
1953.77	51183.1	540			
1954.0479	51175.82	920	Ne II		C
1954.44	51165.6	150	Pt II	42031- 93197	K
1954.7436	51157.604	12000	Pt II	23461- 74619	06
1955.54	51136.8	620	Pt II	46046- 97183	K
1956.06	51123.2	200	Pt I	13496- 64619	N
1956.4950	51111.810	840			
1956.76	51104.9	120	Ne III		L
1956.87	51102.0	220			
1957.0418	51097.529	680	Pt I	0- 51097	D
1957.64	51081.9	240	Ne III		L
1957.8427	51076.626		Fe I		S
1958.05	51071.2	41	Ne III		L
1958.5027	51059.415	7400	Pt II	13329- 64388	08
1958.94	51048.0	130			
1960.0384	51019.409	1300	Pt I	13496- 64515	N
1960.50	51007.4	110			
1961.20	50989.2	510			
1961.3804	50984.501	3300	Pt II	50564-101549	K
1961.5244	50980.758	4400	Pt I	10116- 61097	N
1961.6527	50977.424	1600	Pt I	775- 51753	D
1961.7910	50973.83	460	Ne II		C
1962.1105	50965.529	2700	Pt I	10131- 61097	N
1962.3409	50959.545	3500	Pt II	16820- 67780	K
1962.66	50951.3	220			
1963.1429	50938.726	17000	Pt I	6567- 57506	D
1964.5758	50901.574	2000	Pt I	6140- 57041	N
1965.4370	50879.270	1800	Pt II	23875- 74754	12
1965.92	50866.8	240			
1966.83	50843.2	96	Ne III		L
1967.00	50838.8	310			
1967.15	50835.0	85			
1967.22	50833.2	80	Pt II	50564-101397	K
1967.48	50826.4	29			
1967.87	50816.4	300	Pt II	58491-109307	K
1968.57	50798.3	43	Pt II	53749-104548	K
1968.88	50790.3	74			
1969.07	50785.4	100			
1969.2802	50779.976	4000	Pt II	23461- 74241	07
1969.6807	50769.651	20000	Pt I	775- 51545	D
1970.0007	50761.403	9200	Pt II	104636- 53875	P
1970.33	50752.9	340	Pt I	13496- 64248	N
1970.6936	50743.554	320	Pt II	23875- 74619	08
1971.00	50735.7	110	Pt II	32237- 82972	K
1971.5374	50721.838	51000	Pt I	823- 51545	N
1971.73	50716.9	250	Pt II	42031- 92749	K
1973.4663	50672.261	370	Pt II	115060- 64388	K
1974.54	50644.7	210	Pt II	54373-105018	K
1974.78	50638.6	41	Ne III		L
1975.32	50624.7	150			
1975.45	50621.4	150			
1976.7900	50587.063	540	Pt II	32237- 82824	K
1977.12	50578.6	400			
1977.6654	50564.67	330	Ne II		C
1978.31	50548.2	82			
1978.6960	50538.334	2400	Pt II	23461- 73999	P
1978.8444	50534.544	19000	Pt II	104410- 53875	K
1979.39	50520.6	130			
1979.5138	50517.455	1700	Pt II	114256- 63738	K
1979.7647	50511.054	37000	Pt I	775- 51286	D
1979.8876	50507.918	3100	Pt II	27255- 77763	K
1980.63	50489.0	330			
1980.90	50482.1	120			
1981.09	50477.3	53			
1981.2072	50474.277	390	Pt I	6567- 57041	N
1982.34	50445.4	95			
1982.5759	50439.43	310	Ne II		C
1983.7486	50409.614	18000	Pt II	13329- 63738	05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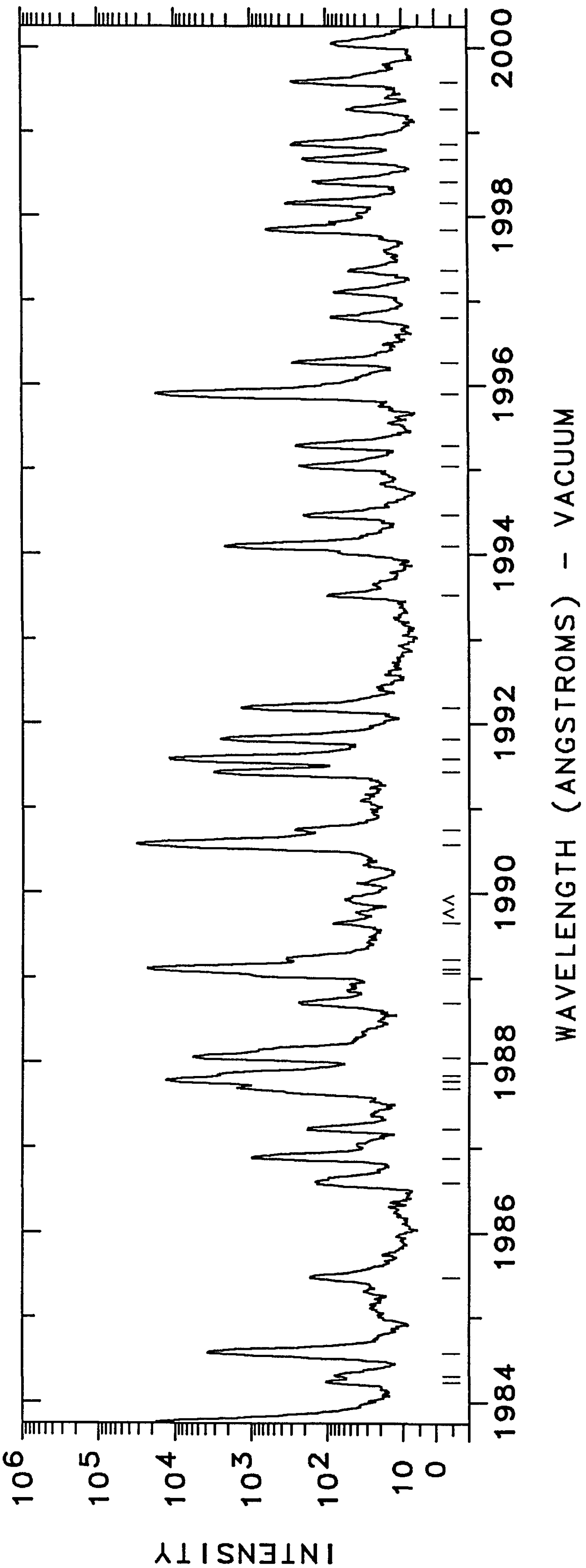
WAVELENGTH (ANGSTROMS) - VACUUM

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1984.23	50397.4	96	Pt II	46046- 96443	K
1984.31	50395.4	71			
1984.5698	50388.754	3700	Pt II	114127- 63738	K
1985.4693	50365.926	160	Pt II	23875- 74241	09
1986.59	50337.5	130	Pt II	113119- 62781	K
1986.8846	50330.049	970	Pt I	13496- 63826	N
1987.2168	50321.637	170	Pt I	775- 51097	D
1987.6987	50309.436	1500	Pt I	10131- 60441	N
1987.7868	50307.206	13000	Pt I	10116- 60423	N
1987.8582	50305.400	2200	Pt II	24879- 75184	05
1988.0622	50300.236	5900	Pt II	23461- 73761	10
1988.71	50283.9	230			
1989.0626	50274.939	1000 U	Ne II		A
1989.0626	50274.939	U	Si I		A
1989.1056	50273.852	23000	Pt I	823- 51097	D
1989.2257	50270.816	200			
1989.65	50260.1	75	Pt II	58062-108322	K
1990.5751	50236.738	32000	Pt II	15791- 66028	05
1990.75	50232.3	260	Pt II	37877- 88110	K
1991.4283	50215.215	3100	Pt II	104090- 53875	K
1991.5830	50211.314	12000	Pt I	10116- 60328	N

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1991.8236	50205.249	2500			
1992.1936	50195.924	1300	Pt I	15501- 65697	AN
1992.1936	50195.924	1300	Pt II	21168- 71364	AK
1993.52	50162.5	91			
1994.0957	50148.05	2200	Ne II		C
1994.46	50138.9	190			
1995.04	50124.3	220	Pt II	23875- 73999	K
1995.2792	50118.30	240	Ne II		C
1995.8991	50102.733	17000	Pt I	6567- 56670	N
1996.27	50093.4	270	Pt II	58062-108155	K
1996.80	50080.1	77			
1997.10	50072.6	70			
1997.36	50066.1	42			
1997.8371	50054.131	590	Pt II	32918- 82972	P
1998.16	50046.0	330			
1998.41	50039.8	140	Pt I	18566- 68606	N
1998.6681	50033.32	190	Ne II		C
1998.86	50028.5	270			
1999.28	50018.0	44			
1999.5947	50010.135	280	Pt I	0- 50010	N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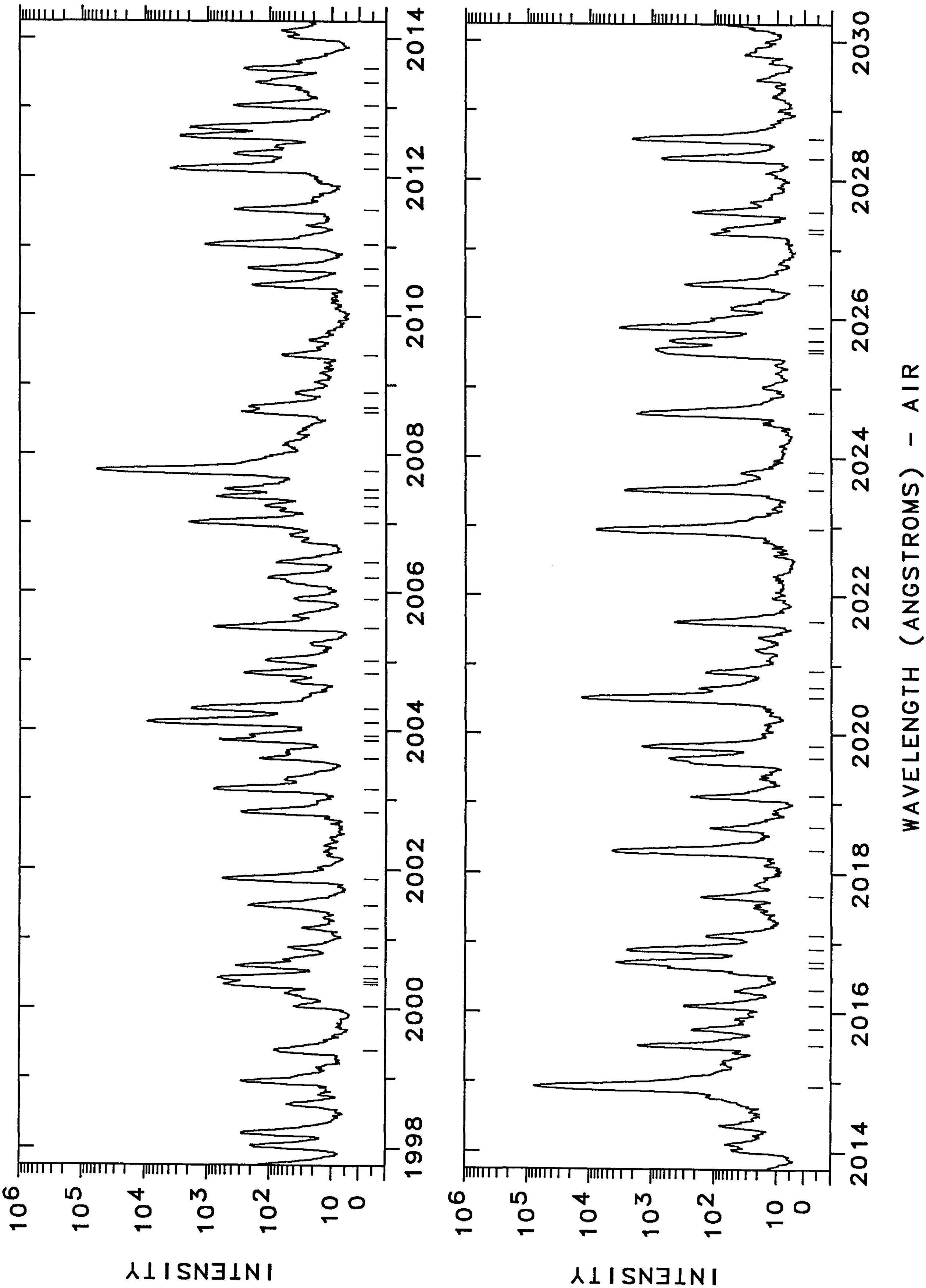
WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
1999.40	49998.8	76	Ne III		L
2000.03	49983.1	33			
2000.3426	49975.245	450	Pt II	58062-108037	K
2000.3826	49974.246	550			
2000.4449	49972.690	660	Pt II	111162- 61190	K
2000.61	49968.6	340			
2000.88	49961.8	43			
2001.16	49954.8	23			
2001.49	49946.6	210	Ne III		L
2001.8736	49937.03	570	Ne II		C
2002.82	49913.4	280	Ne III		L
2003.1419	49905.417	790	Pt II	32918- 82824	K
2003.59	49894.3	140			
2003.8556	49887.646	630	Pt II	53749-103637	K
2003.92	49886.0	210			
2004.1273	49880.883	9300	Pt I	0- 49880	D
2004.3230	49876.013	1800	Pt II	29030- 78906	12
2004.83	49863.4	250			
2005.01	49858.9	110			
2005.4895	49847.007	790	Pt II	106434- 56587	K
2005.90	49836.8	35	Pt II	41434- 91271	K
2006.21	49829.1	100			
2006.43	49823.6	72			
2007.0084	49809.29	2000	Ne II		C
2007.25	49803.3	110	Pt I	10116- 59920	N
2007.3725	49800.256	690	Pt I	10116- 59916	N
2007.4809	49797.568	510			
2007.7572	49790.715	58000	Pt II	101199- 51408	03
2008.60	49769.8	280			
2008.67	49768.1	210			
2008.88	49762.9	32			
2009.42	49749.5	56			
2010.44	49724.3	180			
2010.68	49718.3	220			
2011.0252	49709.814	1100	Pt II	115060- 65351	K
2011.53	49697.3	360			
2012.1226	49682.706	3900	Pt II	18097- 67780	K
2012.3291	49677.610	370			
2012.5939	49671.076	2700	Pt I	13496- 63167	N
2012.7156	49668.071	1900	Pt II	50564-100232	K
2013.0290	49660.341	370	Pt I	10131- 59792	N
2013.36	49652.2	160			
2013.56	49647.2	250	Pt II	21717- 71364	K
2014.9330	49613.421	78000	Pt II	16820- 66434	07
2015.5192	49598.992	1700	Pt II	43737- 93336	K
2015.76	49593.1	220			
2016.10	49584.7	300	Pt II	43737- 93322	K
2016.32	49579.3	41			
2016.6483	49571.226	250	Pt I	13496- 63067	N
2016.7207	49569.447	3700	Pt I	10116- 59686	N
2016.9067	49564.877	2500	Pt II	23461- 73026	08
2017.1136	49559.793	130	Pt II	15791- 65351	05
2017.68	49545.9	160	Pt II	58491-108037	K
2018.3288	49529.958	4400	Pt II	24879- 74409	K
2018.66	49521.8	110			
2019.11	49510.8	230	Pt II	46046- 95557	K
2019.6648	49497.200	530	Pt II	111162- 61665	K
2019.8361	49493.004	1400	Pt II	114539- 65046	K
2020.5434	49475.679	14000	Pt I	823- 50299	N
2020.68	49472.3	170			
2020.92	49466.5	130			
2021.6302	49449.085	430	Pt I	16983- 66432	N
2022.9516	49416.791	7800	Pt II	106434- 57018	P
2023.5420	49402.375	2700	Pt I	15501- 64904	N
2023.79	49396.3	31			
2024.6363	49375.677	1700	Pt I	10116- 59492	N
2025.5109	49354.359	250	Pt II	27255- 76610	08
2025.5585	49353.20	700	Ne II		C
2025.6856	49350.104	510			
2025.8727	49345.547	3300	Pt I	10116- 59462	N
2026.50	49330.3	290	Pt I	10131- 59462	N
2027.24	49312.3	110	Pt II	41434- 90746	K
2027.30	49310.8	70			
2027.54	49305.0	220			
2028.3159	49286.116	690	Pt I	0- 49286	D
2028.5916	49279.420	2100	Pt I	775- 50055	D


INTENSITY
10⁶
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1998
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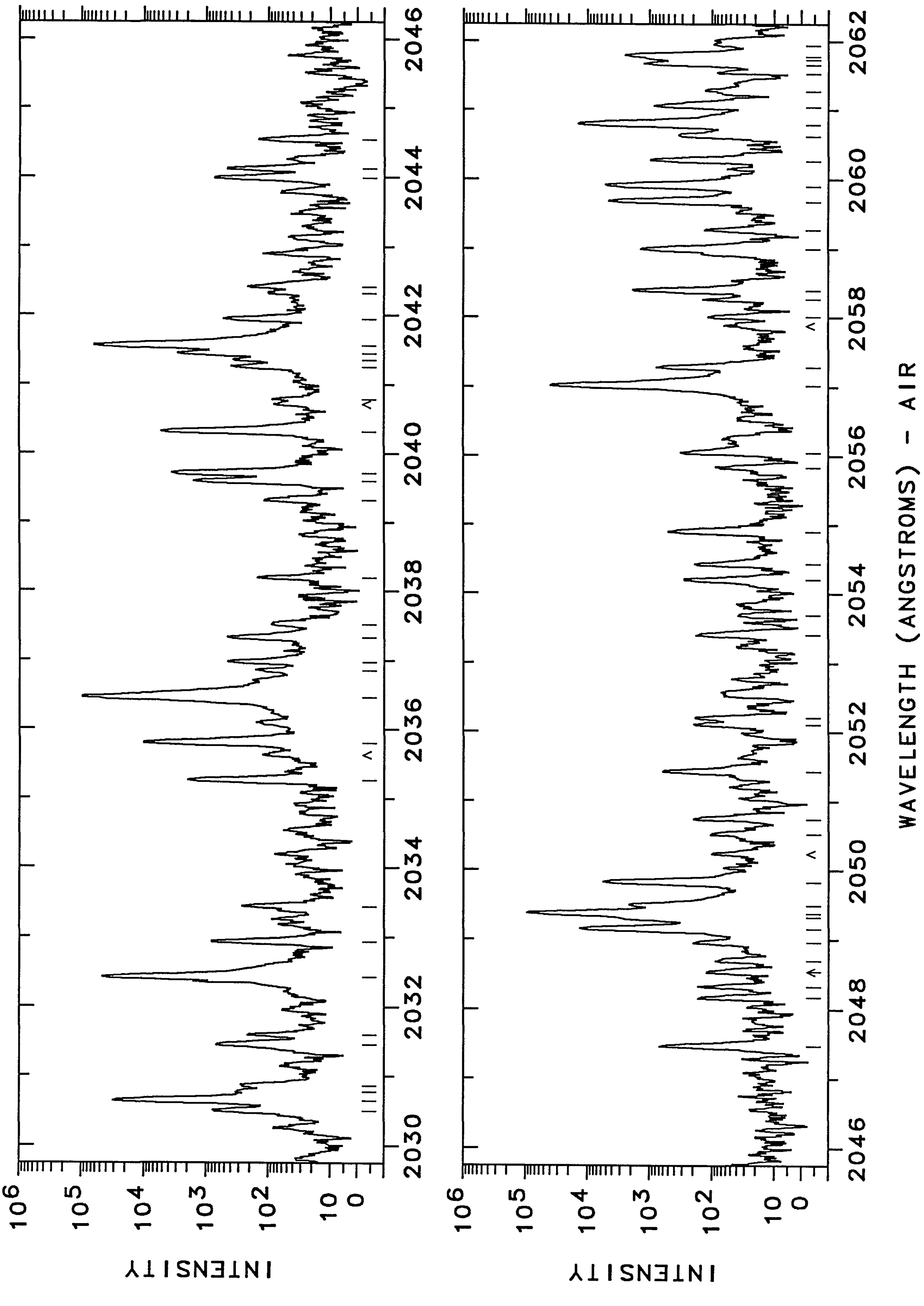
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2030.4978	49233.162	770	Pt II	50564- 99797	K
2030.6456	49229.579	31000	Pt I	10116- 59346	N
2030.77	49226.6	330			
2030.86	49224.4	270	Pt II	29030- 78254	K
2031.4397	49210.339	680	Pt II	21168- 70379	12
2031.59	49206.7	210			
2032.4256	49186.471	46000	Pt I	823- 50010	N
2032.9392	49174.046	820	Pt I	15501- 64675	N
2033.44	49161.9	260			
2035.2685	49117.776	2000	Pt I	15501- 64619	N
2035.7985	49104.991	10000	Pt I	775- 49880	D
2036.4666	49088.882	98000	Pt II	4786- 53875	09
2036.85	49079.6	160			
2036.9743	49076.649	450	Pt I	6140- 55216	D
2037.3229	49068.253	450 S	Pt II	110258- 61190	K
2037.52	49063.5	83			
2038.19	49047.4	150	Pt II	54373-103421	K
2039.32	49020.2	110	Ne III		L
2039.5871	49013.789	1600	Pt I	15501- 64515	N
2039.7039	49010.983	3500	Pt I	10116- 59127	N
2040.3346	48995.833	5200	Pt I	10131- 59127	N
2040.78	48985.1	80	Pt II	42031- 91016	K
2041.25	48973.9	390			
2041.3668	48971.064	360			
2041.4605	48968.815	2900	Pt I	6567- 55536	D
2041.5751	48966.067	62000	Pt II	15791- 64757	05
2041.9609	48956.818	520	Pt II	110146- 61190	K
2042.32	48948.2	95			
2042.41	48946.1	210			
2043.9746	48908.593	740	Pt II	116689- 67780	K
2044.1155	48905.222	460	Pt II	114256- 65351	K
2044.54	48895.1	140	Pt II	58491-107386	K
2047.4477	48825.638	690	Pt I	13496- 62321	N
2048.17	48808.4	160			
2048.33	48804.6	160			
2048.54	48799.6	120	Pt II	43737- 92537	KM
2048.70	48795.8	83			
2048.96	48789.6	200	Pt II	43737- 92526	K
2049.1689	48784.633	13000	Pt II	21168- 69953	06
2049.3255	48780.907	1400 P	Pt II	29261- 78043	K
2049.3915	48779.336	94000	Pt I	0- 48779	D
2049.5141	48776.419	2100	Pt II	105794- 57018	K
2049.8396	48768.673	5600	Pt I	775- 49544	D
2050.52	48752.5	100			
2050.74	48747.3	190	Pt I	15501- 64248	N
2051.4224	48731.051	610	Pt II	113119- 64388	K
2052.11	48714.7	190	Pt II	42031- 90746	K
2052.21	48712.4	180			
2053.41	48683.9	170			
2053.69	48677.3	32			
2054.1900	48665.405	270	Pt II	53749-102414	K
2054.43	48659.7	180			
2054.8678	48649.354	480	Pt I	6567- 55216	AN
2054.8678	48649.354	480	Pt I	10131- 58780	AN
2055.83	48626.6	81	Pt II	115060- 66434	K
2056.0459	48621.481	310	Pt II	32237- 80858	16
2057.0265	48598.308	39000	Pt II	8419- 57018	08
2057.2923	48592.029	770	Pt II	110257- 61665	K
2058.01	48575.1	110			
2058.26	48569.2	130	Ne III		L
2058.3942	48566.020	1800	Pt I	13496- 62062	N
2058.9944	48551.866	1400	Pt II	24879- 73431	15
2059.27	48545.4	120			
2059.6847	48535.596	4500	Pt I	0- 48535	D
2059.9148	48530.175	5100	Pt II	16820- 65351	05
2060.2705	48521.796	970			
2060.62	48513.6	340			
2060.7621	48510.224	14000	Pt I	775- 49286	D
2061.0173	48504.217	840	Pt II	58491-106995	K
2061.27	48498.3	120	Pt II	54373-102872	K
2061.53	48492.2	77			
2061.6538	48489.245	1200	Pt II	29030- 77519	10
2061.7317	48487.413	1000	Pt II	23461- 71948	07
2061.7824	48486.221	2500	Pt II	109676- 61190	K
2061.94	48482.5	88			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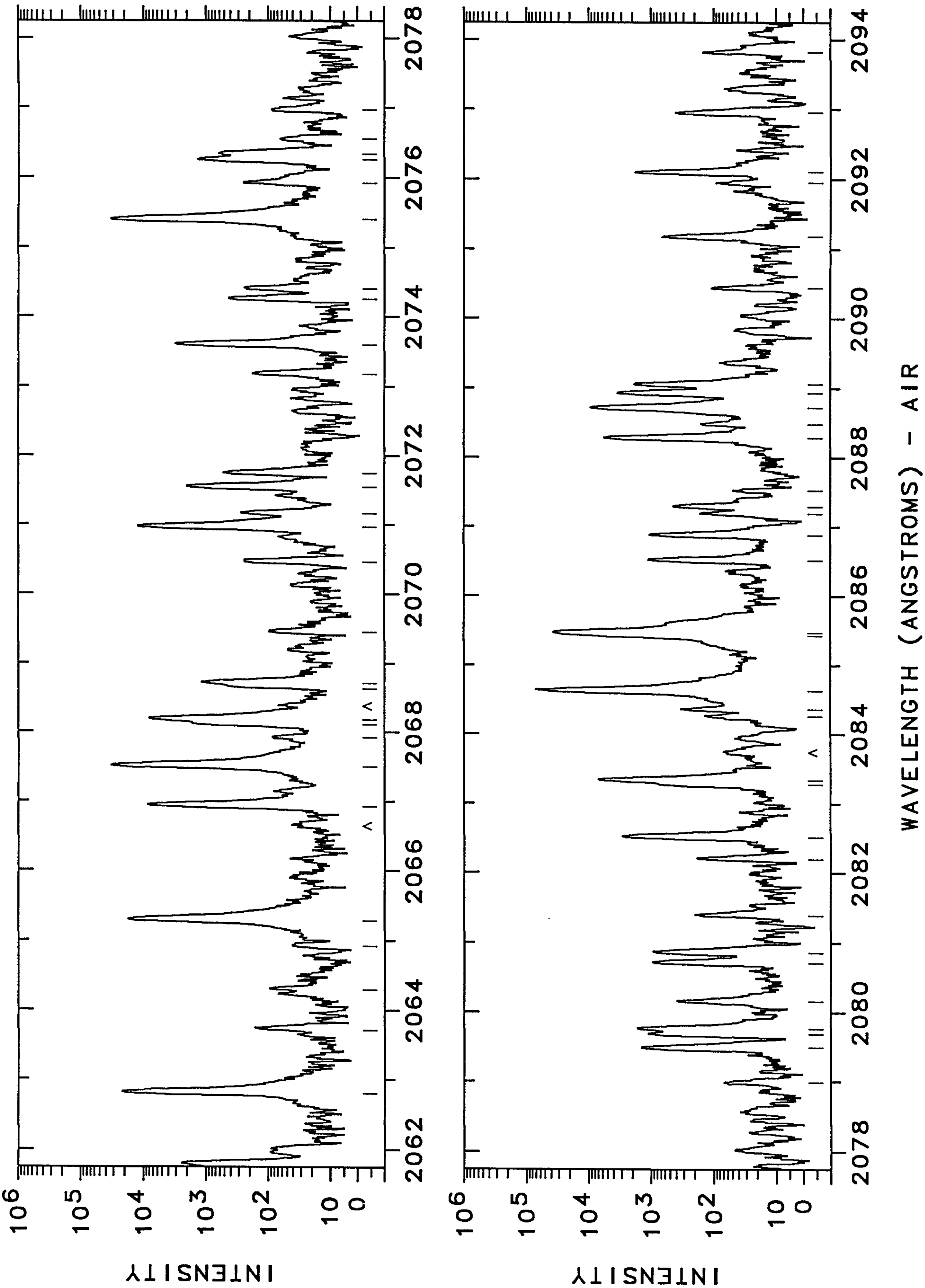
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2062.7943	48462.439	22000	Pt I	823- 49286	D
2063.71	48440.9	160			
2064.29	48427.3	90	Pt II	114455- 66028	AK
2064.29	48427.3	90	Pt II	114861- 66434	AK
2064.92	48412.6	37	Ne III		L
2065.3084	48403.453	17000	Ne III		L
2066.9329	48365.416	8500	Pt I	10116- 58482	N
2067.5105	48351.906	33000	Pt I	0- 48351	D
2067.92	48342.3	81	Pt II	104930- 56587	K
2068.1114	48337.859	1200	Pt II	109527- 61190	K
2068.1799	48336.258	8000	Pt II	13329- 61665	04
2068.6303	48325.735	300	Pt II	27255- 75581	12
2068.6854	48324.447	1200	Pt I	15501- 63826	N
2069.45	48306.6	92			
2070.46	48283.0	240			
2070.9443	48271.745	12000	Pt I	6567- 54839	A
2070.9443	48271.745	12000	Pt I	10116- 58388	AN
2071.16	48266.7	270			
2071.5446	48257.757	2000	Pt II	29261- 77519	10
2071.7423	48253.154	510	Pt II	50564- 98817	K
2073.17	48219.9	170	Pt II	121651- 73431	K
2073.5962	48210.018	3100	Pt I	10116- 58326	N
2074.2473	48194.887	420	Pt I	10131- 58326	N
2074.40	48191.3	230			
2075.4004	48168.112	33000	Pt II	8419- 56587	09
2075.92	48156.1	240			
2076.2219	48149.056	1300	Pt I	13496- 61645	N
2076.2963	48147.332	550	Pt II	54373-102520	K
2076.55	48141.5	58			
2076.97	48131.7	81			
2078.99	48085.0	62	Ne III		L
2079.4914	48073.363	1400	Pt II	23875- 71948	09
2079.6934	48068.696	1100	Pt II	105086- 57018	K
2079.7676	48066.981	1700	Pt II	21168- 69235	11
2080.16	48057.9	380			
2080.7324	48044.696	950	Pt II	112433- 64388	K
2080.8762	48041.375	910	Pt II	54373-102414	K
2081.39	48029.5	190			
2082.20	48010.8	180	Pt II	109676- 61665	K
2082.5207	48003.444	2900	Pt I	775- 48779	D
2083.2782	47985.992	1000			
2083.3453	47984.445	6900	Pt I	10116- 58101	N
2084.26	47963.4	130			
2084.36	47961.1	320			
2084.5960	47955.659	70000	Pt I	823- 48779	D
2085.4315	47936.449	6900 U	Pt II	16820- 64757	05
2085.4628	47935.73	37000	Ne II		C
2086.4898	47912.138	1100	Pt II	104930- 57018	K
2086.8804	47903.173	1000	Pt II	23461- 71364	K
2087.19	47896.1	160			
2087.29	47893.8	430			
2087.52	47888.5	43	Pt II	34647- 82535	K
2088.2978	47870.663	5600	Pt I	10116- 57987	D
2088.48	47866.5	150	Pt I	18566- 66432	N
2088.7282	47860.799	9300	Pt II	13329- 61190	05
2088.9388	47855.976	3400	Pt I	13496- 61352	N
2089.0647	47853.091	1800	Pt II	23461- 71314	07
2090.44	47821.6	100			
2091.1788	47804.719	650			
2091.95	47787.1	86			
2092.0837	47784.046	1800			
2092.9456	47764.370	400			
2093.82	47744.4	140			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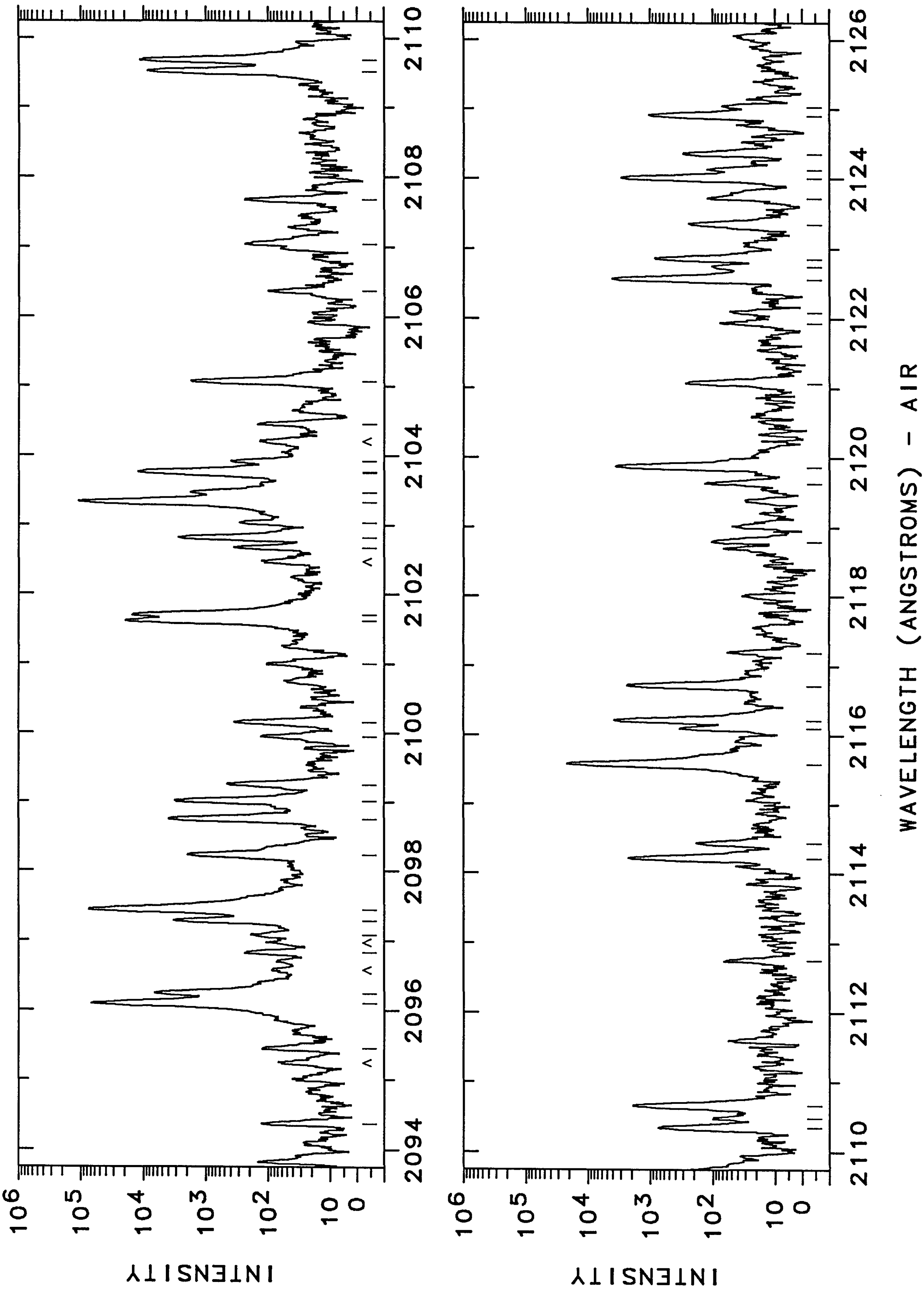
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
2094.37	47731.9	120		
2095.45	47707.3	120	Ne III	L
2096.1065	47692.35	69000	Ne II	C
2096.2538	47689.00	6600	Ne II	C
2096.83	47675.9	230	Pt II 112433- 64757	K
2097.08	47670.2	180		
2097.2881	47665.483	3300	Pt I 15501- 63167	N
2097.4478	47661.856	74000	Pt II 9356- 57018	05
2098.2127	47644.483	1900	Pt II 53749-101394	K
2098.7493	47632.303	3900	Pt I 18566- 66198	N
2099.0111	47626.362	3100	Pt II 110408- 62781	K
2099.25	47620.9	450	Ne III	L
2099.95	47605.1	130		
2100.1196	47601.227	340	Pt I 13496- 61097	N
2101.00	47581.3	100		
2101.5979	47567.748	19000 P	Pt II 16820- 64388	10
2101.6839	47565.801	15000 P	Pt I 15501- 63067	AN
2101.6839	47565.801	15000 P	Pt I 6567- 54133	AN
2102.67	47543.5	350	Pt II 54373-101916	K
2102.8167	47540.181	2800	Pt II 48591- 96131	AK
2102.8167	47540.181	2800	Pt II 117493- 69953	AK
2103.03	47535.4	290	Pt II 58062-105597	K
2103.3449	47528.242	110000	Pt I 823- 48351	D
2103.4852	47525.072	1800	Pt I 6140- 53665	N
2103.7536	47519.011	1900 U		
2103.7804	47518.405	12000	Pt II 21717- 69235	AK
2103.7804	47518.405	12000	Pt II 48591- 96109	AK
2103.92	47515.3	390		
2104.45	47503.3	140		
2105.0776	47489.126	1700	Pt II 23875- 71364	K
2106.37	47460.0	96		

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
2107.04	47444.9	230		
2107.6556	47431.047	230	Pt II 29030- 76461	12
2109.5055	47389.458	8600	Pt I 10116- 57506	D
2109.6631	47385.919	12000	Pt I 6567- 53953	D
2110.3519	47370.453	730	Pt II 32237- 79607	12
2110.48	47367.6	94		
2110.6657	47363.412	1900	Pt II 53749-101113	K
2112.75	47316.7	60	Pt II 64003-111320	K
2114.2307	47283.557	2200	Pt I 18566- 65850	N
2114.44	47278.9	180	Pt II 32918- 80197	K
2115.5823	47253.354	22000	Pt II 18097- 65351	05
2116.1050	47241.683	330	Pt II 121651- 74409	K
2116.2173	47239.175	3700	Pt II 110020- 62781	K
2116.7102	47228.176	2300	Pt II 50564- 97792	K
2117.19	47217.5	53		
2118.79	47181.8	97		
2119.63	47163.1	130		
2119.8880	47157.388	3600	Pt I 15501- 62659	N
2121.0700	47131.113	270	Pt I 18566- 65697	N
2121.93	47112.0	71		
2122.09	47108.5	47	Pt II 119057- 71948	K
2122.5713	47097.781	4100	Pt I 6567- 53665	N
2122.74	47094.0	97		
2122.8504	47091.588	830	Pt II 113119- 66028	K
2123.34	47080.7	240	Pt II 114861- 67780	K
2123.71	47072.5	120	Pt II 104090- 57018	K
2124.0062	47065.967	2900	Pt II 50564- 97630	K
2124.12	47063.4	120	Pt II 42031- 89095	K
2124.35	47058.3	290		
2124.9015	47046.138	1000 S	Pt II 53749-100795	K
2125.03	47043.3	64		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WAVELENGTH (ANGSTROMS) - AIR

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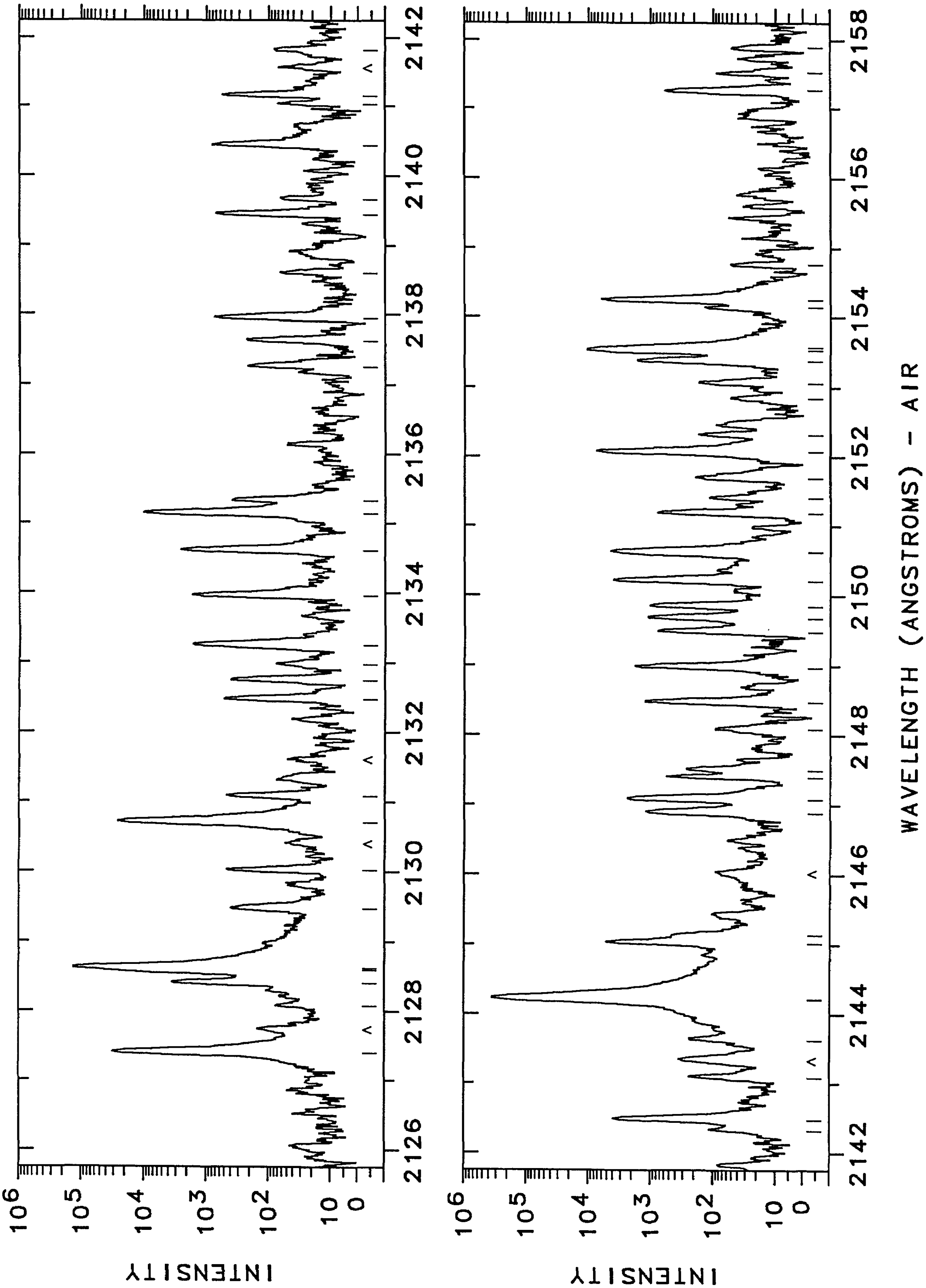
2127.4231	46990.382	32000	Pt II	15791- 62781	06
2128.07	46976.1	71			
2128.4205	46968.364	3500	Pt II	54373-101341	K
2128.5878	46964.673	40000 P	Pt I	775- 47740	D
2128.6340	46963.654	130000	Pt I	0- 46963	N
2129.47	46945.2	400	Pt I	13496- 60441	N
2130.02	46933.1	460			
2130.7079	46917.947	26000	Pt II	16820- 63738	05
2131.0749	46909.869	470	Pt I	10131- 57041	N
2132.4727	46879.123	520	Pt I	6140- 53019	D
2132.7460	46873.116	400			
2132.9687	46868.223	70	Pt II	36484- 83352	19
2133.2486	46862.073	1700	Pt II	53749-100611	K
2133.9737	46846.153	1700	Pt II	112433- 65587	K
2134.6307	46831.737	2600	Pt I	13496- 60328	N
2135.1631	46820.061	10000	Pt I	15501- 62321	N
2135.3443	46816.087	390			
2137.25	46774.3	210	Pt II	111162- 64388	K
2137.62	46766.3	220			
2137.9562	46758.900	740	Pt II	64003-110762	K
2138.59	46745.0	61			
2139.4476	46726.308	700	Pt II	109507- 62781	K
2139.66	46721.7	59	Pt II	46046- 92767	K
2140.4367	46704.718	800			
2141.02	46692.0	65			
2141.1620	46688.899	550	Pt II	32918- 79607	12
2141.81	46674.8	77	Pt II	114455- 67780	K
2142.32	46663.7	110			
2142.5054	46659.628	3900	Pt II	18097- 64757	06
2143.08	46647.1	230			
2143.62	46635.4	230	Pt II	48591- 95226	K
2144.2123	46622.489	200000 U	Pt I	0- 46622	D
2144.2458	46621.759	350000 P	Pt II	4786- 51408	10

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2145.0395	46604.512	5200	Pt I	15501- 62106	N
2145.1386	46602.359	300			
2146.8767	46564.634	1200	Pt II	109346- 62781	K
2147.0706	46560.428	2400	Pt I	15501- 62062	N
2147.3909	46553.485	560	Pt I	10116- 56670	N
2147.50	46551.1	260			
2148.09	46538.3	88	Pt I	10131- 56670	N
2148.4748	46530.002	1200	Pt II	54373-100903	K
2148.9998	46518.636	1800	Pt II	110257- 63738	K
2149.5030	46507.747	780	Pt II	116689- 70181	K
2149.7007	46503.470	1100	Pt II	23875- 70379	14
2149.8689	46499.832	1000	Ne III		L
2150.2397	46491.814	4000	Pt II	23461- 69953	06
2150.6274	46483.433	850 U	Ne III		L
2150.6567	46482.800	4200 P	Pt I	16983- 63466	N
2151.2003	46471.055	790	Ne III		L
2151.40	46466.7	110	Pt II	121651- 75184	K
2151.69	46460.5	190	Ne III		L
2152.0902	46451.842	7500	Pt I	6567- 53019	D
2152.32	46446.9	170			
2152.8656	46435.114	47	Pt II	24879- 71314	07
2153.06	46430.9	170	Ne III		L
2153.3933	46423.736	1600	Pt I	13496- 59920	N
2153.5394	46420.587	7500 P	Pt I	13496- 59916	N
2153.5684	46419.962	6500 U	Pt I	0- 46419	D
2154.14	46407.6	130	Pt II	110146- 63738	K
2154.2472	46405.336	6200	Pt II	112433- 66028	AK
2154.2472	46405.336	6200	Pt II	111162- 64757	AK
2154.76	46394.3	48			
2157.2670	46340.384	580	Pt II	58491-104831	K
2157.52	46335.0	82			
2157.89	46327.0	46			



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WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2159.1595	46299.771	500	Pt I	21967- 68266	N
2159.29	46297.0	240	Ne III		L
2159.3719	46295.216	530	Ne III		L
2159.5153	46292.143	420	Ne III		L
2159.8289	46285.424	590			
2160.02	46281.3	74			
2160.57	46269.5	120			
2160.82	46264.2	170	Ne III		L
2160.9675	46261.037	690	Ne III		L
2161.1343	46257.468	1200	Ne III		L
2162.05	46237.9	340			
2163.6119	46204.503	550	Ne III		L
2163.7345	46201.886	2000	Ne III		L
2163.8965	46198.426	360	Pt II	64003-110202	K
2164.18	46192.4	210	Pt II	64003-110196	K
2164.2949	46189.923	1300	Pt I	13496- 59686	N
2164.3955	46187.776	910			
2165.1407	46171.882	8000 P	Pt I	10116- 56288	N
2165.2108	46170.386	30000 P	Pt I	0- 46170	D
2165.8714	46156.306	400			
2165.9608	46154.401	1600	Pt II	29030- 75184	07
2166.2045	46149.21	220	Ne II		C
2166.5655	46141.521	300 U	Pt II	24879- 71021	K
2166.6376	46139.986	6500	Pt I	823- 46963	N
2167.30	46125.9	68	Pt II	43737- 89863	K
2168.56	46099.1	63			
2168.70	46096.1	79			
2169.2711	46083.977	3300	Pt I	16983- 63067	N
2169.5637	46077.764	710	Pt II	23875- 69953	09
2170.5112	46057.65	160	Ne II		C
2170.6696	46054.29	300 U	Ne II		C
2170.7267	46053.079	1100	Pt I	18566- 64619	N
2171.79	46030.5	110	Pt II	119057- 73026	K
2172.00	46026.1	110	Pt II	117340- 71314	K
2172.3162	46019.385	420	Pt II	110408- 64388	K
2172.3937	46017.744	1600	Pt II	32237- 78254	K
2172.89	46007.2	170			
2173.19	46000.9	57			
2173.43	45995.8	110			
2174.6853	45969.257	290000	Pt I	823- 46792	N
2174.8392	45966.005	1000	Pt I	13496- 59462	N
2175.32	45955.8	150			
2175.52	45951.6	330			
2176.19	45937.5	150	Pt II	109676- 63738	K
2176.4730	45931.504	820	Pt I	6140- 52071	D
2176.6289	45928.214	2600	Ne III		L
2176.8802	45922.913	4200	Pt II	29261- 75184	07
2177.6988	45905.652	5700	Ne III		L
2178.1182	45896.809		Fe I		S
2178.6549	45885.508	2000	Ne III		L
2179.4123	45869.563	1000	Pt II	110258- 64388	K
2179.5832	45865.967	1300	Pt II	54373-100239	K
2179.83	45860.8	430			
2180.3229	45850.408	4800	Pt I	15501- 61352	N
2180.5042	45846.596	17000	Pt I	775- 46622	D
2180.8613	45839.090	11000	Ne III		L
2181.7748	45819.90	60	Ne II		C
2182.1734	45811.532	250	Pt II	111162- 65351	K
2182.2632	45809.645	2000	Ne III		L
2182.59	45802.8	110			
2182.7795	45798.811	7200	Pt I	823- 46622	D
2183.23	45789.4	180	Pt II	109527- 63738	K
2183.47	45784.3	270	Pt II	111371- 65587	K
2184.1755	45769.542	7500	Pt II	110158- 64388	K
2185.17	45748.7	140			
2186.4314	45722.325	600 P			
2186.4768	45721.375	8900 L	Pt II	53749- 99471	K
2188.3437	45682.374	840	Pt I	18566- 64248	N
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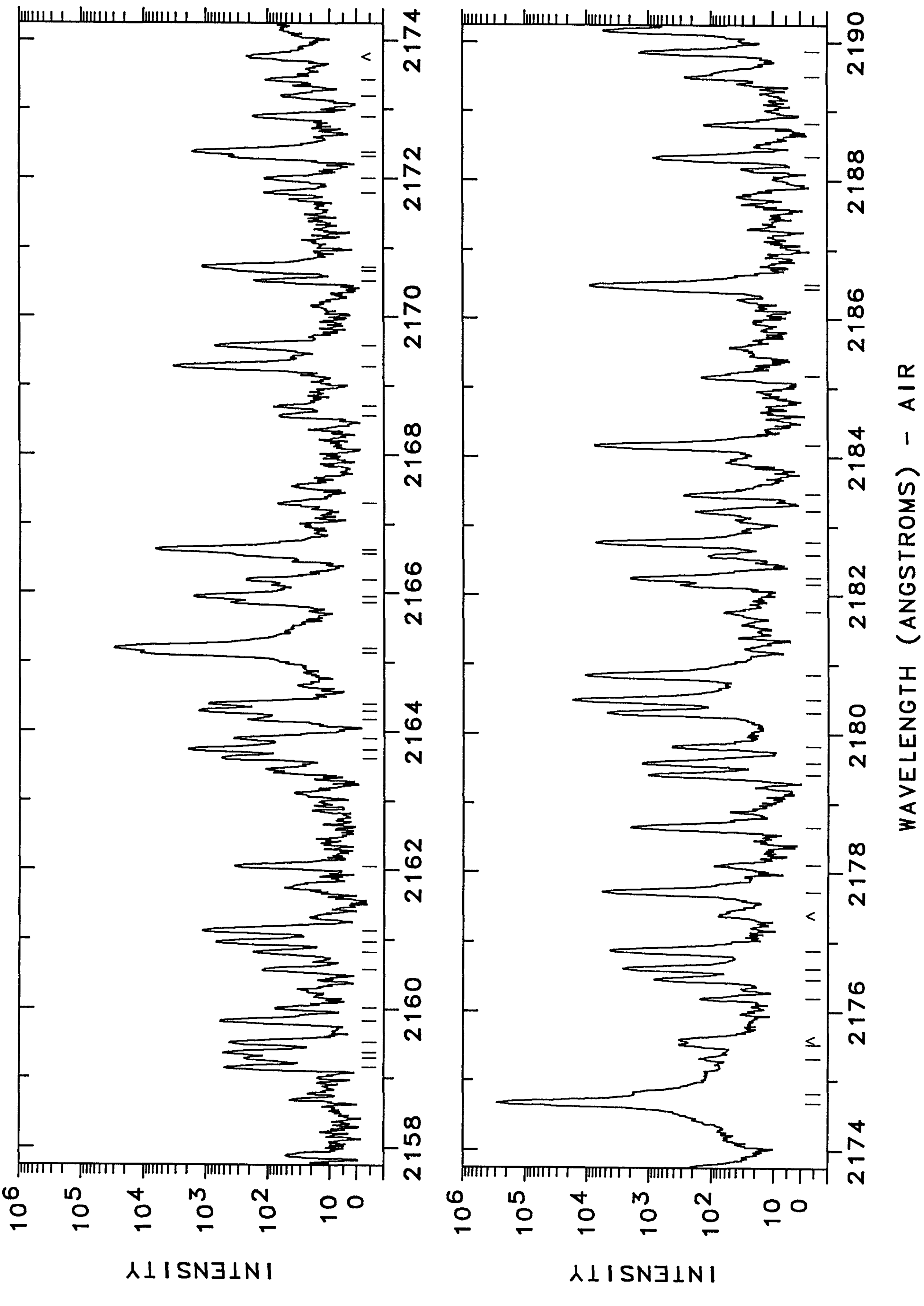
2189.50	45658.3	250			
2189.8625	45650.694	1400	Pt II	110408- 64757	K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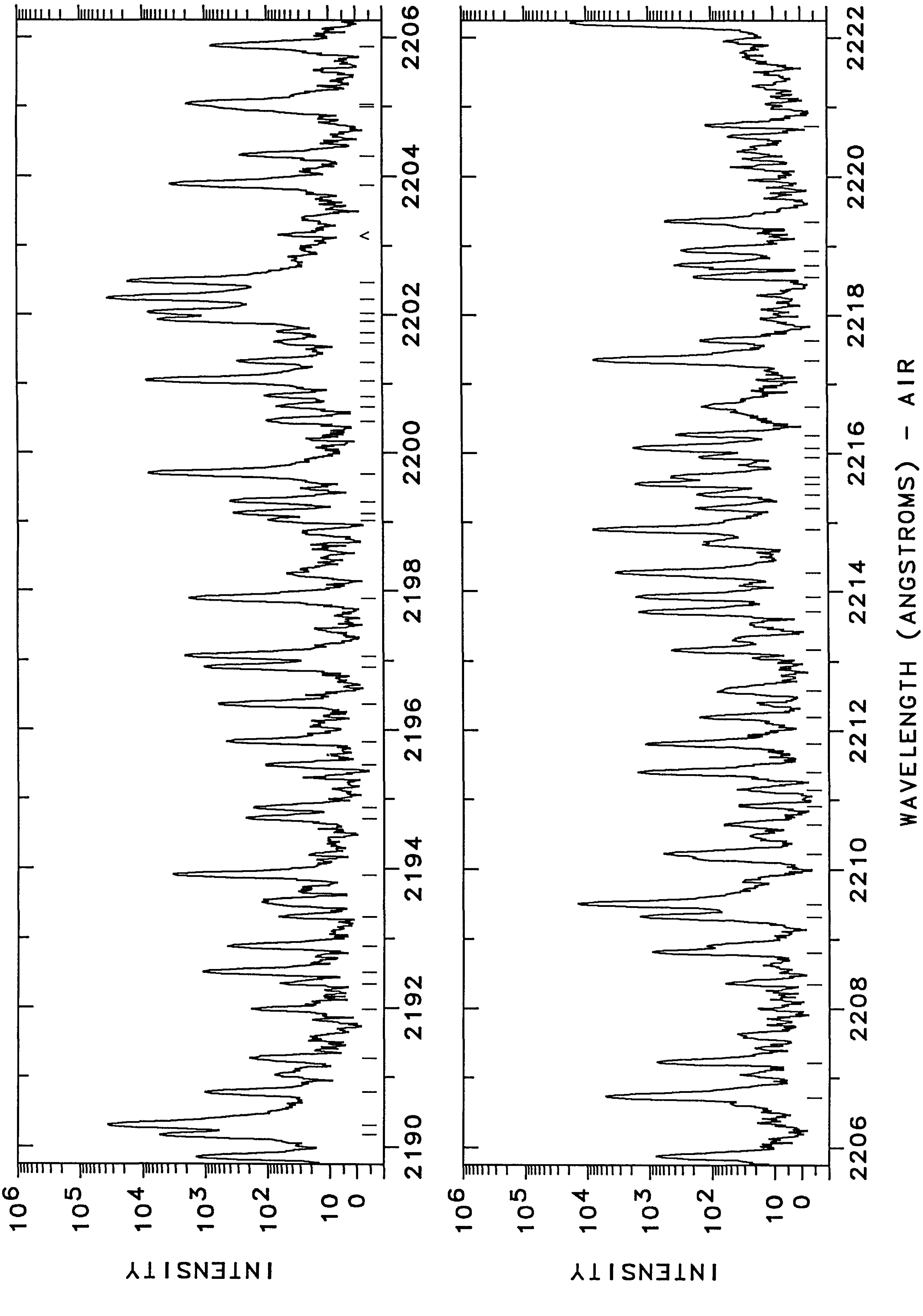
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
2190.1803	45644.069	5400	Pt I 775- 46419	D
2190.3216	45641.126	40000	Pt II 18097- 63738	06
2190.7859	45631.455	1000	Pt I 13496- 59127	N
2191.27	45621.4	190		
2191.98	45606.6	180		
2192.34	45599.1	60		
2192.5064	45595.650	1100	Pt I 15501- 61097	N
2192.8441	45588.628	450	Pt II 29030- 74619	08
2193.31	45578.9	64		
2193.9016	45566.656	3300	Pt II 50564- 96131	K
2194.71	45549.9	220	Pt II 34647- 80197	K
2194.87	45546.6	170	Ne III	L
2195.49	45533.7	100	Pt II 32918- 78452	K
2195.8322	45526.598	450	Pt II 32237- 77763	K
2196.3763	45515.321	610		
2196.9120	45504.223	1000	Pt I 6567- 52071	D
2197.0743	45500.863	2100	Pt II 110258- 64757	K
2197.8914	45483.949	1800	Pt II 29261- 74745	08
2199.02	45460.6	92		
2199.12	45458.5	340		
2199.29	45455.0	380	Pt II 58062-103517	K
2199.7010	45446.535	8000	Pt I 21967- 67413	N
2200.45	45431.1	98	Pt II 48591- 94022	K
2200.66	45426.7	66		
2200.81	45423.6	100		
2201.0082	45419.547	8500	Pt I 10116- 55536	D
2201.31	45413.3	290	Pt II 36484- 81897	K
2201.59	45407.5	71		
2201.74	45404.5	64		
2201.9153	45400.836	5500	Pt II 110158- 64757	K
2202.0165	45398.750	7900	Pt II 15791- 61190	06
2202.2230	45394.494	42000	Pt I 775- 46170	D
2202.4664	45389.478	17000	Pt II 110146- 64757	K
2203.8924	45360.112	3500	Pt II 23875- 69235	14
2204.29	45351.9	260		
2204.9955	45337.422	750	Ne III	L
2205.0541	45336.218	1900	Pt II 32918- 78254	K
2205.8839	45319.165	780	Pt II 53749- 99068	K
2206.7295	45301.801	5100	Pt II 24879- 70181	10
2207.2323	45291.482	770	Ne III	L
2208.35	45268.6	57		
2208.7801	45259.748	910	Pt I 18566- 63826	N
2209.3139	45248.814	1400	Ne III	L
2209.5043	45244.913	14000	Pt II 106434- 61190	P
2210.2121	45230.427	590		
2210.64	45221.7	61		
2210.8919	45216.522		Si I	B
2211.14	45211.4	36	Pt II 110257- 65046	K
2211.4074	45205.982	1500	Pt II 96614- 51408	05
2211.8204	45197.542	1200	Ne III	L
2212.20	45189.8	150	Pt II 50564- 95754	K
2212.58	45182.0	78	Ne III	L
2213.17	45170.0	430		
2213.7165	45158.833	1500	Ne III	L
2213.9314	45154.449	1600	Pt I 21967- 67121	N
2214.2720	45147.503	3400	Pt II 29261- 74409	K
2214.9014	45134.676	7800	Pt II 111162- 66028	K
2215.21	45128.4	170		
2215.40	45124.5	160	Pt II 32918- 78043	K
2215.5540	45121.384	1600		
2215.6525	45119.378	430	Pt II 109507- 64388	K
2215.94	45113.5	150		
2216.0389	45111.511	1700	Ne III	L
2216.26	45107.0	350		
2216.6688	45098.692		Si I	B
2217.3450	45084.941	7500	Pt I 10131- 55216	D
2217.63	45079.1	140		
2218.55	45060.5	180		
2218.72	45057.0	370	Pt II 119057- 73999	AK
2218.72	45057.0	370	Pt II 110408- 65351	AK
2218.93	45052.7	290		
2219.35	45044.2	520		
2220.73	45016.2	120		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WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
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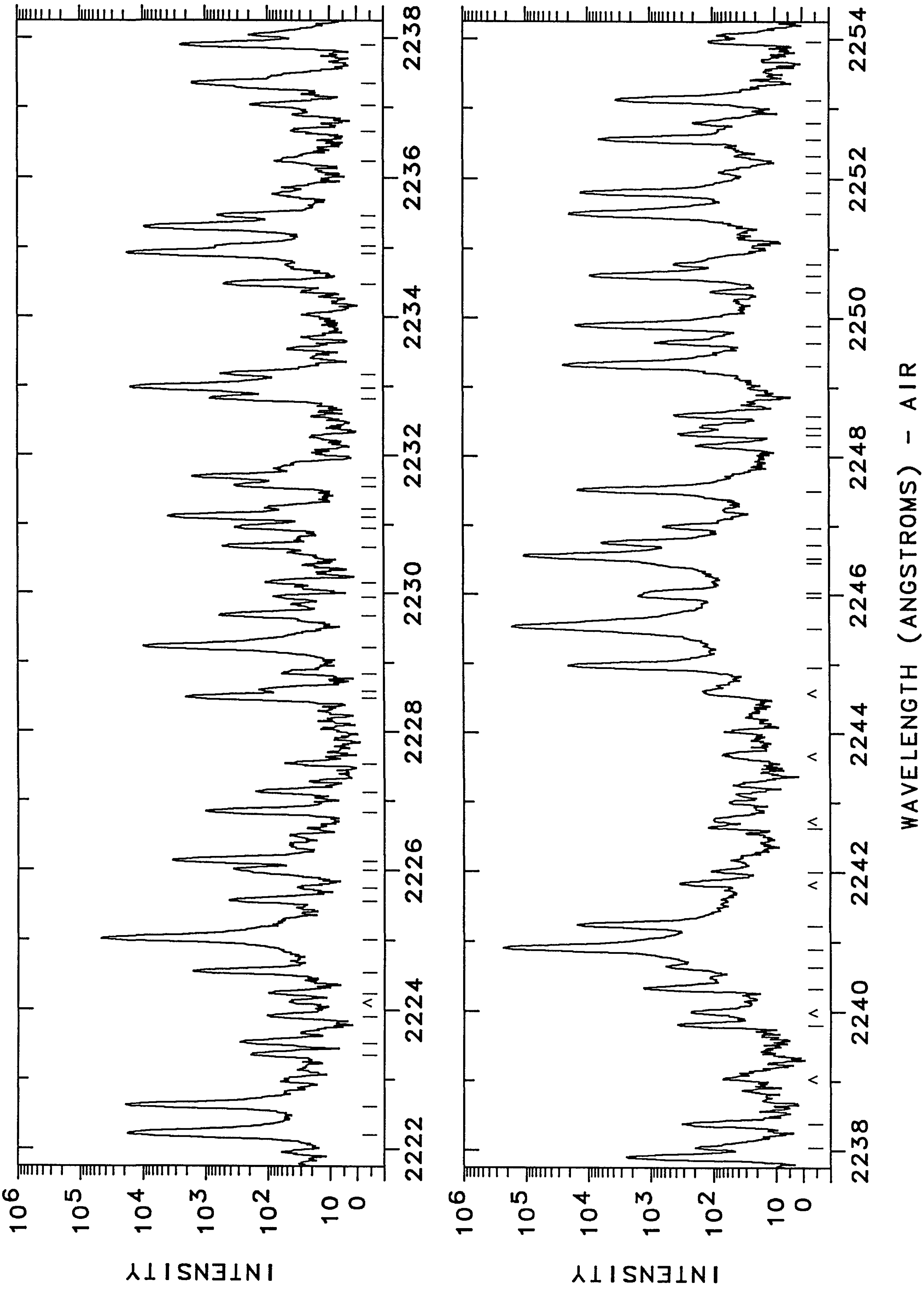
2222.6134	44978.083	19000	Pt I	6567- 51545	D
2223.35	44963.2	180			
2223.52	44959.7	280			
2223.90	44952.1	99			
2224.23	44945.4	93			
2224.5247	44939.443	1600	Pt I	15501- 60441	N
2225.0094	44929.655	48000	Pt II	101517- 56587	K
2225.56	44918.5	420			
2225.75	44914.7	28			
2226.00	44909.7	350	Pt II	60986-105896	K
2226.1261	44907.118	3400	Pt II	110258- 65351	K
2226.8442	44892.639	990	Pt I	10116- 55009	N
2227.12	44887.1	150	Pt II	105794- 60907	K
2227.53	44878.8	49			
2228.4978	44859.330	2100	Pt II	21168- 66028	07
2228.59	44857.5	130			
2228.84	44852.4	54	Pt II	43737- 88589	K
2229.2303	44844.591	9700	Pt II	16820- 61665	04
2229.67	44835.7	590	Pt II	54373- 99209	K
2229.94	44830.3	75	Pt I	13496- 58326	N
2230.15	44826.1	100	Pt I	15501- 60328	N
2230.67	44815.7	520	Pt II	119057- 74241	K
2230.9447	44810.133	320	Pt II	58062-102872	K
2231.0958	44807.099	3900	Pt II	110158- 65351	K
2231.23	44804.4	110			
2231.55	44798.0	330	Pt II	64003-108802	K
2231.6623	44795.727	1600	Pt II	110146- 65351	K
2232.8199	44772.504	830	Pt II	105962- 61190	K
2232.9725	44769.445	15000	Pt II	106434- 61665	P
2233.1579	44765.727	550			
2234.47	44739.4	490	Pt II	60986-105726	K
2234.9262	44730.313	18000	Pt I	0- 44730	D
2235.0229	44728.376	600	Pt II	111162- 66434	K
2235.3029	44722.774	9300	Pt II	18097- 62820	06
2235.4674	44719.485	620	Pt I	6567- 51286	D
2236.2508	44703.82	71	Ne II		C
2236.66	44695.6	36	Pt II	54373- 99068	K
2237.03	44688.2	180			
2237.3520	44681.818	1600	Pt II	115060- 70379	K
2237.8916	44671.046	2400	Pt II	110258- 65587	K
2238.04	44668.1	190			
2238.38	44661.3	310	Pt II	50564- 95226	K
2239.80	44633.0	370			
2240.3222	44622.586	1300	Pt I	775- 45398	D
2240.6434	44616.189	560	Pt II	58062-102678	K
2240.8965	44611.151	240000	Pt II	101199- 56587	04
2241.2288	44604.537	15000	Pt II	105794- 61190	K
2242.00	44589.2	100	Pt II	109346- 64757	K
2242.63	44576.7	110			
2244.9773	44530.068	21000	Pt I	6567- 51097	D
2245.5244	44519.219	170000	Pt II	9356- 53875	06
2245.9752	44510.284	650			
2246.0273	44509.252	650			
2246.4630	44500.620	600 U	Pt I	18566- 63067	N
2246.5216	44499.460	110000	Pt II	101517- 57018	K
2246.7172	44495.585	5900			
2246.9427	44491.121	600	Pt I	13496- 57987	D
2247.4822	44480.442	15000	Pt II	105388- 60907	11
2248.15	44467.2	180			
2248.32	44463.9	340			
2248.42	44461.9	150			
2248.59	44458.5	400	Pt II	58062-102520	K
2249.3075	44444.350	24000	Pt I	0- 44444	A
2249.3075	44444.350	24000	Pt II	54373- 98817	AK
2249.6320	44437.939	800	Pt II	119057- 74619	K
2249.8994	44432.659	16000	Pt I	0- 44432	E
2250.38	44423.2	99			
2250.6201	44418.431	9000	Pt II	21168- 65587	12
2250.7883	44415.113	410	Pt I	15501- 59916	N
2251.5105	44400.867	19000	Pt II	29030- 73431	18
2251.8084	44394.993	13000	Pt II	95803- 51408	05
2252.09	44389.4	72			
2252.32	44384.9	38			
2252.5690	44380.005	6400	Pt II	110408- 66028	K
2252.8022	44375.41	200	Ne II		C
2253.1210	44369.132	3500	Pt II	16820- 61190	05
2253.96	44352.6	110	Pt II	58062-102414	K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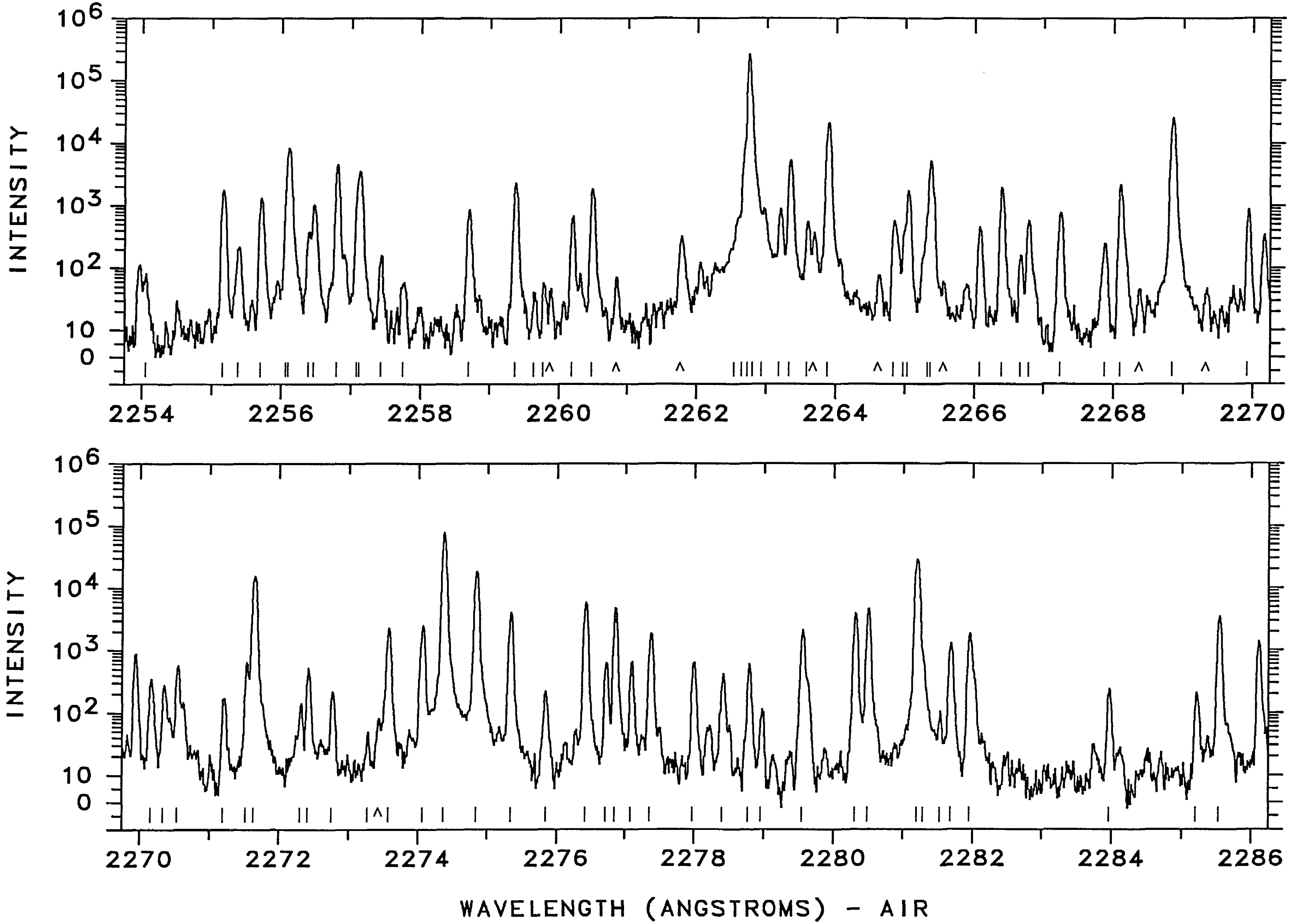
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2254.05	44350.8	77			
2255.1285	44329.640	1800	Pt II	105388- 61058	11
2255.38	44324.7	210	Pt II	109676- 65351	K
2255.6725	44318.949	1300	Pt II	23461- 67780	K
2256.0645	44311.249	600 U	Pt II	119057- 74745	K
2256.0897	44310.754	8200 P	Pt II	21717- 66028	07
2256.3955	44304.75	380	Ne II		C
2256.4402	44303.873	1000			
2256.7868	44297.069	4500	Pt II	105962- 61665	K
2257.0841	44291.234	1000 P			
2257.1283	44290.367	3500 P	Pt I	15501- 59792	N
2257.43	44284.4	150			
2257.75	44278.2	53	Pt II	50564- 94842	K
2258.7143	44259.271	840	Pt II	34647- 78906	16
2259.3776	44246.278	2300			
2259.63	44241.3	35			
2259.77	44238.6	53			
2260.1994	44230.191	670	Pt II	110258- 66028	K
2260.4894	44224.519	1800	Pt II	32237- 76461	13
2262.5437	44184.367	400	Pt I	15501- 59686	N
2262.6453	44182.385	8200	Pt II	21168- 65351	07
2262.7185	44180.955	260000	Pt II	101199- 57018	04
2262.8033	44179.300	1000 P	Pt II	105086- 60907	K
2262.9279	44176.868	890	Pt II	109527- 65351	K
2263.1646	44172.247	870	Ne III		L
2263.3116	44169.379	5300	Pt II	29261- 73431	18
2263.5635	44164.463	540			
2263.8611	44158.659	21000	Pt II	105066- 60907	11
2264.8318	44139.733	570	Ne III		L
2264.9735	44136.973	300 P			
2265.0364	44135.747	1700			
2265.3238	44130.148	400 P	Pt II	110158- 66028	K
2265.3794	44129.065	5200	Pt II	105794- 61665	K
2266.0799	44115.426	450	Ne III		L
2266.4082	44109.035	1900	Pt II	27255- 71364	K
2266.66	44104.1	160			
2266.7928	44101.552	580			
2267.2445	44092.766	760	Pt I	18566- 62659	N
2267.87	44080.6	240			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2268.1057	44076.026	2100	Pt II	114455- 70379	K
2268.8384	44061.794	25000	Pt I	10116- 54178	N
2269.8986	44041.215	870			
2270.15	44036.3	340	Pt II	53749- 97786	K
2270.33	44032.8	270	Pt II	64003-108037	K
2270.53	44029.0	560	Pt II	58491-102520	K
2271.1694	44016.576	170	Pt I	10116- 54133	N
2271.5067	44010.040	500	Pt I	13496- 57506	N
2271.6194	44007.857	15000	Pt II	105066- 61058	11
2272.30	43994.7	140			
2272.3928	43992.880	510	Pt II	110020- 66028	K
2272.75	43986.0	210			
2273.27	43975.9	43			
2273.5812	43969.886	2300	Ne III		L
2274.0682	43960.471	2500	Pt I	15501- 59462	N
2274.3816	43954.415	78000	Pt I	775- 44730	E
2274.8409	43945.541	18000	Pt I	0- 43945	E
2275.3406	43935.891	4000	Pt II	48591- 92526	K
2275.84	43926.3	220			
2276.4229	43915.004	5800	Pt I	6140- 50055	E
2276.7069	43909.527	630	Pt II	117340- 73431	K
2276.8553	43906.665	4700	Pt I	823- 44730	E
2277.0957	43902.030	640			
2277.3650	43896.838	1900	Pt II	105086- 61190	K
2277.9574	43885.424	630	Pt I	21967- 65852	N
2278.3772	43877.339	410	Pt II	114256- 70379	K
2278.7659	43869.855	590	Pt II	21717- 65587	12
2278.95	43866.3	110	Ne III		L
2279.5408	43854.944	2100	Pt II	58062-101916	K
2280.3080	43840.190	3900	Pt II	114861- 71021	K
2280.4916	43836.661	4600	Pt I	10116- 53953	E
2281.1942	43823.161	29000	Pt II	110257- 66434	K
2281.2798	43821.517	400	Pt I	10131- 53953	N
2281.52	43816.9	99			
2281.6963	43813.518	1300	Pt II	54373- 98186	K
2281.9613	43808.430	1900			
2283.96	43770.1	230			
2285.20	43746.3	200	Pt II	115060- 71314	K
2285.5181	43740.261	3500	Pt II	104930- 61190	K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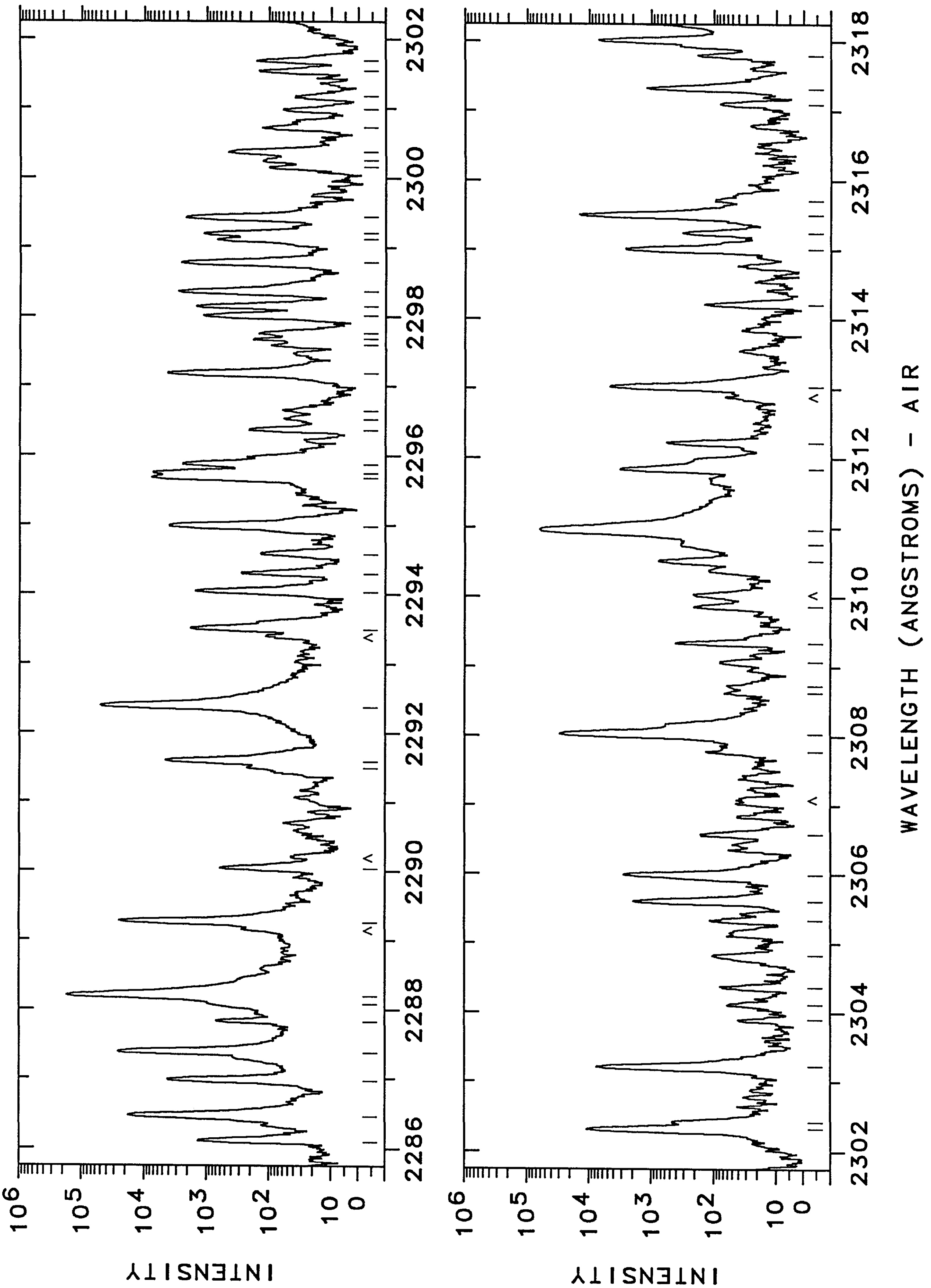
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2286.0942	43729.238	1400	Pt II	104636- 60907	P
2286.4390	43722.645	18000	Pt II	105388- 61665	11
2286.9707	43712.480	4200	Pt II	110146- 66434	K
2287.3643	43704.959	26000	Pt II	104763- 61058	K
2287.8248	43696.164	680	Pt II	115060- 71364	K
2288.0770	43691.348	250 P	Pt II	32918- 76610	A
2288.0770	43691.348	250 P	Pt II	119057- 75365	AK
2288.2050	43688.903	180000	Pt II	13329- 57018	05
2289.2765	43668.457	25000	Pt I	775- 44444	E
2290.0616	43653.488	610			
2291.5144	43625.813	250	Pt I	15501- 59127	N
2291.6058	43624.073	4500			
2292.3987	43608.986	90000	Pt I	823- 44432	E
2293.4678	43588.659	1800	Pt II	21168- 64757	07
2294.0059	43578.436	1500	Pt II	104636- 61058	P
2294.29	43573.0	280			
2294.5676	43567.770	130	Pt II	18097- 61665	05
2294.9724	43560.086	4000			
2295.6764	43546.728	6400	Pt II	114861- 71314	K
2295.7435	43545.455	6000	Pt I	13496- 57041	N
2295.8748	43542.965	2400	Pt II	32918- 76461	14
2296.3797	43533.393	210	Pt I	10131- 53665	N
2296.52	43530.7	53	Pd II		
2296.64	43528.5	57			
2297.1873	43518.089	4300	Pt II	114539- 71021	K
2297.59	43510.5	88			
2297.68	43508.8	180			
2297.7869	43506.735		Fe I		R
2298.0163	43502.392	1100	Pt II	104410- 60907	K
2298.1494	43499.873	1500	Pt II	109527- 66028	K
2298.3680	43495.735	2900	Pt I	18566- 62062	N
2298.7859	43487.830	2600	Pt I	6567- 50055	N
2299.1162	43481.583	680			
2299.2020	43479.960	1100	Pt II	109507- 66028	K
2299.4324	43475.603	2200	Pt II	119057- 75581	K
2300.1421	43462.191		Fe I		R
2300.2469	43460.21	120	Ne II		C
2300.38	43457.7	450	Pt I	16983- 60441	AN
2300.38	43457.7	450	Pt II	50564- 94022	AK

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2300.73	43451.1	130			
2300.99	43446.2	55			
2301.175	43442.68		Fe		S
2301.54	43435.8	140			
2301.69	43433.0	160	Pt II	53749- 97183	K
2302.3068	43421.330	11000	Pt II	105086- 61665	K
2302.42	43419.2	460	Pt II	54373- 97792	K
2303.2065	43404.369	7600	Pt I	6140- 49544	E
2303.90	43391.3	34	Ne III		L
2304.12	43387.2	54			
2304.37	43382.5	72	Pt II	64003-107386	AK
2304.37	43382.5	72	Pt II	111162- 67780	AK
2304.83	43373.8	99	Ne III		L
2305.34	43364.2	110	Pt I	21967- 65331	N
2305.6355	43358.646	1900			
2306.0122	43351.565	2800	Pt II	104410- 61058	K
2306.58	43340.9	160	Ne III		L
2307.78	43318.4	130	Pt II	109346- 66028	K
2308.0437	43313.411	35000	Pt I	6567- 49880	E
2308.63	43302.4	61	Ne III		L
2308.73	43300.5	55			
2309.07	43294.2	74			
2309.3225	43289.427	400			
2309.87	43279.2	200			
2310.5009	43267.351	770			
2310.76	43262.5	340			
2310.9626	43258.707	200000	Pt II	13329- 56587	05
2311.8636	43241.850	3200	Pt II	109676- 66434	K
2312.2207	43235.172	570	Pt II	114256- 71021	K
2313.0347	43219.958	4700	Pt II	21168- 64388	12
2314.21	43198.0	140	Pt II	112433- 69235	K
2315.0140	43183.009	2600	Pt II	104090- 60907	K
2315.24	43178.8	310			
2315.5024	43173.902	14000	Pt I	13496- 56670	N
2315.71	43170.0	90			
2317.10	43144.1	74			
2317.2977	43140.456	1200	Pt II	114455- 71314	K
2317.80	43131.1	180			



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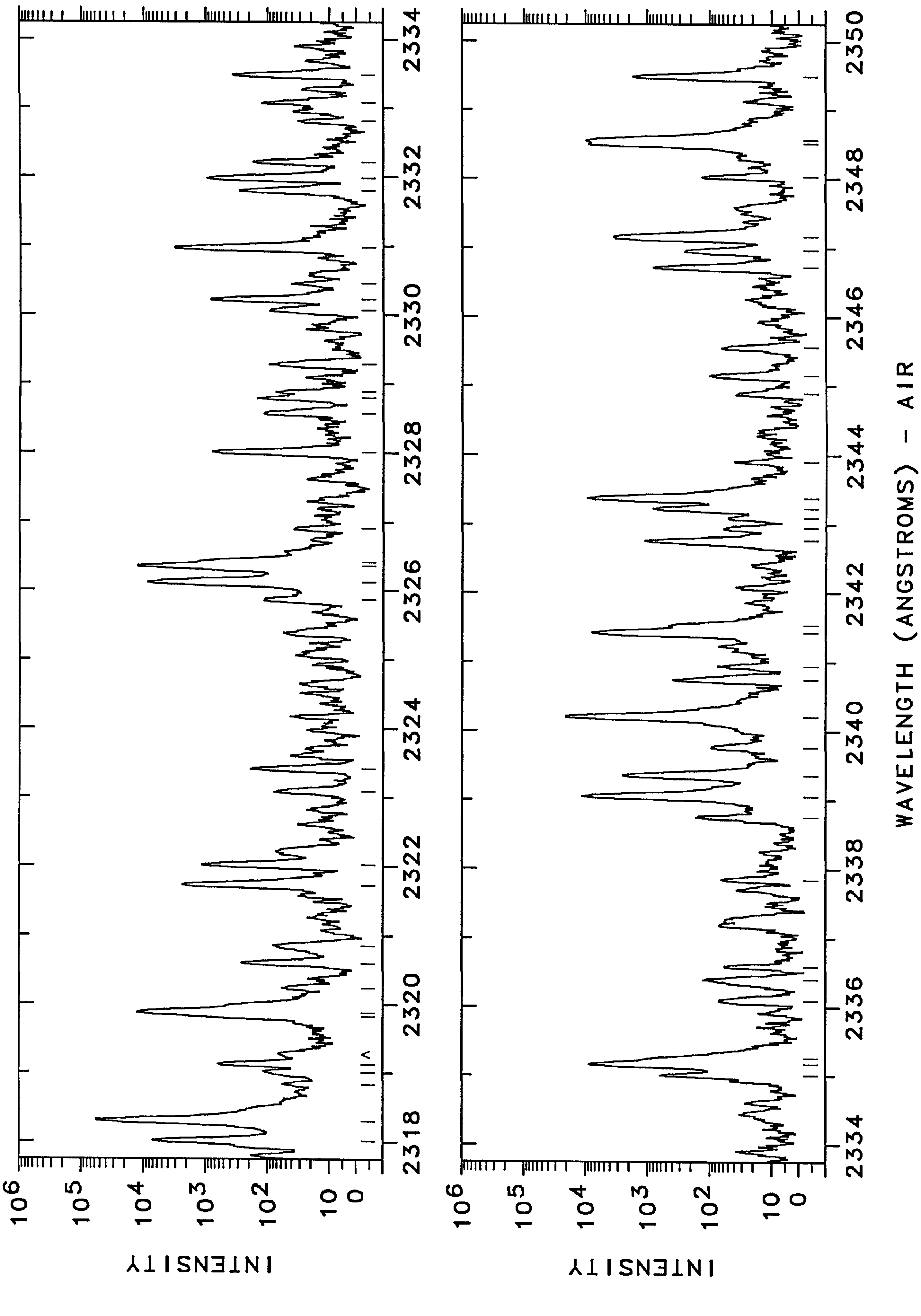
2318
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
2318.0081	43127.235	7000	Pt II 58491-101618	K
2318.2969	43121.864	57000	Pt I 823- 43945	E
2318.83	43112.0	54	Pt II 115060- 71948	K
2319.01	43108.6	110		
2319.1251	43106.466	620	Pt II 114127- 71021	K
2319.8215	43093.526	750	Pt II 109527- 66434	K
2319.8869	43092.311	12000	Pt II 18097- 61190	06
2320.23	43085.9	55		
2320.6133	43078.823	250	Pt I 18566- 61645	N
2320.85	43074.4	77		
2321.7422	43057.879	2400	Pt II 58491-101549	K
2322.0304	43052.535	1100		
2323.09	43032.9	75		
2323.42	43026.8	190		
2325.87	42981.5	110		
2326.1053	42977.122	8600	Pt I 6567- 49544	E
2326.3386	42972.812	13000	Pt II 23461- 66434	10
2326.4148	42971.406	750	Pt II 104636- 61665	K
2326.91	42962.3	35		
2328.0220	42941.741	780	Pt II 114256- 71314	K
2328.57	42931.6	110	Pt II 117340- 74409	K
2328.79	42927.6	150	Pt II 116689- 73761	K
2328.88	42925.9	71		
2329.2862	42918.437	92	Pt II 29030- 71948	09
2330.07	42904.0	89		
2330.2360	42900.945	830	Pt II 24879- 67780	K
2330.46	42896.8	38		
2330.9705	42887.428	3200	Pt I 10131- 53019	E
2331.7820	42872.503	280	Pt II 34647- 77519	13
2331.9574	42869.279	950		
2332.21	42864.6	170		
2332.7994	42853.808		Fe II	S
2333.08	42848.7	120		
2333.48	42841.3	360	Pt II 58062-100903	K

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
2335.0214	42813.032	610	Pt II 114127- 71314	K
2335.1888	42809.963	8800	Pt II 18097- 60907	A
2335.1888	42809.963	8800	Pt II 54373- 97183	AK
2335.2555	42808.740	1000	Pt I 16983- 59792	N
2336.09	42793.4	66		
2336.40	42787.8	120		
2336.59	42784.3	53		
2337.85	42761.2	61		
2338.75	42744.8	160	Pt II 121651- 78906	K
2339.0741	42738.859	11000	Pt II 96614- 53875	05
2339.3589	42733.657	2500	Pt II 58062-100795	K
2339.77	42726.1	90		
2340.1805	42718.654	21000	Pt I 6567- 49286	E
2340.7195	42708.819	380	Pt I 21967- 64675	N
2340.94	42704.8	72		
2341.4178	42696.082	7900	Pt II 106434- 63738	P
2341.53	42694.0	450	Pt II 53749- 96443	K
2342.7732	42671.382	1100	Pt II 21717- 64388	13
2342.95	42668.2	56		
2343.10	42665.4	48		
2343.2412	42662.861	830	Pt II 32918- 75581	13
2343.3952	42660.057	9500	Pt I 0- 42660	E
2343.91	42650.7	38	Pt II 60986-103637	K
2344.89	42632.9	35	Pt II 50564- 93197	K
2345.15	42628.1	99		
2345.56	42620.7	60		
2346.7367	42599.318	810	Pt I 15501- 58101	N
2346.97	42595.1	250	Pt II 117340- 74745	K
2347.1600	42591.638	3600	Pt I 10116- 52708	N
2348.03	42575.9	130		
2348.4833	42567.641	6000	Pt II 105388- 62820	12
2348.5456	42566.511	6600	Pt II 23461- 66028	07
2349.4764	42549.648	1700	Pt II 58062-100611	K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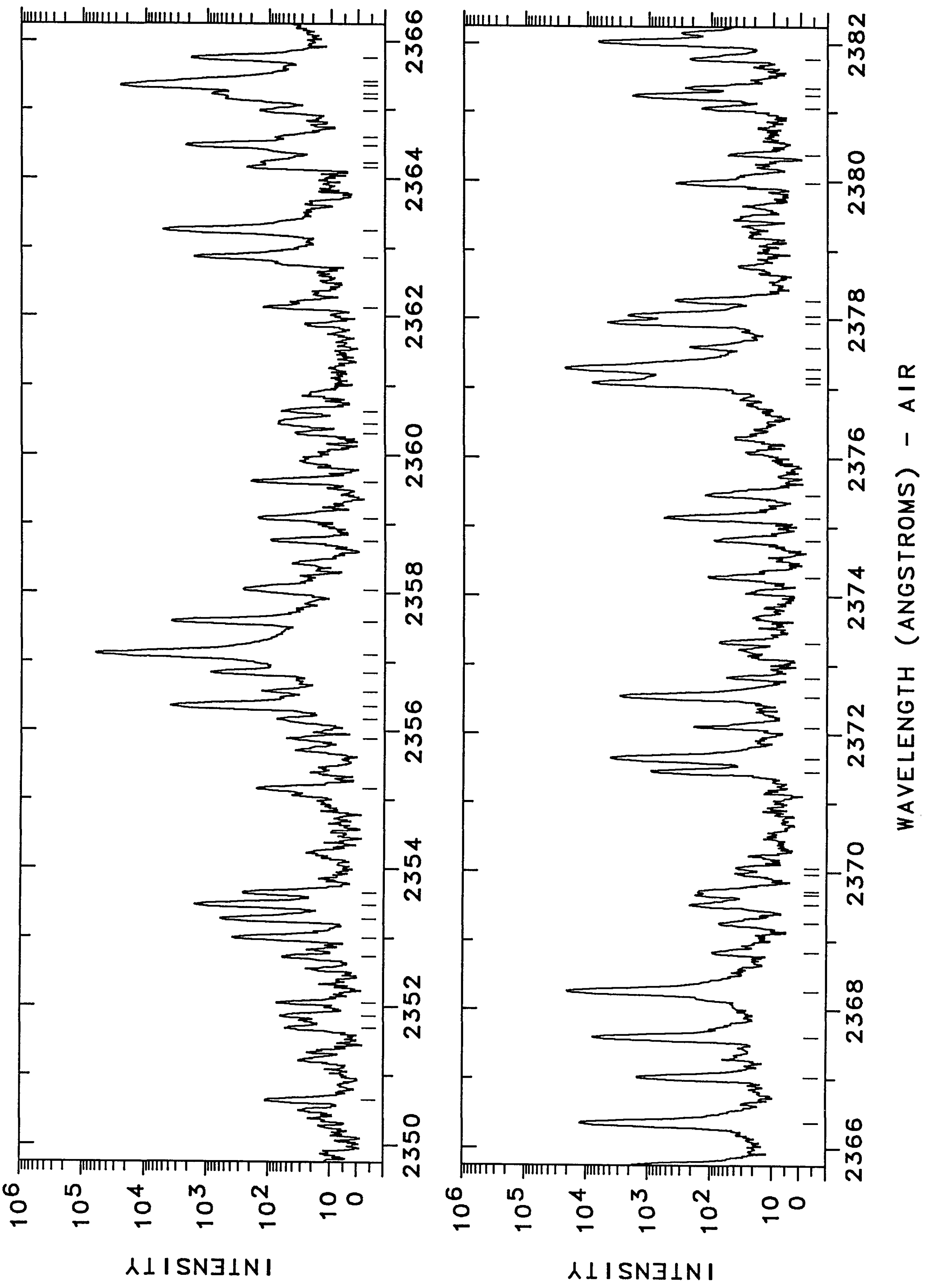
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2350.65	42528.4	110			
2351.69	42509.6	50			
2351.86	42506.5	59			
2352.05	42503.1	69			
2352.73	42490.8	56			
2353.0213	42485.551	380	Pt I	15501- 57987	N
2353.2883	42480.732	590			
2353.4916	42477.062	1600	Pt II	110257- 67780	K
2353.65	42474.2	260			
2355.16	42447.0	160	Pt II	32918- 75365	AK
2355.16	42447.0	160	Pt II	119057- 76610	AK
2355.89	42433.8	49			
2356.17	42428.8	72			
2356.3384	42425.748	3900 L			
2356.57	42421.6	130			
2356.8505	42416.531	880			
2357.1047	42411.956	64000	Pt I	775- 43187	E
2357.5804	42403.399	3800	Pt I	10116- 52520	N
2358.04	42395.1	260			
2358.7653	42382.100	92	Pt II	32237- 74619	09
2359.08	42376.4	150			
2359.61	42366.9	200			
2360.31	42354.4	35			
2360.45	42351.9	69	Pt I	21967- 64319	N
2360.63	42348.6	61			
2362.12	42321.9	120			
2362.8646	42308.578	1600	Pt II	117493- 75184	K
2363.2297	42302.043	5200	Ne III		L
2364.16	42285.4	230			
2364.2318	42284.115	140	Pt II	29030- 71314	09
2364.4860	42279.569	2200	Pt II	116689- 74409	K
2364.60	42277.5	78			
2364.9754	42270.82	140	Ne II		C
2365.1539	42267.63	350	Ne II		C
2365.2273	42266.319	850	Pt II	32918- 75184	A
2365.2273	42266.319	850	Pt II	105086- 62820	AK
2365.3485	42264.153	25000 C			
2365.4128	42263.005	1600 P	Ne III		L

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2365.7487	42257.004	1800	Ne III		L
2366.3729	42245.858	13000	Pt II	105066- 62820	13
2367.0394	42233.964	1500	Ne III		L
2367.6160	42223.680	7800	Pt II	105962- 63738	K
2368.2781	42211.876	21000	Pt I	6567- 48779	E
2368.83	42202.0	89			
2369.26	42194.4	68			
2369.53	42189.6	210			
2369.67	42187.1	170			
2369.72	42186.2	160			
2369.97	42181.7	37			
2370.06	42180.1	35			
2371.4185	42155.980	920	Pt II	117340- 75184	K
2371.6165	42152.461	4200	Pt II	23875- 66028	11
2372.10	42143.9	180			
2372.5390	42136.073	2900	Pt II	111371- 69235	K
2372.82	42131.1	53			
2373.32	42122.2	70			
2374.27	42105.4	110			
2374.8090	42095.80	86	Ne II		C
2375.13	42090.1	570			
2375.46	42084.3	120			
2377.0752	42055.671	8400	Pt II	105794- 63738	K
2377.1539	42054.277	900	Pt II	112433- 70379	K
2377.2773	42052.096	23000	Pt II	9356- 51408	07
2377.58	42046.7	220	Pt II	106434- 64388	K
2377.9606	42040.012	4700	Pt I	13496- 55536	E
2378.0597	42038.260	2200	Pt II	43737- 85775	K
2378.2731	42034.490	380	Pt II	115060- 73026	K
2379.9758	42004.419	370	Pt I	15501- 57506	A
2379.9758	42004.419	370	Pt II	32237- 74241	A
2379.9758	42004.419	370	Pt II	53749- 95754	AK
2380.38	41997.3	50			
2381.06	41985.3	140			
2381.2324	41982.254	1900			
2381.3616	41979.978	260	Pt II	27255- 69235	15
2381.78	41972.6	220	Pt II	50564- 92537	K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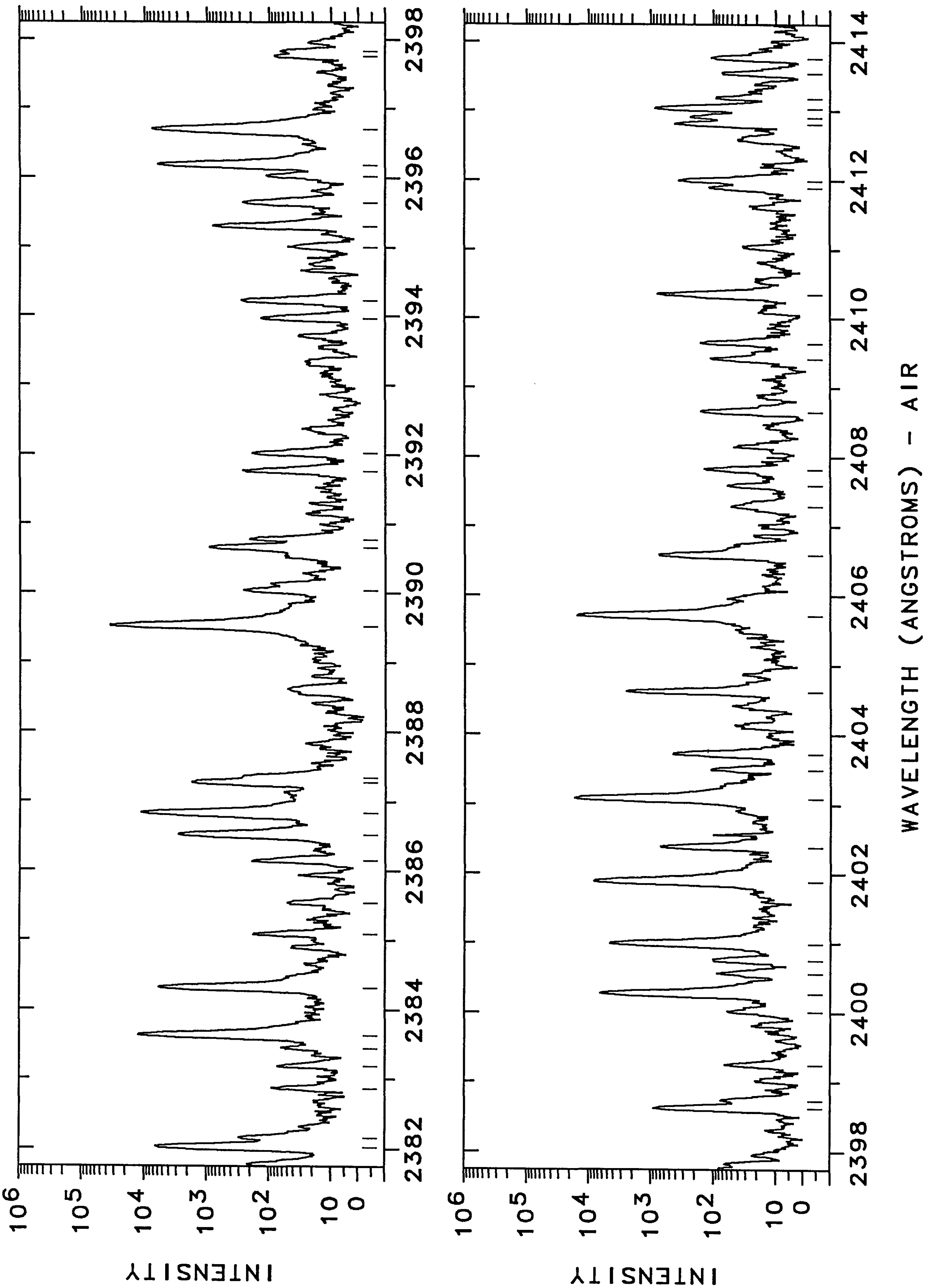
2382
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2382.0330	41968.145	6500	Pt I	6567- 48535	A
2382.0330	41968.145	6500	Pt I	26638- 68606	AN
2382.15	41966.1	300			
2382.86	41953.6	87			
2383.18	41947.9	69			
2383.44	41943.4	61	Pt II	116689- 74745	K
2383.6432	41939.797	12000	Pt I	10131- 52071	E
2384.3213	41927.870	5900	Pt II	95803- 53875	06
2385.09	41914.4	180			
2385.54	41906.5	47			
2386.15	41895.7	190	Pt II	109676- 67780	K
2386.5017	41889.566	2900	Pt II	23461- 65351	07
2386.8089	41884.176	11000	Pt I	775- 42660	E
2387.2596	41876.270	1700			
2387.3456	41874.760	250	Pt I	18566- 60441	N
2389.5358	41836.382	36000	Pt I	823- 42660	E
2390.0515	41827.355	260	Pt II	32918- 74745	09
2390.6758	41816.434	920	Pt II	104636- 62820	P
2390.7975	41814.305	200	Pt II	34647- 76461	15
2391.76	41797.5	260	Pt I	16983- 58780	N
2392.02	41792.9	180			
2393.96	41759.1	130	Pt II	29261- 71021	K
2394.22	41754.5	270			
2395.00	41740.9	46			
2395.2985	41735.738	800	Pt II	58062- 99797	K
2395.6470	41729.668	260	Pt II	37877- 79607	17
2396.02	41723.2	110			
2396.1705	41720.552	6000	Pt I	13496- 55216	E
2396.6869	41711.562	7400	Pt II	23875- 65587	15
2397.76	41692.9	79			
2397.83	41691.7	62	Pt II	60986-102678	K
2398.6409	41677.586	900	Pt II	106434- 64757	P

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2398.73	41676.0	73			
2399.2413	41667.158		Fe II		S
2400.01	41653.8	57			
2400.2707	41649.289	6500	Pt II	105388- 63738	13
2400.56	41644.3	85	Ne III		L
2400.75	41641.0	100			
2401.0033	41636.581	4700	Pt I	10116- 51753	E
2401.8773	41621.432	8500	Pt I	10131- 51753	E
2402.3655	41612.974	700	Pt II	21168- 62781	09
2403.0918	41600.398	17000	Pt I	6140- 47740	E
2403.50	41593.3	110			
2403.7227	41589.480	450	Pt II	104410- 62820	K
2404.6239	41573.895	2500	Pt II	105962- 64388	K
2405.7269	41554.835	15000	Pt II	24879- 66434	10
2406.5926	41539.889	740	Pt I	15501- 57041	N
2407.29	41527.9	49			
2407.59	41522.7	57			
2407.82	41518.7	140			
2408.65	41504.4	160	Pt II	116689- 75184	K
2409.41	41491.3	110			
2409.63	41487.5	160			
2410.3280	41475.516	780	Pt II	23875- 65351	11
2411.89	41448.7	110			
2411.99	41446.9	360			
2412.8173	41432.731	410	Ne III		L
2412.90	41431.3	230	Ne III		L
2413.0462	41428.800	850	Pt I	10116- 51545	A
2413.0462	41428.800	850	Pt II	114455- 73026	AK
2413.18	41426.5	86	Ne III		L
2413.54	41420.3	68	Ne III		L
2413.76	41416.5	100	Ne III		L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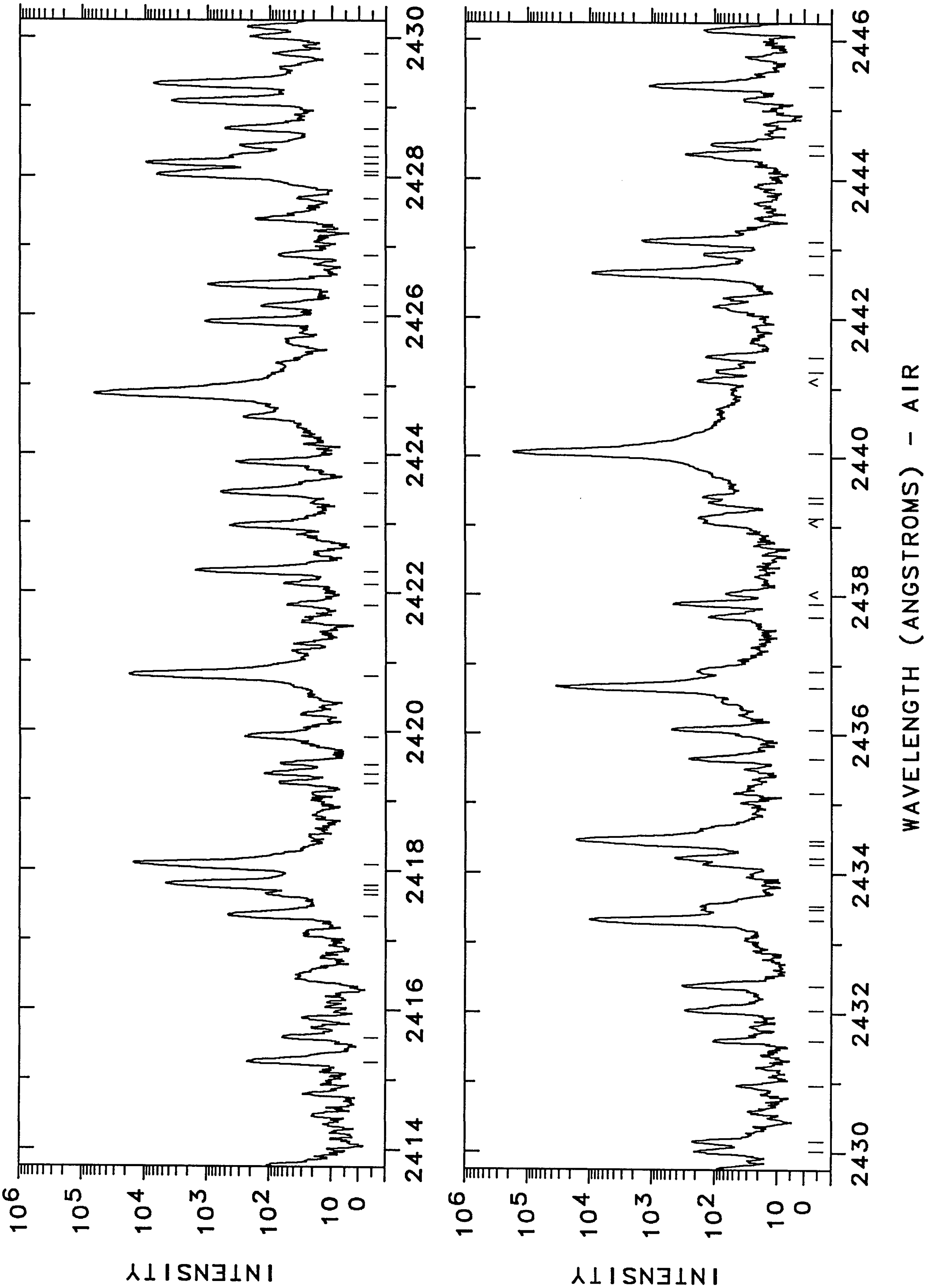
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2415.25	41391.0	220			
2415.60	41385.0	57			
2417.3375	41355.26	450	Ne II		C
2417.66	41349.7	110			
2417.7302	41348.544	910 U	Pt II	29030- 70379	16
2417.7630	41347.982	4600 P	Pt II	105086- 63738	K
2418.0583	41342.934	15000	Pt I	13496- 54839	E
2419.2297	41322.918	64	Pt II	32918- 74241	10
2419.38	41320.3	120			
2419.52	41318.0	61			
2419.92	41311.1	240			
2420.8161	41295.840	18000	Pt II	23461- 64757	08
2421.82	41278.7	46			
2422.12	41273.6	53			
2422.3192	41270.216	1500	Pt II	104090- 62820	K
2422.9672	41259.18	420	Ne II		C
2423.4495	41250.97	600	Ne II		C
2423.88	41243.6	340	Pt II	54373- 95617	K
2424.5504	41232.24	250	Ne II		C
2424.8672	41226.854	64000	Pt II	15791- 57018	05
2425.8955	41209.380	1100	Pt II	111162- 69953	K
2426.14	41205.2	130	Pt II	105962- 64757	K
2426.4352	41200.215	950	Pt I	21967- 63167	N
2426.87	41192.8	66	Ne III		L
2427.39	41184.0	160	Pt II	54373- 95557	K
2427.69	41178.9	30			
2428.0333	41173.099	6400	Pt I	6567- 47740	E
2428.0806	41172.297	950 P	Pt II	110408- 69235	K
2428.2031	41170.220	9600	Pt I	10116- 51286	E
2428.3122	41168.370	440	Pt I	15501- 56670	N
2428.4520	41166.00	290	Ne II		C
2428.7069	41161.68	510	Ne II		C
2429.0969	41155.073	3700	Pt I	10131- 51286	E
2429.3490	41150.802	7200	Pt II	29030- 70181	13

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2429.7731	41143.62	83	Ne II		C
2430.0176	41139.48	200	Ne II		C
2430.1647	41136.99	220	Ne II		C
2430.96	41123.5	37			
2431.60	41112.7	98			
2432.04	41105.3	290	Pt II	50564- 91669	K
2432.39	41099.4	320	Pt II	114861- 73761	K
2433.3064	41083.882	10000	Pt II	106434- 65351	P
2433.49	41080.8	160	Pt II	32918- 73999	AK
2433.49	41080.8	160	Ne II		A
2433.54	41079.9	160	Pt II	53749- 94829	K
2434.14	41069.8	150			
2434.2105	41068.624	430	Pt II	112433- 71364	K
2434.4128	41065.210	1000 P			
2434.4610	41064.398	16000	Pt II	21717- 62781	09
2435.1545	41052.705		Si I		B
2435.6448	41044.44	250	Ne II		C
2436.0764	41037.169	480	Pt II	105794- 64757	K
2436.6887	41026.858	35000	Pt I	775- 41802	E
2436.91	41023.1	180			
2437.69	41010.0	120			
2437.8887	41006.664	440	Pt II	58062- 99068	K
2439.1180	40986.00	170	Ne II		C
2439.34	40982.3	120			
2439.42	40980.9	150	Pt I	10116- 51097	N
2440.0608	40970.165	170000	Pt I	0- 40970	E
2441.24	40950.4	87			
2441.4347	40947.11	130	Ne II		C
2442.6261	40927.139	9100	Pt II	23461- 64388	13
2442.91	40922.4	140	Pt II	110158- 69235	K
2443.0933	40919.314	1400	Pt II	29261- 70181	13
2444.36	40898.1	280	Pt II	104636- 63738	K
2444.50	40895.8	110	Pt I	18566- 59462	N
2445.3359	40881.790	1100	Pt II	23875- 64757	11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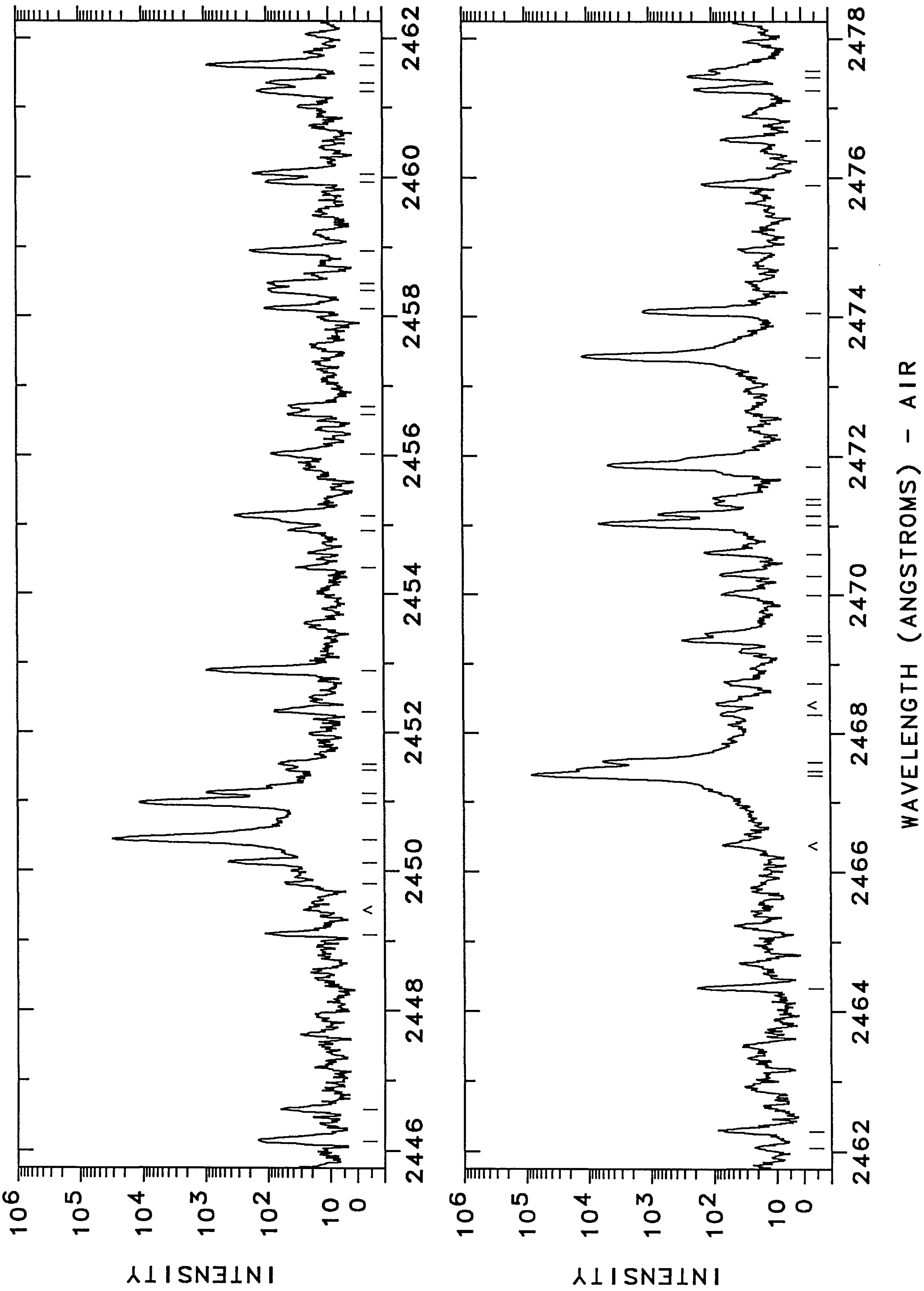
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2446.13	40868.5	140	Pt I	21967- 62835	N
2446.58	40861.0	57			
2449.09	40819.1	110	Pt II	115060- 74241	K
2449.82	40807.0	47			
2450.12	40802.0	420			
2450.4390	40796.658	30000	Pt II	15791- 56587	06
2450.9670	40787.870	11000 C	Pt I	0- 40787	E
2451.1276	40785.198	940	Pt II	110020- 69235	K
2451.45	40779.8	45			
2451.54	40778.3	61			
2452.30	40765.7	71			
2452.9005	40755.722	940	Pt II	58062- 98817	K
2454.38	40731.2	28			
2454.92	40722.2	39	Ne III		L
2455.1380	40718.582	320	Pt II	34647- 75365	K
2456.02	40704.0	78			
2456.59	40694.5	39			
2456.70	40692.7	38			
2458.11	40669.4	99			
2458.37	40665.1	84			
2458.47	40663.4	87			
2458.94	40655.6	170			
2459.93	40639.3	94			
2460.05	40637.3	160	Pt I	13496- 54133	N
2461.2423	40617.60	130	Ne II		C
2461.35	40615.8	90			
2461.6167	40611.423	880	Pt II	105962- 65351	K

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2461.79	40608.6	18			
2462.05	40604.3	16			
2462.29	40600.3	81	Ne III		L
2464.33	40566.7	180			
2467.4003	40516.236	80000 P	Pt I	0- 40516	E
2467.4824	40514.888	15000 P	Pt I	13496- 54011	E
2467.5920	40513.089	5800	Pt II	23875- 64388	16
2468.27	40502.0	69			
2468.72	40494.6	60	Pt II	114256- 73761	K
2469.33	40484.6	300	Pt II	112433- 71948	K
2469.41	40483.3	120	Pt I	26638- 67121	N
2470.0003	40473.59	63	Ne II		C
2470.27	40469.2	69	Pt II	54373- 94842	K
2470.59	40463.9	130	Pt II	41434- 81897	K
2471.0073	40457.098	6400	Pt I	13496- 53953	E
2471.1551	40454.678	700	Pt II	110408- 69953	K
2471.31	40452.1	83	Pt II	114861- 74409	K
2471.39	40450.8	88			
2471.8422	40443.433	4600	Pt II	105794- 65351	K
2473.3856	40418.199	12000	Ne III		L
2474.0576	40407.221	1300 L	Pt II	60986-101394	K
2475.89	40377.3	130	Pt II	37877- 78254	K
2476.53	40366.9	64			
2477.2734	40354.772	180	Pt I	21967- 62321	N
2477.44	40352.1	230	Pt II	104090- 63738	K
2477.5449	40350.35	100	Ne II		C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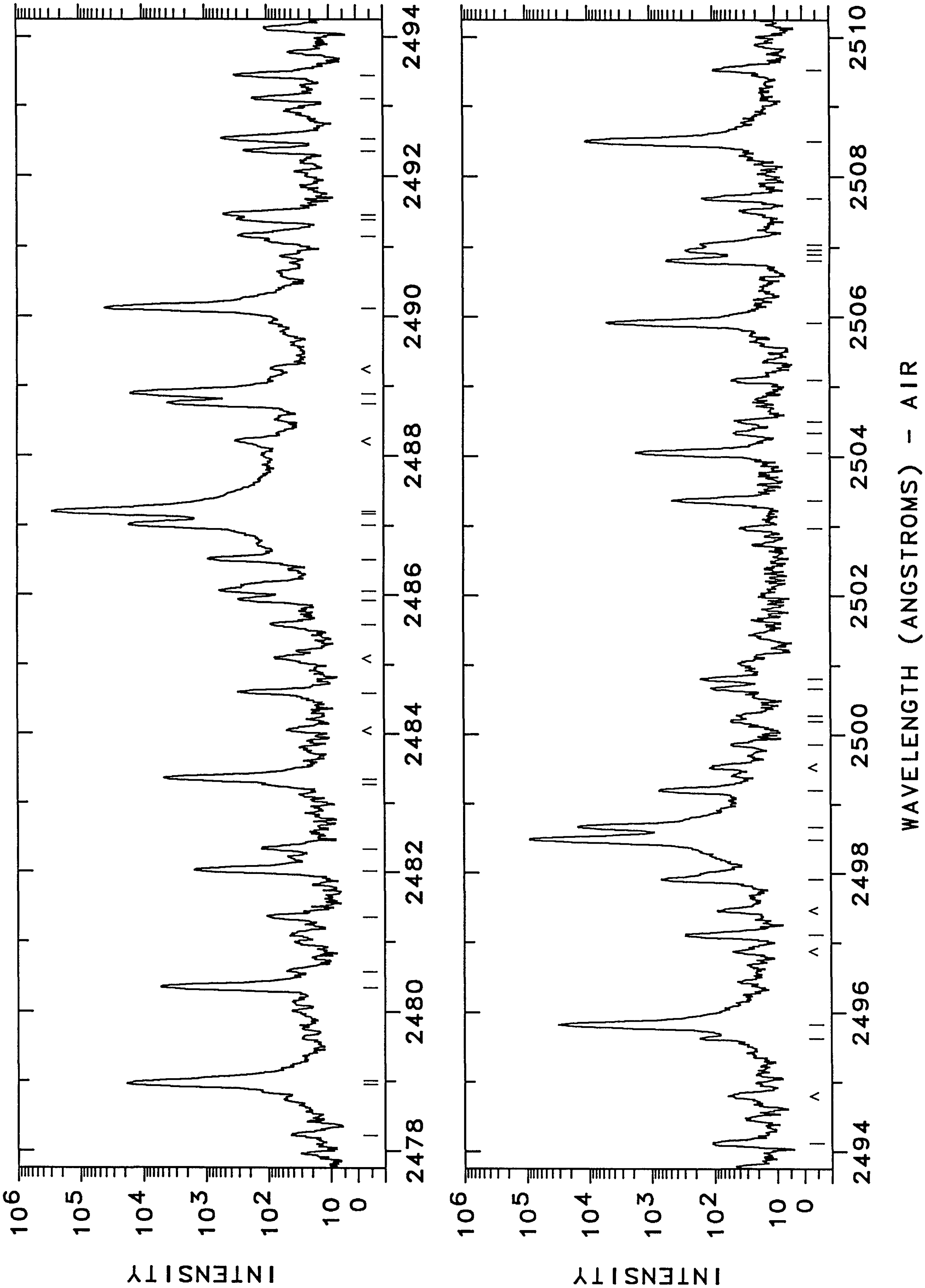
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
2478.22	40339.4	37		
2478.9449	40327.563	18000	Pt II 101517- 61190	K
2479.0091	40326.519	550 P	Pt II 58491- 98817	K
2480.3415	40304.858	5200	Pt II 110258- 69953	K
2480.57	40301.1	45		
2481.35	40288.5	100		
2482.0363	40277.338	1500	Pt II 23461- 63738	08
2482.33	40272.6	120	Pt II 109507- 69235	K
2483.2714	40257.306		Fe I	R
2483.3675	40255.750	4600	Pt I 10131- 50387	N
2484.59	40235.9	290		
2485.57	40220.1	83		
2485.9312	40214.237	290	Pt I 18566- 58780	N
2486.0694	40212.001	580		
2486.5135	40204.819	890	Pt II 110158- 69953	K
2486.9827	40197.236	17000	Pt II 16820- 57018	05
2487.1685	40194.232	280000	Pt I 775- 40970	E
2487.1685	40194.232	280000	Pt I 0- 40194	E
2488.7321	40168.981	4000	Pt I 13496- 53665	N
2488.8753	40166.671	15000	Pt II 24879- 65046	K
2490.1265	40146.489	40000	Pt I 823- 40970	E
2491.1651	40129.754	280	Pt II 114539- 74409	K
2491.38	40126.3	300	Pt II 60986-101113	AK
2491.38	40126.3	300	Pt II 36484- 76610	A
2491.4659	40124.909	490	Pt II 58062- 98186	K
2492.35	40110.7	230	Pt II 109346- 69235	K
2492.5276	40107.819	520	Pt II 32918- 73026	12
2493.0948	40098.695	160	Pt II 34647- 74745	11

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
2493.4332	40093.252	330	Pt II 113119- 73026	K
2494.12	40082.2	100		
2495.63	40058.0	160	Pt I 16983- 57041	N
2495.8126	40055.032	31000	Pt I 6567- 46622	E
2497.0968	40034.434	280	Pt I 15501- 55536	N
2497.9137	40021.342	680	Pt II 21168- 61190	08
2498.4996	40011.958	89000	Pt I 775- 40787	E
2498.6806	40009.059	15000	Pt II 101199- 61190	07
2499.2092	40000.598	730	Pt II 106434- 66434	P
2499.86	39990.2	46		
2500.20	39984.7	47		
2500.28	39983.5	36		
2500.67	39977.2	100		
2500.81	39975.0	150	Pt I 21967- 61942	N
2502.97	39940.5	31		
2503.3469	39934.487	440	Pt II 105962- 66028	K
2504.0404	39923.427	1700	Pt I 10131- 50055	E
2504.34	39918.7	39		
2504.50	39916.1	38		
2505.09	39906.7	44		
2505.9225	39893.445	5000	Pt I 10116- 50010	N
2506.8216	39879.138	540	Pt II 110258- 70379	K
2506.8973	39877.934		Si I	B
2506.96	39876.9	260		
2507.04	39875.7	150	Ne III	L
2507.69	39865.3	140		
2508.4973	39852.500	11000	Pt I 6567- 46419	E
2509.53	39836.1	89	Pt II 114455- 74619	K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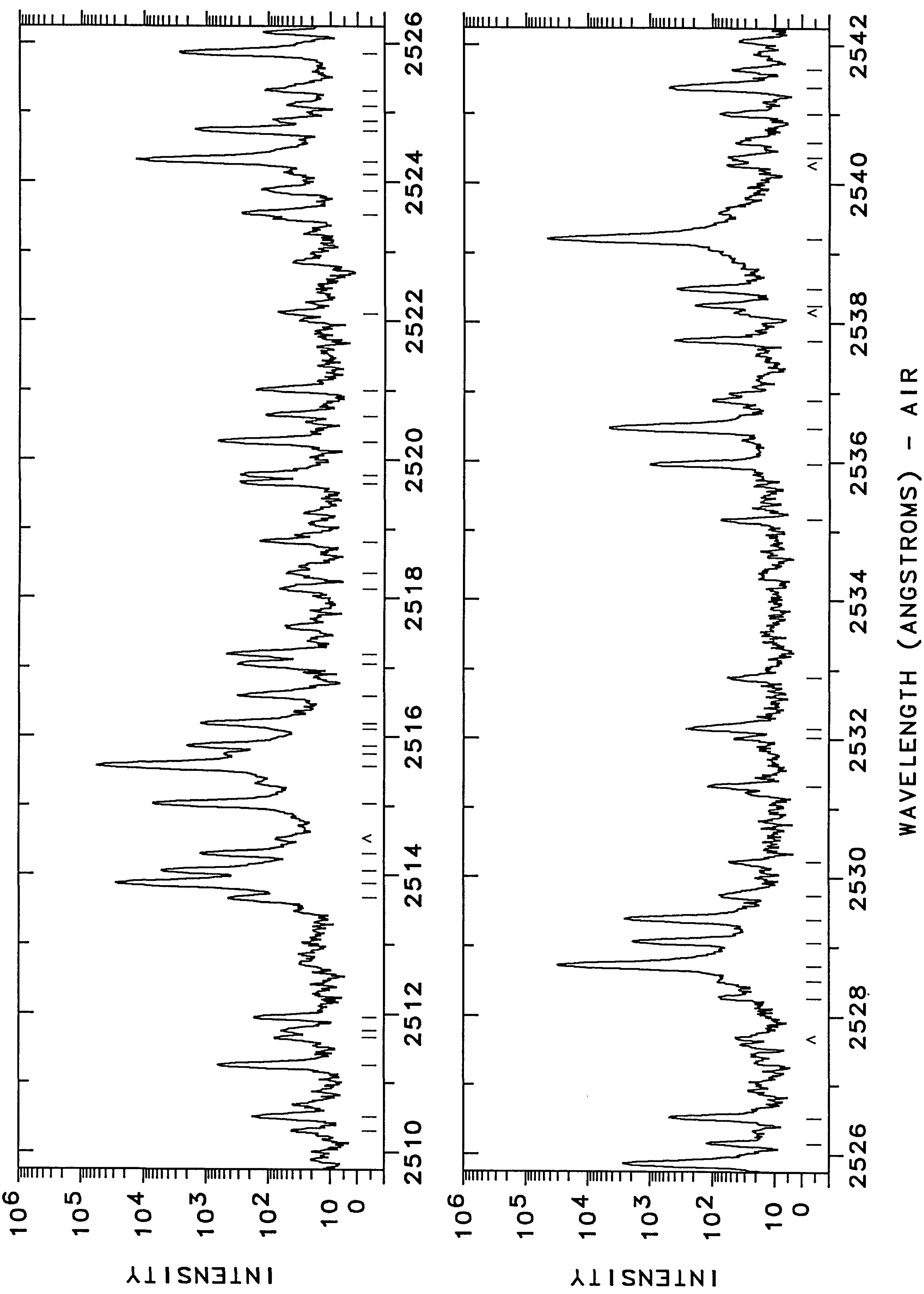
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2510.31	39823.7	35			
2510.51	39820.6	170			
2511.2422	39808.943	620	Pt II	60986-100795	K
2511.66	39802.3	71			
2511.76	39800.7	55			
2511.95	39797.7	160			
2513.6789	39770.355	430			
2513.8885	39767.040	28000	Pt II	16820- 56587	05
2514.0705	39764.160	5100	Pt I	10116- 49880	E
2514.3161	39760.277		Si I		B
2515.0305	39748.984	7000	Pt I	10131- 49880	E
2515.5770	39740.349	56000	Pt I	775- 40516	E
2515.7517	39737.589	450			
2515.8665	39735.776	2000	Pt II	105086- 65351	K
2516.1125	39731.891		Si I		B
2516.1835	39730.770	1200	Pt II	58062- 97792	K
2516.59	39724.4	310	Pt II	58062- 97786	K
2517.05	39717.1	300	Pt II	104763- 65046	K
2517.1843	39714.975	450	Pt I	15501- 55216	N
2518.1079	39700.41	58	Ne II		C
2518.36	39696.4	44			
2518.81	39689.3	130			
2519.66	39676.0	280			
2519.78	39674.1	280			
2520.2494	39666.678	630	Pt I	21967- 61633	N
2520.63	39660.7	100	Pt II	37877- 77538	K
2521.00	39654.9	150			
2522.10	39637.6	64	Pt II	114256- 74619	K
2523.53	39615.1	260	Pt II	43737- 83352	K
2523.87	39609.8	120			
2524.1079	39606.045		Si I		B
2524.3065	39602.929	13000	Pt I	6567- 46170	E
2524.7341	39596.222	1500	Pt II	96614- 57018	05

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2524.8688	39594.11	78	Ne II		C
2525.09	39590.6	43	Pt II	104636- 65046	K
2525.31	39587.2	110			
2525.8211	39579.183	2700	Pt II	104930- 65351	K
2526.15	39574.0	110	Pt II	109527- 69953	K
2526.5031	39568.499	480	Pt II	58062- 97630	K
2528.26	39541.0	71			
2528.5086	39537.117		Si I		B
2528.7336	39533.600	30000	Pt II	101199- 61665	05
2529.0806	39528.176	1900	Pt II	105962- 66434	K
2529.4100	39523.029	2500	Pt I	13496- 53019	E
2529.74	39517.9	69			
2530.23	39510.2	46	Ne II		A
2530.23	39510.2	46	Pt II	114256- 74745	AK
2531.32	39493.2	110			
2532.02	39482.3	37			
2532.1535	39480.21	260	Ne II		C
2532.89	39468.7	50			
2535.17	39433.2	67			
2535.9677	39420.834	1000	Pt I	18566- 57987	E
2536.4932	39412.668	4500	Pt I	10131- 49544	E
2536.89	39406.5	93			
2537.7612	39392.976	410	Pt II	109346- 69953	K
2538.25	39385.4	180	Pt I	21967- 61352	N
2538.5033	39381.461	360	Pt II	114127- 74745	AK
2538.5033	39381.461	360	Ne II		A
2539.2067	39370.552	46000	Pt I	823- 40194	E
2540.38	39352.4	49	Pt II	34647- 73999	K
2540.59	39349.1	36			
2541.00	39342.8	69	Pt II	104930- 65587	K
2541.3494	39337.359	480	Pt I	15501- 54839	N
2541.65	39332.7	42			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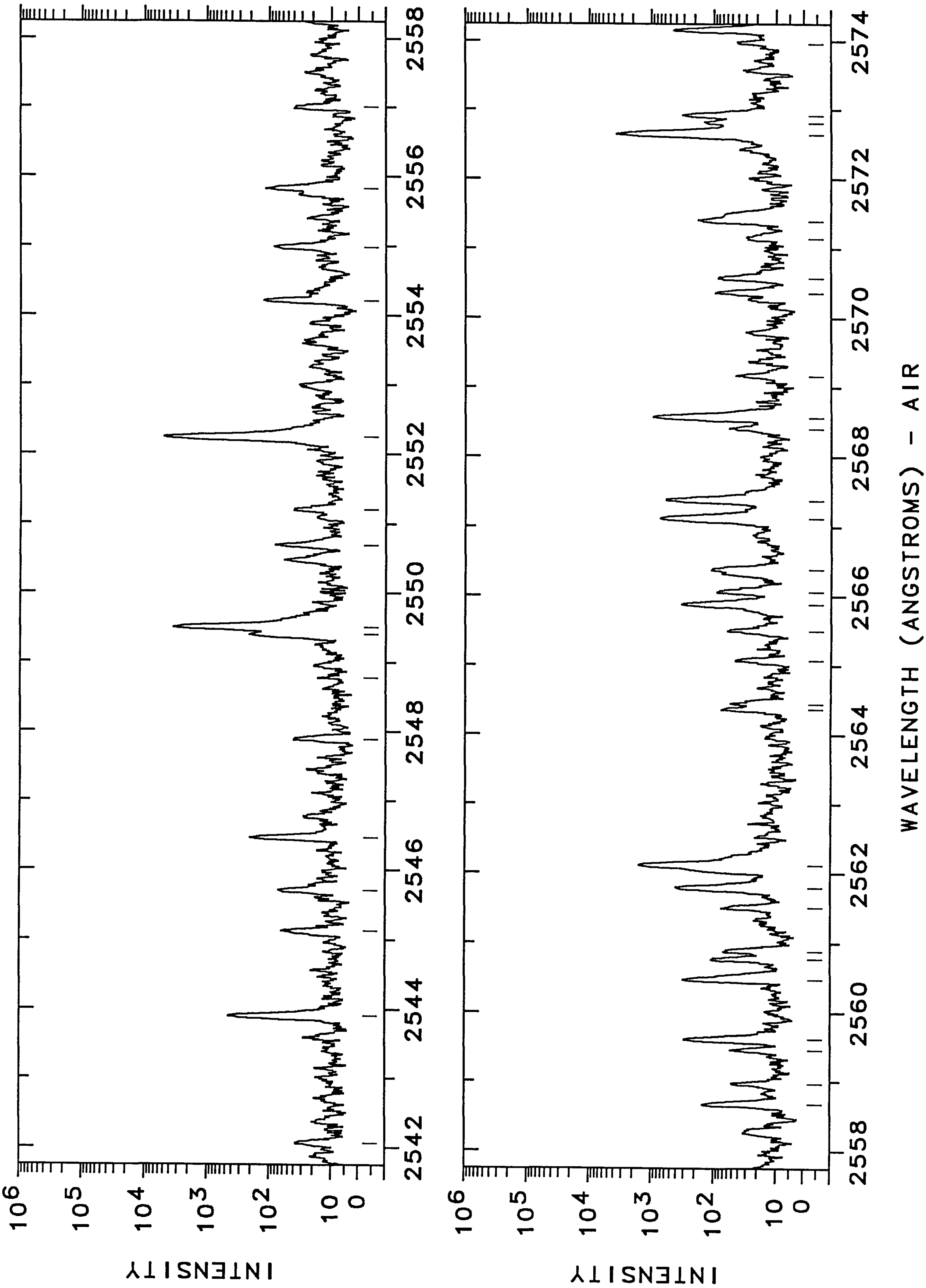
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2542.06	39326.4	30			
2543.9076	39297.803	440	Pt II	117340- 78043	K
2545.13	39278.9	56			
2545.71	39270.0	63	Pt II	114455- 75184	K
2546.4674	39258.302	200	Pt I	6140- 45398	N
2547.89	39236.4	34	Pt II	110257- 71021	K
2548.78	39222.7	10			
2549.40	39213.1	210			
2549.4688	39212.088	3500	Pt I	13496- 52708	A
2549.4688	39212.088	3500	Pt I	26638- 65850	AN
2550.69	39193.3	75			
2551.20	39185.5	34			
2552.2488	39169.380	5000	Pt I	10116- 49286	E
2554.21	39139.3	120	Pt II	58491- 97630	K
2554.98	39127.5	79	Pt II	32237- 71364	K
2555.8288	39114.518	110	Pt II	34647- 73761	16
2557.00	39096.6	33			
2558.67	39071.1	140	Pt II	114256- 75184	K
2558.97	39066.5	44			
2559.45	39059.2	46	Pt I	26638- 65697	N
2559.61	39056.7	290	Pt II	64003-103060	K
2560.4897	39043.322	300	Pt II	110408- 71364	AK
2560.4897	39043.322	300	Pt II	50564- 89607	AK
2560.77	39039.0	100			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2560.88	39037.4	61			
2561.51	39027.8	67			
2561.7989	39023.37	390	Ne II		C
2562.1226	39018.44	1600	Ne II		C
2564.37	38984.2	69			
2564.45	38983.0	47			
2565.07	38973.6	39			
2565.50	38967.1	54	Pt II	109346- 70379	K
2565.8574	38961.65	330	Ne II		C
2566.06	38958.6	84	Pt II	121651- 82692	K
2566.3736	38953.814	100	Pt II	105388- 66434	17
2567.1244	38942.422	720	Ne II		
2567.3836	38938.49	590	Ne II		C
2568.40	38923.1	50			
2568.5760	38920.415	950	Pt II	18097- 57018	06
2569.16	38911.6	38			
2570.36	38893.4	90	Pt II	110258- 71364	K
2570.57	38890.2	79	Pt II	114256- 75365	K
2571.14	38881.6	23	Pt II	36484- 75365	K
2571.39	38877.8	170	Pt II	113119- 74241	K
2572.6119	38859.361	3700	Pt II	24879- 63738	08
2572.81	38856.4	140			
2572.9020	38854.98	310	Ne II		C
2573.96	38839.0	35			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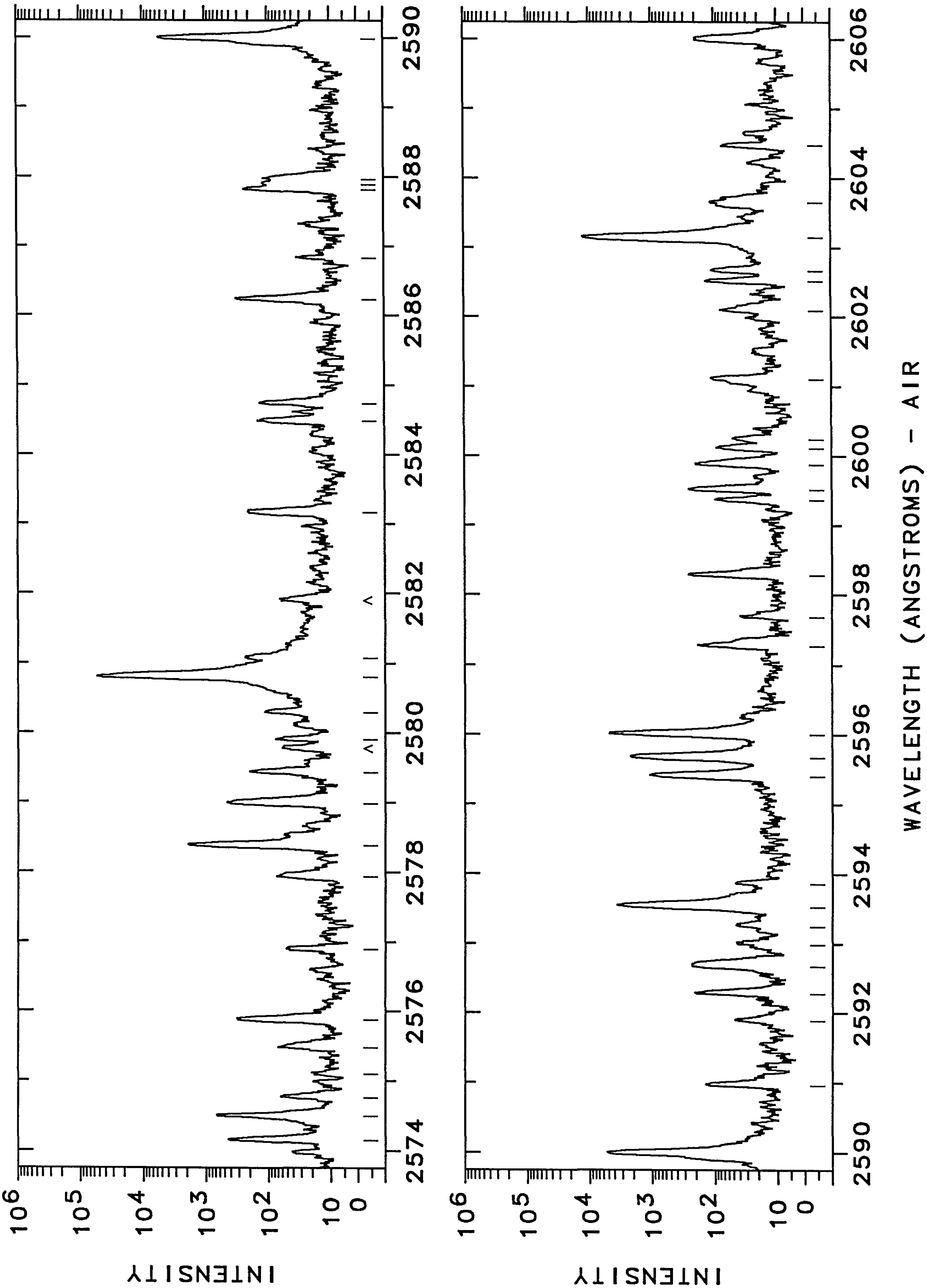
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2574.1330	38836.40	440	Ne II		C
2574.4904	38831.008	680	Pt I	6567- 45398	E
2574.76	38826.9	58	Pt II	42031- 80858	K
2575.0945	38821.900		Al I		F
2575.47	38816.2	63	Pt I	0- 38815	N
2575.87	38810.2	320			
2576.89	38794.9	46			
2577.9221	38779.32	67	Ne II		C
2578.3871	38772.327	1900	Pt II	27255- 66028	11
2578.9887	38763.284	460	Pt II	41434- 80197	K
2579.4082	38756.98	190	Ne II		C
2579.90	38749.6	70	Pt II	29030- 67780	K
2580.29	38743.7	110			
2580.8102	38735.926	55000	Pt II	101517- 62781	K
2581.0549	38732.254	230	Pt II	37877- 76610	12
2583.1494	38700.852	210	Pt II	36484- 75184	10
2584.48	38680.9	140			
2584.73	38677.2	130			
2586.22	38654.9	320	Pt II	109676- 71021	K
2586.82	38645.9	27	Pt II	116689- 78043	K
2587.7936	38631.401	230	Pt I	15501- 54133	N
2587.886	38630.02	110	Ne II		C
2587.960	38628.92	110	Ne II		C
2589.9962	38598.550	5400	Ne III		L
2590.96	38584.2	130			
2591.88	38570.5	41			
2592.27	38564.7	200			
2592.67	38558.7	230			
2592.99	38554.0	38			
2593.25	38550.1	38			
2593.5555	38545.581	3700	Ne III		L
2593.86	38541.1	40			
2595.3814	38518.466	1100	Pt II	29261- 67780	K
2595.6498	38514.483	2300	Ne III		L
2595.9986	38509.308	4900	Pt I	15501- 54011	E
2597.27	38490.5	180	Ne III		L
2597.68	38484.4	32	Pt II	60986- 99471	K
2598.3020	38475.172	260	Pt I	18566- 57041	N
2599.36	38459.5	90	Pt II	110408- 71948	K
2599.5423	38456.816	250	Pt I	21967- 60423	N
2599.9043	38451.461	200	Pt I	15501- 53953	N
2600.11	38448.4	86			
2600.24	38446.5	44	Pt II	32918- 71364	K
2601.10	38433.8	110	Pt II	112433- 73999	K
2602.09	38419.2	73	Pt I	10116- 48535	N
2602.51	38413.0	130			
2602.66	38410.8	100			
2603.1374	38403.708	13000	Pt I	10131- 48535	E
2603.6578	38396.032	110	Pt II	32918- 71314	11
2604.47	38384.1	67			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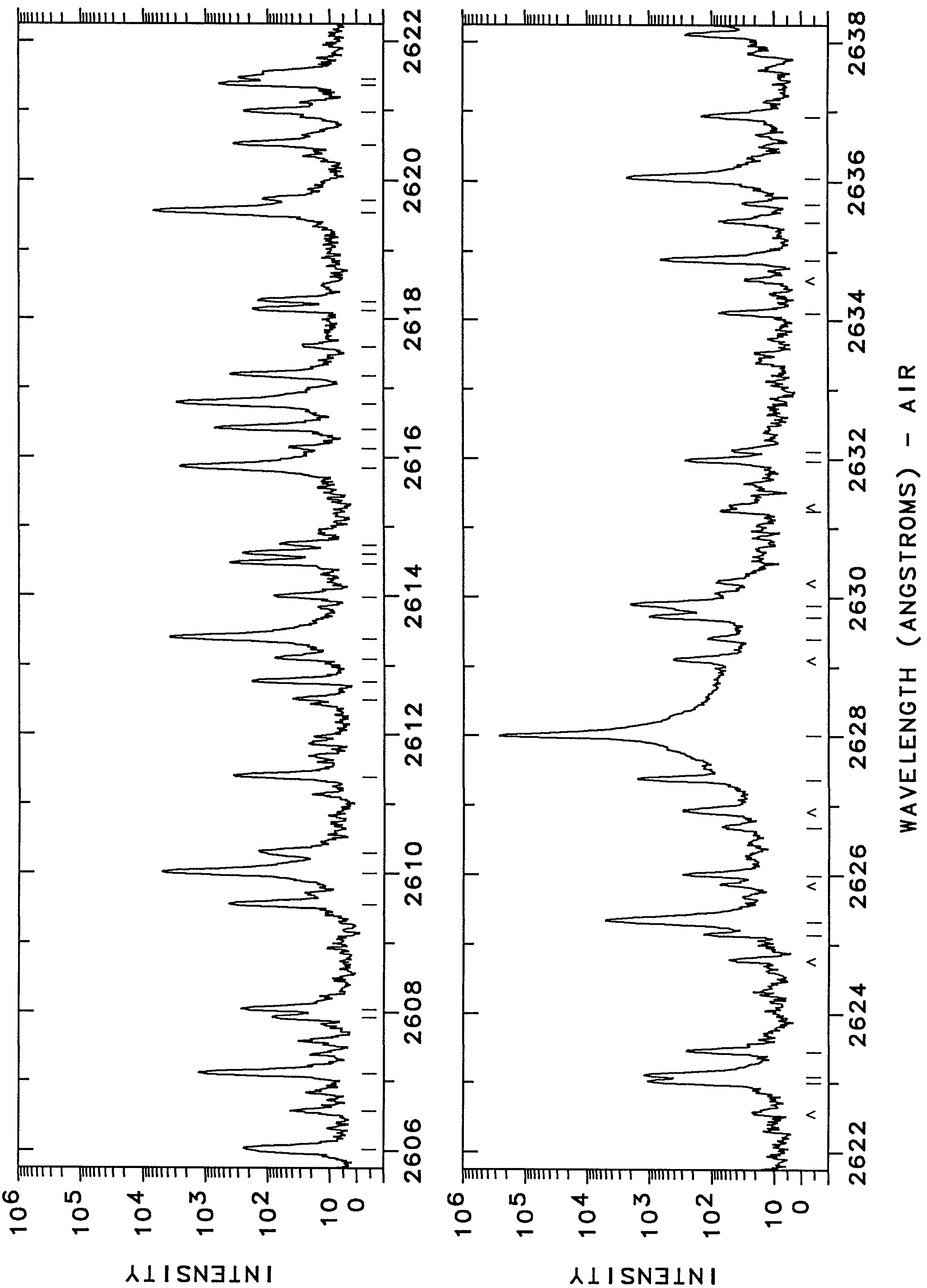
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2606.02	38361.2	240	Pt I	21967- 60328	N
2606.57	38353.1	38			
2607.1001	38345.339	1300	Pt II	111371- 73026	K
2607.92	38333.3	80			
2608.0449	38331.449	260	Pt II	27255- 65587	A
2608.0449	38331.449	260	Ne II		A
2609.5560	38309.253	420	Pt II	110258- 71948	K
2610.0069	38302.636	5000	Ne III		L
2610.3051	38298.26	140	Ne II		C
2611.4088	38282.075	360	Ne III		L
2612.50	38266.1	35	Pt I	26638- 64904	N
2612.76	38262.3	180			
2613.09	38257.4	72	Pt I	13496- 51753	N
2613.4164	38252.669	3700	Ne III		L
2613.98	38244.4	75			
2614.4727	38237.215	410	Ne III		L
2614.60	38235.4	250	Pt I	10116- 48351	N
2614.73	38233.5	60	Pt I	16983- 55216	N
2615.8502	38217.080	2600	Ne III		L
2616.13	38213.0	40	Pt II	109527- 71314	K
2616.3865	38209.247	710	Pt II	110158- 71948	K
2616.7471	38203.982	2900	Pt II	23461- 61665	07
2617.17	38197.8	400	Pt II	110146- 71948	K
2617.59	38191.7	22	Pt II	112433- 74241	K
2618.12	38183.9	170			
2618.25	38182.1	140	Pt II	105962- 67780	K
2619.5353	38163.322	600	Pt I	15501- 53665	AN
2619.5353	38163.322	600	Pt II	109527- 71364	AK
2619.5674	38162.854	6700	Pt I	6567- 44730	E
2619.72	38160.6	110	Pt II	43737- 81897	K
2620.5386	38148.71	350	Ne II		C
2620.9986	38142.016	230	Pt II	32237- 70379	19
2621.3906	38136.312	600	Pt II	111162- 73026	K
2621.4754	38135.079	290	Pt II	36484- 74619	11
2623.0193	38112.633	1100	Pt II	121651- 83538	K
2623.1070	38111.36	1200	Ne II		C
2623.4567	38106.28	250	Ne II		C
2625.14	38081.8	130	Pt II	64003-102086	AK
2625.14	38081.8	130	Pt II	60986- 99068	AK
2625.3264	38079.143	5100	Pt II	13329- 51408	06
2625.9859	38069.58	290	Ne II		C
2626.68	38059.5	64			
2627.3883	38049.262	1600	Pt I	13496- 51545	E
2628.0269	38040.016	270000	Pt I	775- 38815	E
2629.40	38020.2	110			
2629.7211	38015.51	1000	Ne II		C
2629.8858	38013.13	2000	Ne II		C
2631.24	37993.6	68	Pt II	114455- 76461	K
2631.9686	37983.05	260	Ne II		C
2632.11	37981.0	43	Pt I	26638- 64619	N
2634.10	37952.3	69			
2634.8852	37941.009	640	Pt II	24879- 62820	08
2635.42	37933.3	69			
2635.68	37929.6	26	Ne III		L
2636.0734	37923.907	2200 S	Ne II		
2636.9466	37911.35	140	Ne II		C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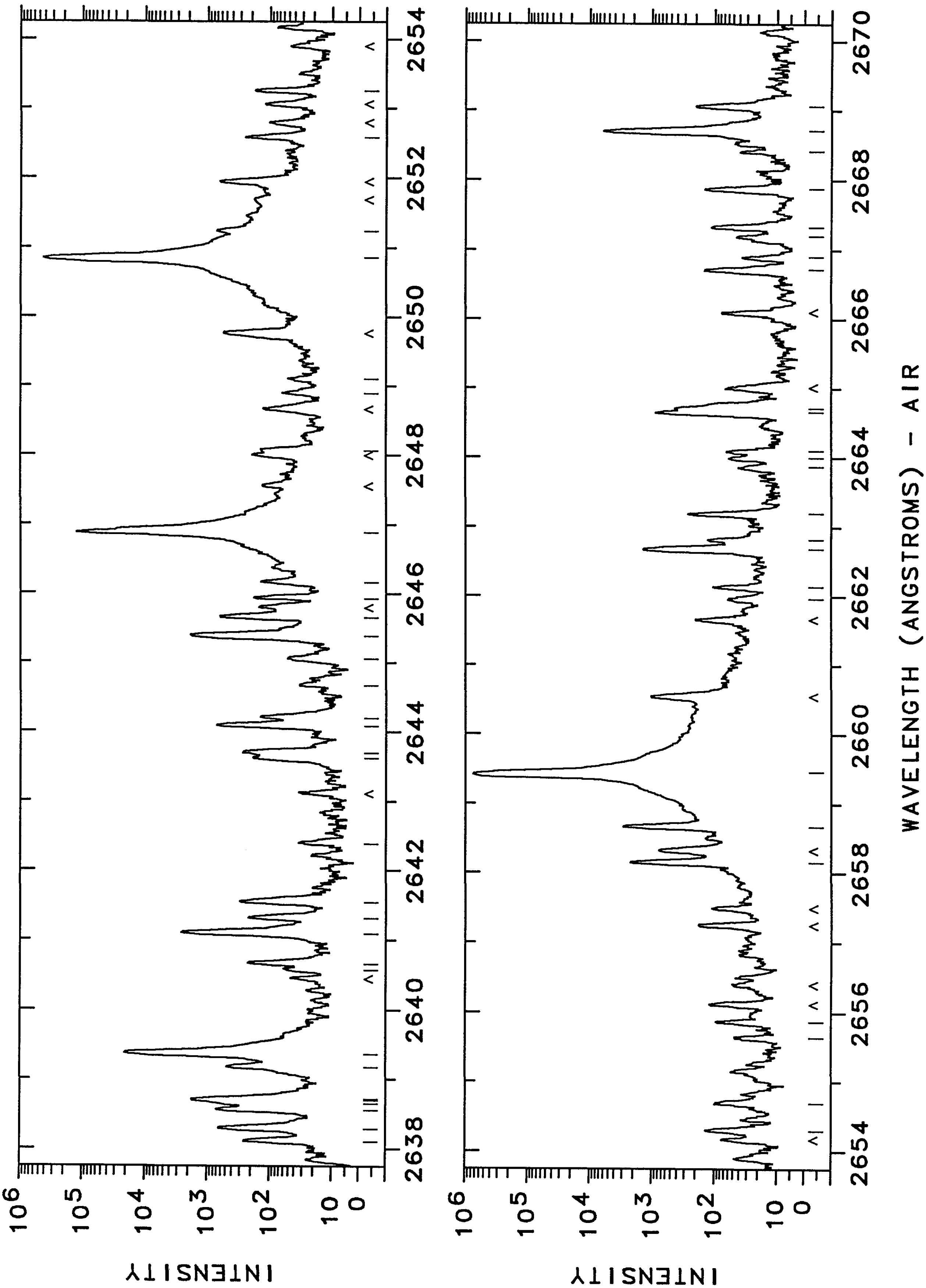
WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2638.0969	37894.82	260	Ne II		C
2638.2912	37892.03	650	Ne II		C
2638.5593	37888.180	710	Ne II		
2638.6418	37886.995	480			
2638.6949	37886.233	710 U			
2638.7081	37886.044	1100 P	Pt II	117493- 79607	AK
2638.7081	37886.044	1100 P	Ne III		AL
2639.1678	37879.445	480	Ne III		L
2639.3454	37876.896	26000	Pt I	6567- 44444	A
2639.3454	37876.896	26000	Pt I	26638- 64515	A
2640.57	37859.3	56	Ne III		L
2640.6629	37858.00	220	Ne II		C
2641.0821	37851.990	2600	Ne III		L
2641.31	37848.7	220			
2641.5274	37845.61	300	Ne II		C
2642.39	37833.3	29	Ne III		L
2643.6259	37815.57	190	Ne II		C
2643.69	37814.7	270	Pt II	112433- 74619	AK
2643.69	37814.7	270	Ne II		A
2644.0965	37808.84	710	Ne II		C
2644.20	37807.4	140			
2644.67	37800.6	28			
2645.05	37795.2	46	Pt II	114256- 76461	K
2645.3682	37790.666	1900	Pt I	13496- 51286	E
2645.6438	37786.729	620	Ne II		
2645.93	37782.6	180	Pt II	116689- 78906	K
2646.1739	37779.16	140	Ne II		C
2646.8804	37769.077	130000	Pt I	0- 37769	E
2648.06	37752.3	130			
2648.89	37740.4	58			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2649.10	37737.4	47			
2650.8524	37712.487	430000	Pt I	823- 38536	E
2651.2572	37706.73	720	Ne II		C
2652.5953	37687.71	250	Ne II		C
2653.25	37678.4	170	Pt II	112433- 74754	K
2654.3075	37663.40	130	Ne II		C
2654.69	37658.0	94	Pt II	41434- 79092	K
2655.64	37644.5	42			
2655.87	37641.2	88			
2658.1694	37608.684	2200	Pt I	10131- 47740	E
2658.6943	37601.260	2900	Pt I	13496- 51097	E
2659.4503	37590.571	770000	Pt I	0- 37590	E
2661.97	37555.0	56			
2662.14	37552.6	99			
2662.6599	37545.262	1400	Pt II	64003-101549	K
2662.82	37543.0	120			
2663.20	37537.6	260			
2663.87	37528.2	36			
2664.00	37526.4	54			
2664.10	37525.0	59	Pt I	21967- 59492	N
2664.6346	37517.439	870	Pt I	15501- 53019	E
2664.6996	37516.525	300			
2666.72	37488.1	140	Pt II	37877- 75365	K
2666.9122	37485.40	31	Ne II		C
2667.20	37481.4	39			
2667.33	37479.5	110			
2667.8866	37471.71	140	Ne II		C
2668.42	37464.2	34			
2668.7033	37460.244	6100	Pt II	101199- 63738	08
2669.0563	37455.29	190	Ne II		C



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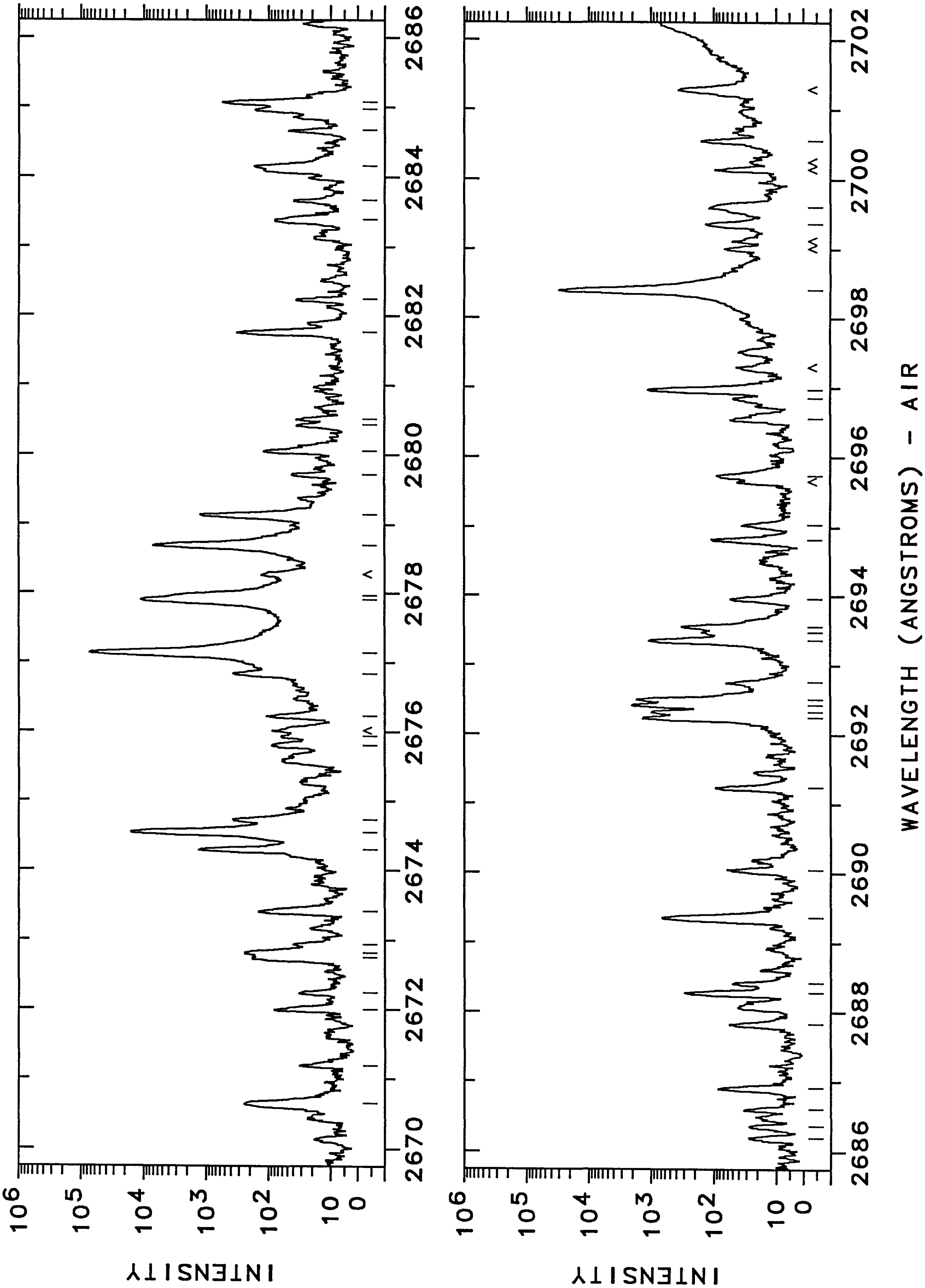
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2670.6400	37433.08	240	Ne II		C
2671.19	37425.4	27			
2672.00	37414.0	76			
2672.24	37410.7	28			
2672.7281	37403.837	180	Pt II	29030- 66434	13
2672.82	37402.6	230			
2672.94	37400.9	35	Pt II	111162- 73761	AK
2673.42	37394.2	140	Ne II		A
2673.42	37394.2	140	Pt II	64003-101397	K
2674.3124	37381.680	1300	Pt II	110408- 73026	K
2674.5700	37378.079	13000	Pt I	6567- 43945	E
2674.7524	37375.53	370	Ne II		C
2675.81	37360.8	84			
2675.94	37358.9		Au I		
2676.2411	37354.74	100	Ne II		C
2676.84	37346.4	360	Pt II	43737- 81083	K
2677.1477	37342.092	73000	Pt I	0- 37342	E
2677.9046	37331.537	11000 P	Ne III		L
2677.9694	37330.634	2300 P	Ne III		L
2678.6908	37320.581	6900	Ne III		L
2679.1293	37314.473	1200	Pt II	23875- 61190	13
2679.72	37306.2	37	Pt II	105086- 67780	K
2680.0471	37301.695	110	Pt II	34647- 71948	13
2680.43	37296.4	30	Pt II	54373- 91669	K
2680.51	37295.3	31			
2681.7715	37277.711	310	Pt II	36484- 73761	18
2682.24	37271.2	31			
2683.3985	37255.11	75	Ne II		C
2683.67	37251.3	34			
2684.1572	37244.58	170	Ne II		C
2684.67	37237.5	42			
2684.9769	37233.21	160	Ne II		C

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2685.0785	37231.802	540	Pt II	110258- 73026	K
2686.20	37216.3	23			
2686.37	37213.9	22			
2686.61	37210.6	28			
2686.91	37206.4	79	Pt I	15501- 52708	N
2687.83	37193.7	51			
2688.28	37187.5	290	Pt I	26638- 63826	N
2688.42	37185.5	45			
2689.3733	37172.348	670 L	Pt II	29261- 66434	13
2690.05	37163.0	56	Pt II	111162- 73999	K
2691.24	37146.6	88			
2692.2265	37132.955	1400	Pt II	27255- 64388	18
2692.3116	37131.781	980	Pt II	110158- 73026	K
2692.4255	37130.211	2000 L	Pt II	111371- 74241	AK
2692.4255	37130.211	2000 L	Ne II		A
2692.5154	37128.971	1700	Pt II	101517- 64388	K
2692.76	37125.6	57			
2693.3555	37117.39	1100	Ne II		C
2693.48	37115.7	150			
2693.5391	37114.86	320	Ne II		C
2693.96	37109.1	48	Pt II	48591- 85700	K
2694.8186	37097.24	100	Ne II		C
2695.04	37094.2	30			
2695.7211	37084.82	82	Ne II		C
2696.55	37073.4	49			
2696.85	37069.3	43			
2696.9844	37067.450	1100	Pt II	112433- 75365	K
2698.4248	37047.665	30000	Pt I	6140- 43187	E
2699.3655	37034.756	130	Pt II	32918- 69953	10
2699.61	37031.4	110	Ne III		L
2700.56	37018.4	150	Pt II	41434- 78452	K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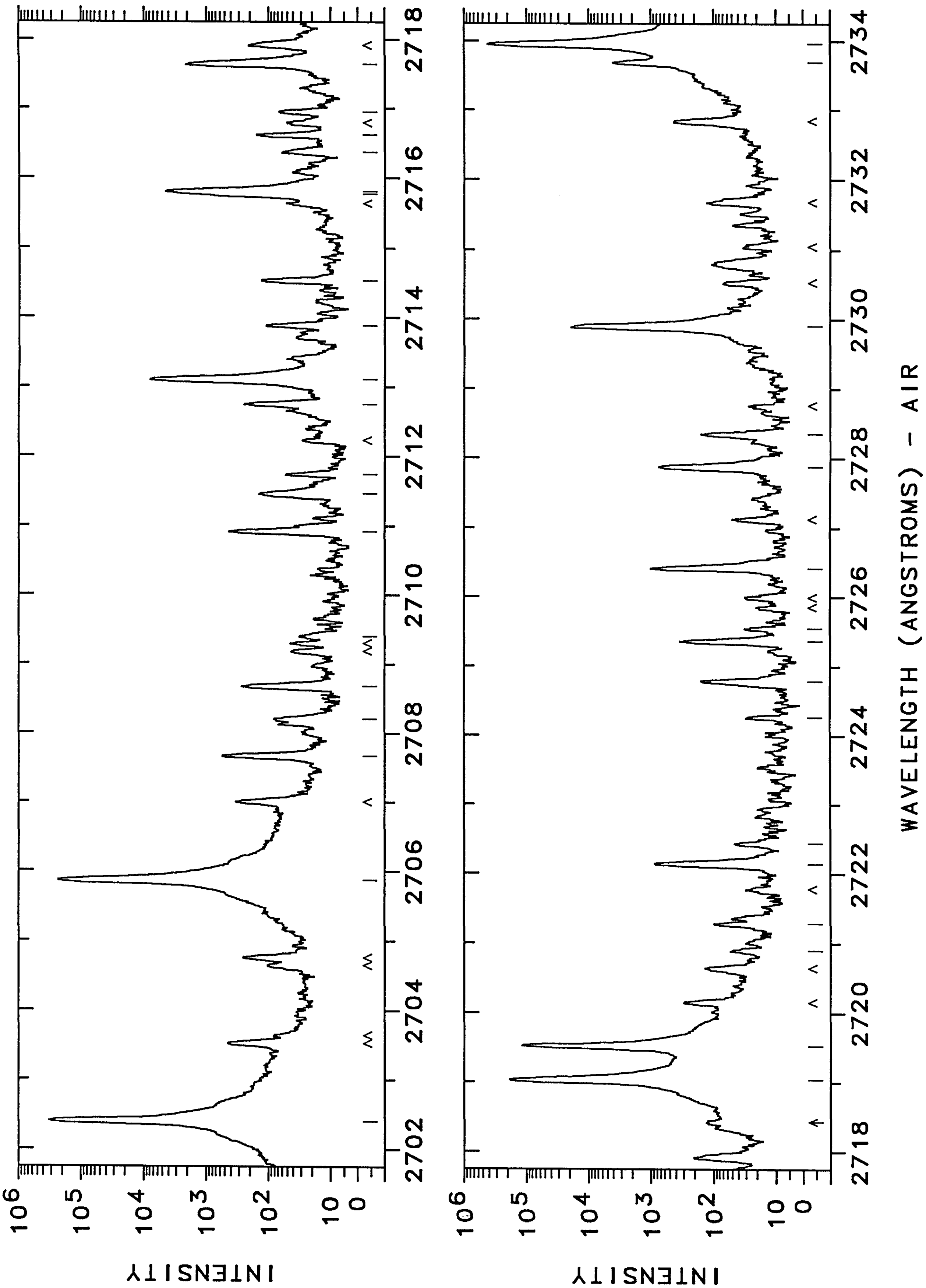
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
2702.3995	36993.178	330000	Pt I 775- 37769	E
2705.8951	36945.391	240000	Pt I 823- 37769	E
2707.6694	36921.183	550	Pt II 111162- 74241	K
2708.21	36913.8	76		
2708.68	36907.4	260		
2709.40	36897.6	27	Pt II 54373- 91271	K
2710.9114	36877.031	420 W	Pt II 37877- 74754	23
2711.4534	36869.66	140	Ne II	C
2711.7322	36865.87	48	Ne II	C
2712.75	36852.0	240	Pt II 112433- 75581	K
2713.1254	36846.940	7900	Pt I 10116- 46963	N
2713.8944	36836.50	110	Ne II	C
2714.53	36827.9	130	Pt I 26638- 63466	N
2715.7683	36811.084	800 P	Pt I 66967- 30156	N
2715.8156	36810.443	4500	Pt II 101199- 64388	16
2716.37	36802.9	56		
2716.62	36799.5	150	Pt II 60986- 97786	K
2716.95	36795.1	64		

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
2717.6199	36786.005	2100	Pt II 24879- 61665	06
2718.4363	36774.958		Fe I	MR
2719.0333	36766.883	190000	Pt I 823- 37590	E
2719.5239	36760.251	120000	Pt II 101517- 64757	K
2720.9024	36741.628		Fe I	R
2721.29	36736.4	92	Pt II 114256- 77519	K
2722.1611	36724.64	860	Ne II	C
2722.44	36720.9	41		
2724.27	36696.2	24		
2724.79	36689.2	150		
2725.37	36681.4	340	Pt I 16983- 53665	N
2725.55	36679.0	26		
2726.4128	36667.373	990	Pt II 34647- 71314	13
2727.8956	36647.444	740		
2728.35	36641.3	150		
2729.9123	36620.372	19000	Pt I 6567- 43187	E
2733.6855	36569.829	4100	Pt I 15501- 52071	E
2733.9567	36566.201	420000	Pt I 775- 37342	E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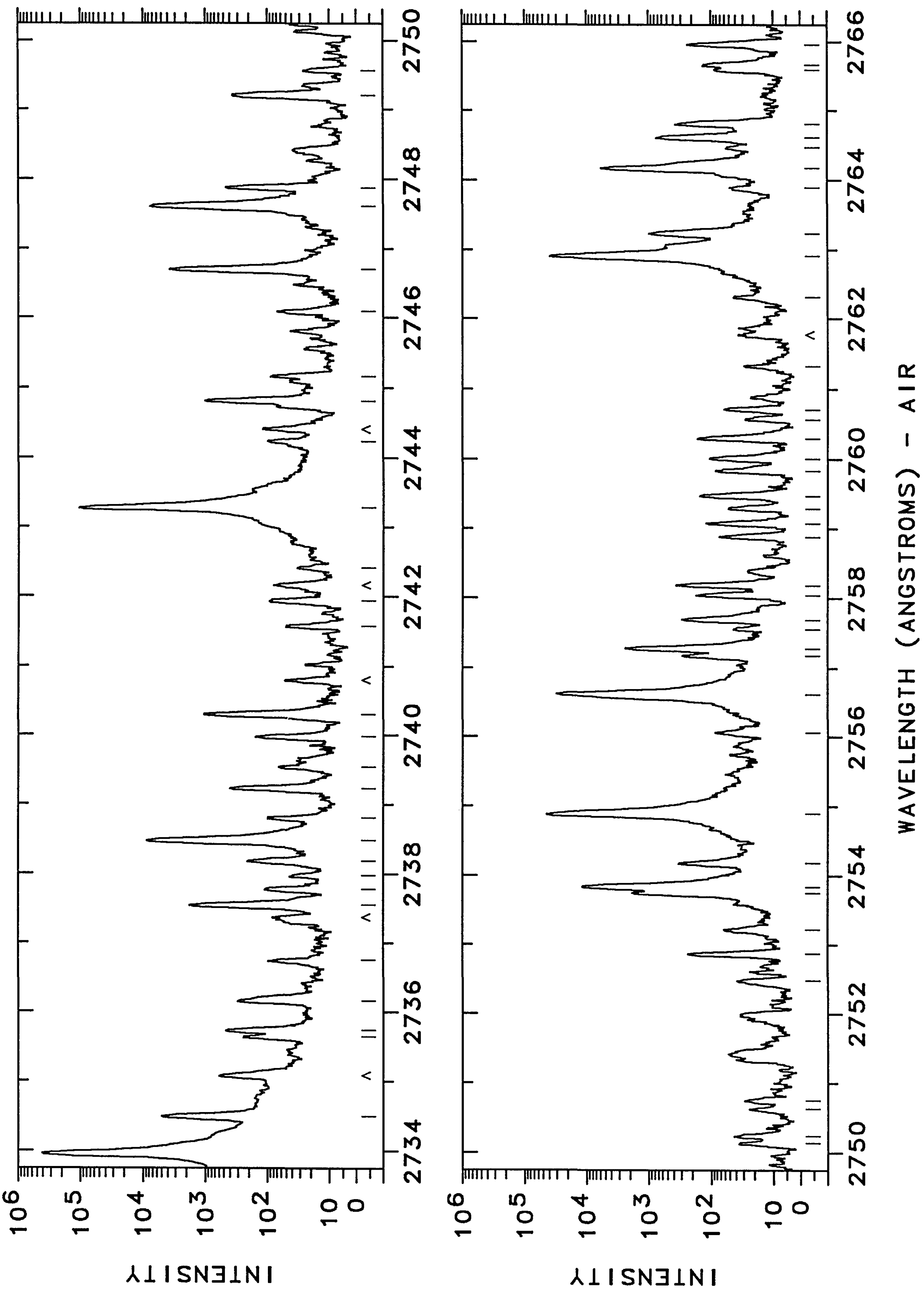
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2734.4930	36559.030	5000	Pt I	13496- 50055	E
2735.64	36543.7	240	Pt II	111162- 74619	K
2735.7411	36542.352	470	Pt II	36484- 73026	14
2736.16	36536.8	300	Ne I		
2736.75	36528.9	92	Pt I	26638- 63167	N
2737.5573	36518.109	1800			
2737.78	36515.1	110	Pt I	21967- 58482	N
2737.98	36512.5	39	Ne III		L
2738.19	36509.7	210	Pt II	113119- 76610	K
2738.4831	36505.764	8700	Pt I	10116- 46622	E
2738.81	36501.4	94	Pt II	109527- 73026	K
2739.23	36495.8	400	Pt II	110257- 73761	K
2739.54	36491.7	60	Pt II	116689- 80197	K
2739.98	36485.8	150			
2740.2940	36481.642	1000	Pt II	106434- 69953	AK
2740.2940	36481.642	1000	Pt II	109507- 73026	AK
2741.58	36464.5	46	Ne III		L
2741.94	36459.7	89	Pt II	43737- 80197	AK
2741.94	36459.7	89	Ne II		A
2742.4055	36453.554		Fe I		R
2743.2944	36441.742	110000	Pt II	101199- 64757	09
2744.24	36429.2	93	Pt I	26638- 63067	N
2744.8285	36421.377	1000	Pt I	21967- 58388	N
2745.16	36417.0	84	Pt II	111162- 74745	K
2746.09	36404.6	64	Ne III		L
2746.7095	36396.436	3700	Pt II	110158- 73761	K
2747.6023	36384.609	7600	Pt I	13496- 49880	E
2747.8517	36381.307	460			
2749.1833	36363.687	360	Pt II	37877- 74241	16
2749.56	36358.7	21			
2750.1408	36351.027		Fe I		R
2750.24	36349.7	37			
2750.63	36344.6	19			
2750.75	36343.0	24			
2752.48	36320.1	34	Pt II	109346- 73026	K
2752.87	36315.0	230			
2753.22	36310.4	57	Pt II	104090- 67780	K
2753.7613	36303.237	1800	Pt I	10116- 46419	E
2753.8531	36302.027	12000	Pt I	10131- 46433	E
2754.19	36297.6	330			
2754.9122	36288.071	45000	Pt I	10131- 46419	E
2756.06	36273.0	81			
2756.6186	36265.61	31000	Ne II		C
2757.18	36258.2	290	Pt II	110258- 73999	K
2757.2786	36256.929	2400	Pt II	117340- 81083	K
2757.56	36253.2	39			
2757.69	36251.5	290	Pt I	15501- 51753	N
2758.04	36246.9	170			
2758.1983	36244.840	360	Pt II	109676- 73431	K
2758.88	36235.9	69	Pt II	64003-100239	K
2759.07	36233.4	120			
2759.29	36230.5	48			
2759.47	36228.1	150			
2759.83	36223.4	80			
2760.01	36221.1	99			
2760.30	36217.2	160			
2760.57	36213.7	23			
2760.71	36211.9	57			
2761.32	36203.9	24			
2762.31	36190.9	38			
2762.9217	36182.88	39000	Ne II		C
2763.2173	36179.010	980 H	Pt II	24879- 61058	08
2763.89	36170.2	44			
2764.1709	36166.530	5800	Pt II	110408- 74241	AK
2764.1709	36166.530	5800	Pt II	101517- 65351	AK
2764.47	36162.6	51			
2764.6067	36160.829	740	Ne III		L
2764.81	36158.2	370	Pt II	110158- 73999	K
2765.59	36148.0	83			
2765.66	36147.1	130	Pt II	110146- 73999	K
2765.96	36143.1	230	Ne III		L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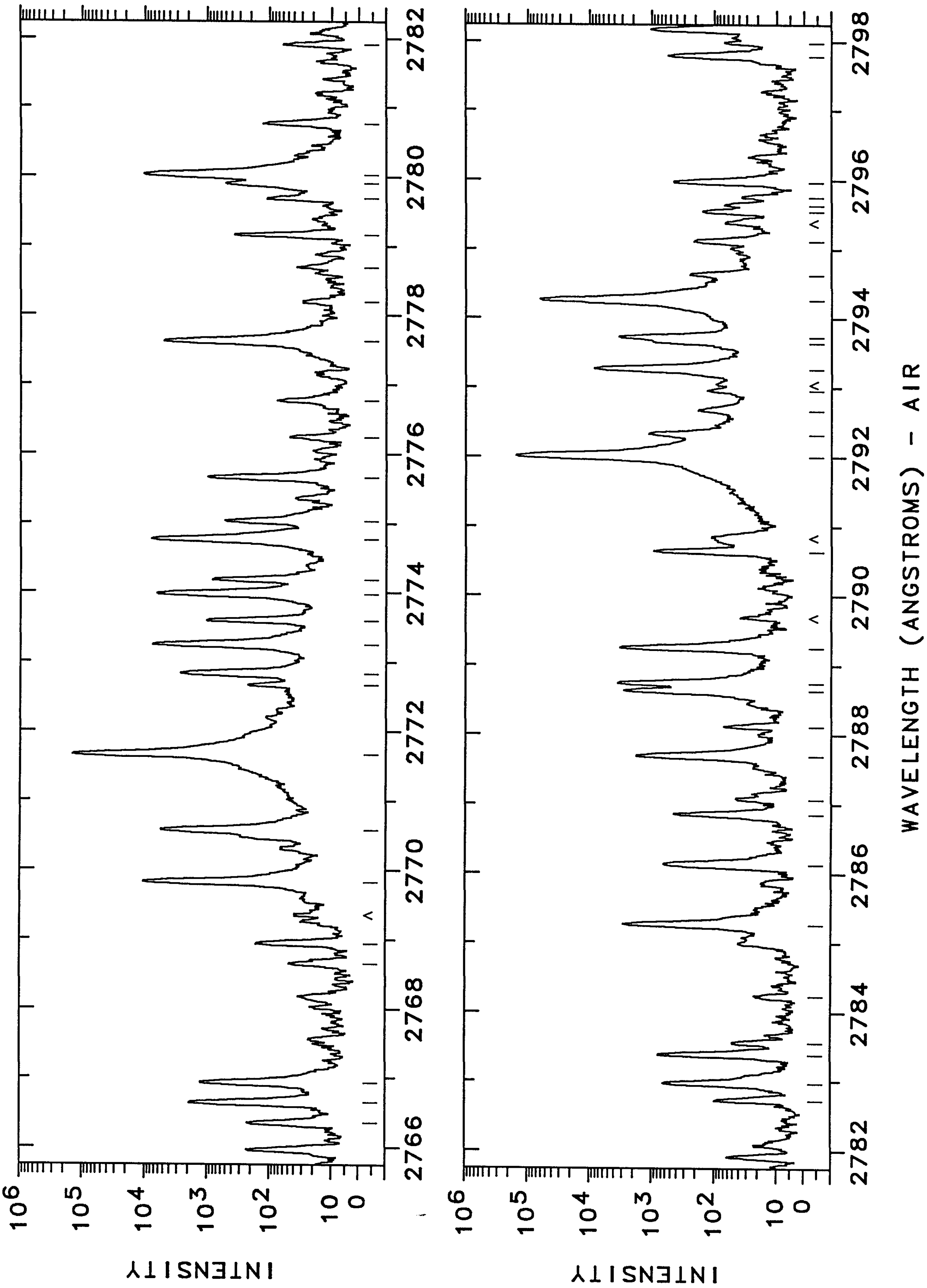
WAVELENGTH (ANGSTROMS) - AIR

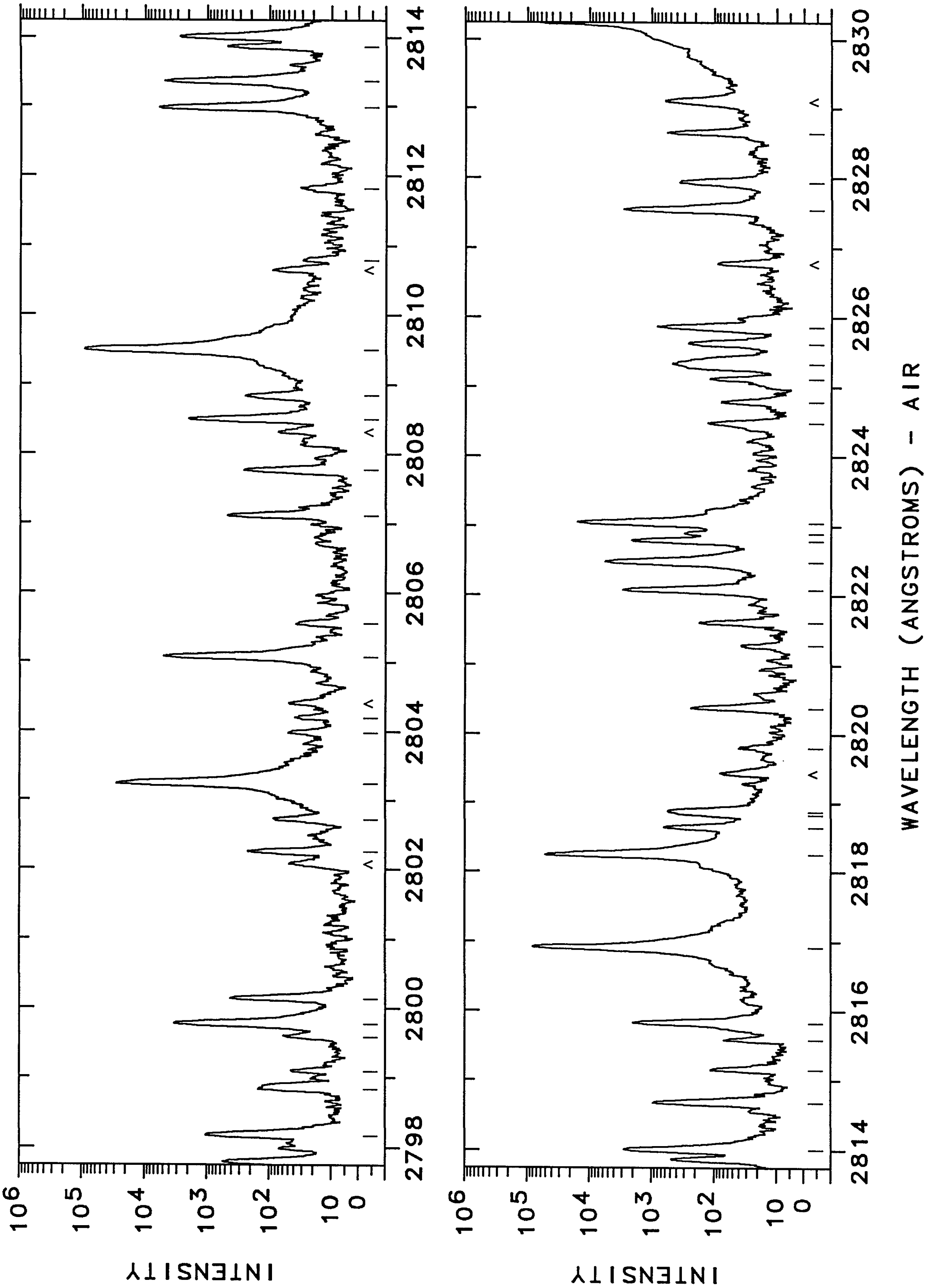
WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2766.35	36138.0	220			
2766.6534	36134.080	1900	Pt I	21967- 58101	N
2766.9444	36130.279	1300	Ne III		L
2768.65	36108.0	43			
2768.94	36104.2	160	Pt II	41434- 77538	K
2769.8332	36092.599	11000	Pt I	6567- 42660	E
2770.5747	36082.94	5500	Ne II		C
2771.6594	36068.819	150000	Pt I	775- 36844	E
2772.67	36055.7	220	Pt II	106434- 70379	K
2772.8253	36053.654	2700	Pt I	10116- 46170	E
2773.2372	36048.299	7600	Pt I	13496- 49544	E
2773.5903	36043.710	1000	Pt I	15501- 51545	E
2773.9918	36038.494	6500	Pt I	10131- 46170	E
2774.1959	36035.843	840	Pt I	16983- 53019	N
2774.7838	36028.208	7900	Pt II	24879- 60907	09
2775.0515	36024.733	520	Ne I		
2775.6679	36016.734	1000	Pt II	110258- 74241	K
2776.24	36009.3	43	Pt II	105962- 69953	K
2776.76	36002.6	72	Pt II	114455- 78452	K
2777.6274	35991.326	5000	Ne III		L
2778.2204	35983.645		Fe I		R
2778.69	35977.6	32	Pt II	111162- 75184	K
2779.16	35971.5	370	Pt II	112433- 76461	K
2779.69	35964.6	110			
2779.9025	35961.872	500	Ne III		L
2780.0249	35960.289	11000	Ne II		G
2780.76	35950.8	130	Pt II	121651- 85700	K
2781.91	35935.9	56			
2782.72	35925.5	92	Pt II	50564- 86489	K
2782.9913	35921.961	640	Ne III		L
2783.3975	35916.719	770	Pt II	110158- 74241	K
2783.56	35914.6	45	Pt II	109676- 73761	K
2784.23	35906.0	17			
2785.2734	35892.529	2900	Ne III		L
2786.1247	35881.563	650	Ne III		L
2786.85	35872.2	440	Ne III		L
2787.07	35869.4	40			
2787.6892	35861.426	1800	Ne III		L
2788.1048	35856.082		Fe I		R
2788.6209	35849.446	2800 H	Pt II	21168- 57018	09
2788.7317	35848.022	3600	Pt II	101199- 65351	A
2788.7317	35848.022	3600	Pt II	110257- 74409	AK
2789.2620	35841.206	3300	Pt II	105794- 69953	K
2790.6578	35823.281	940	Pt II	112433- 76610	K
2792.0165	35805.849	150000	Ne II		G
2792.3180	35801.983	1100	Ne I		
2792.66	35797.6	180	Ne I		
2792.95	35793.9	130	Pt II	64003- 99797	K
2793.2647	35789.849	8600	Pt I	13496- 49286	E
2793.6347	35785.109	940	Pt I	15501- 51286	E
2793.7012	35784.258	3400	Pt II	29261- 65046	K
2794.2192	35777.625	64000	Ne II		G
2794.62	35772.5	240			
2795.11	35766.2	210	Pt II	109527- 73761	K
2795.54	35760.7		Mg II		
2795.63	35759.6	64			
2795.75	35758.0	31			
2795.9565	35755.394	450	Ne I		
2797.8027	35731.802	550	Pt II	34647- 70379	22
2797.98	35729.5		Mg II		



INTENSITY
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2798.1894	35726.864	1000	Pt II	29030- 64757	10
2798.83	35718.7	140	Ne III		L
2799.09	35715.4	39			
2799.58	35709.1	54			
2799.7725	35706.664	3400	Pt II	96614- 60907	10
2800.13	35702.1	420	Ne III		L
2802.25	35675.1	210	Ne III		L
2802.72	35669.1		Mg II		
2803.2357	35662.553	28000	Pt I	6140- 41802	E
2803.98	35653.1	45	Pt II	110408- 74754	K
2804.20	35650.3	34	Ne III		L
2805.0833	35639.064	4900	Pt II	110258- 74619	K
2805.56	35633.0	32	Pt II	114539- 78906	K
2807.11	35613.3	470	Pt II	105794- 70181	K
2807.77	35605.0	250	Pt II	116689- 81083	K
2808.5026	35595.677	2000	Pt I	15501- 51097	E
2808.84	35591.4	240	Pt II	48591- 84182	K
2809.4835	35583.249	92000	Ne II		G
2810.79	35566.7	24			
2811.82	35553.7	27			
2812.9789	35539.036	6000	Pt I	21967- 57506	A
2812.9789	35539.036	6000	Pt II	110158- 74619	AK
2813.3728	35534.060	4900	Pt II	34647- 70181	18
2813.8769	35527.694	470	Pt II	110146- 74619	K
2814.0134	35525.971	2800	Pt II	27255- 62781	15
2814.6921	35517.405	930	Ne I		

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2815.15	35511.6	110	Pt II	110257- 74745	K
2815.58	35506.2	64	Pt II	42031- 77538	K
2815.8103	35503.302	2000	Pt II	110258- 74754	K
2816.9021	35489.542	81000	Pt II	101517- 66028	K
2818.2450	35472.632	51000	Pt I	823- 36296	E
2818.6341	35467.736	630	Pt I	26638- 62106	N
2818.8232	35465.356	350	Ne III		L
2818.8604	35464.888	400	Pt II	36484- 71948	14
2819.81	35452.9	35			
2820.38	35445.8	230	Ne III		L
2821.28	35434.5	31			
2821.61	35430.3	160	Ne III		L
2822.0882	35424.326	2900	Pt II	96614- 61190	09
2822.4927	35419.250	5600	Pt II	21168- 56587	09
2822.7941	35415.469	2100	Pt II	105794- 70379	K
2822.89	35414.3	300	Ne III		L
2823.0513	35412.242	16000	Pt II	110158- 74745	K
2824.48	35394.3	120	Ne III		L
2824.78	35390.6	72	Ne III		L
2825.11	35386.4	110			
2825.33	35383.7	470	Ne III		L
2825.62	35380.1	260	Ne III		L
2825.8440	35377.247	820	Ne III		L
2827.5379	35356.054	2900	Pt II	113119- 77763	K
2827.93	35351.2	360	Ne III		L
2828.64	35342.3	570	Ne III		L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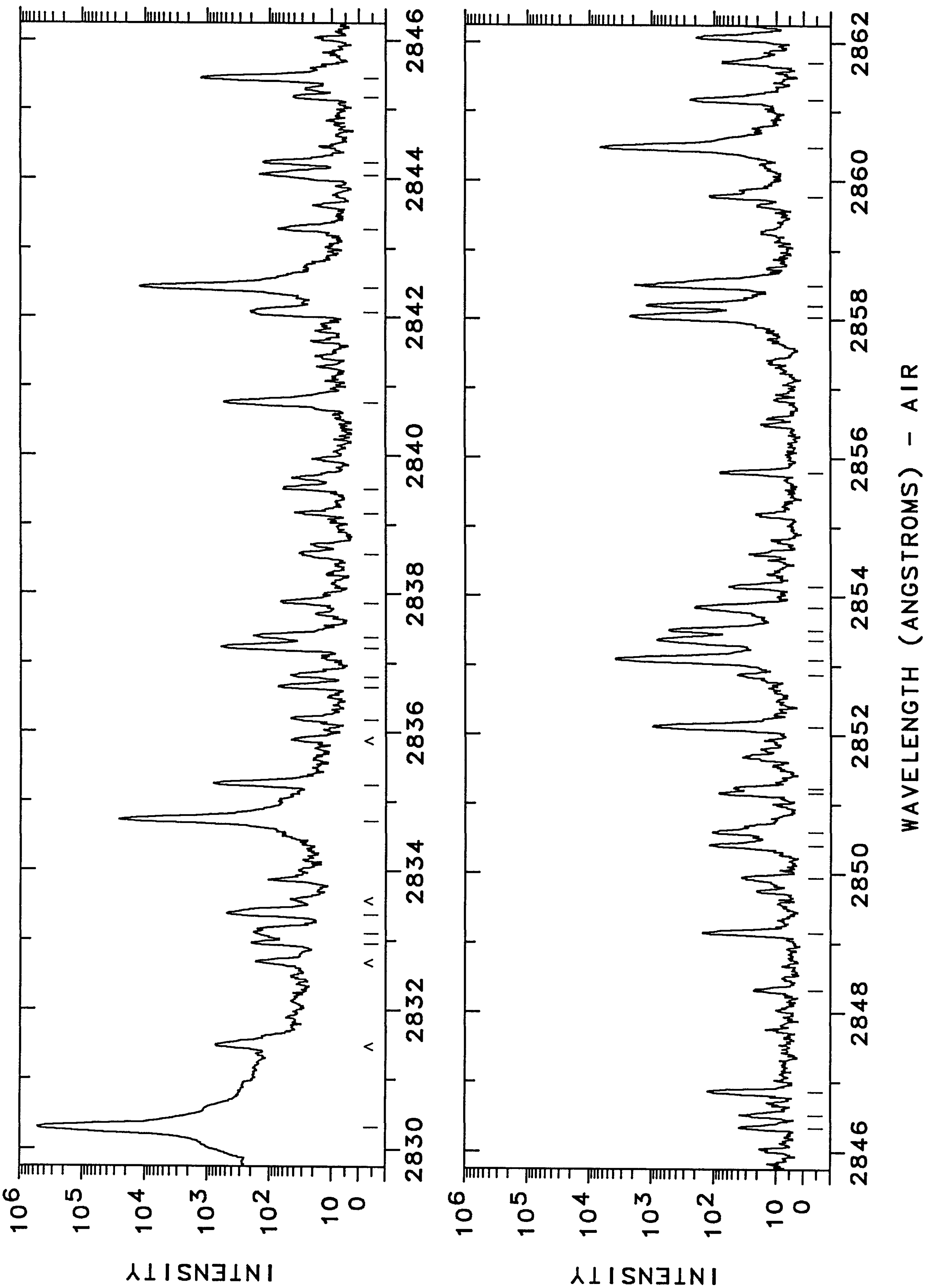
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2830.2919	35321.653	520000 C	Pt I	0- 35321	E
2832.95	35288.5	190			
2833.10	35286.6	180	Pt II	109527- 74241	K
2833.37	35283.3	490	Pt I	13496- 48779	N
2834.7107	35266.596	26000	Pt I	10131- 45398	E
2835.2370	35260.049	800	Ne I		
2836.18	35248.3	41			
2836.65	35242.5	68			
2836.80	35240.6	41	Ne III		L
2837.2284	35235.302	610	Pt I	6567- 41802	N
2837.37	35233.5	180	Ne III		L
2837.86	35227.5	62			
2838.57	35218.6	29			
2839.16	35211.3	35			
2839.5216	35206.848	55	Pt II	105388- 70181	23
2840.76	35191.5	540	Ne III		L
2842.07	35175.3	200			
2842.4101	35171.071	12000	Pt II	101199- 66028	09
2843.27	35160.4	67			
2844.05	35150.8	140	Pt I	68831- 33680	N
2844.2284	35148.588	120	Pt II	37877- 73026	18
2845.17	35137.0	37			
2845.4468	35133.538	1300	Pt II	105086- 69953	K
2846.34	35122.5	34			
2846.52	35120.3	33	Pt II	106434- 71314	K
2846.86	35116.1	120			
2848.32	35098.1	18			
2849.15	35087.9	150	Pt I	16983- 52071	N
2849.94	35078.1	31			
2850.41	35072.4	110	Pt II	110257- 75184	K
2850.60	35070.0	100	Pt II	106434- 71364	K
2851.16	35063.1	78	Ne III		L
2851.23	35062.3	43			
2852.1238	35051.293		Mg I		
2852.87	35042.1	37	Pt II	110408- 75365	K
2853.0972	35039.335	3800	Pt I	13496- 48535	E
2853.3729	35035.950	810	Pt I	68716- 33680	N
2853.5092	35034.275	510			
2853.84	35030.2	190			
2854.14	35026.5	52			
2855.79	35006.3	74			
2858.0244	34978.931	2200	Ne II		G
2858.1879	34976.930	810 P	Pt II	104930- 69953	K
2858.2026	34976.750	650 U			
2858.4846	34973.299	1800	Pt II	110158- 75184	K
2859.77	34957.6	110	Pt II	117493- 82535	K
2860.4830	34948.867	6600	Pt II	96614- 61665	08
2861.17	34940.5	230			
2861.71	34933.9	68			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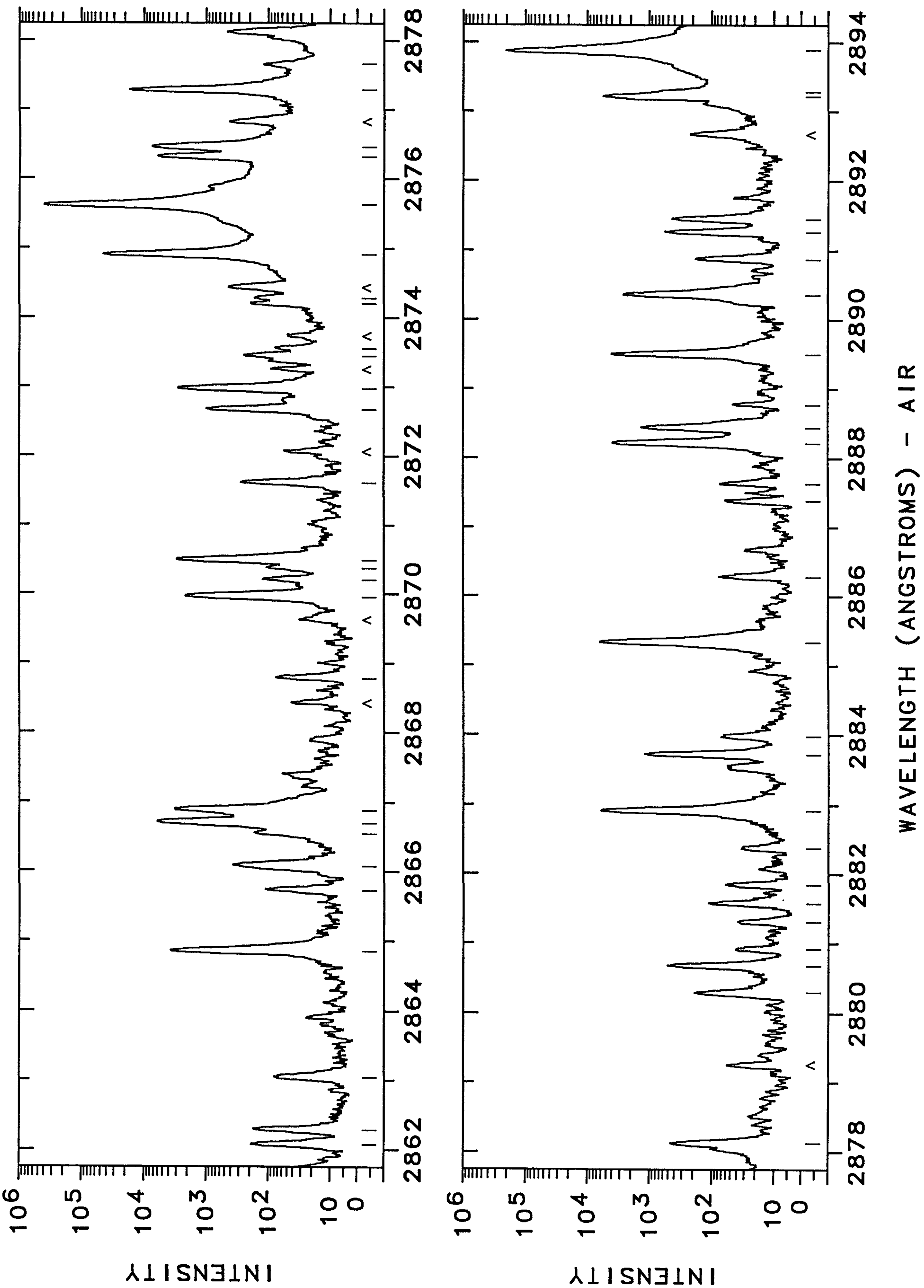
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2862.07	34929.5	180	Ne I		
2862.28	34926.9	170			
2863.04	34917.7	75			
2864.8435	34895.675	3700	Pt II	95803- 60907	11
2865.7148	34885.066	110	Pt II	105066- 70181	23
2866.08	34880.6	360	Pt II	36484- 71364	K
2866.55	34874.9	160			
2866.7186	34872.851	6100	Ne III		L
2866.8976	34870.674	3200 L	Pt II	21717- 56587	10
2868.78	34847.8	69	Pt II	114455- 79607	K
2869.9556	34833.520	2100	Ne II		G
2870.1991	34830.565	120	Pt II	36484- 71314	13
2870.37	34828.5	100			
2870.4651	34827.338	3000	Pt I	21967- 56794	N
2871.61	34813.5	270			
2872.6628	34800.695	970	Ne I		G
2872.9581	34797.118	2800	Ne II		G
2873.44	34791.3	240	Pt II	116689- 81897	K
2873.55	34790.0	72	Pt I	68912- 34122	N
2874.20	34782.1	180	Pt II	109527- 74745	K
2874.28	34781.1	160	Pt II	110146- 75365	K
2874.9196	34773.378	44000	Pt II	105794- 71021	K
2875.6314	34764.770	400000	Pt II	101199- 66434	14
2876.3291	34756.338	5900	Ne II		G
2876.4674	34754.667	7400	Ne II		G
2877.2783	34744.873	17000	Pt II	95803- 61058	09
2877.66	34740.3	110			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2878.1094	34734.84	450	Ne II		C
2880.30	34708.4	180	Pt II	29030- 63738	AK
2880.30	34708.4	180	Ne I		A
2880.68	34703.8	510			
2880.92	34701.0	37	Pt II	111162- 76461	K
2881.31	34696.3	32	Ne I		
2881.5792	34693.016		Si I		B
2881.85	34689.8	55	Ne I		
2882.38	34683.4	28			
2882.9326	34676.731	6000	Pt II	110258- 75581	K
2883.7321	34667.117	1200	Pt II	113119- 78452	K
2883.98	34664.1	66	Pt II	114861- 80197	K
2885.3275	34647.949	6300	Pt II	105962- 71314	K
2886.28	34636.5	71	Pt I	68759- 34122	N
2887.38	34623.3	55			
2887.63	34620.3	68			
2888.1924	34613.582	3900	Pt I	10116- 44730	E
2888.4162	34610.90	1300	Ne II		C
2888.77	34606.7	40			
2889.5096	34597.805	4000	Pt II	105962- 71364	K
2890.3725	34587.476	2600	Pt II	16820- 51408	07
2890.87	34581.5	180	Pt I	68703- 34122	N
2891.26	34576.9	560	Pt II	110158- 75581	K
2891.4581	34574.49	430	Ne II		C
2893.2175	34553.466	5600	Pt I	15501- 50055	E
2893.2881	34552.623	600 P	Pt II	111162- 76610	K
2893.8630	34545.759	200000	Pt I	775- 35321	E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WAVELENGTH (ANGSTROMS) - AIR

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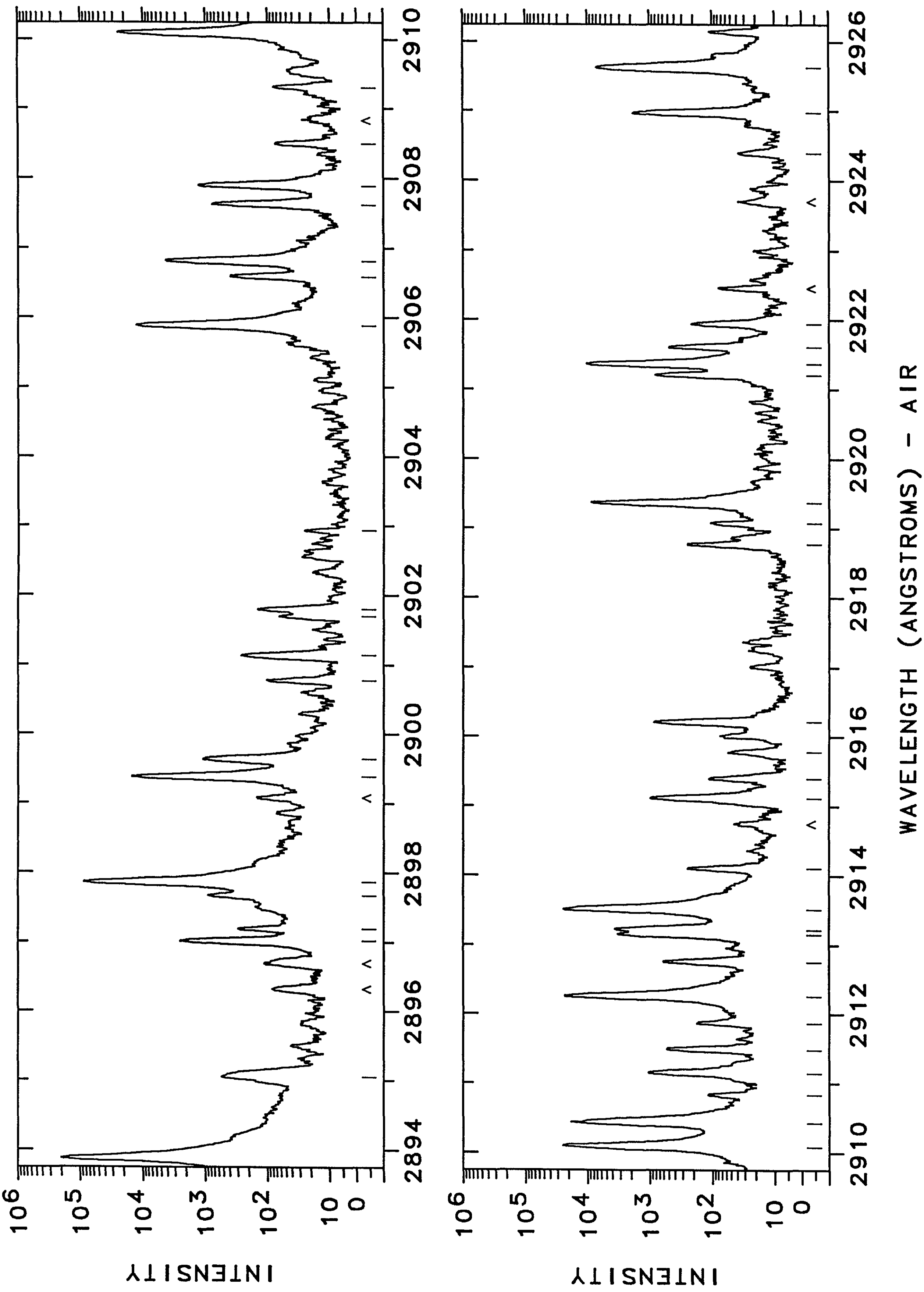
2895.05	34531.6	550	Ne III		L
2897.0028	34508.32	2500	Ne II		C
2897.2001	34505.97	290	Ne II		C
2897.6782	34500.277	890	Ne II		G
2897.8715	34497.976	88000	Pt I	823- 35321	E
2899.3861	34479.955	15000	Pt II	105794- 71314	K
2899.6452	34476.874	1100 L	Pt II	29261- 63738	11
2900.78	34463.4	98			
2901.14	34459.1	260	Pt I	26638- 61097	N
2901.70	34452.5	58	Pt I	18566- 53019	N
2901.80	34451.3	140	Ne III		L
2902.93	34437.9	19	Ne III		L
2905.8974	34402.699	12000	Pt I	6567- 40970	A
2905.8974	34402.699	12000	Ne III		AL
2906.5918	34394.48	390	Ne II		C
2906.8152	34391.837	4300	Ne II		G
2907.6288	34382.214	760	Ne III		L
2907.8960	34379.055	1300	Pt I	15501- 49880	E
2908.49	34372.0	69	Ne III		L
2909.30	34362.5	73			
2910.0599	34353.493	25000	Ne II		G
2910.4075	34349.389	20000	Ne II		G
2910.83	34344.4	110			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2911.1372	34340.78	1100	Ne II		C
2911.48	34336.7	530			
2911.8588	34332.27	170	Ne II		C
2912.2515	34327.641	23000	Pt I	10116- 44444	E
2912.7692	34321.540	600	Pt I	21967- 56288	N
2913.1735	34316.777	3200	Ne I		G
2913.2445	34315.940	3600	Pt I	10116- 44432	E
2913.5386	34312.477	24000	Pt I	10131- 44444	E
2914.11	34305.7	240	Pt II	43737- 78043	K
2915.1200	34293.864	980	Ne II		G
2915.40	34290.6	110	Ne III		L
2915.78	34286.1	49	Ne III		L
2916.2029	34281.13	850	Ne II		C
2918.7487	34251.23	240	Ne II		C
2919.07	34247.5	100			
2919.3402	34244.291	8800	Pt I	13496- 47740	E
2921.2203	34222.252	800	Pt I	64379- 30156	N
2921.3792	34220.391	10000	Pt I	6567- 40787	E
2921.6217	34217.55	490	Ne II		C
2921.9574	34213.62	210	Ne II		C
2924.39	34185.2	32	Ne III		L
2924.9582	34178.520	1800	Pt II	112433- 78254	K
2925.6169	34170.825	7000	Ne II		G



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WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2926.91	34155.7	370	Pt I	64312- 30156	N
2927.64	34147.2	110	Pt II	41434- 75581	K
2927.7843	34145.53	170	Ne II		C
2928.1044	34141.798	1800	Pt I	18566- 52708	E
2928.4406	34137.878	690	Pt II	95803- 61665	09
2929.3257	34127.564	620	Ne I		
2929.7894	34122.163	610000	Pt I	0- 34122	E
2930.7847	34110.576	4400	Pt I	64267- 30156	N
2931.61	34101.0	400	Pt II	48591- 82692	K
2932.1079	34095.182	900	Ne II		G
2932.7252	34088.006	2900	Ne I		G
2933.7138	34076.52	970	Ne II		C
2933.9707	34073.536	170	Pt II	105388- 71314	21
2934.66	34065.5	34	Pt II	105086- 71021	K
2935.2626	34058.54	510	Ne II		C
2935.59	34054.7	110			
2936.61	34042.9	490	Pt I	15501- 49544	N
2936.9037	34039.510		Fe I		R
2937.21	34036.0	840	Pt II	58491- 92526	K
2937.9421	34027.479	3800	Pt II	113119- 79092	K
2938.8101	34017.430	6000	Pt I	21967- 55984	N
2939.14	34013.6	35	Pt II	105962- 71948	K
2940.39	33999.2	130	Pt I	68121- 34122	N
2940.6481	33996.168	1300	Ne II		G
2941.12	33990.7	380			
2941.34	33988.2	120	Pt II	117340- 83352	K
2941.98	33980.8	140	Pt II	112433- 78452	K
2942.15	33978.8	44			
2942.7514	33971.871	8400	Pt I	64128- 30156	E
2944.57	33950.9	80			
2944.7525	33948.786	7100	Pt I	6567- 40516	E
2944.93	33946.7	61	Pt II	110408- 76461	AK
2944.93	33946.7	61	Pt II	109527- 75581	AK
2945.76	33937.2	160			
2946.0435	33933.91	520	Ne II		C
2946.21	33932.0	64	Pt II	41434- 75365	K
2947.3010	33919.432	3700	Ne I		G
2948.21	33909.0	88			
2949.08	33899.0	290			
2949.35	33895.9	290			
2949.93	33889.2	60	Ne III		L
2950.08	33887.5	470			
2950.32	33884.7	49	Pt I	68006- 34122	N
2950.64	33881.1	36	Ne III		L
2951.0485	33876.36	450	Ne II		C
2951.32	33873.2	31			
2952.50	33859.7	94			
2953.0047	33853.92	140	Ne II		C
2953.35	33850.0	31			
2953.71	33845.8	720	Pt II	105794- 71948	K
2954.79	33833.5	220	Pt II	111371- 77538	K
2955.7255	33822.759	130000	Ne II		G
2956.70	33811.6	69			
2957.29	33804.9	120			
2957.52	33802.2	290	Pt II	117340- 83538	K
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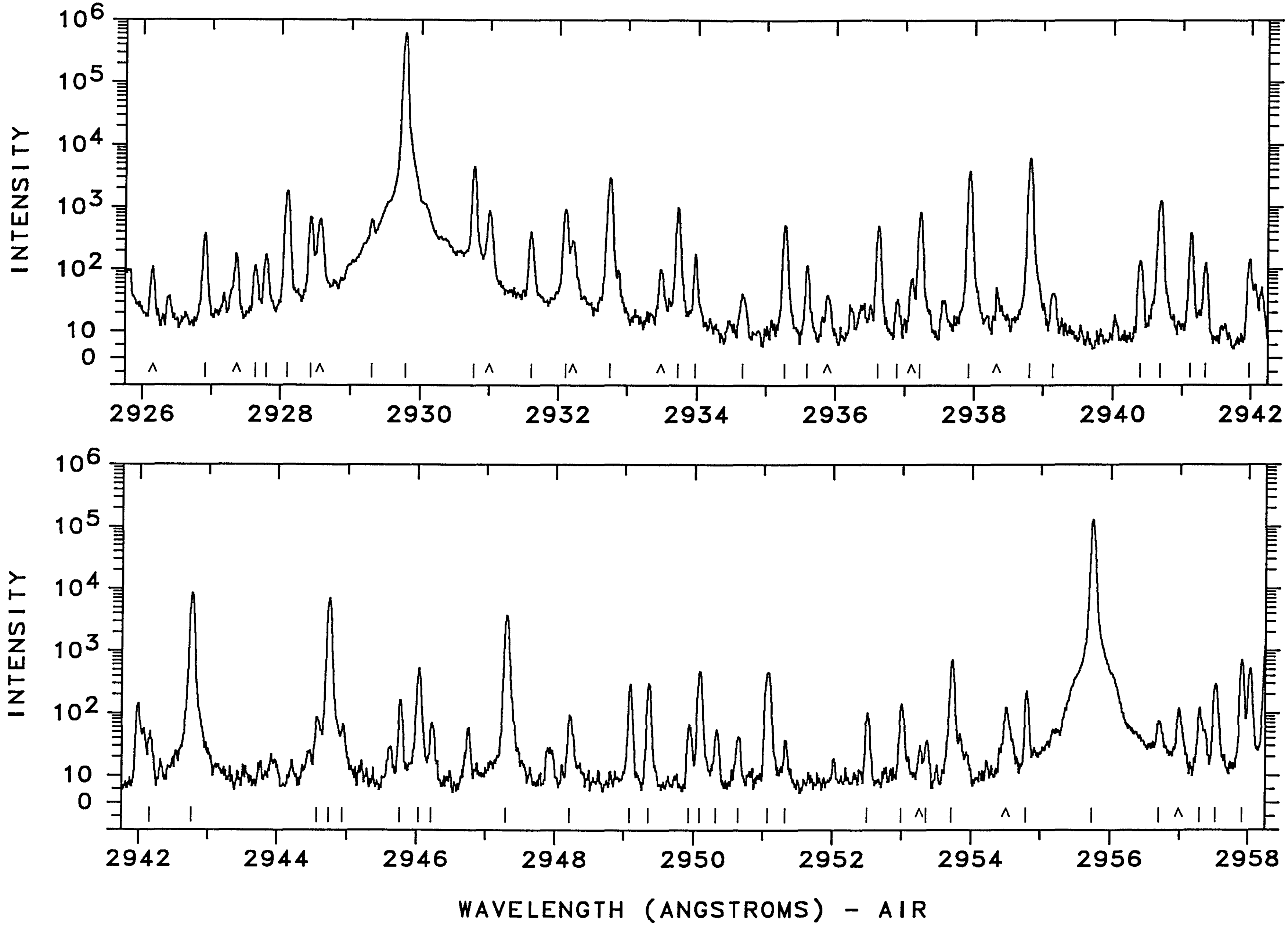
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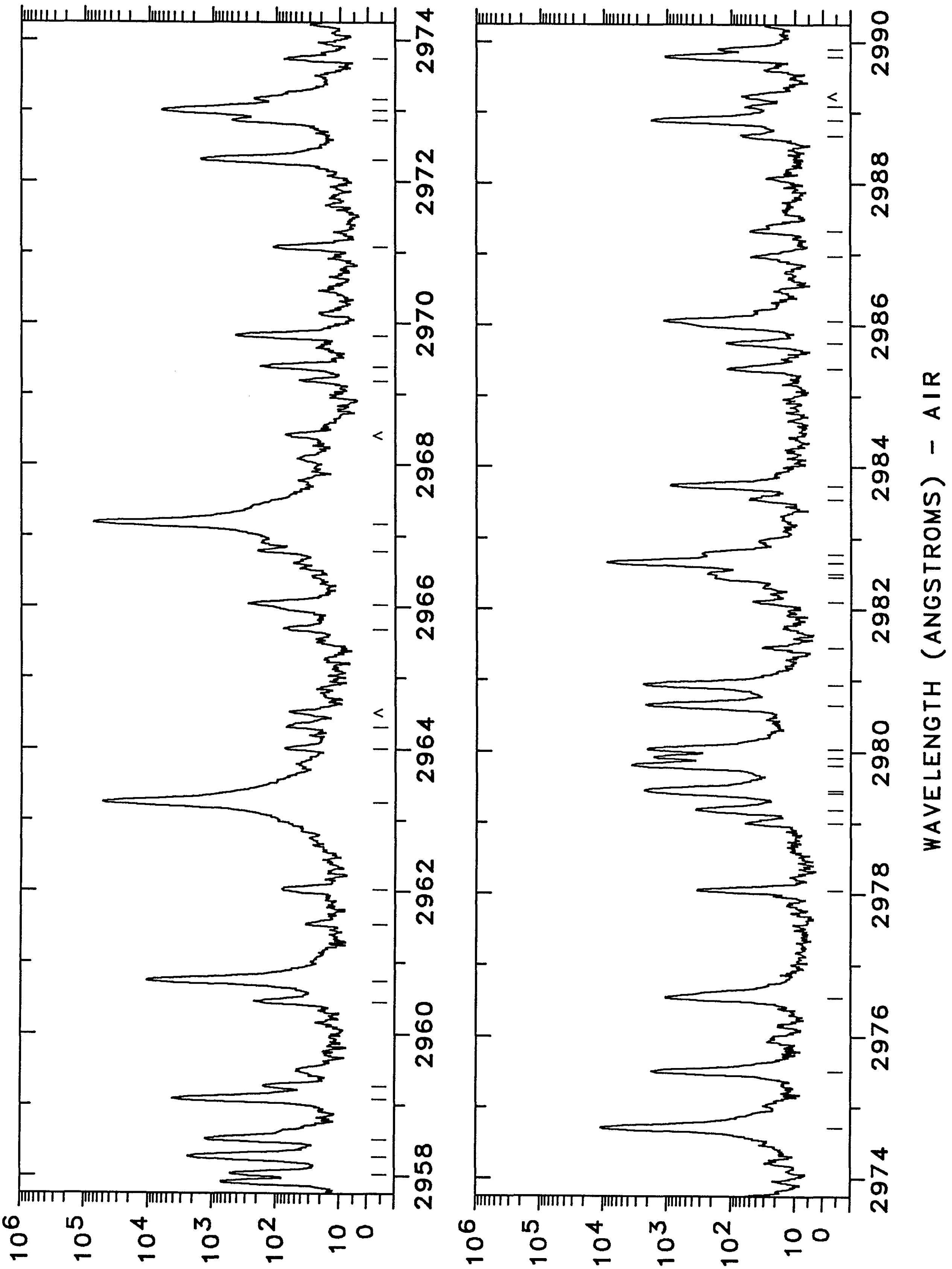
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2958.02	33796.5	510	Pt II	110258- 76461	K
2958.2529	33793.863	2300	Pt II	96614- 62820	11
2958.5030	33791.007	1200	Pt II	32237- 66028	11
2959.0936	33784.263	4100	Pt I	15501- 49286	E
2959.26	33782.4	150	Pt II	43737- 77519	K
2960.4556	33768.72	220	Ne II		C
2960.7494	33765.369	11000	Pt I	63922- 30156	N
2961.53	33756.5	28			
2962.02	33750.9	74	Pt II	41434- 75184	K
2963.2351	33737.046	53000	Ne II		G
2964.01	33728.2	68			
2964.31	33724.8	64			
2965.68	33709.2	70			
2966.03	33705.3	270			
2966.78	33696.7	190	Pt II	110158- 76461	K
2967.1827	33692.164	74000	Ne II		G
2969.18	33669.5	38			
2969.3909	33667.11	170	Ne II		C
2969.82	33662.2	430			
2971.07	33648.1	110	Pt II	110258- 76610	K
2972.2799	33634.388	1500	Ne II		G
2972.8560	33627.87	490 W	Ne II		C
2972.9959	33626.287	6200	Ne II		G
2973.16	33624.4	220	Pt II	111162- 77538	K
2973.74	33617.9	69	Pt II	50564- 84182	K
2974.7189	33606.812	11000	Ne I		G
2975.5233	33597.726	1800	Ne I		G
2976.5553	33586.079	1100	Ne II		G
2978.05	33569.2	330	Pt I	21967- 55536	N
2978.9996	33558.522	54	Pt II	29261- 62820	11
2979.1679	33556.627	350	Pt II	23461- 57018	08
2979.4223	33553.761	1430 P			
2979.4585	33553.353	2100 P	Ne II		G
2979.8086	33549.411	3600	Ne I		G
2979.9237	33548.116	1600	Pt II	110158- 76610	K
2980.0375	33546.834	2100	Ne II		G
2980.6453	33539.994	2200	Ne I		G
2980.9252	33536.845	2400	Ne I		G
2981.4453	33530.995		Fe I		R
2982.10	33523.6	39			
2982.45	33519.7	180			
2982.50	33519.1	230			
2982.6696	33517.233	8800	Ne I		G
2982.8011	33515.754	280	Pt II	32918- 66434	16
2983.5700	33507.118		Fe I		R
2983.7465	33505.136	890	Pt I	18566- 52071	E
2985.39	33486.7	110	Pt II	37877- 71364	K
2985.75	33482.7	110			
2986.0615	33479.162	1100	Ne II		G
2986.9423	33469.289	42	Pt II	36484- 69953	12
2987.33	33464.9	43			
2988.67	33449.9	64			
2988.8832	33447.556	1800	Ne II		G
2989.09	33445.2	54			
2989.7940	33437.367	1100	Pt I	68759- 35321	N
2989.90	33436.2	150	Pt II	113119- 79683	K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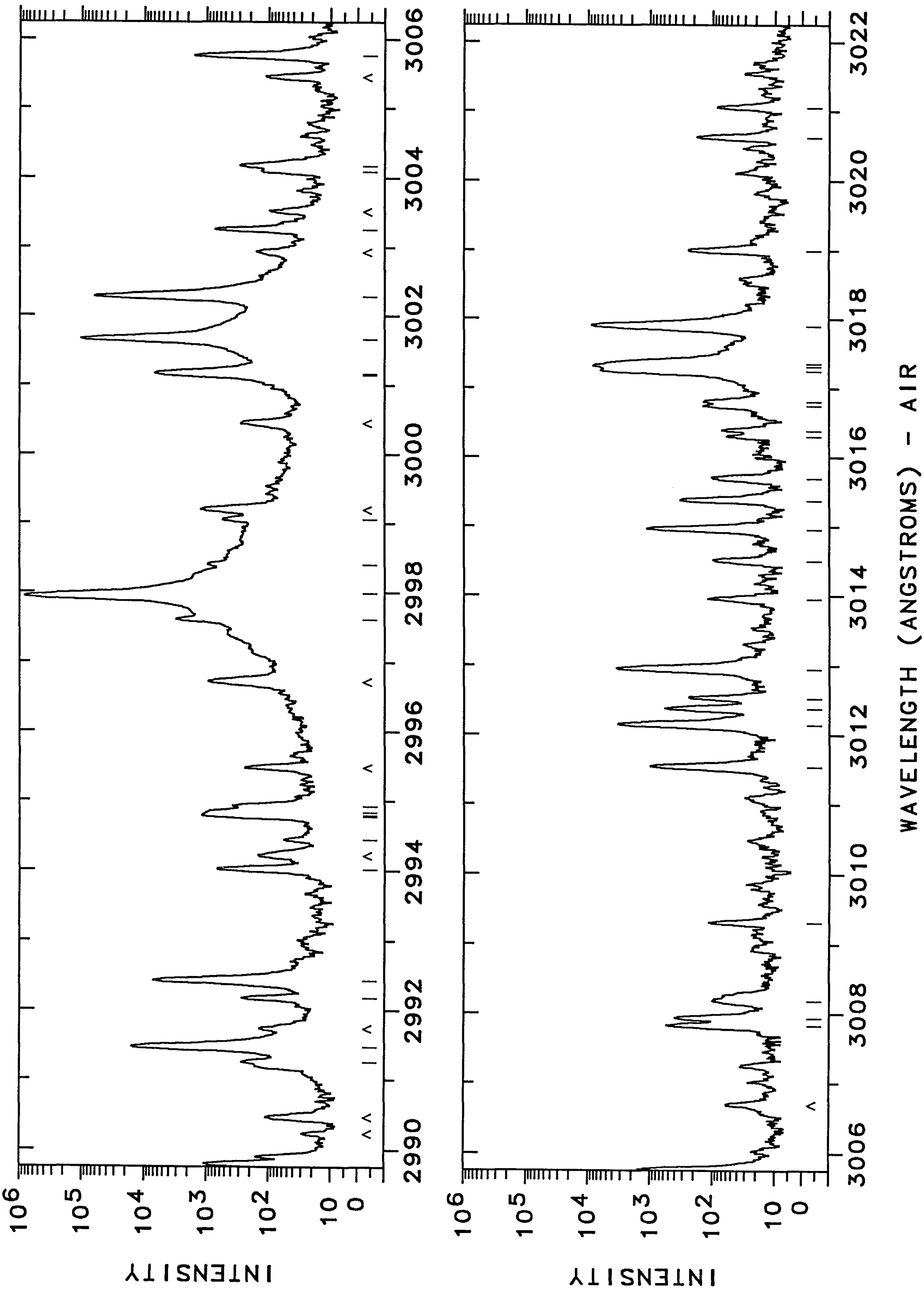
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
2991.25	33421.1	260			
2991.4665	33418.674	24000	Pt II	101199- 67780	K
2992.17	33410.8	270	Pt II	110020- 76610	K
2992.4296	33407.918	7100	Ne I		G
2994.0230	33390.14	660	Ne II		C
2994.44	33385.5	50			
2994.7722	33381.787	850	Pt I	68703- 35321	N
2994.79	33381.6	1200			
2994.8285	33381.159	500	Ne II		G
2994.9101	33380.25	380	Ne II		C
2997.6170	33350.108	3100	Pt II	32237- 65587	20
2997.9622	33346.268	840000 C	Pt I	775- 34122	E
2998.40	33341.4	940	Pt II	112433- 79092	K
2999.05	33334.2	540	Pt II	42031- 75365	K
3001.1410	33310.950	900 U	Pt II	117493- 84182	K
3001.1675	33310.655	6800 D	Pt II	18097- 51408	08
3001.6685	33305.096	110000	Ne II		G
3002.2641	33298.489	63000	Pt I	823- 34122	E
3003.2488	33287.572	730	Pt I	66967- 33680	N
3004.09	33278.3	130	Pt I	26638- 59916	N
3004.17	33277.4	290	Pt I	15501- 48779	N
3005.7717	33259.632	1600			
3007.8321	33236.85	530	Ne II		C
3007.9335	33235.73	400	Ne II		C

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3008.18	33233.0	95			
3009.31	33220.5	110			
3011.5305	33196.035	1000			
3012.1354	33189.368	3300	Ne I		G
3012.38	33186.7	570	Pt I	18566- 51753	N
3012.53	33185.0	240	Pt II	41434- 74619	K
3012.9576	33180.311	3500	Ne I		G
3013.9706	33169.16	110	Ne II		C
3014.50	33163.3	90	Pt II	115060- 81897	K
3014.9700	33158.165	1100	Pt II	117340- 84182	K
3015.37	33153.8	320	Pt I	26638- 59792	N
3015.69	33150.2	95			
3016.30	33143.5	51			
3016.3882	33142.577	63	Pt II	23875- 57018	15
3016.74	33138.7	130			
3016.80	33138.1	130	Pt II	105086- 71948	K
3017.2399	33133.222	6200	Pt II	34647- 67780	K
3017.3093	33132.459	8000	Ne II		G
3017.3498	33132.014	1300	Ne I		
3017.8714	33126.289	8800	Pt I	13496- 46622	E
3018.9858	33114.062	230	Pt II	32237- 65351	11
3020.6390	33095.939		Fe I		R
3021.05	33091.4	77			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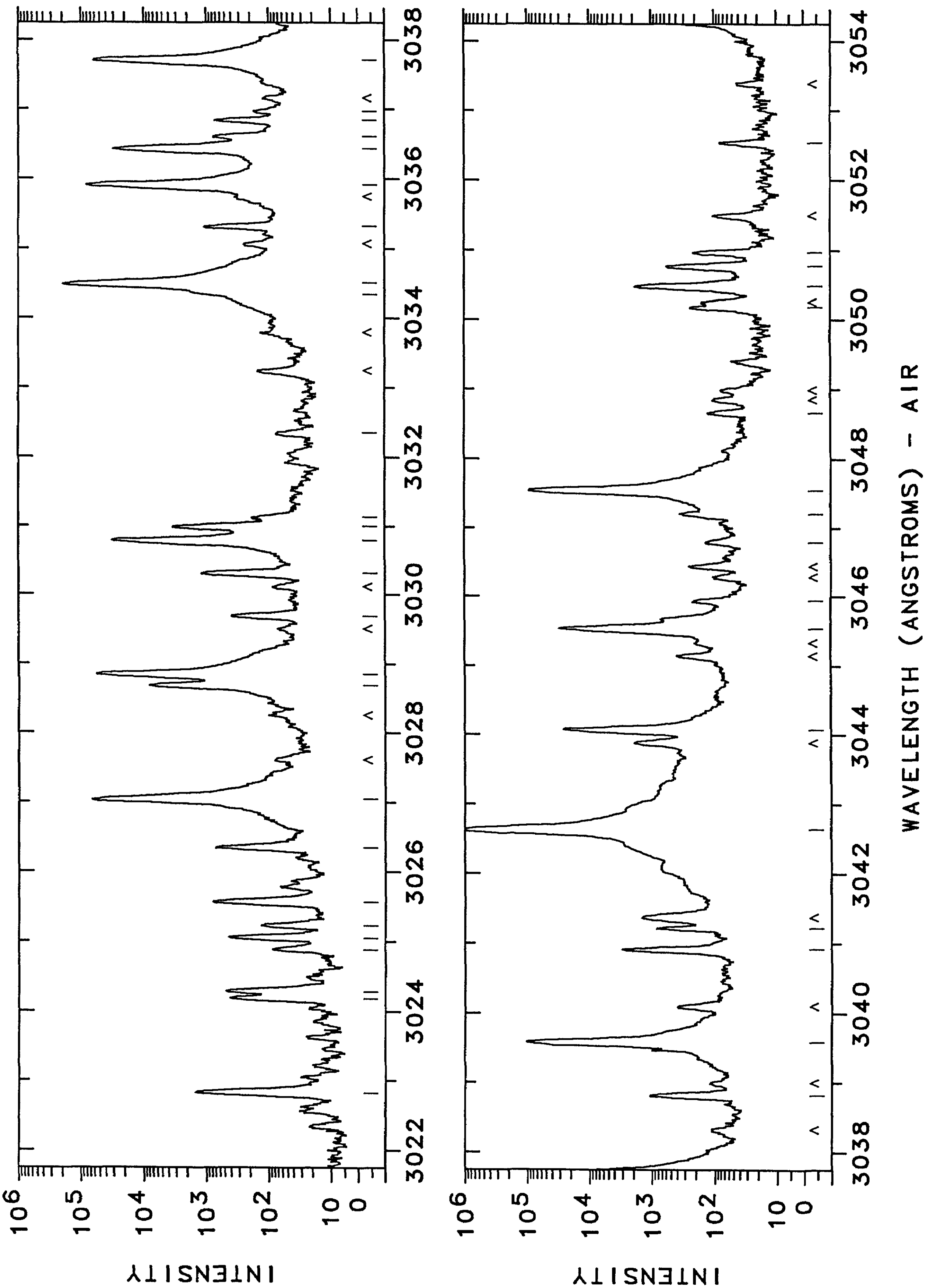
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3022.8401	33071.841	1500	Pt I	16983- 50055	N
3024.18	33057.2	410			
3024.2929	33055.954	480	Pt I	10131- 43187	E
3024.88	33049.5	80			
3025.05	33047.7	430	Pt I	26638- 59686	N
3025.23	33045.7	130	Pt II	46046- 79092	K
3025.5458	33042.266	790	Pt I	21967- 55009	N
3026.3266	33033.742	710	Pt I	15501- 48535	E
3027.0151	33026.228	68000	Ne II		G
3028.7000	33007.856	8100	Ne II		G
3028.8633	33006.076	57000	Ne II		G
3029.7112	32996.84	380	Ne II		C
3030.3209	32990.201	1200	Ne I		
3030.7876	32985.122	31000	Ne II		G
3030.9941	32982.874	3400	Pt II	95803- 62820	12
3031.13	32981.4	180	Pt II	104930- 71948	K
3032.35	32968.1	67			
3034.3397	32946.51	1100 U	Ne II		C
3034.4609	32945.193	190000	Ne II		G
3035.32	32935.9	1100	Pt II	105962- 73026	K
3035.9216	32929.343	81000	Ne II		G
3036.4425	32923.694	30000	Pt I	13496- 46419	E

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3036.6237	32921.73	750	Ne II		C
3036.84	32919.4	710	Pt II	111371- 78452	K
3036.97	32918.0	160	Pt II	109527- 76610	K
3037.7192	32909.858	62000	Ne II		G
3038.8196	32897.941	1100	Pt II	109507- 76610	K
3039.5855	32889.651	100000	Ne II		G
3040.8930	32875.511	3000	Pt II	96614- 63738	11
3041.2085	32872.100	830	Pt I	21967- 54839	E
3042.6318	32856.724	1200000 C	Pt I	823- 33680	E
3044.0878	32841.009	26000	Ne II		G
3045.5563	32825.174	30000	Ne II		G
3045.94	32821.0	210	Ne I		
3046.79	32811.9	130			
3047.21	32807.4	340	Pt II	41434- 74241	K
3047.5569	32803.627	91000	Ne II		G
3048.66	32791.8	120			
3050.18	32775.4	230			
3050.4724	32772.276	1800	Ne II		G
3050.7662	32769.12	560	Ne II		C
3050.97	32766.9	200	Pt I	65387- 32620	N
3052.54	32750.1	72	Pt II	112433- 79683	K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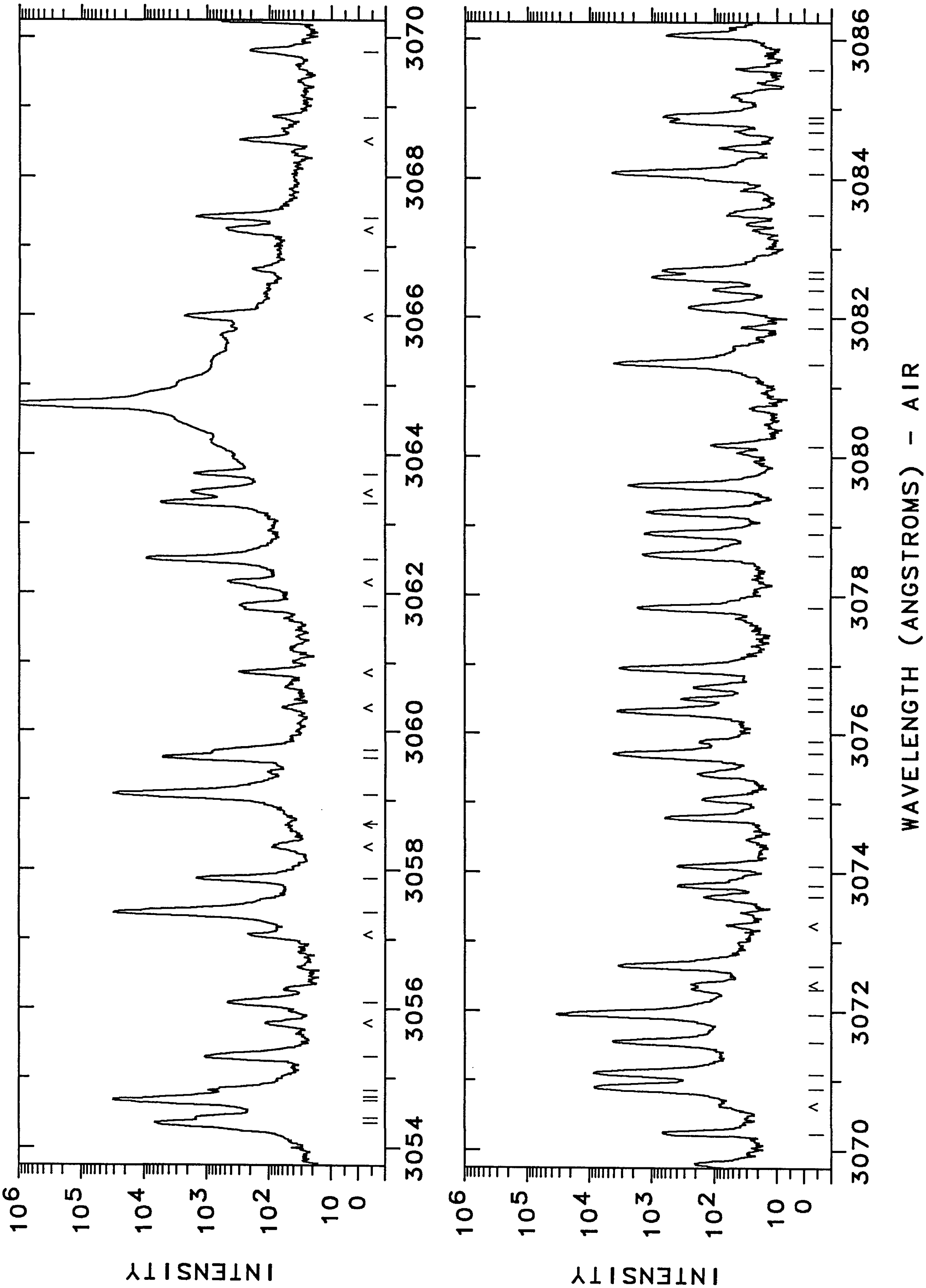
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3054.3449	32730.726	6600	Ne II		G
3054.4287	32729.828	1000	Ne II		G
3054.6747	32727.193	31000	Ne II		G
3054.7312	32726.588	850 U			
3054.8344	32725.483	1000			
3055.3115	32720.372	1100	Pt I	18566- 51286	E
3056.0579	32712.381	440	Pt II	23875- 56587	16
3057.3907	32698.122	30000	Ne I		G
3057.8669	32693.030	1400	Ne II		G
3058.66	32684.6	47	Pt II	58062- 90746	KM
3059.1050	32679.799	31000	Ne II		G
3059.6366	32674.121	5000	Pt I	13496- 46170	E
3059.7250	32673.177	330	Pt II	106434- 73761	A
3059.7250	32673.177	330	Ne II		A
3061.82	32650.8	290	Pt I	68947- 36296	AN
3061.82	32650.8	290	Ne II		A
3062.4913	32643.664	9300	Ne II		G
3063.3015	32635.032	5400	Ne II		G
3063.6948	32630.842	1600	Ne I		
3064.7110	32620.023	1500000 C	Pt I	0- 32620	E
3066.6875	32599.00	180	Ne II		C
3067.4494	32590.903	1500	Ne II		G
3068.85	32576.0	82			
3069.79	32566.1	200	Pt II	41434- 73999	K
3070.23	32561.4	660	Pt I	16983- 49544	N
3070.8916	32554.372	8300	Ne II		G
3071.0871	32552.300	8500	Ne II		G
3071.5310	32547.596	4200	Ne II		G
3071.9336	32543.331	33000	Pt I	10116- 42660	E
3072.3009	32539.44	220	Ne II		C
3072.6543	32535.698	3400	Ne II		G

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3073.65	32525.2	140	Pt II	115060- 82535	K
3073.8238	32523.32	380	Ne II		C
3074.1059	32520.336	380	Pt II	32237- 64757	12
3074.80	32513.0	600	Pt I	65132- 32620	N
3075.0719	32510.12	150	Ne II		C
3075.43	32506.3	180	Pt II	116689- 84182	K
3075.7378	32503.081	4100	Ne II		G
3075.9129	32501.231	160	Pt II	37877- 70379	28
3076.3569	32496.540	3500	Ne II		G
3076.52	32494.8	320	Pt II	110258- 77763	K
3076.69	32493.0	200	Pt II	48591- 81083	K
3076.9761	32490.002	3300	Ne I		G
3077.8393	32480.89	1700	Ne II		C
3078.5872	32472.999	1400	Ne II		G
3078.8791	32469.921	1300	Ne I		
3079.1801	32466.747	1200	Ne I		
3079.5650	32462.689	2400	Pt I	68759- 36296	N
3080.15	32456.5	110			
3081.3421	32443.967	4100	Ne II		G
3081.85	32438.6	29			
3082.1527	32435.435		Al I		F
3082.4310	32432.508	97	Pt II	32918- 65351	12
3082.6171	32430.549	1000	Ne II		G
3082.7159	32429.51	680	Ne II		C
3083.48	32421.5	56			
3084.1111	32414.839	4400	Ne II		C
3084.44	32411.4	76	Pt I	62567- 30156	N
3084.67	32409.0	40			
3084.81	32407.5	510	Pt I	68703- 36296	N
3084.9201	32406.34	660	Ne II		C
3085.56	32399.6	39	Pt II	64003- 96403	K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INTENSITY
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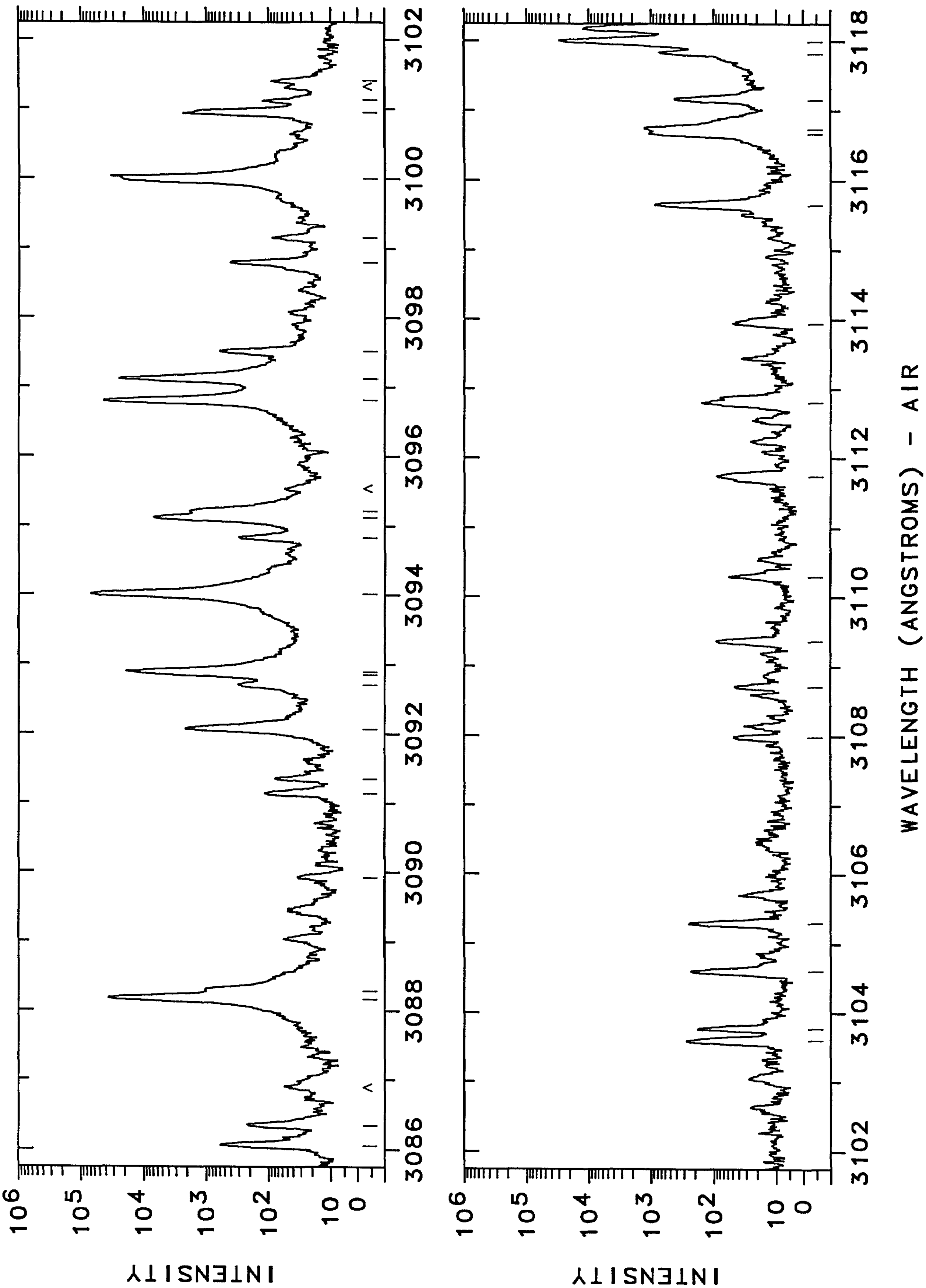
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3086.0810	32394.15	580	Ne II		C
3086.34	32391.4	210			
3088.1641	32372.300	36000	Ne II		G
3088.2852	32371.03	1000	Ne II		C
3089.92	32353.9	27			
3091.14	32341.1	110			
3091.35	32338.9	72			
3092.0940	32331.158	2100	Ne II		G
3092.7101	32324.717		Al I		F
3092.8520	32323.233	U	Al I		
3092.9020	32322.711	19000	Ne II		G
3094.0059	32311.179	69000	Ne II		G
3094.83	32302.6	290			
3095.1034	32299.723	6900	Ne II		G
3095.1843	32298.879	1500 P	Ne II		G
3096.8104	32281.920	44000	Pt II	101517- 69235	K
3097.1318	32278.569	25000	Ne II		G
3097.5425	32274.29	600	Ne II		C
3098.8282	32260.90	410	Ne II		C
3099.15	32257.6	79	Pt II	110020- 77763	K
3100.0252	32248.444	34000	Pt I	6567- 38815	E

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3100.9598	32238.725	2300	Pt I	15501- 47740	E
3101.13	32237.0	120	Pt II	115060- 82824	K
3101.41	32234.0	81			
3103.60	32211.3	260	Pt I	21967- 54178	N
3103.77	32209.5	170	Pt II	42031- 74241	K
3104.61	32200.8	220	Pt II	105962- 73761	K
3105.30	32193.7	240	Pt II	106434- 74241	K
3107.99	32165.8	39			
3108.71	32158.4	38			
3109.3597	32151.635	82	Pt II	32237- 64388	21
3110.30	32141.9	49	Pt I	26638- 58780	AN
3110.30	32141.9	49	Pt II	104090- 71948	AK
3111.74	32127.0	82	Pt II	64003- 96131	K
3112.80	32116.1	150	Pt II	54373- 86489	K
3113.94	32104.3	42			
3115.64	32086.8	850	Ne II		C
3116.684	32076.08	1100	Ne II		C
3116.7380	32075.525	1300	Pt II	37877- 69953	17
3117.155	32071.24	410	Ne II		C
3117.8076	32064.522	730	Pt II	95803- 63738	12
3117.9807	32062.742	29000	Ne II		G



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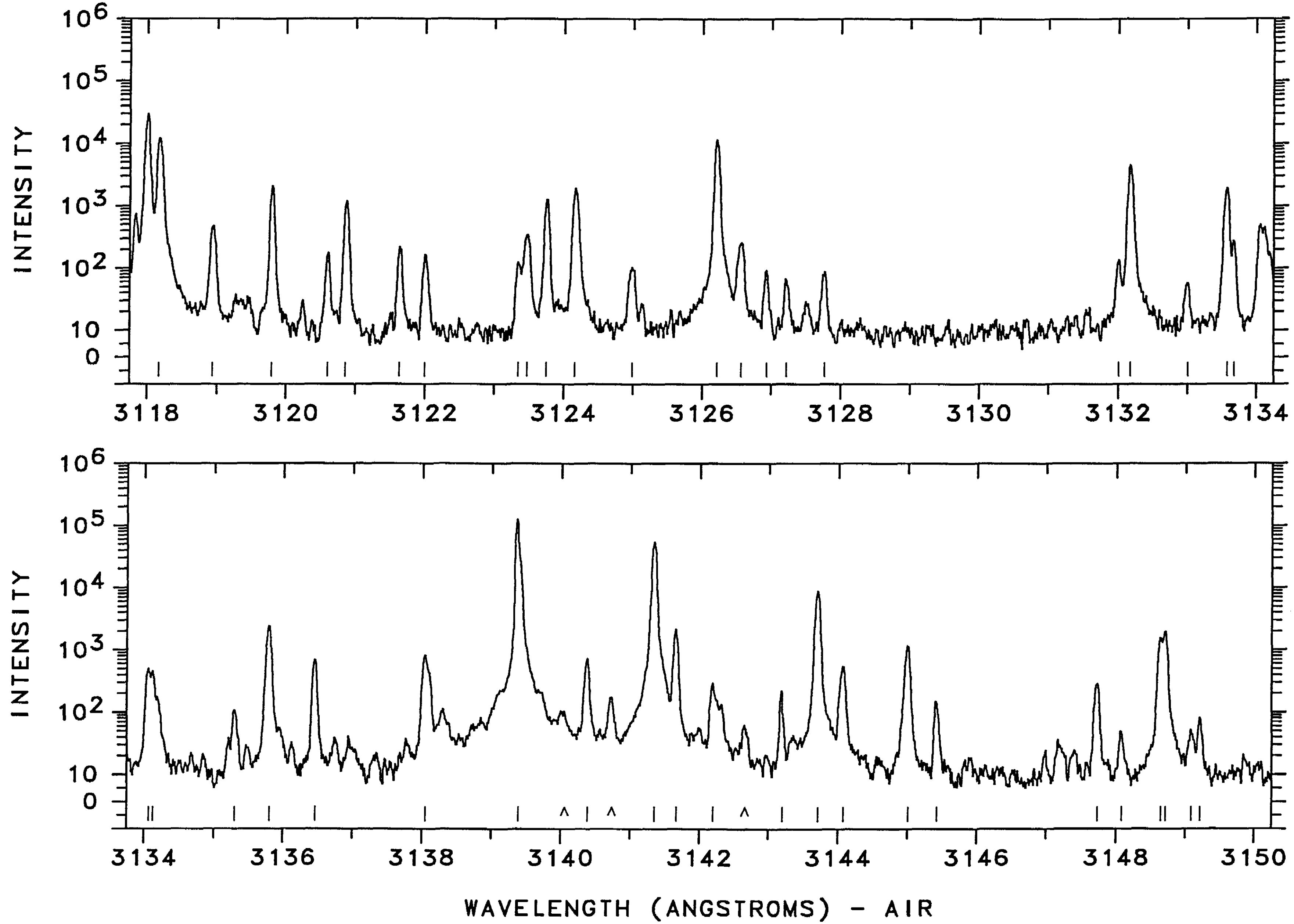
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3118.1600	32060.898	12000	Ne II		G
3118.94	32052.9	470			
3119.8001	32044.044	2100	Pt I	21967- 54011	E
3120.60	32035.8	170			
3120.86	32033.2	1200	Pt II	105794- 73761	K
3121.64	32025.2	210			
3122.00	32021.5	160			
3123.365	32007.47	120	Ne II		C
3123.461	32006.49	330	Ne II		C
3123.7644	32003.380	1200	Pt II	110258- 78254	K
3124.1846	31999.074	1900	Ne II		G
3124.99	31990.8	96			
3126.1965	31978.483	12000	Ne I		G
3126.57	31974.7	250			
3126.94	31970.9	85			
3127.22	31968.0	59	Pt II	42031- 73999	K
3127.77	31962.4	80			
3132.01	31919.1	130	Pt II	114455- 82535	K
3132.1882	31917.312	4400	Ne II		G
3133.01	31908.9	50			
3133.5572	31903.368	1900	Pt II	110158- 78254	K
3133.6714	31902.206	260	Pt I	13496- 45398	E

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3134.065	31898.20	490	Ne II		C
3134.134	31897.50	450	Ne II		C
3135.30	31885.6	99	Pt I	64505- 32620	N
3135.8153	31880.395	2400	Ne II		G
3136.476	31873.68	680	Ne II		C
3138.056	31857.63	810	Ne II		C
3139.3870	31844.126	130000	Pt I	775- 32620	E
3140.358	31834.28	710	Ne II		C
3141.3320	31824.410	54000 S	Ne II		G
3141.6559	31821.130	2100	Pt I	18566- 50387	N
3142.20	31815.6	280	Pt II	106434- 74619	K
3143.20	31805.5	210	Pt II	110258- 78452	K
3143.7204	31800.233	8900	Ne II		G
3144.0872	31796.523	540	Pt II	29261- 61058	11
3145.0199	31787.094	1100	Pt II	34647- 66434	19
3145.433	31782.92	140	Ne II		C
3147.73	31759.7	280			
3148.08	31756.2	42			
3148.6107	31750.844	1500	Ne I		I
3148.6805	31750.140	2000	Ne II		G
3149.09	31746.0	44			
3149.22	31744.7	73	Pt II	109507- 77763	K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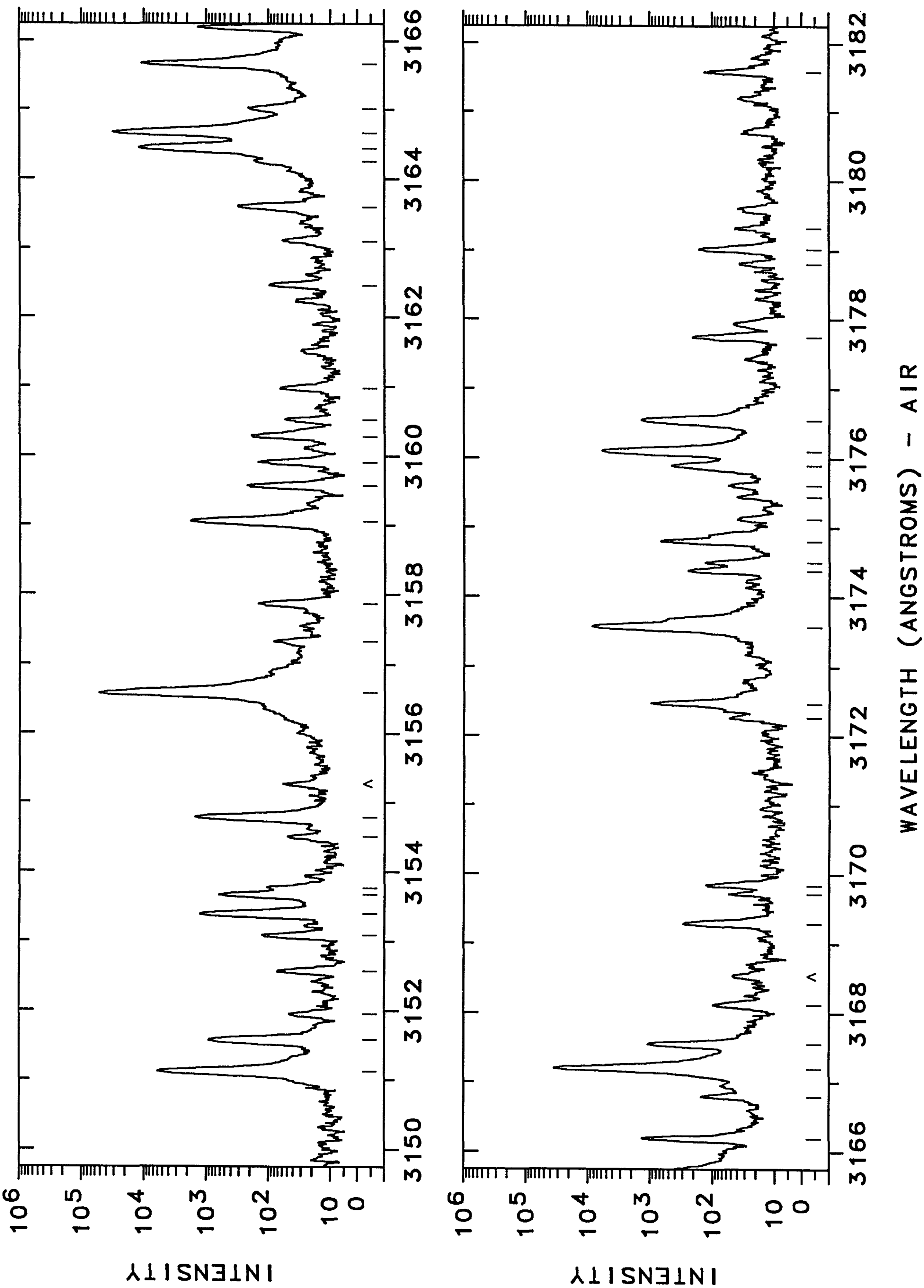
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3151.1364	31725.396	6000	Ne II		G
3151.58	31720.9	900	Pt II	105962- 74241	AK
3151.58	31720.9	900	Ne II		A
3151.58	31720.9	900	Pt II	114256- 82535	AK
3151.95	31717.2	38	Pt II	46046- 77763	K
3152.57	31711.0	63	Pt I	68006- 36296	N
3153.09	31705.7	120	Pt II	110158- 78452	K
3153.4107	31702.516	1300	Ne I		I
3153.678	31699.83	620	Ne II		C
3153.77	31698.9	100			
3154.51	31691.5	42			
3154.794	31688.62	1500	Ne II		C
3156.5625	31670.862	53000	Pt I	10131- 41802	E
3157.33	31663.2	76			
3157.87	31657.7	140			
3159.0704	31645.721	1800	Pt II	29261- 60907	13
3159.57	31640.7	210	Pt II	117340- 85700	K
3159.91	31637.3	140	Ne II		A
3159.91	31637.3	140	Ne III		AL
3160.28	31633.6	180			
3160.52	31631.2	46	Pt II	114455- 82824	K
3161.0013	31626.390	56	Pt II	105388- 73761	30
3162.46	31611.8	89			
3163.10	31605.4	51	Pt I	68947- 37342	N
3163.578	31600.63	300	Ne II		C
3164.231	31594.11	160	Ne II		C
3164.4295	31592.129	12000	Ne II		G
3164.6618	31589.810	31000	Ne II		G

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3165.01	31586.3	200	Ne III		L
3165.6479	31579.971	11000	Ne II		G
3166.180	31574.66	1300	Ne II		C
3166.79	31568.6	140	Pt II	110020- 78452	K
3167.2244	31564.252	35000	Pt II	101517- 69953	K
3167.55	31561.0	1100	Ne I		
3168.12	31555.3	90	Pt II	111162- 79607	K
3169.304	31543.54	290	Ne II		C
3169.72	31539.4	47			
3169.84	31538.2	120			
3172.27	31514.0	45	Pt II	117340- 85826	K
3172.474	31512.03	960	Ne II		C
3173.5726	31501.115	8600	Ne II		G
3174.37	31493.2	240			
3174.49	31492.0	120	Pt II	46046- 77538	K
3174.8232	31488.707	660	Pt I	18566- 50055	E
3175.12	31485.8	32	Ne III		L
3175.44	31482.6	31	Pt II	114455- 82972	K
3175.61	31480.9	46	Ne III		L
3175.90	31478.0	440	Pt II	121651- 90173	K
3176.1199	31475.852	5900	Ne II		G
3176.548	31471.61	1400	Ne II		C
3177.745	31459.76	200	Ne II		C
3178.80	31449.3	29			
3179.02	31447.1	150			
3179.32	31444.2		Ca II		
3181.58	31421.8	120			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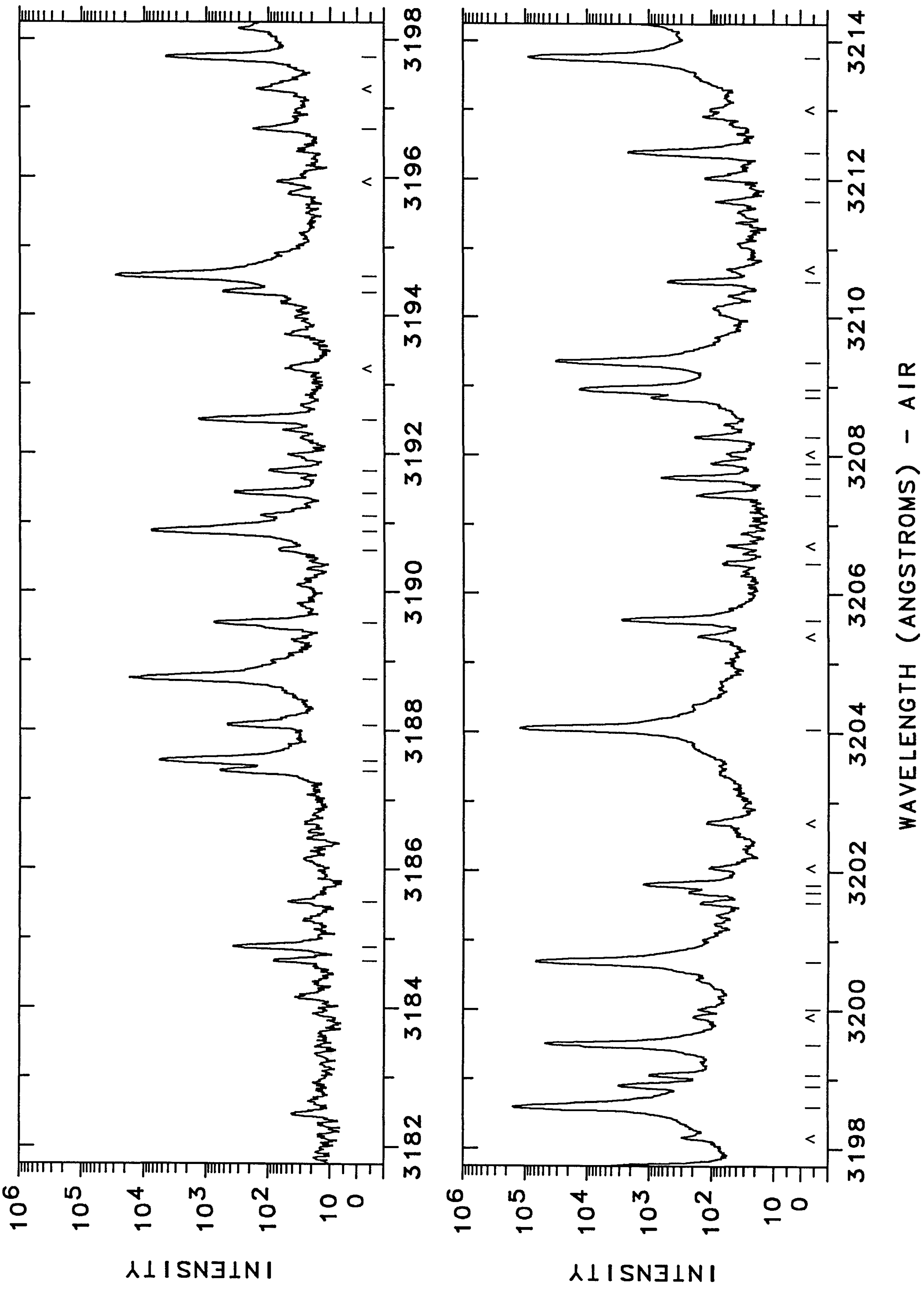
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3184.68	31391.3	72			
3184.88	31389.3	360			
3185.53	31382.9	38			
3187.42	31364.3	600			
3187.5763	31362.729	5700 L	Ne II		G
3188.0700	31357.873	450	Pt II	37877- 69235	27
3188.7410	31351.275	17000	Ne II		G
3189.55	31343.3	750	Pt II	105962- 74619	K
3190.60	31333.0	59	Pt II	50564- 81897	K
3190.8630	31330.426	7600	Ne II		G
3191.10	31328.1	120			
3191.43	31324.9	340	Pt II	105086- 73761	AK
3191.43	31324.9	340	Pt I	68169- 36844	AN
3191.75	31321.7	89	Pt I	68912- 37590	N
3192.5031	31314.331	1300	Pt I	18566- 49880	E
3194.34	31296.3	520	Pt II	36484- 67780	K
3194.5754	31294.018	28000	Ne II		G
3196.70	31273.2	160	Pt II	109527- 78254	K
3197.7161	31263.283	4400	Pt II	96614- 65351	12
3198.5862	31254.779	160000	Ne II		G
3198.916	31251.56	3100	Ne II		C
3199.06	31250.2	970	Pt I	68094- 36844	AN

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3199.06	31250.2	970	Pt II	106434- 75184	AK
3199.5087	31245.768	48000	Pt II	101199- 69953	13
3200.01	31240.9	150	Pt I	68831- 37590	N
3200.7097	31234.044	67000	Pt I	13496- 44730	E
3201.55	31225.8	140			
3201.70	31224.4	220			
3201.81	31223.3	1200			
3204.0364	31201.615	120000	Pt I	6567- 37769	E
3205.6023	31186.374	2800	Pt I	65308- 34122	N
3206.44	31178.2	57	Pt I	68947- 37769	N
3207.43	31168.6	160	Pt I	68759- 37590	N
3207.68	31166.2	620	Pt II	110258- 79092	K
3207.89	31164.1	91			
3208.27	31160.4	170			
3208.84	31154.9	920			
3208.9647	31153.697	17000	Ne II		G
3209.3554	31149.905	32000	Ne II		G
3210.52	31138.6	490	Pt II	101517- 70379	K
3211.69	31127.3	73			
3211.994	31124.32	110	Ne II		C
3212.3775	31120.602	2100	Pt I	15501- 46622	E
3213.7348	31107.459	88000	Ne II		G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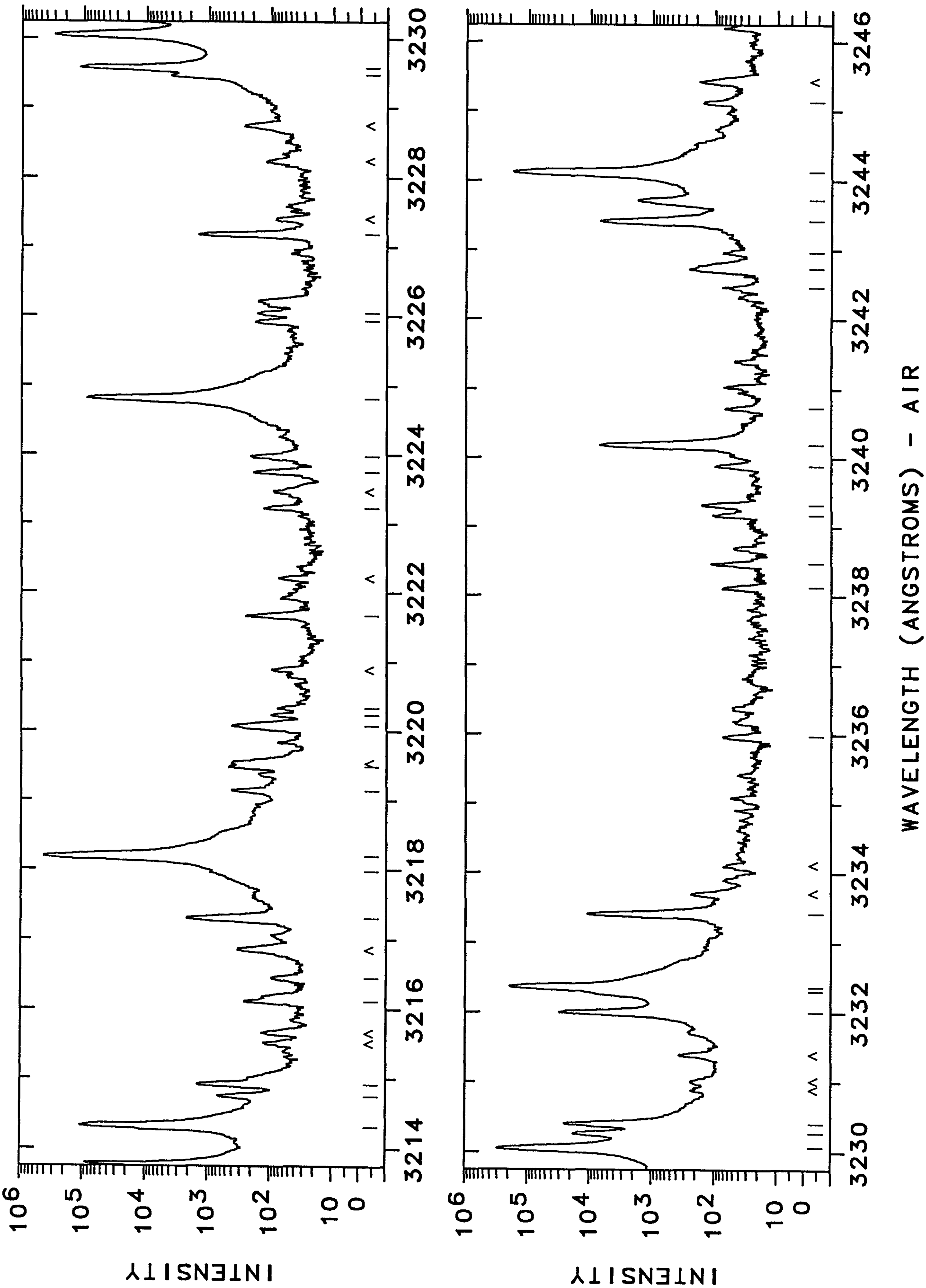
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3214.3262	31101.735	110000	Ne II		G
3214.756	31097.58	660	Ne II		C
3214.926	31095.93	1400	Ne II		C
3216.11	31084.5	240			
3216.45	31081.2	80			
3217.31	31072.9	2200			
3217.98	31066.4	890			
3218.1925	31064.371	430000	Ne II		G
3219.14	31055.2	410	Pt II	109507- 78452	K
3219.49	31051.9	450			
3220.08	31046.2	400			
3220.24	31044.6	82			
3220.34	31043.7	61			
3221.67	31030.8	230			
3223.23	31015.8	110			
3223.75	31010.8	170	Pt I	65132- 34122	N
3223.98	31008.6	200	Pt II	43737- 74745	K
3224.8174	31000.556	87000	Ne II		G
3225.93	30989.9	160	Pt I	68759- 37769	N
3226.05	30988.7	150	Pt II	116689- 85700	K
3227.1645	30978.011	1400	Pt I	18566- 49544	E
3229.457	30956.02	4000	Ne II		C
3229.5717	30954.921	120000	Ne II		G
3230.0698	30950.148	300000	Ne II		G
3230.2837	30948.099	18000	Pt I	13496- 44444	E
3230.4209	30946.784	26000	Ne II		G
3232.0240	30931.436	31000	Ne II		G
3232.3096	30928.703	5000 U	Pt II	110020- 79092	K
3232.3731	30928.095	200000 P	Ne II		G
3233.4167	30918.113	11000	Pt I	15501- 46419	E
3235.98	30893.6	59	Pt II	109346- 78452	K
3238.13	30873.1	60			
3238.48	30869.8	98			
3239.17	30863.2	92			
3239.32	30861.8	140			
3239.89	30856.3	82			
3240.1957	30853.430	7000	Pt I	10116- 40970	E
3240.73	30848.3	52			
3242.46	30831.9	59			
3242.73	30829.3	240	Pd I		
3242.96	30827.1	58	Pt I	68169- 37342	N
3243.3963	30822.985	6900	Ne II		G
3243.7039	30820.062	1700	Pt II	101199- 70379	28
3244.0942	30816.354	170000	Ne II		G
3245.13	30806.5	140			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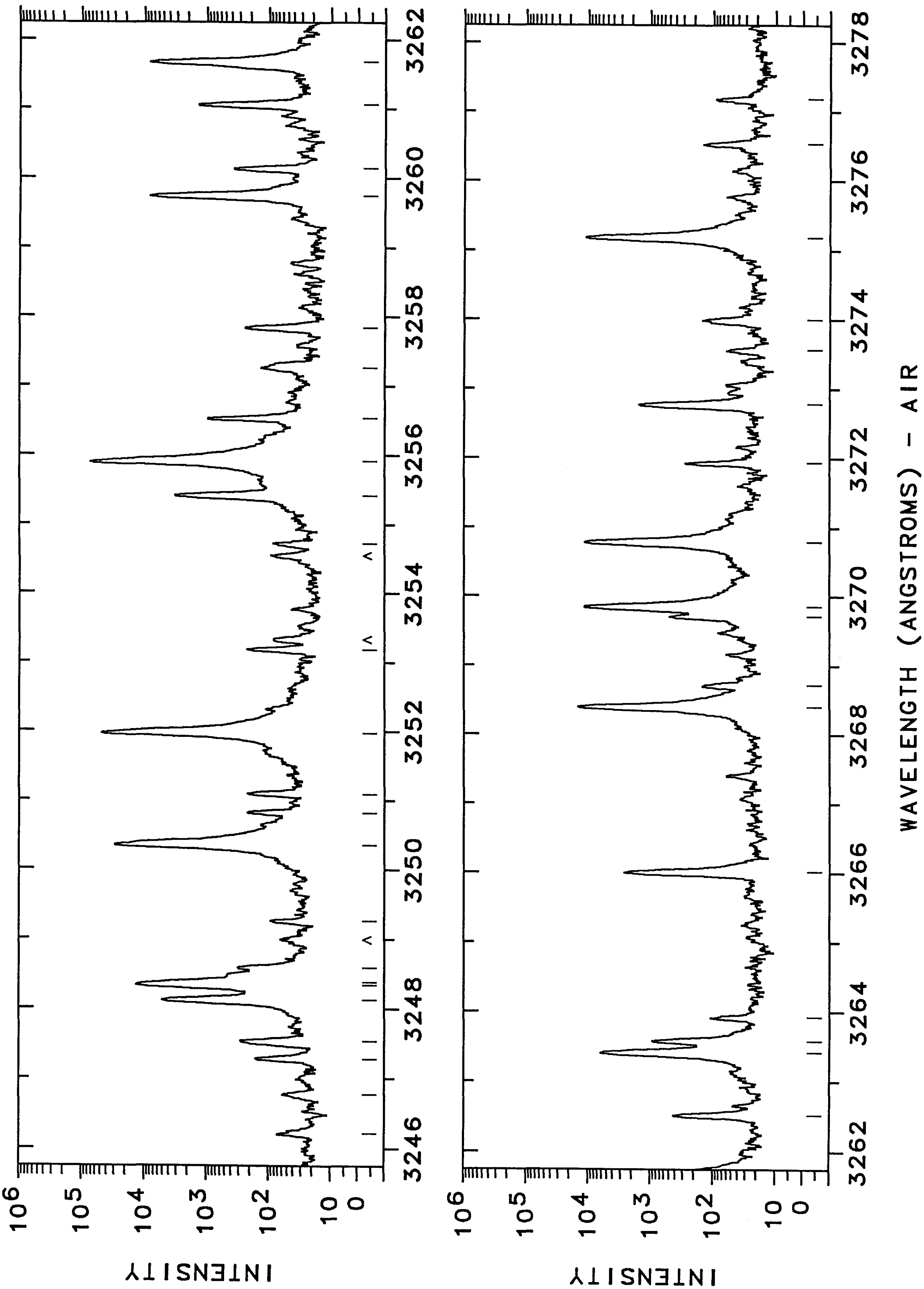
3246
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3246.21	30796.3	57			
3246.77	30791.0	44			
3247.28	30786.1	150			
3247.53	30783.8		Cu I		
3248.1314	30778.053	5000	Ne II		G
3248.3449	30776.030	13000 P	Ne II		G
3248.3787	30775.710	3100	Ne II		G
3248.59	30773.7	290			
3249.26	30767.4	76			
3250.3571	30756.978	29000	Ne II		G
3250.82	30752.6	200	Pt I	68094- 37342	N
3251.09	30750.0	200			
3251.9787	30741.642	47000	Pt I	10131- 40873	E
3253.18	30730.3	200	Pt I	68072- 37342	N
3254.72	30715.8	69			
3255.4223	30709.124	3100	Ne II		G
3255.9088	30704.536	72000	Pt I	6140- 36844	E
3256.53	30698.7	930	Pt I	64379- 33680	N
3257.26	30691.8	120			
3257.84	30686.3	230			
3259.7308	30668.536	8200	Pt I	15501- 46170	E

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3260.14	30664.7	350	Pt I	68006- 37342	N
3261.0683	30655.958	1300	Pt I	10131- 40787	E
3261.6887	30650.127	8200	Pt I	64330- 33680	N
3262.5311	30642.213	410	Pt II	105388- 74745	26
3263.4128	30633.935	6400	Ne II		G
3263.58	30632.4	920	Pt I	64312- 33680	N
3263.92	30629.2	94	Pt II	64003- 94633	K
3266.02	30609.5	2600	Pt II	105794- 75184	K
3268.4170	30587.034	15000	Pt I	64267- 33680	N
3268.72	30584.2	130			
3269.71	30574.9	470	Pt II	110258- 79683	K
3269.8705	30573.438	12000	Ne II		G
3270.8010	30564.741	11000	Ne II		G
3271.94	30554.1	260			
3272.78	30546.3	1600	Pt I	64668- 34122	N
3273.56	30539.0	46	Pt II	110146- 79607	K
3274.00	30534.9	130	Cu I		
3275.1810	30523.866	11000	Ne II		G
3276.54	30511.2	130			
3277.19	30505.2	76			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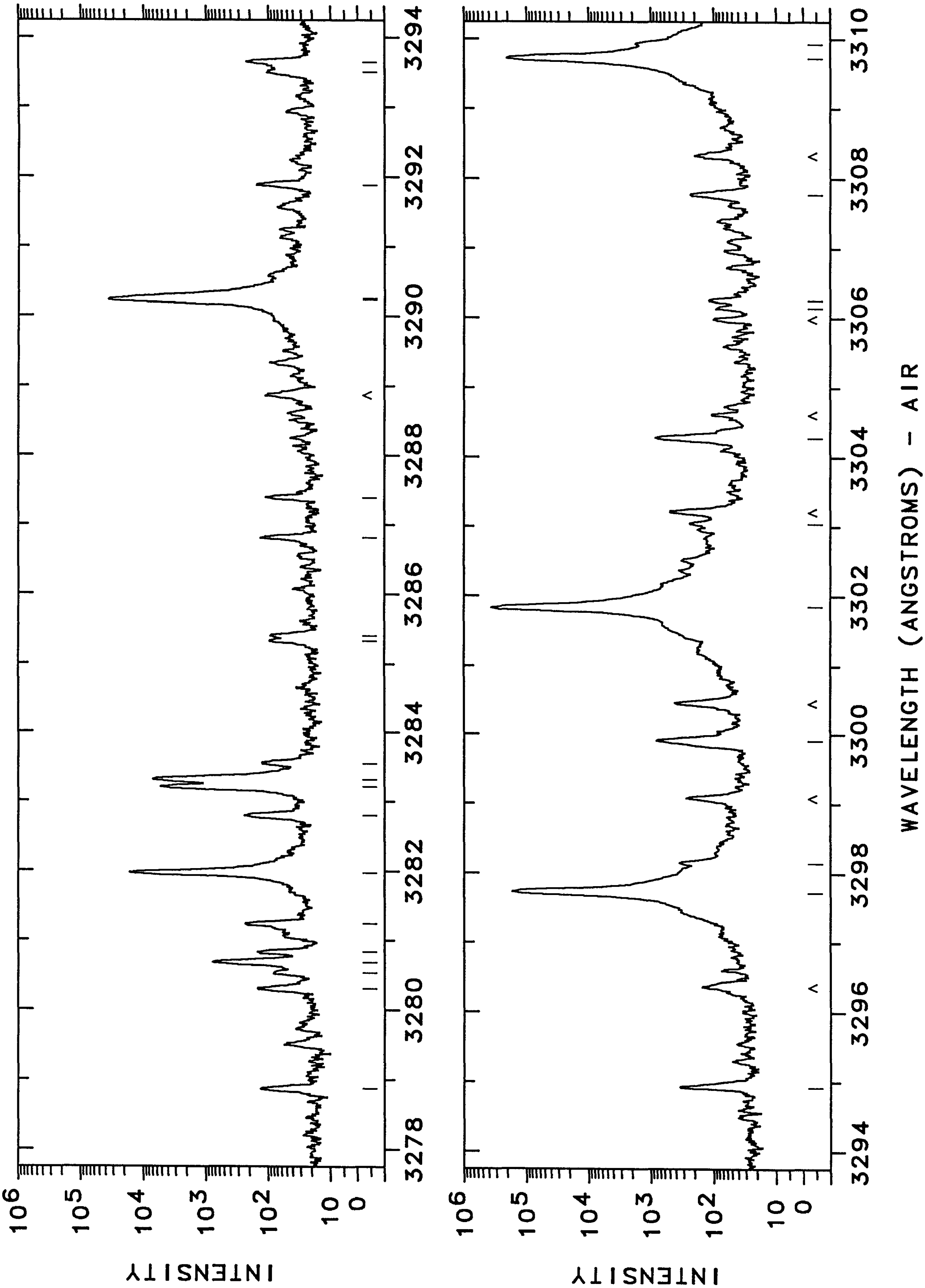
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3278.87	30489.5	120			
3280.30	30476.2	130			
3280.53	30474.1		Rh I		
3280.68	30472.7		Ag I		
3280.83	30471.3	130	Pt I	21967- 52438	N
3281.24	30467.5	220	Pt II	105086- 74619	AK
3281.24	30467.5	220	Pt II	119057- 88589	AK
3281.9670	30460.756	17000	Pt I	64141- 33680	E
3282.80	30453.0	230			
3283.2046	30449.274	5300	Pt I	13496- 43945	E
3283.3086	30448.310	7000	Pt I	64128- 33680	E
3283.54	30446.2		Rh I		
3285.33	30429.6	80			
3285.40	30428.9	77	Pt II	105794- 75365	K
3286.81	30415.9	120	Pt II	109507- 79092	K
3287.39	30410.5	94			
3290.2196	30384.356	36000	Pt I	10131- 40516	E

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3290.2517	30384.060	6000 U			
3291.88	30369.0	140			
3293.50	30354.1	90	Pt II	104763- 74409	K
3293.64	30352.8	210	Pt I	68121- 37769	N
3294.92	30341.0	330	Pt II	105086- 74745	K
3297.7252	30315.203	170000	Ne II		G
3298.15	30311.3	330	Pt II	104930- 74619	K
3299.91	30295.1	790	Pt I	68831- 38536	N
3301.8596	30277.246	370000	Pt I	6567- 36844	E
3303.04	30266.4	230			
3304.28	30255.1	820			
3306.14	30238.0	76	Pt I	68006- 37769	N
3306.25	30237.0	100			
3307.77	30223.1	220	Pt I	68759- 38536	N
3309.7398	30205.161	210000	Ne II		G
3309.9493	30203.250	1700	Pt II	105388- 75184	26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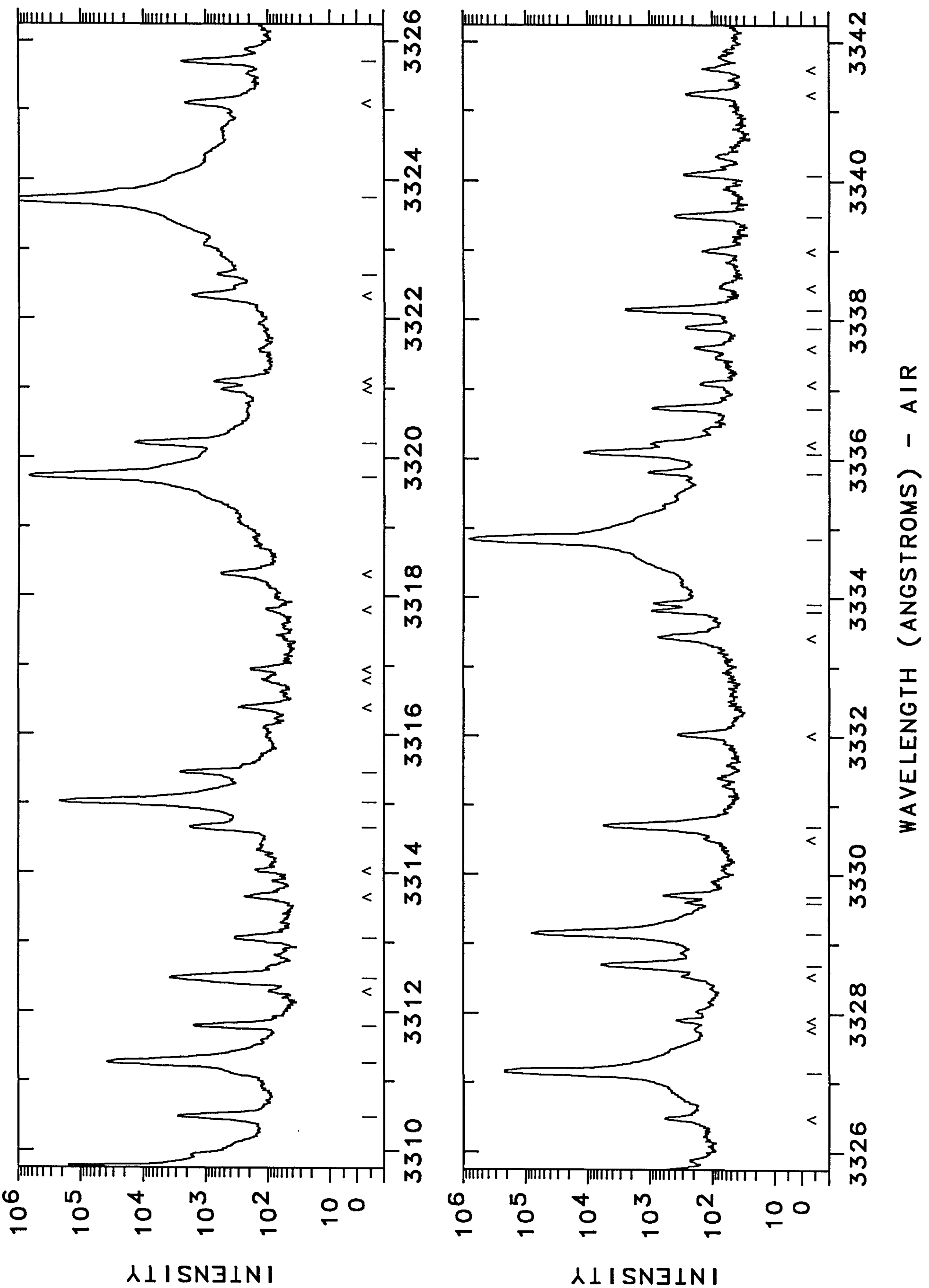
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
3310.499	30198.24	2800	Ne II	C
3311.2711	30191.193	37000	Ne II	G
3311.7986	30186.385	1500	Pt I 66967- 36781	N
3312.4818	30180.159	3700	Pt I 68716- 38536	AN
3312.4818	30180.159	3700	Pt II 96614- 66434	A
3313.06	30174.9	330		
3314.674	30160.20	1800	Ne II	C
3315.0419	30156.852	220000	Pt I 0- 30156	E
3315.45	30153.1	2500	Pt II 101517- 71364	K
3319.7246	30114.315	680000	Ne II	G
3320.1973	30110.028	14000	Ne II	G
3322.63	30088.0	640		
3323.7350	30077.980	1900000	Ne II	G
3325.70	30060.2	2400	Pt I 64182- 34122	N
3325.70	30060.2	2400	Pt II 110257- 80197	K
3327.1534	30047.079	220000	Ne II	G

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
3328.6977	30033.140	6000	Ne III	L
3329.1575	30028.992	80000	Ne II	G
3329.59	30025.1	260		
3329.69	30024.2	590	Pt II 43737- 73761	K
3330.7335	30014.784	5500	Ne II	G
3333.80	29987.2	920		
3333.91	29986.2	860		
3334.8368	29977.853	820000	Ne II	G
3335.8163	29969.051	1100	Pt I 18566- 48535	E
3336.0922	29966.572	11000	Ne II	G
3336.73	29960.8	900	Pt II 110158- 80197	K
3337.9063	29950.287	250	Pt II 36484- 66434	20
3338.14	29948.2	2500	Pt I 62567- 32620	N
3339.49	29936.1	390		
3340.08	29930.8	270	Pt II 41434- 71364	K



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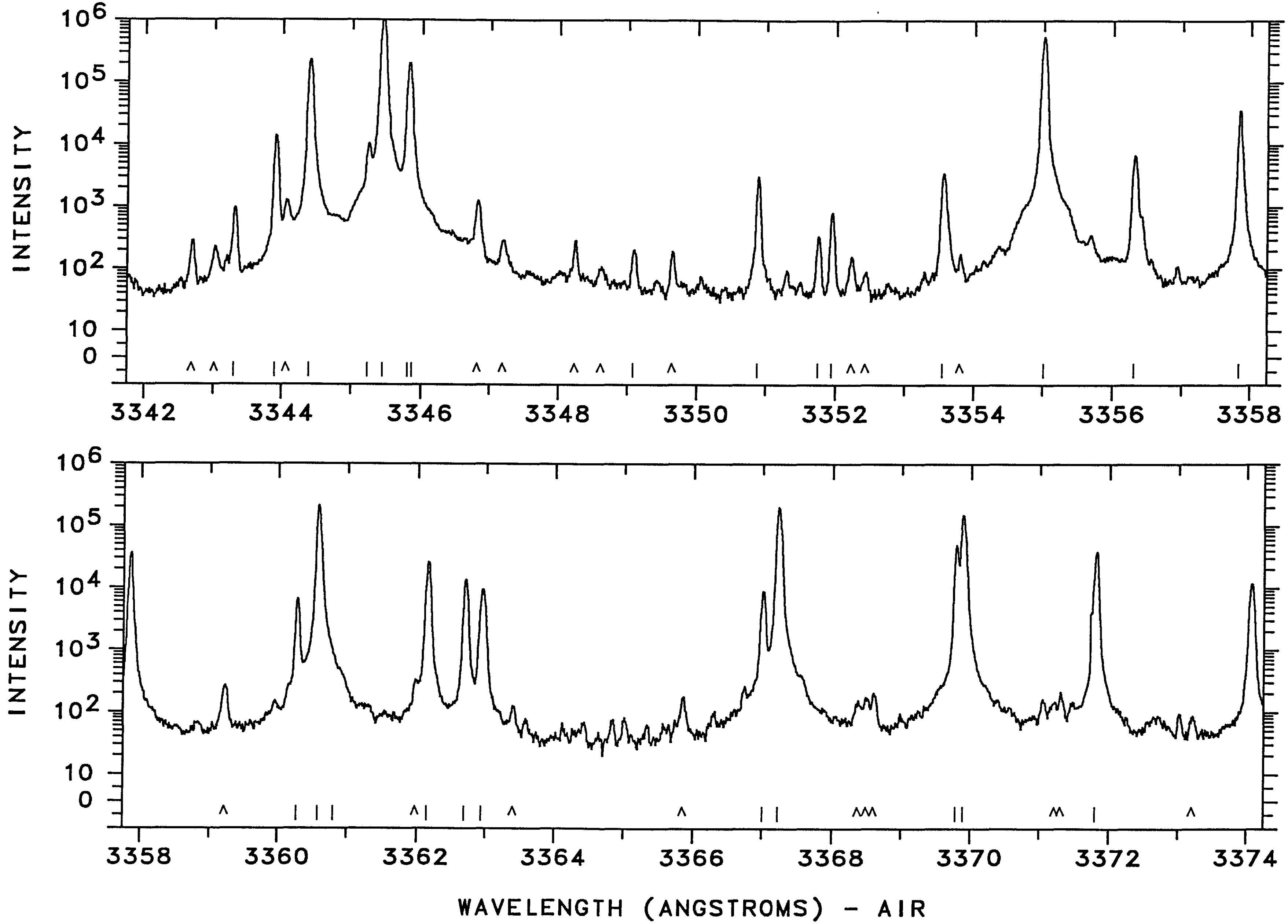
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3343.30	29902.0	960	Pt II	105086- 75184	K
3343.8961	29896.640	14000	Pt I	15501- 45398	E
3344.3956	29892.175	230000	Ne II		G
3345.2555	29884.491	10000	Pt II	101199- 71314	17
3345.4544	29882.715	1200000	Ne II		G
3345.8304	29879.356	210000	Ne II		G
3345.8678	29879.023	15000 U			
3349.08	29850.4	190			
3350.88	29834.3	3000	Pt II	101199- 71364	K
3351.7492	29826.595	320	Ne I		B
3351.94	29824.9	800	Pt II	106434- 76610	K
3353.567	29810.43	3400	Ne II		C
3355.0176	29797.539	550000	Ne II		G
3356.3078	29786.084	6800	Ne II		G

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3357.8190	29772.680	36000	Ne II		G
3360.2707	29750.958	6600	Ne II		G
3360.5977	29748.063	210000	Ne II		G
3360.8058	29746.222	1000			
3362.1623	29734.220	26000	Ne II		G
3362.7067	29729.407	14000	Ne II		G
3362.9378	29727.363	9400 L	Ne II		G
3366.9903	29691.585	8900	Pt I	13496- 43187	A
3366.9903	29691.585	8900	Ne II		A
3367.2164	29689.592	200000	Ne II		G
3369.8073	29666.766	49000	Ne I		G
3369.9068	29665.890	150000	Ne I		G
3371.797	29649.26	39000	Ne II		C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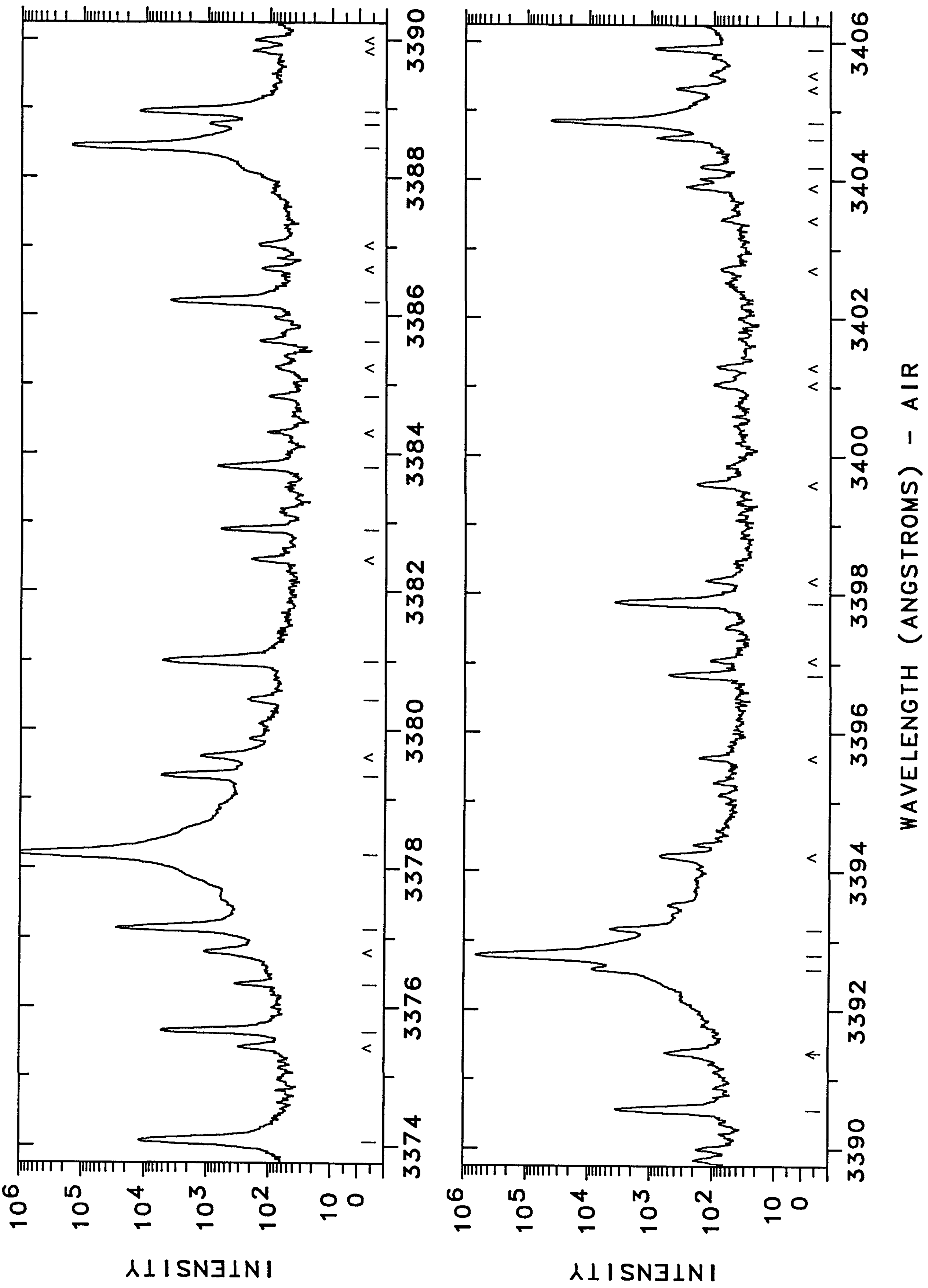
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3374.0607	29629.368	12000	Ne II		G
3375.6490	29615.427	5300	Ne I		B
3376.33	29609.5	330	Pt II	112433- 82824	K
3377.1543	29602.228	28000	Ne II		G
3378.2193	29592.895	1200000	Ne II		G
3379.3209	29583.249	5500	Ne II		G
3380.44	29573.5	200			
3380.99	29568.6	5200	Pt II	101517- 71948	K
3382.89	29552.0		Ag I		
3383.8121	29543.986	670	Pt II	36484- 66028	15
3384.82	29535.2	83	Pt II	46046- 75581	K
3385.62	29528.2	130			
3386.202	29523.13	4000	Ne II		C
3388.4169	29503.837	150000	Ne II		G

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3388.77	29500.8	920	Pt II	105962- 76461	K
3388.9431	29499.256	12000	Ne II		G
3390.552	29485.26	3500	Ne II		C
3391.38	29478.1	550	Pt II	64003- 93482	KM
3392.606	29467.41	8700	Ne II		C
3392.8006	29465.717	650000	Ne II		G
3393.1812	29462.412	4400	Ne II		G
3396.83	29430.8		Rh I		
3397.866	29421.79	3800	Ne II		C
3404.18	29367.2	140			
3404.59	29363.7		Pd I		
3404.8208	29361.696	42000	Ne II		G
3405.89	29352.5	830	Pt II	105962- 76610	K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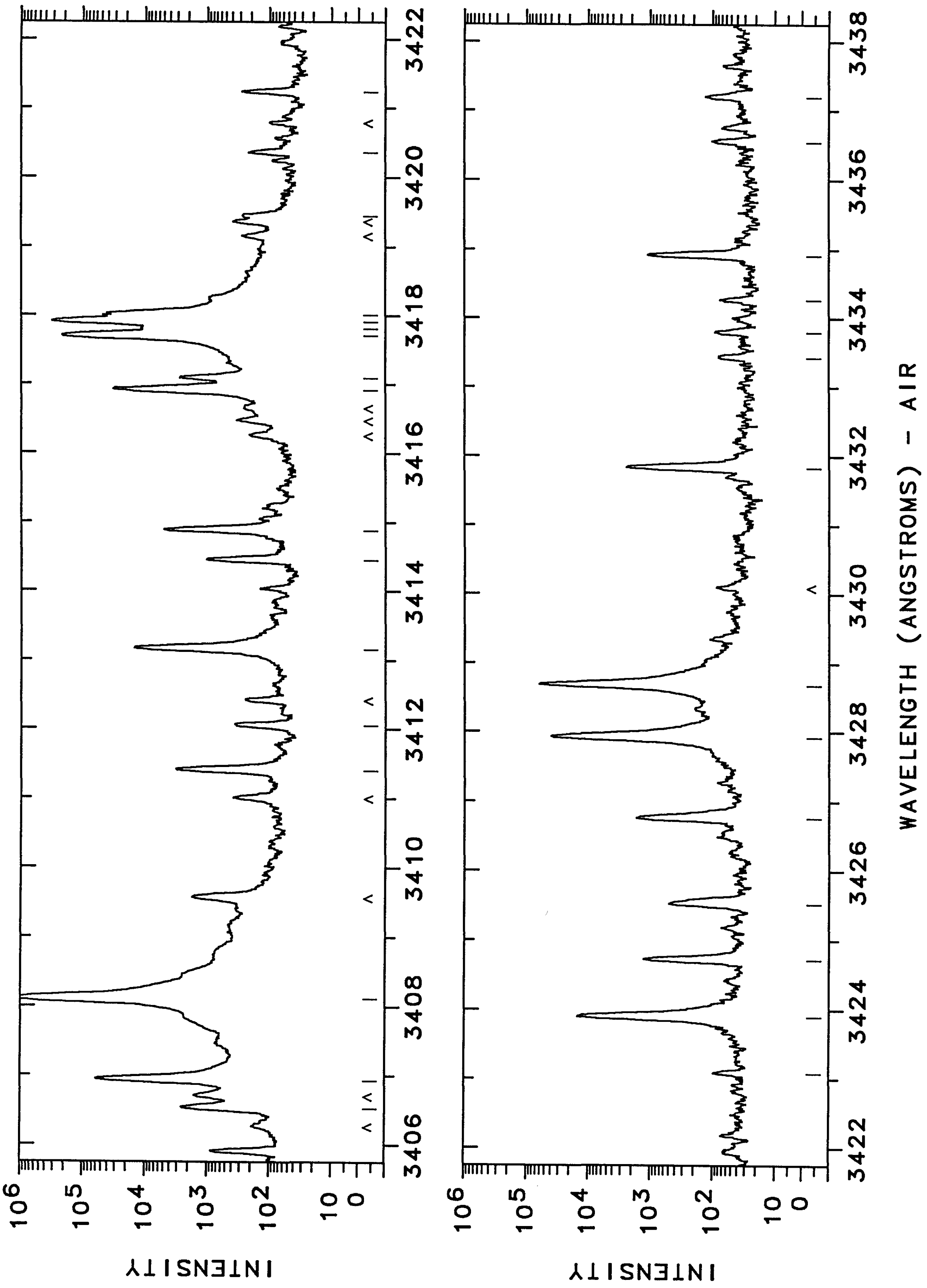
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3406.52	29347.1	2500	Pt I	64668- 35321	N
3406.9451	29343.389	60000	Ne II		G
3408.1308	29333.181	1300000 C	Pt I	823- 30156	E
3411.3604	29305.412	3200	Ne II		G
3412.0248	29299.705	350	Pt II	110158- 80858	K
3413.1453	29290.087	15000	Ne II		G
3414.4564	29278.841	1000	Pt I	68094- 38815	N
3414.8886	29275.135	5000	Ne II		G
3416.9126	29257.794	33000	Ne II		G
3417.0828	29256.337	2800	Pt I	68072- 38815	N
3417.6870	29251.165	220000	Ne II		G
3417.8034	29250.169	12000 P	Pt II	101199- 71948	19
3417.9029	29249.318	320000	Ne I		N
3418.0052	29248.441	35000 P	Ne I		G
3419.44	29236.2	250			
3420.3407	29228.471	200	Pt I	15501- 44730	N

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3421.2218	29220.943	260	Pd I		
3423.08	29205.1	74			
3423.9126	29197.981	15000	Ne I		B
3424.7283	29191.027	1300	Pt I	68006- 38815	N
3425.5299	29184.195	480	Pt I	64505- 35321	E
3426.7263	29174.006	1600 L	Pt I	18566- 47740	E
3427.9268	29163.790	40000	Pt I	13496- 42660	E
3428.6850	29157.340	62000	Ne II		G
3431.8551	29130.408	2400	Pt I	21967- 51097	E
3433.42	29117.1	57			
3433.79	29114.0	70	Pt II	121651- 92537	K
3434.26	29110.0	54			
3434.8865	29104.701		Rh I		
3436.54	29090.7	79	Pt I	65387- 36296	N
3437.19	29085.2	110			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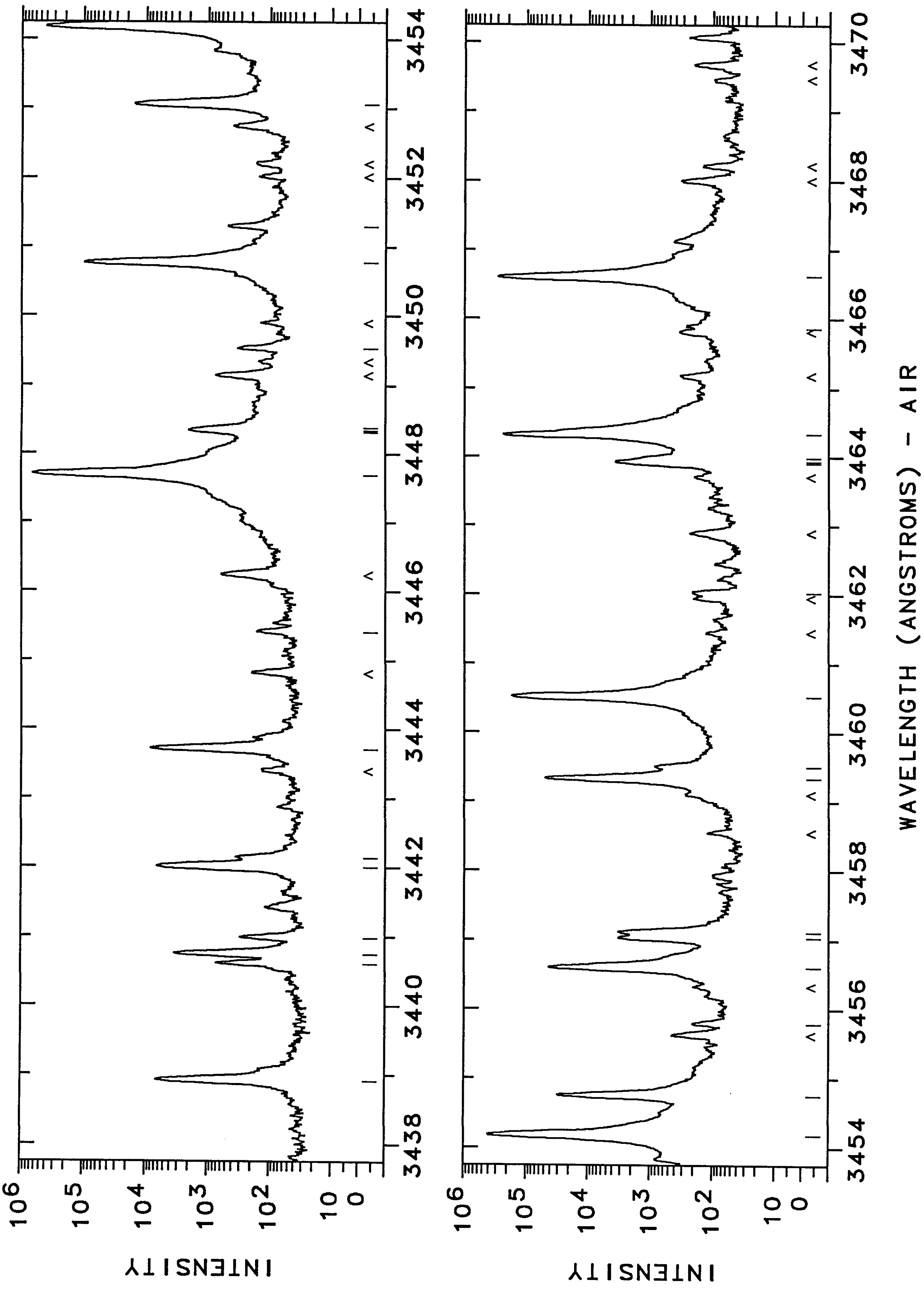
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3438.9331	29070.453	6600	Ne II		G
3440.6059	29056.320		Fe I		R
3440.7474	29055.125	3400	Ne II		G
3440.9887	29053.088		Fe I		R
3441.9762	29044.753	6500	Ne II		G
3442.1028	29043.685	330			
3443.7065	29030.159	8200	Ne II		G
3445.41	29015.8	140			
3447.7022	28996.516	660000	Ne I		G
3448.3169	28991.348	700 U	Pt I	64312- 35321	H
3448.3424	28991.133	2000	Pt I	64312- 35321	H
3448.3817	28990.803	600 P	Pt I	64312- 35321	H
3449.5082	28981.336	310			
3450.7642	28970.788	97000	Ne I		G
3451.2854	28966.413	460			
3453.0685	28951.455	15000	Ne II		G
3454.1940	28942.022	410000	Ne I		G
3454.7720	28937.180	30000	Ne II		G
3455.7881	28928.672	190	Pt II	48591- 77519	K
3456.6081	28921.809	43000	Ne II		G
3457.0079	28918.464	3300	Ne II		G
3457.084	28917.83	3300	Ne II		C
3459.3197	28899.140	50000	Ne II		G
3459.4946	28897.679	820	Pt I	26638- 55536	E
3460.5233	28889.089	170000	Ne I		G
3462.03	28876.5		Rh I		
3463.9094	28860.849	1200 U	Pt I	64182- 35321	H
3463.9340	28860.644	3600 P	Pt I	64182- 35321	H
3463.9873	28860.200	1000	Pt I	64182- 35321	H
3464.3377	28857.281	240000	Ne I		G
3465.8607	28844.601		Fe I		R
3466.5778	28838.634	290000	Ne I		G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WAVELENGTH (ANGSTROMS) - AIR

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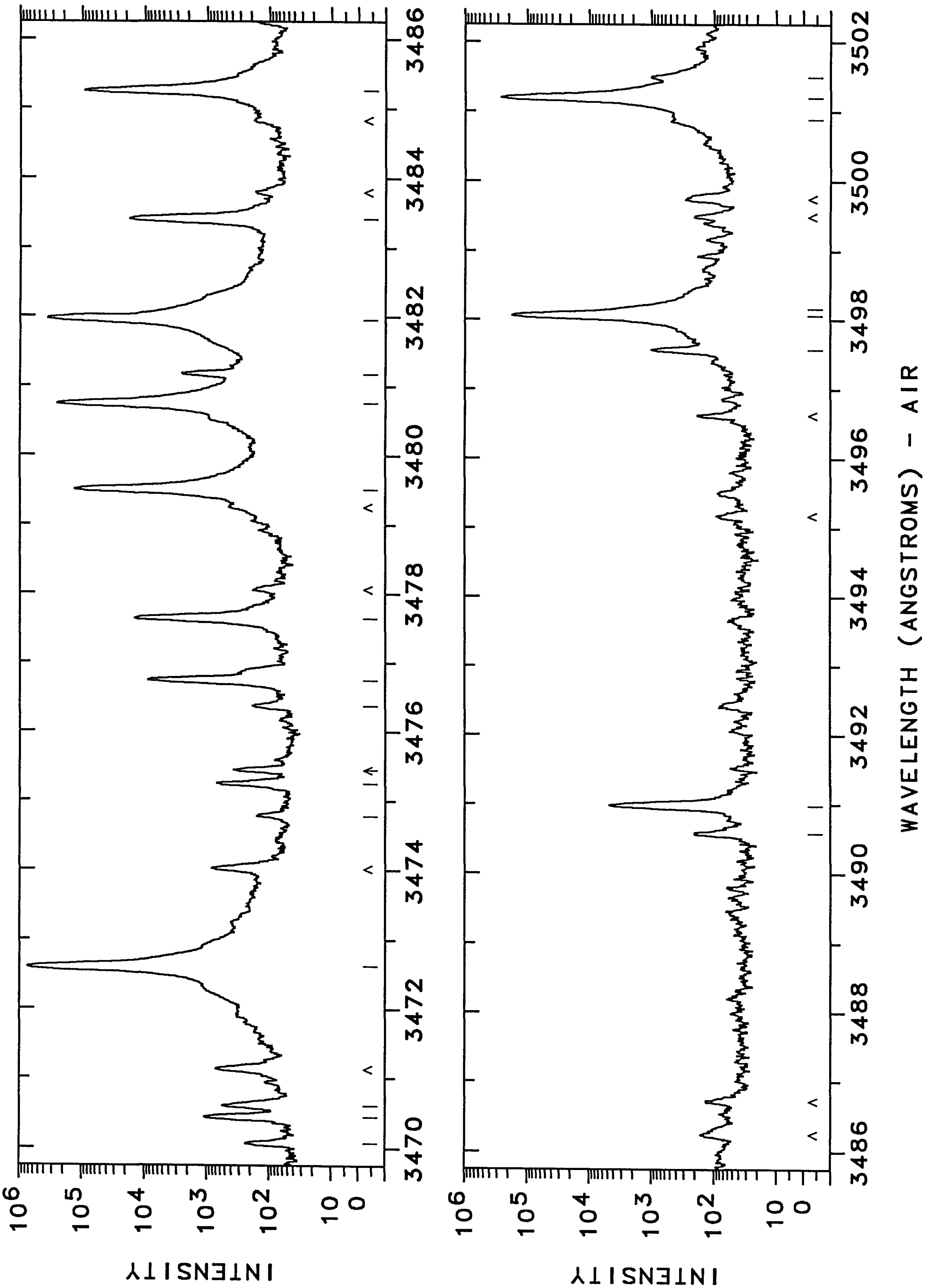
3470.07	28809.6	210			
3470.4444	28806.505	1100			
3470.6071	28805.154	530			
3472.5701	28788.871	750000	Ne I		G
3474.78	28770.6		Rh I		
3475.241	28766.75	670	Ne II		C
3475.4502	28765.015		Fe I		MR
3476.37	28757.4	160			
3476.7600	28754.179	8800	Pt I	6567- 35321	
3477.6466	28746.848	14000	Ne II		G
3479.5193	28731.377	130000	Ne II		G
3480.7181	28721.482	250000	Ne II		G
3481.1429	28717.977	2500	Pt I	68912- 40194	AN
3481.1429	28717.977		Pd I		A
3481.9337	28711.455	360000	Ne II		G
3483.4231	28699.179	18000	Pt I	10116- 38815	E
3485.2641	28684.020	92000	Pt I	10131- 38815	E
3490.5739	28640.388		Fe I		R
3490.9998	28636.894	4700 C	Pt I	68831- 40194	N
3497.5624	28583.163	980	Pt I	62705- 34122	N
3498.0635	28579.068	180000	Ne I		G
3498.1646	28578.243	2300 P	Pt I	26638- 55216	E
3500.8873	28556.017	600 P	Pt II	114256- 85700	K
3501.2158	28553.338	270000	Ne I		G
3501.4968	28551.047	980	Pt I	65395- 36844	N



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WAVELENGTH (ANGSTROMS) - AIR

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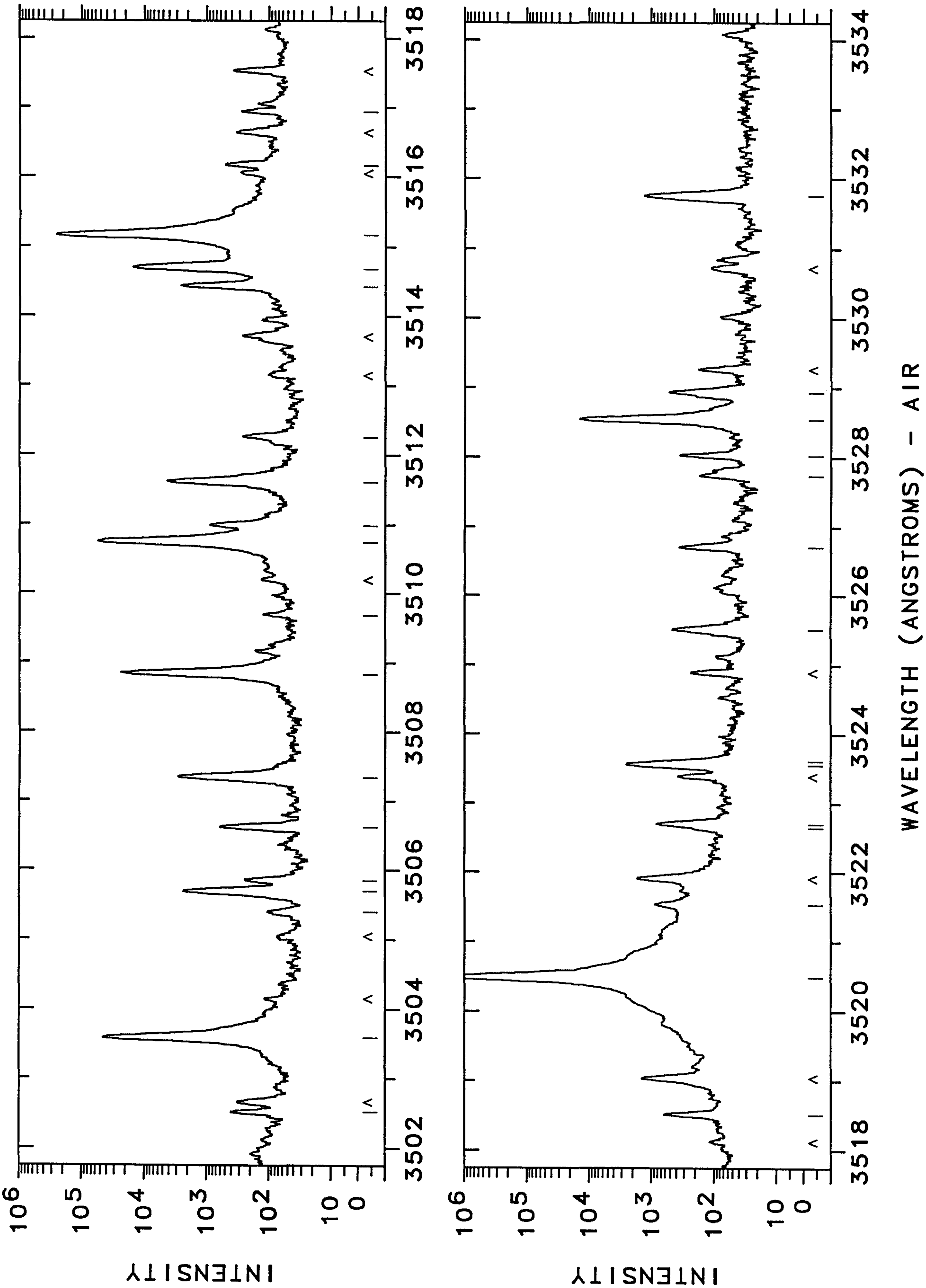
3502.5154	28542.744		Rh I		
3503.5820	28534.055	45000	Ne II		G
3505.40	28519.3	80	Pt II	41434- 69953	K
3505.6874	28516.919	2300 C	Pt I	65361- 36844	N
3505.85	28515.6	220	Pt II	116689- 88173	K
3506.6335	28509.226	580	Pt I	68703- 40194	N
3507.364	28503.29	2800	Ne II		C
3508.8500	28491.217	24000	Pt II	101517- 73026	K
3509.68	28484.5	98			
3510.7214	28476.029	54000	Ne I		G
3510.9507	28474.170	860			
3511.5797	28469.07	4200	Ne II		C
3512.25	28463.6	240			
3514.4480	28445.835	2600	Pt I	62567- 34122	N
3514.7134	28443.688	15000	Pt I	15501- 43945	E
3515.1899	28439.832	260000	Ne I		G
3516.1820	28431.808	480	Pt I	66967- 38536	N

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3516.9422	28425.663		Pd I		
3518.4850	28413.199	600			
3520.4707	28397.172	1700000	Ne I		G
3521.54	28388.6	850			
3522.6501	28379.604	350			
3522.724	28379.01	550	Ne II		C
3523.5520	28372.341	400 U	Pt I	64668- 36296	H
3523.5736	28372.167	2000 P	Pt I	64668- 36296	H
3523.6105	28371.870	350 P	Pt I	64668- 36296	H
3525.51	28356.6	430			
3526.71	28346.9	330	Pt II	42031- 70379	K
3527.74	28338.7	150	Pt II	111162- 82824	K
3528.03	28336.3		Rh I		
3528.5348	28332.276	14000	Pt I	21967- 50299	N
3528.9426	28329.002	500	Pt II	121651- 93322	K
3531.7516	28306.471	1300 L	Pt I	13496- 41802	E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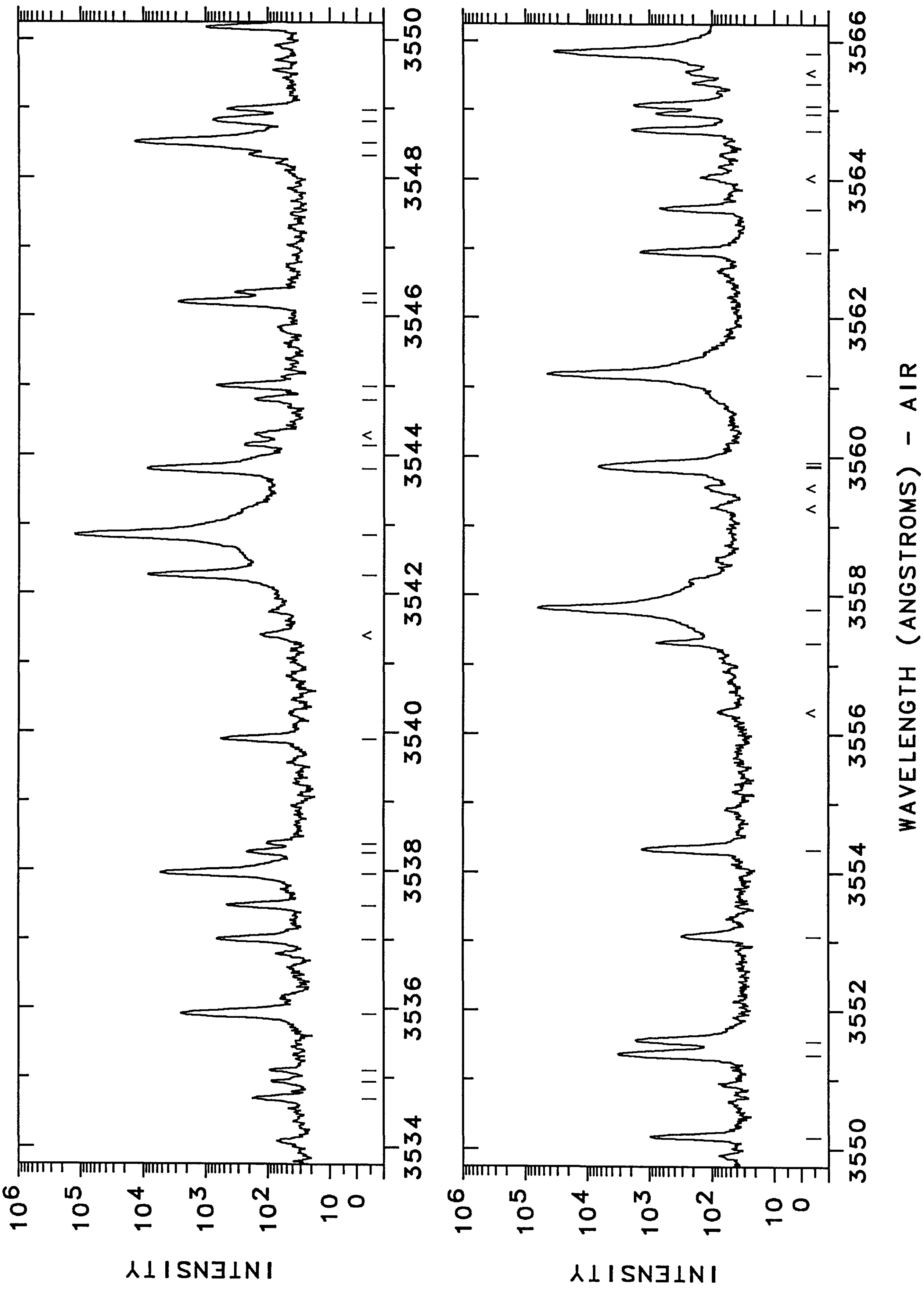
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3534.69	28282.9	150			
3534.94	28280.9	62			
3535.10	28279.7	68			
3535.8934	28273.315	2500 L	Pt II	36484- 64757	16
3537.002	28264.45	630	Ne II		C
3537.5014	28260.463	430	Pt II	110158- 81897	K
3537.9757	28256.674	5300	Ne II		G
3538.26	28254.4	190			
3538.39	28253.4	78			
3539.897	28241.34	550	Ne II		C
3542.2406	28222.654	8500	Ne II		G
3542.8452	28217.838	130000	Ne II		G
3543.7907	28210.310	8700	Ne II		G
3544.14	28207.5	210			
3544.815	28202.16	140	Ne II		C
3545.0094	28200.612	650	Pt I	26638- 54839	E
3546.2099	28191.065	2700	Ne II		G
3546.33	28190.1	320	Pt II	111162- 82972	K
3548.32	28174.3	180			
3548.5211	28172.705	14000	Pt II	101199- 73026	23
3548.8143	28170.377	740	Pt I	60790- 32620	E
3548.9635	28169.193	430	Pt II	121651- 93482	K
3550.1696	28159.624	950	Pt I	68947- 40787	N
3551.3553	28150.222	3200 L	Pt II	37877- 66028	22
3551.557	28148.62	1600 H	Ne II		C
3553.07	28136.6		Pd I		
3554.3563	28126.455	1300			
3557.313	28103.08	750	Ne II		C
3557.8055	28099.188	64000	Ne II		G
3559.8455	28083.086	2500 P	Ne II		A
3559.8455	28083.086	2500 P	Pt I	64379- 36296	AH
3559.8748	28082.855	3500 P	Pt I	64379- 36296	H
3559.9178	28082.515	1000 P	Pt I	64379- 36296	H
3561.1990	28072.413	46000	Ne II		G
3562.9541	28058.584	1400	Ne I		B
3563.5851	28053.617	660	Pt I	65395- 37342	N
3564.6881	28044.936	1900	Pt I	65387- 37342	N
3564.9264	28043.062	760	Pt I	21967- 50010	N
3565.0472	28042.111	1800			
3565.3790	28039.502		Fe I		R
3565.8232	28036.008	34000	Ne II		G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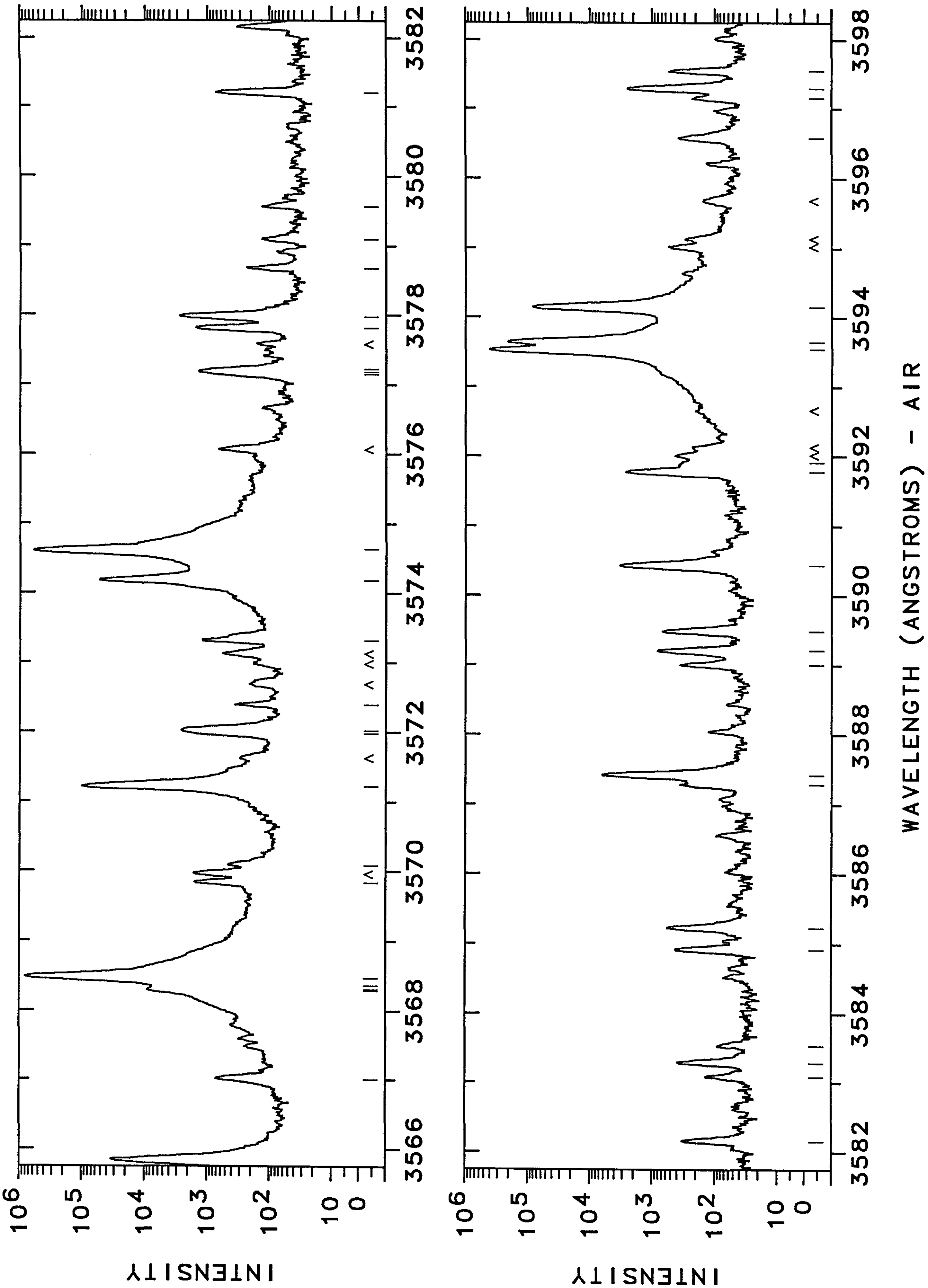
WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3567.00	28026.8	690			
3568.2840	28016.675	3000 U	Pt I	64312- 36296	H
3568.3094	28016.476	4500 P	Pt I	64312- 36296	H
3568.3594	28016.083	3000 P	Pt I	64312- 36296	H
3568.5022	28014.962	820000	Ne II		G
3569.8461	28004.416	1600			
3570.0985	28002.436		Fe I		R
3571.2311	27993.555	100000	Ne II		G
3571.9845	27987.651	1500 C	Pt II	29030- 57018	12
3572.026	27987.33	1200 P	Ne II		C
3572.378	27984.57	330	Ne II		C
3573.3068	27977.295	1200	Pt I	68947- 40970	N
3574.1826	27970.440	53000	Ne II		G
3574.6122	27967.078	610000	Ne II		G
3577.1483	27947.251	250 P	Pt II	23461- 51408	H
3577.1960	27946.878	900 P	Pt II	23461- 51408	H
3577.2202	27946.689	500 U	Pt II	23461- 51408	H
3577.8151	27942.042	1500	Pt I	68912- 40970	N
3577.9772	27940.776	2800	Ne II		G
3578.6866	27935.238		Cr I		
3579.09	27932.1	110			
3579.56	27928.4	110			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3581.1928	27915.689		Fe I		R
3582.146	27908.26	310	Ne II		C
3583.08	27901.0		Rh I		
3583.3024	27899.254	360			
3583.53	27897.5	64			
3584.932	27886.57	400	Ne II		C
3585.241	27884.17	540	Ne II		C
3587.2691	27868.405	330	Pt II	105388- 77519	37
3587.4045	27867.353	6300	Pt I	18566- 46433	E
3588.9941	27855.011	330			
3589.1981	27853.428	810	Pt I	18566- 46419	N
3589.4879	27851.179	650	Ne II		
3590.450	27843.72	3300	Ne II		C
3591.796	27833.28	2700	Ne II		C
3591.9077	27832.417	300	Pt I	64128- 36296	E
3593.5252	27819.889	410000	Ne I		G
3593.6385	27819.012	210000	Ne I		G
3594.1582	27814.990	83000	Ne II		G
3596.5531	27796.469	350	Pt I	65387- 37590	N
3597.15	27791.9		Rh I		
3597.2858	27790.807	2400	Pt I	65132- 37342	N
3597.5403	27788.841	510	Pt I	68759- 40970	N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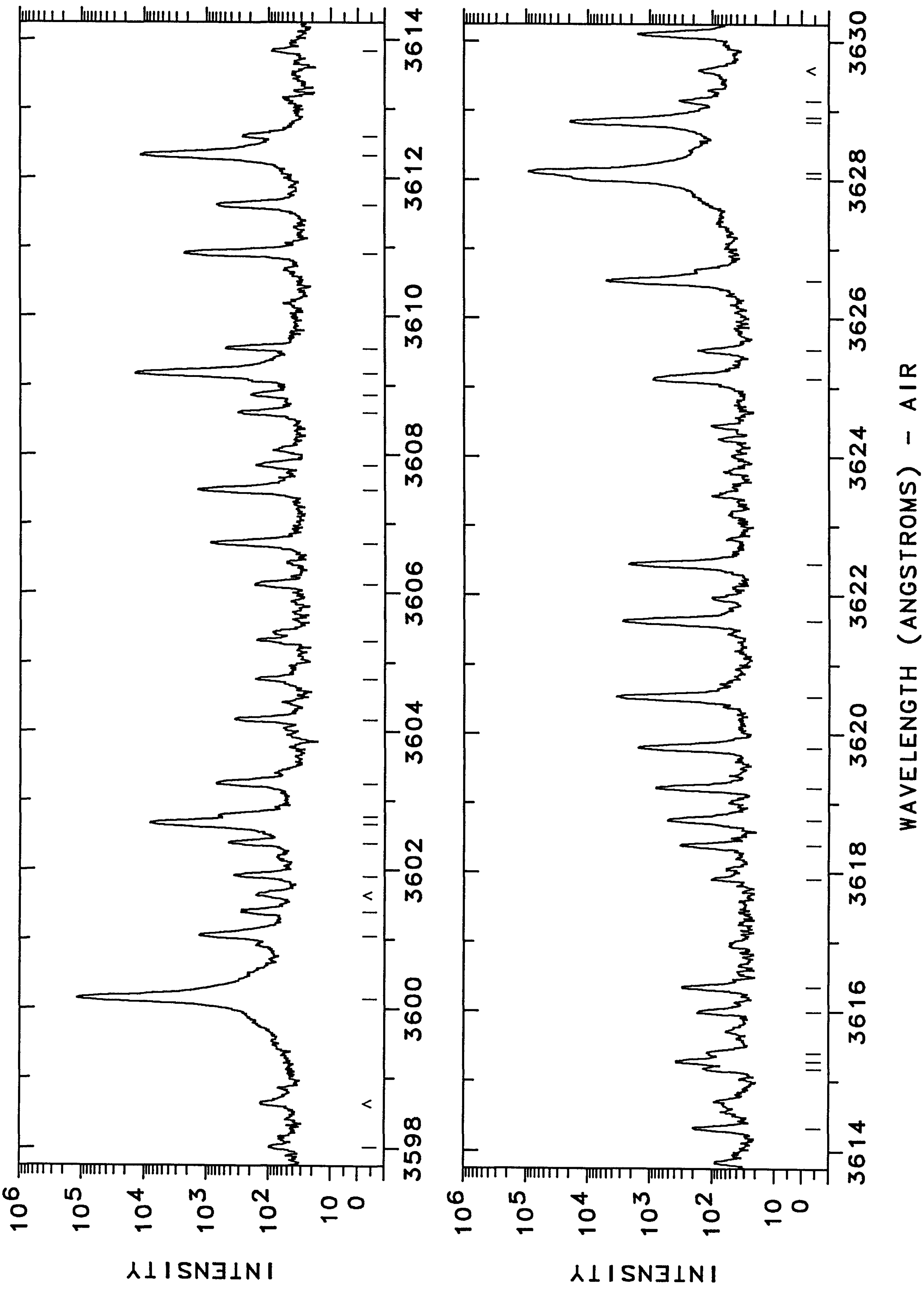
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3598.02	27785.1	71			
3600.1682	27768.557	120000	Ne I		G
3601.056	27761.71	1300	Ne II		C
3601.4005	27759.057	250	Pt I	68275- 40516	N
3601.9340	27754.945	330 L			
3602.3841	27751.477	420 L	Pt II	105794- 78043	K
3602.6582	27749.366	8100			
3602.771	27748.50	630	Ne II		C
3603.236	27744.92	680	Ne II		C
3604.1641	27737.772	330	Pt I	60357- 32620	E
3604.76	27733.2	140	Pt I	68703- 40970	N
3605.31	27729.0		Cr I		
3606.12	27722.7	150			
3606.7395	27717.966	840	Pt I	65308- 37590	N
3607.504	27712.09	1400	Ne II		C
3607.8646	27709.323	140	Pt II	37877- 65587	33
3608.605	27703.64	290	Ne II		C
3608.8592	27701.686		Fe I		R
3609.1783	27699.236	14000	Ne I		G
3609.5443	27696.428		Pd I		
3610.9063	27685.982	2300	Pt I	15501- 43187	E
3611.599	27680.67	650	Ne II		C
3612.326	27675.10	11000	Ne II		C
3612.606	27672.96	240	Ne II		C
3613.84	27663.5	65			
3614.33	27659.8	180			
3615.17	27653.3	110	Pt I	68169- 40516	N
3615.28	27652.5	350	Pt I	10116- 37769	N
3615.40	27651.6	95			
3615.99	27647.1	150			
3616.348	27644.32	270	Ne II		C
3617.91	27632.4	78			
3618.3806	27628.794	300	Pt II	121651- 94022	K
3618.7603	27625.895	500	Ne II		A
3618.7603	27625.895		Fe I		A
3619.2212	27622.377	780	Pt II	110158- 82535	K
3619.8007	27617.955	1500	Pt I	65387- 37769	N
3620.5414	27612.305	3500			
3621.6546	27603.818	2800	Pt I	18566- 46170	E
3622.4709	27597.598	2200	Pt I	64379- 36781	N
3625.1223	27577.413	870 L			
3625.54	27574.2	140			
3626.5363	27566.661	5000	Ne II		G
3628.0329	27555.290	15000	Ne II		G
3628.1107	27554.699	91000	Pt I	6567- 34122	E
3628.8660	27548.965	20000	Pt I	64330- 36781	N
3628.9097	27548.632	400 U			
3629.1744	27546.623	310 W	Pt II	105066- 77519	38



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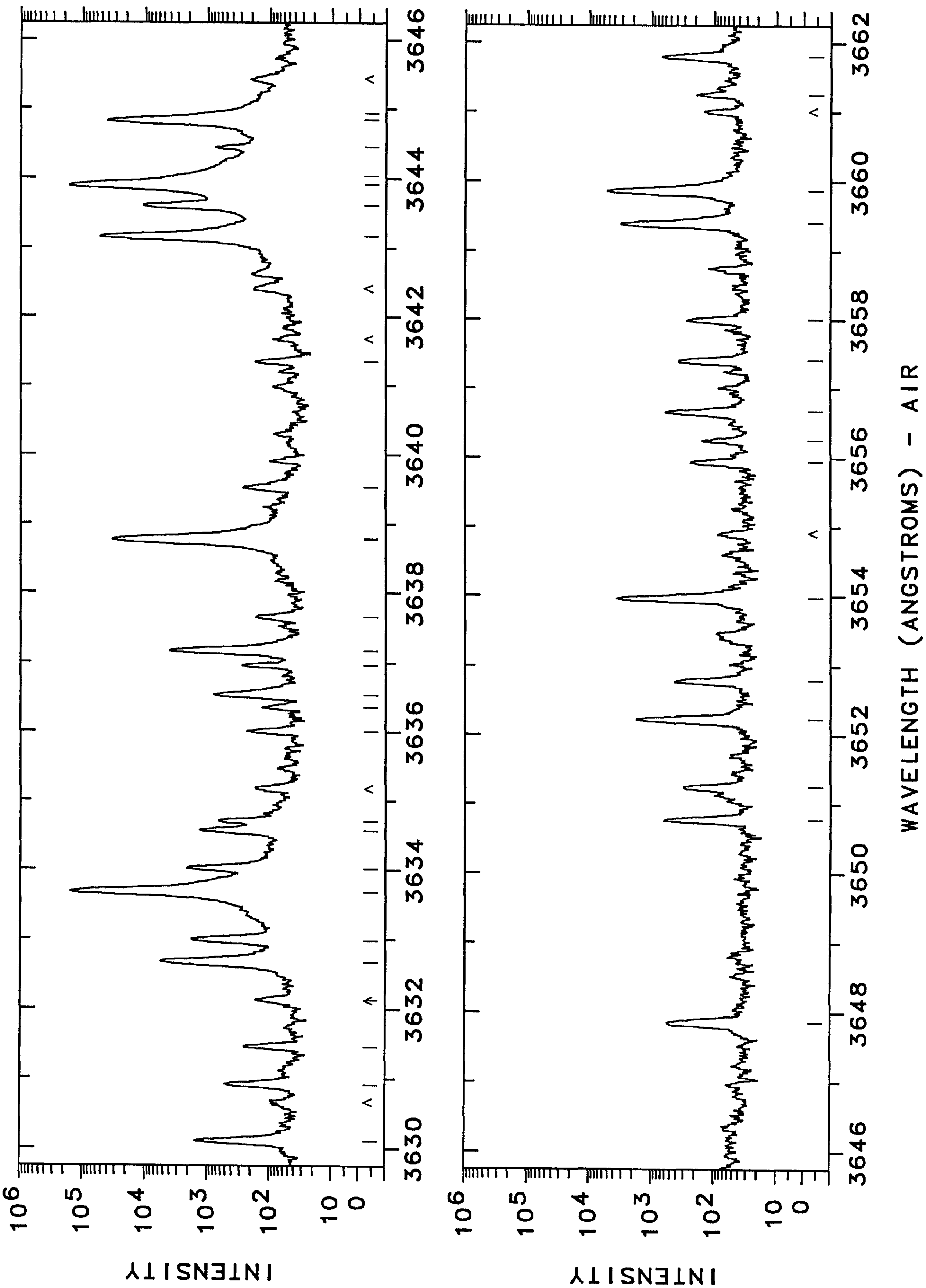
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3630.1180	27539.463	1500	Pt I	65308- 37769	N
3630.9299	27533.305	480	Ne II		
3631.4632	27529.262		Fe I		R
3632.13	27524.2	140	Pt II	54373- 81897	KM
3632.6804	27520.038	5500	Ne II		G
3632.9823	27517.751	1800 H	Pt II	101517- 73999	K
3633.6637	27512.591	160000	Ne I		G
3634.0023	27510.027	2100	Pt II	105962- 78452	K
3634.568	27505.75	1300	Ne II		C
3634.6874	27504.843		Pd I		
3636.01	27494.8	210	Pt I	26638- 54133	N
3636.36	27492.2	110			
3636.5559	27490.711	750	Pt I	68006- 40516	N
3636.9875	27487.449	250	Pt I	68275- 40787	N
3637.1933	27485.893	4000	Pt I	64267- 36781	N
3637.66	27482.4	140			
3638.7879	27473.848	34000	Pt I	13496- 40970	E
3638.7879	27473.848	34000	Pt I	10116- 37590	E
3639.54	27468.2	240			
3641.35	27454.5	150	Pt II	110146- 82692	K
3643.1667	27440.828	53000	Pt I	64222- 36781	N
3643.6290	27437.346	11000	Pt II	101199- 73761	32

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3643.9291	27435.087	170000	Ne II		G
3644.0403	27434.249	1000 P	Pt II	110258- 82824	K
3644.4680	27431.030	730			
3644.8566	27428.105	39000	Ne II		G
3644.9425	27427.459	550 U			
3647.8477	27405.616	W	Fe I		A
3647.8477	27405.616	520 W	Ne II		A
3650.7680	27383.695	610	Pt I	62705- 35321	N
3651.266	27379.96	280	Ne II		C
3652.2552	27372.544	1700	Pt I	26638- 54011	E
3652.812	27368.37	400	Ne II		C
3653.9828	27359.603	3600	Pt I	64141- 36781	E
3655.95	27344.9	210	Pt II	105388- 78043	K
3656.26	27342.6	120	Pt II	106434- 79092	K
3656.651	27339.64	570	Ne II		C
3657.41	27334.0	330	Pt II	110158- 82824	K
3658.01	27329.5		Rh I		
3659.4131	27319.004	3100	Pt I	21967- 49286	E
3659.8921	27315.429	5200	Ne II		G
3661.25	27305.3	160	Pt I	68275- 40970	N
3661.809	27301.13	650	Ne II		C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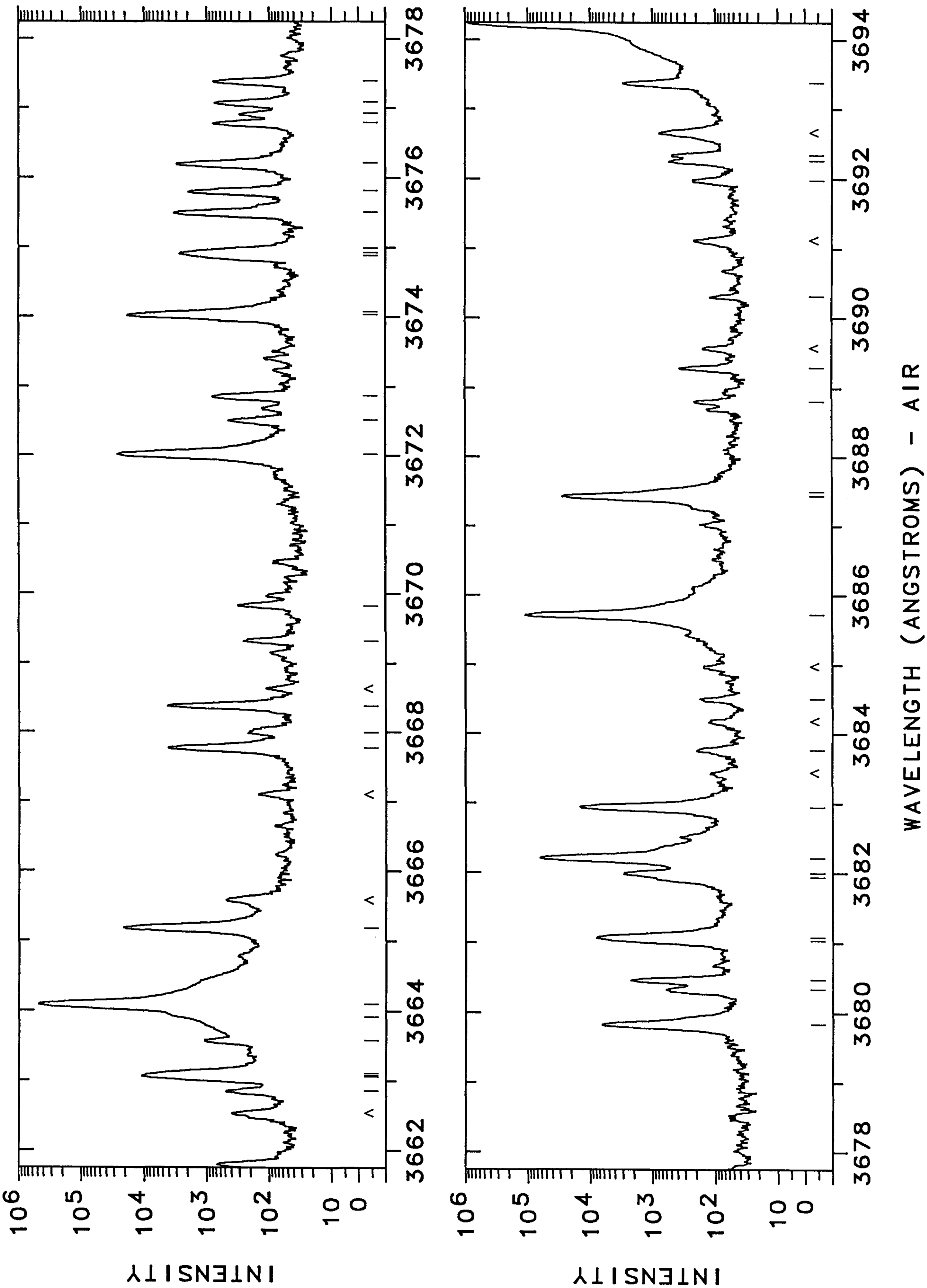
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3662.8761	27293.177	460			
3663.0602	27291.805	2500 U	Pt I	13496- 40787	H
3663.0952	27291.544	5000	Pt I	13496- 40787	H
3663.1071	27291.455	4400 U	Pt I	13496- 40787	H
3663.5492	27288.162	1100	Pt I	59908- 32620	E
3663.9192	27285.407	4000 P	Pt II	110258- 82972	K
3664.0740	27284.254	490000	Ne II		G
3665.1680	27276.110	21000	Pt II	101517- 74241	K
3667.7969	27256.560	4100	Ne II		G
3668.0321	27254.813	190	Pt II	36484- 63738	17
3668.3939	27252.125	4100	Pt I	59872- 32620	E
3669.32	27245.2	230			
3669.83	27241.5	280			
3671.9990	27225.370	23000	Pt I	10116- 37342	E
3672.5042	27221.625	420			
3672.8450	27219.099	760	Pt I	68006- 40787	N
3674.0449	27210.210	18000 P	Pt I	10131- 37342	E
3674.0738	27209.996	2500 U			
3674.8829	27204.005	500	Pt II	42031- 69235	AK
3674.8829	27204.005	500	Pt I	60884- 33680	AH
3674.9388	27203.591	2700	Pt I	60884- 33680	H
3674.9872	27203.233	500	Pt I	60884- 33680	H
3675.5230	27199.268	3300	Pt II	101199- 73999	AK
3675.5230	27199.268	3300	Pt I	68169- 40970	AN
3675.8238	27197.042	1900			
3676.226	27194.07	3000	Ne II		C

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3676.804	27189.79	750	Ne II		C
3676.93	27188.9	270			
3677.090	27187.68	700	Ne II		C
3677.3943	27185.427	730	Pt II	110158- 82972	K
3679.8160	27167.536	6500	Ne II		G
3680.3319	27163.729	580	Pt I	64505- 37342	N
3680.4520	27162.842	2200	Pt I	59782- 32620	E
3681.0364	27158.530	2500 U	Ne II		G
3681.0798	27158.210	7500 P	Pt I	15501- 42660	E
3681.941	27151.86	600 P	Ne II		C
3682.0226	27151.256	2900	Ne II		G
3682.2418	27149.640	64000	Ne I		G
3682.9727	27144.252	15000	Pt I	59764- 32620	E
3683.77	27138.4	170			
3684.51	27132.9	150			
3685.7349	27123.910	110000	Ne I		G
3687.4152	27111.550	28000	Pt I	59731- 32620	E
3687.497	27110.95	350 U	Ne II		C
3688.81	27101.3	180			
3689.316	27097.58	330	Ne II		C
3690.32	27090.2	87	Pd I		
3691.98	27078.0	200	Pt I	64668- 37590	N
3692.272	27075.89	500	Ne II		C
3692.3525	27075.299		Rh I		
3693.389	27067.70	2900	Ne II		C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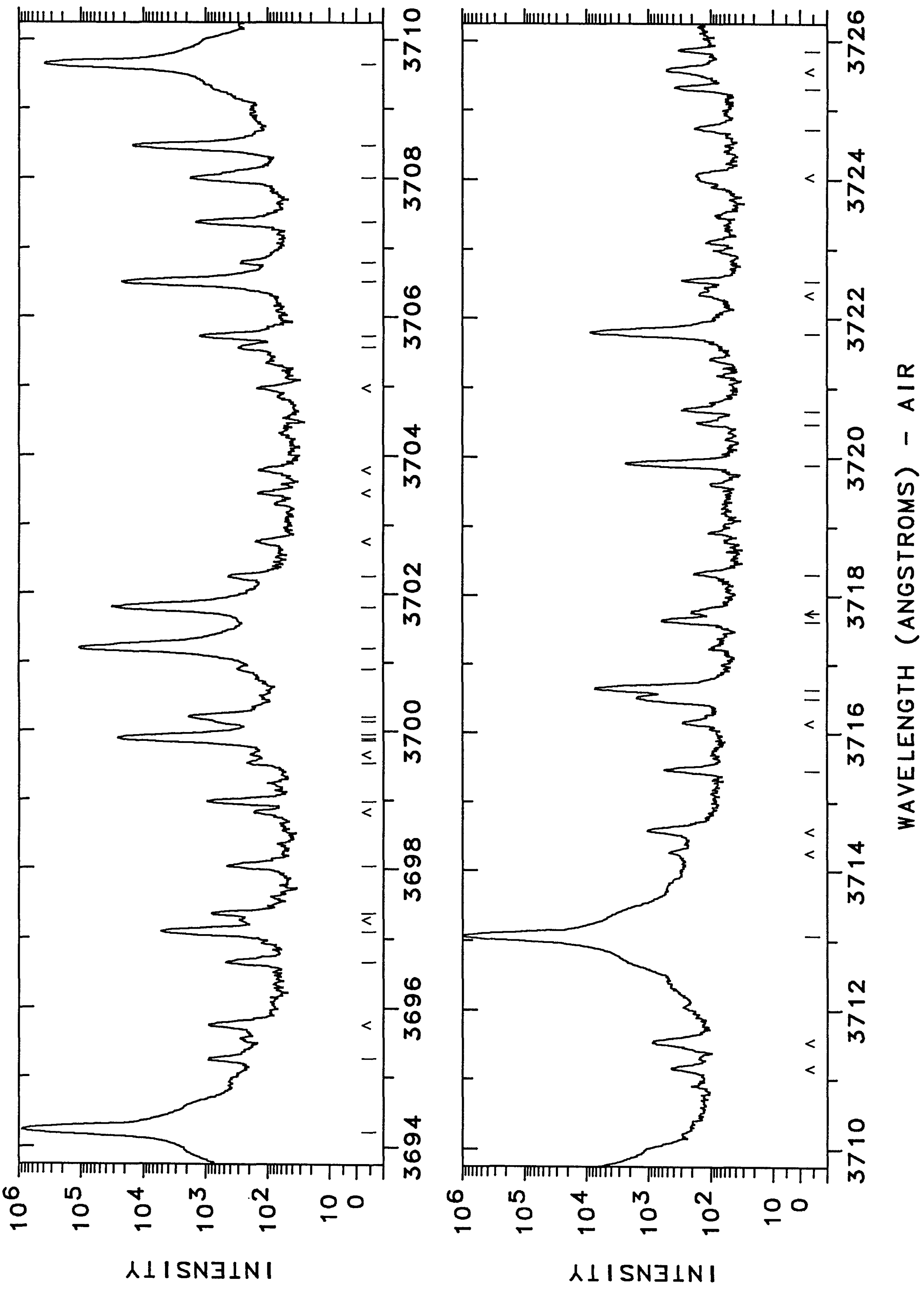
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3694.2145	27061.652	910000	Ne II		G
3695.247	27054.09	860	Ne II		C
3696.6518	27043.810	430	Pt II	105086- 78043	K
3697.1234	27040.360	5100	Ne II		G
3697.3787	27038.493	760			
3698.067	27033.46	420	Ne II		C
3698.9960	27026.671	920	Pt I	26638- 53665	N
3699.54	27022.7	180			
3699.8649	27020.325	300 U	Pt I	13496- 40516	H
3699.9126	27019.976	21000	Pt I	13496- 40516	H
3699.9539	27019.675	350 U	Pt I	13496- 40516	H
3700.1471	27018.264	450 W	Pt II	34647- 61665	16
3700.219	27017.74	1900	Ne II		C
3700.9064	27012.721	270			
3701.2242	27010.401	110000	Ne I		G
3701.7769	27006.368	31000	Ne II		G
3702.2305	27003.060	400			
3705.5660	26978.754		Fe I		R
3705.744	26977.46	1200	Ne II		C
3706.5217	26971.798	22000	Pt I	59591- 32620	N
3706.79	26969.8	230			
3707.386	26965.51	1400	Ne II		C
3707.998	26961.06	1700	Ne II		C
3708.4731	26957.606	15000	Pt II	101199- 74241	22
3709.6222	26949.256	380000	Ne II		G
3713.0826	26924.141	1000000	Ne II		G
3715.458	26906.93	520	Ne II		C
3716.5006	26899.380	1500 C	Pt I	64668- 37769	N
3716.6265	26898.469	7300	Pt II	101517- 74619	K
3717.6207	26891.276	570			
3717.75	26890.3	170	Pt II	104410- 77519	KM
3718.31	26886.3	150			
3719.9346	26874.549		Fe I		R
3720.48	26870.6	130	Pt II	105962- 79092	K
3720.717	26868.90	250	Ne II		C
3721.819	26860.94	8700	Ne II		C
3722.53	26855.8	250			
3724.72	26840.0	150	Pt I	64182- 37342	N
3725.2851	26835.951	340			
3725.85	26831.9	290	Pt I	18566- 45398	N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WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3726.871	26824.53	6800 P	Ne II		C
3727.1081	26822.825	550000	Ne II		G
3729.20	26807.8	480			
3730.07	26801.5	200			
3730.50	26798.4	410			
3730.981	26794.98	950	Ne II		C
3731.8721	26788.585	900 S	Pt I	64379- 37590	N
3732.346	26785.18	350	Ne II		C
3732.777	26782.09	650	Ne II		C
3733.8023	26774.737	190			
3734.9388	26766.589	150000	Ne II		G
3735.4749	26762.749	420	Pt II	101517- 74754	K
3735.5740	26762.039	1200 U	Pt I	60884- 34122	H
3735.6027	26761.833	3500 P	Pt I	60884- 34122	H
3735.6221	26761.694	1300 U	Pt I	60884- 34122	H
3737.1313	26750.887		Fe I		R
3738.688	26739.75	150	Ne II		C
3738.78	26739.1	420			
3739.1037	26736.776	1100 S	Pt I	64505- 37769	E
3740.5987	26726.090	3000	Ne II		G
3740.967	26723.46	130	Ne II		C
3741.1392	26722.229	800	Pt I	64312- 37590	N
3742.4511	26712.862	160	Pt I	10131- 36844	E
3742.67	26711.3	170			
3743.69	26704.0	100	Pt II	109527- 82824	K
3744.6245	26697.358	11000	Ne II		G
3745.5613	26690.681		Fe I		R
3745.8995	26688.271		Fe I		R
3746.4653	26684.241	950	Ne II		
3747.53	26676.7	350	Pt I	64267- 37590	N
3747.849	26674.39	450	Ne II		C
3748.2622	26671.449		Fe I		R
3748.7156	26668.223	1700	Pt I	60790- 34122	E
3748.7469	26668.000	400 U			
3749.4853	26662.749		Fe I		R
3749.7263	26661.035	2900	Pt II	96614- 69953	18
3750.588	26654.91	920 W	Ne II		C
3751.2459	26650.235	68000	Ne II		G
3751.6678	26647.238	310			
3751.7200	26646.868	250			
3751.9754	26645.054	300			
3752.1269	26643.978	140			
3752.6447	26640.301	300			
3753.6755	26632.986	310			
3753.7792	26632.250	35000	Ne II		G
3754.2143	26629.163	23000	Ne I		G
3754.2685	26628.779	1000 P			
3754.4527	26627.473	3400	Pt I	56784- 30156	E
3754.92	26624.2	460			
3755.0849	26622.990	280			
3756.393	26613.72	410	Ne II		C
3756.88	26610.3	260			
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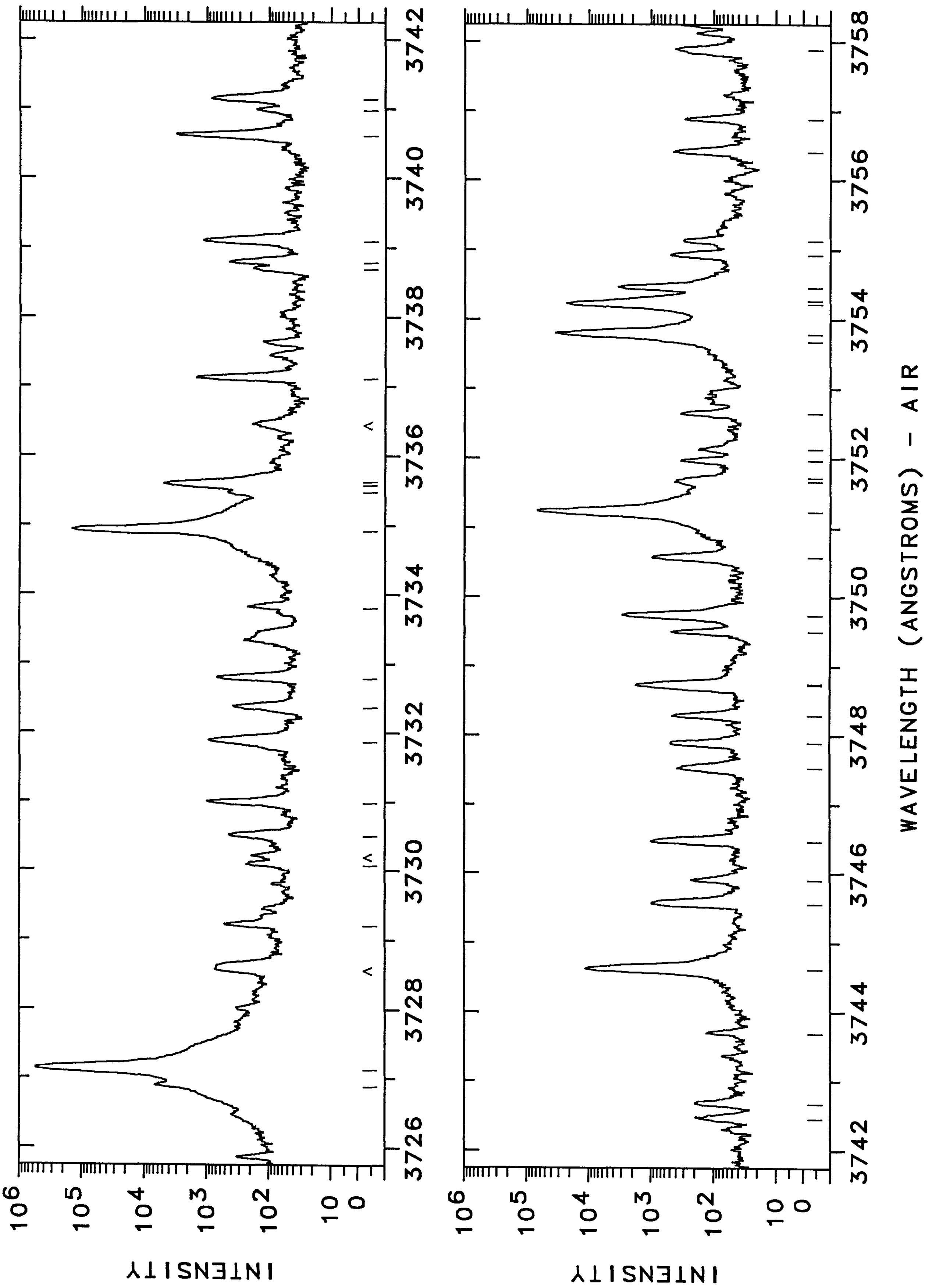
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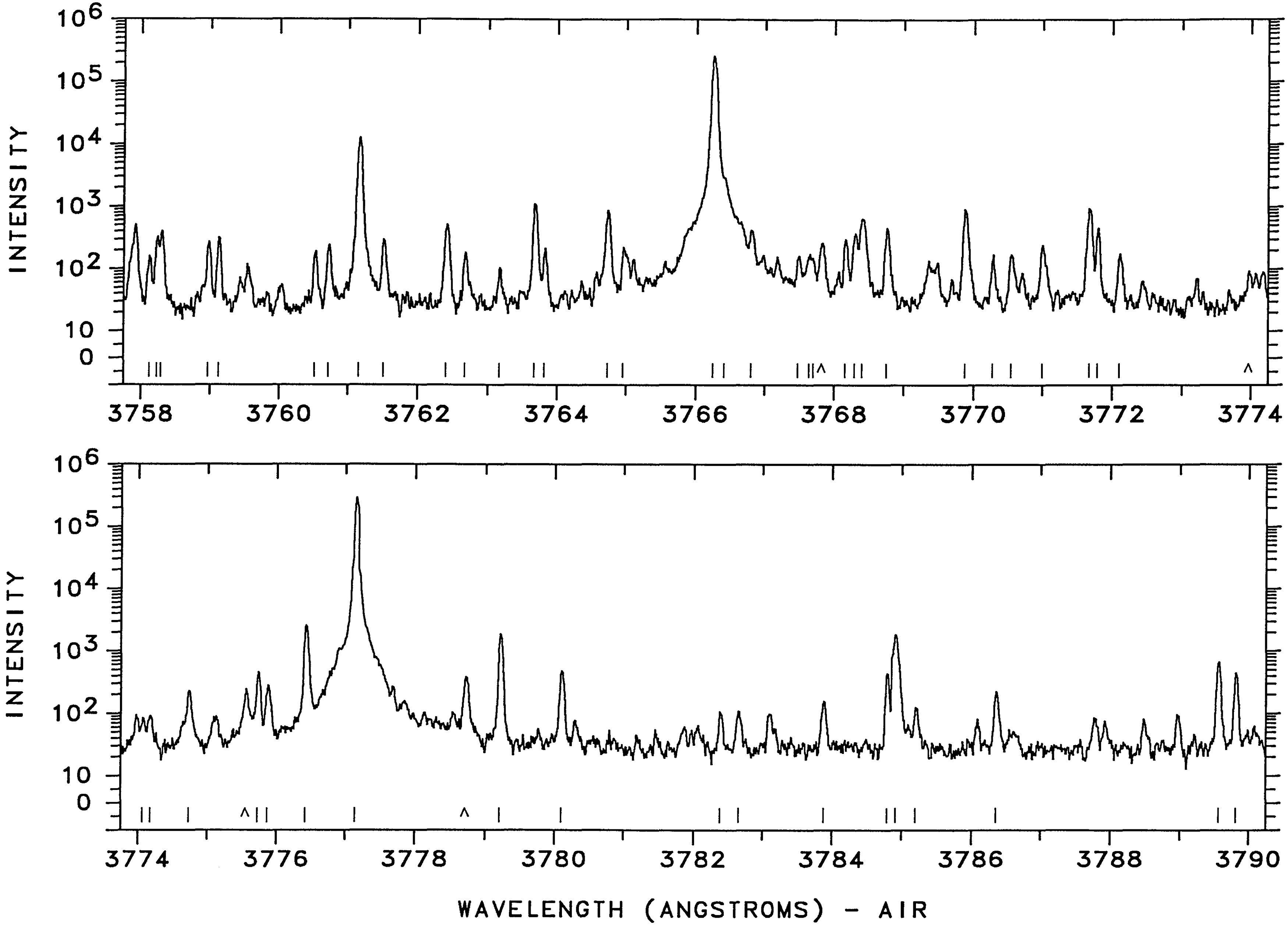
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION	CODE
3758.12	26601.5	140		
3758.2330	26600.690		Fe I	R
3758.29	26600.3	380		
3758.97	26595.5	240		
3759.12	26594.4	290		
3760.51	26584.6	160		
3760.71	26583.2	220		
3761.1616	26579.978	12000	Pt II 101199- 74619	22
3761.51	26577.5	270		
3762.40	26571.2	490	Pt I 65387- 38815	N
3762.67	26569.3	160		
3763.16	26565.9	80		
3763.646	26562.43	1100	Ne II	C
3763.7891	26561.423		Fe I	R
3764.708	26554.94	840 H	Ne II	C
3764.9789	26553.029	200		
3766.260	26544.00	260000	Ne II	C
3766.4078	26542.956	2500 U		
3766.810	26540.12	390	Ne II	C
3767.4986	26535.271	140	Pt II 109507- 82972	K
3767.6446	26534.242	150		
3767.6959	26533.881	120		
3768.1727	26530.524	270		
3768.29	26529.7	340		
3768.4048	26528.890	610 C	Pt II 24879- 51408	12
3768.7573	26526.409	430 W		
3769.8806	26518.505	890	Pt I 60640- 34122	E
3770.27	26515.8	150	Pt II 116689- 90173	K
3770.54	26513.9	150		
3770.9691	26510.851	220	Pt II 37877- 64388	36
3771.6504	26506.062	900	Ne III	L
3771.7806	26505.147	430		
3772.10	26502.9	150		
3774.06	26489.1	60		
3774.17	26488.4	66		
3774.73	26484.4	200		
3775.7464	26477.308	430		
3775.86	26476.5	250		
3776.4251	26472.550	2500	Pt I 68275- 41802	N
3777.1359	26467.568	290000	Ne II	G
3779.1920	26453.169	1800	Pt II 101199- 74745	22
3780.0762	26446.981	450		
3782.38	26430.9	83	Ne III	L
3782.65	26429.0	85		
3783.88	26420.4	130	Ne III	L
3784.7698	26414.184	410		
3784.9106	26413.201	1800 S	Pt I 64182- 37769	N
3785.19	26411.3	100		
3786.35	26403.2	200	Ne III	L
3789.5705	26380.723	640	Pt I 26638- 53019	E
3789.8282	26378.930	420		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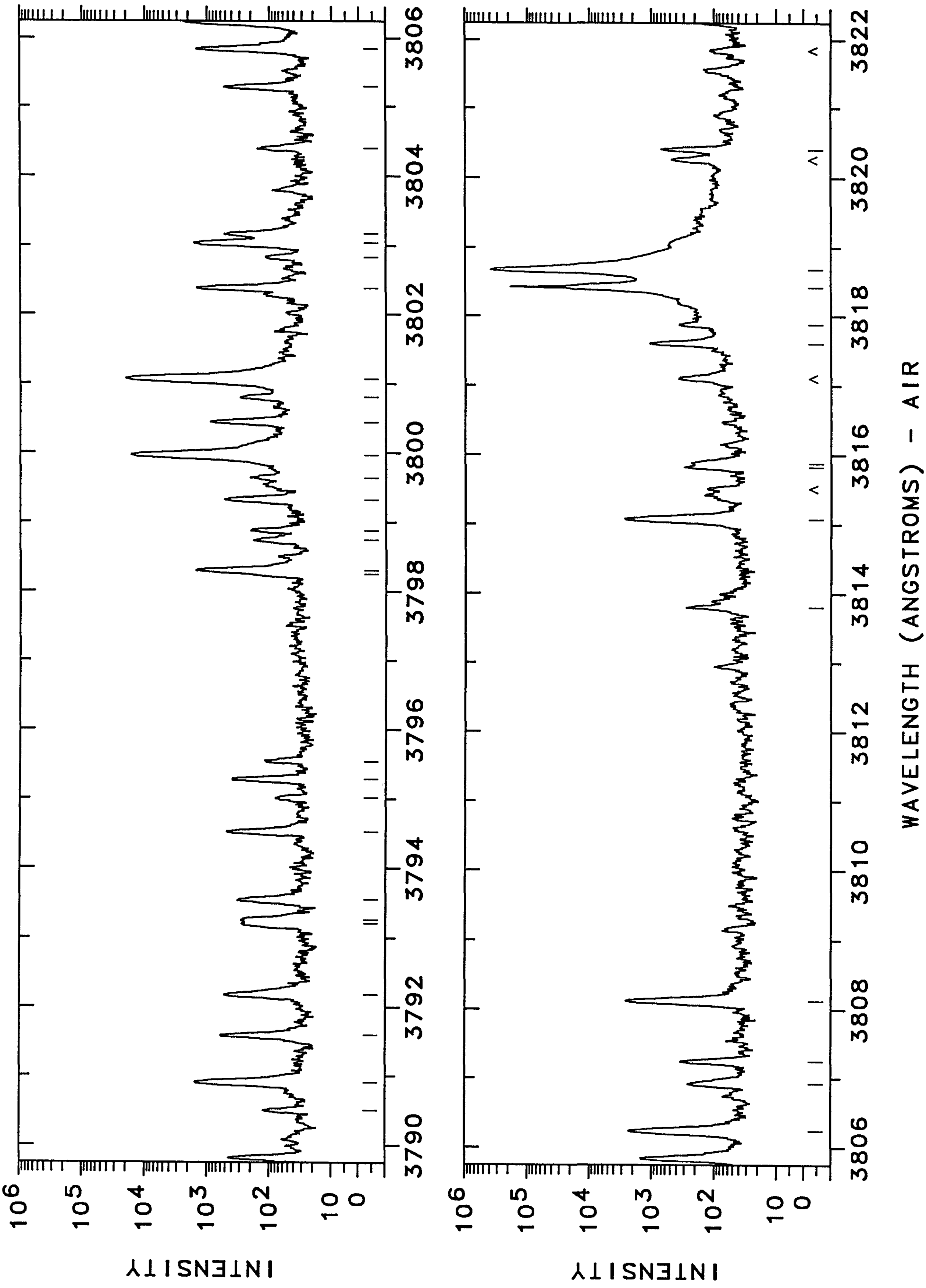
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3790.50	26374.3	98			
3790.918	26371.35	1500	Ne II		C
3791.59	26366.7	580	Pt I	68169- 41802	N
3792.161	26362.70	500	Ne II		C
3793.2055	26355.443		Rh I		
3793.26	26355.1	260	Pt II	105962- 79607	K
3793.55	26353.0	300			
3794.5166	26346.337	460	Pt II	41434- 67780	K
3795.01	26342.9	55			
3795.2677	26341.123	370			
3795.54	26339.2	95			
3798.2534	26320.418	1000			
3798.3227	26319.937	1500	Ne II		G
3798.74	26317.0	160	Pt I	65132- 38815	N
3798.88	26316.1	180			
3799.32	26313.0		Rh I		
3799.64	26310.8	180			
3799.9645	26308.566	17000	Ne II		G
3800.456	26305.16	870	Ne II		C
3800.80	26302.8	270			
3801.0723	26300.899	20000 D	Pt I	15501- 41802	E

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3802.3589	26291.999	1400	Pt I	68094- 41802	N
3802.83	26288.7	90			
3803.0226	26287.412	1600	Pt I	68947- 42660	N
3803.17	26286.4	510			
3804.40	26277.9	130			
3805.2973	26271.698	500	Pt I	62567- 36296	N
3805.8569	26267.835	1500			
3806.249	26265.13	2300	Ne II		C
3806.9248	26260.467	240	Pt II	34647- 60907	21
3807.2422	26258.278	320			
3808.1298	26252.157	2600	Pt I	68912- 42660	N
3813.8174	26213.008	250			
3815.0673	26204.420	2700 L	Pt I	16983- 43187	N
3815.8403	26199.112		Fe I		R
3815.88	26198.8	200			
3817.5962	26187.062	1000	Pt II	105794- 79607	K
3817.8859	26185.075	330			
3818.4236	26181.388	34000	Ne II		G
3818.6874	26179.579	380000	Pt I	10116- 36296	E
3820.4254	26167.670		Fe I		R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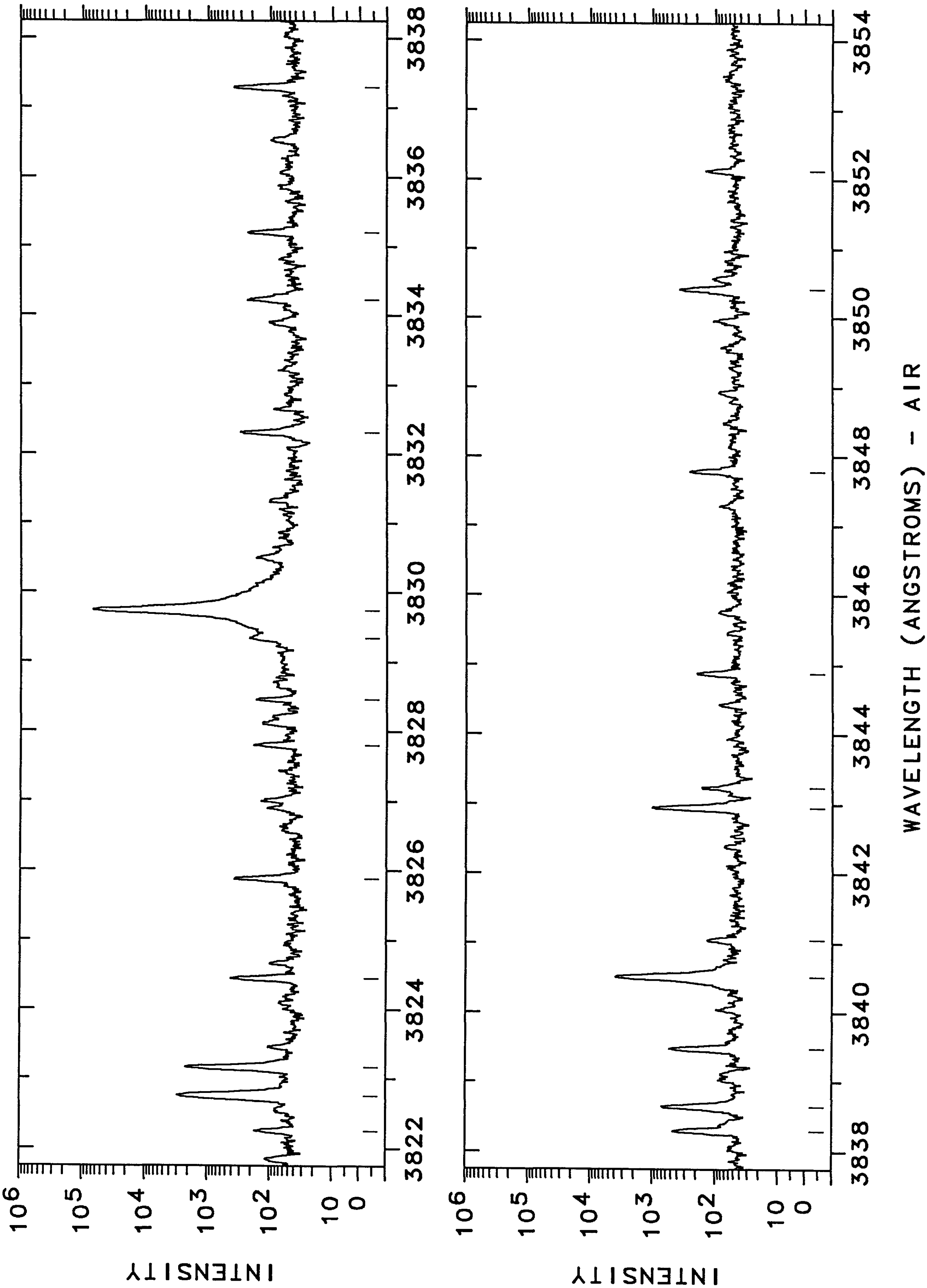
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3822.25	26155.2		Rh I		
3822.7531	26151.736	2900 L	Pt II	101517- 75365	K
3823.152	26149.01	2200	Ne II		C
3824.4436	26140.177		Fe I		Q
3825.8814	26130.354		Fe I		Q
3827.8227	26117.102		Fe I		Q
3828.46	26112.8		Rh I		
3829.34	26106.8	180			
3829.7503	26103.957	69000	Ne II		G
3832.31	26086.5		Mg I		
3834.2224	26073.511		Fe I		Q
3835.20	26066.9	190			
3837.29	26052.7	350	Pt I	6567- 32620	N
3838.2891	26045.886		Mg I		
3838.6561	26043.396	670	Pt I	68703- 42660	N
3839.4742	26037.847	500			
3840.4953	26030.924	3900	Ne II		C
3841.0480	26027.179		Fe I		Q
3842.9636	26014.205	980	Pt II	101199- 75184	20
3843.24	26012.3	130	Ne III		L
3844.88	26001.2	160	Ne III		L
3847.78	25981.6	220	Ne III		L
3850.41	25963.9	340	Pt II	110146- 84182	K
3852.13	25952.3	110			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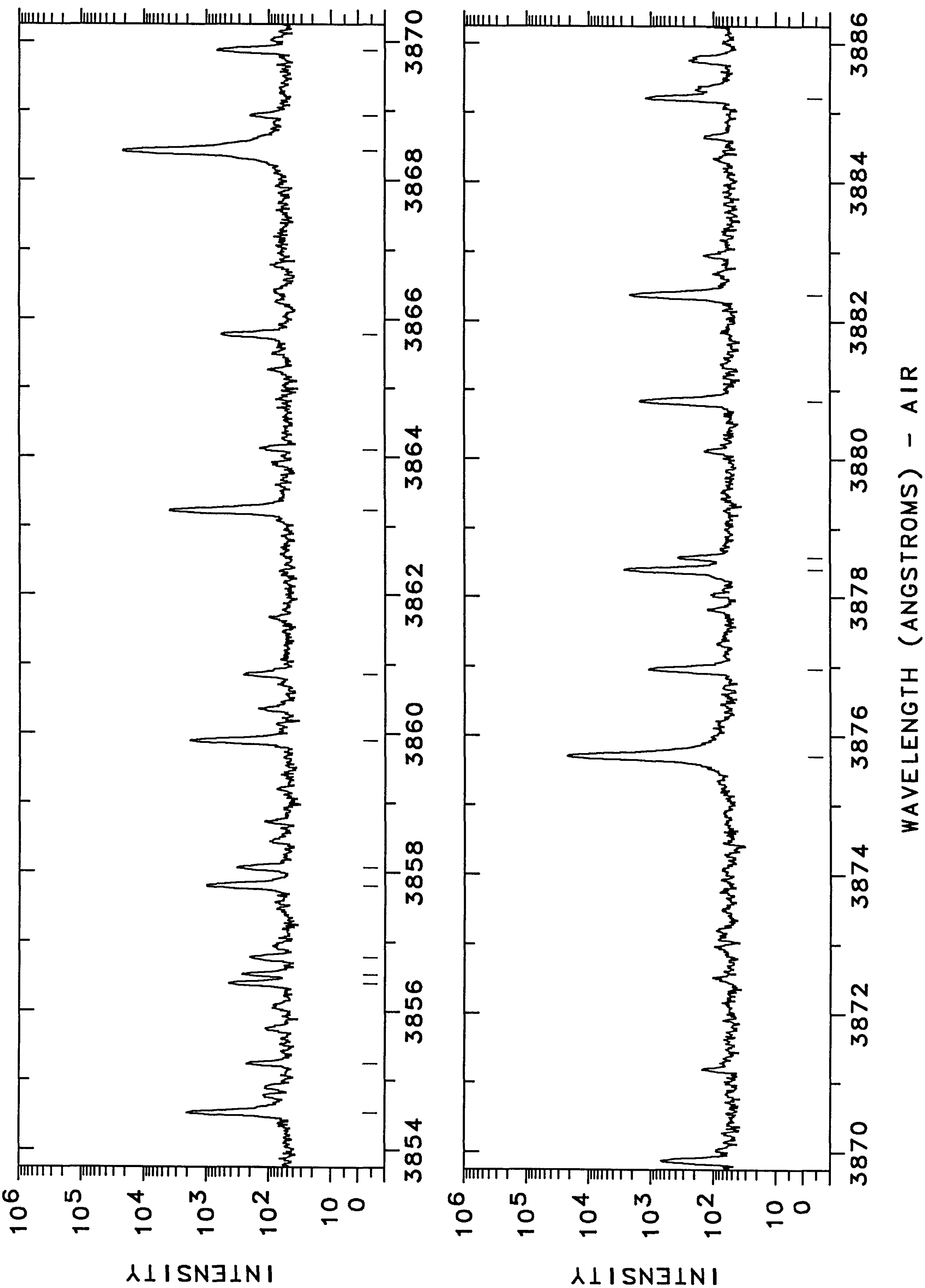
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3854.5252	25936.178	2000	Pt II	101517- 75581	K
3855.24	25931.4	180			
3856.3716	25923.760		Fe I		Q
3856.53	25922.7		Rh I		
3856.78	25921.0	160			
3857.817	25914.05	960	Ne II		C
3858.07	25912.3	280			
3859.9115	25899.986		Fe I		R
3860.86	25893.6	210			
3863.2223	25877.790	3900	Pt I	18566- 44444	E
3864.1005	25871.909	94			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3865.7875	25860.619	530	Pt I	62705- 36844	N
3868.4209	25843.015	22000	Pt I	64379- 38536	N
3868.93	25839.6	160			
3869.8816	25833.261	640	Pt II	101199- 75365	K
3875.7150	25794.380	22000	Pt I	64330- 38536	N
3876.9749	25785.997	1000	Pt I	59908- 34122	E
3878.3549	25776.823	2600			
3878.5733	25775.371		Fe I		Q
3880.8488	25760.258	1500	Pt I	59882- 34122	E
3882.3976	25749.982	2100	Pt I	59872- 34122	E
3885.2172	25731.295	1200	Pt I	64267- 38536	N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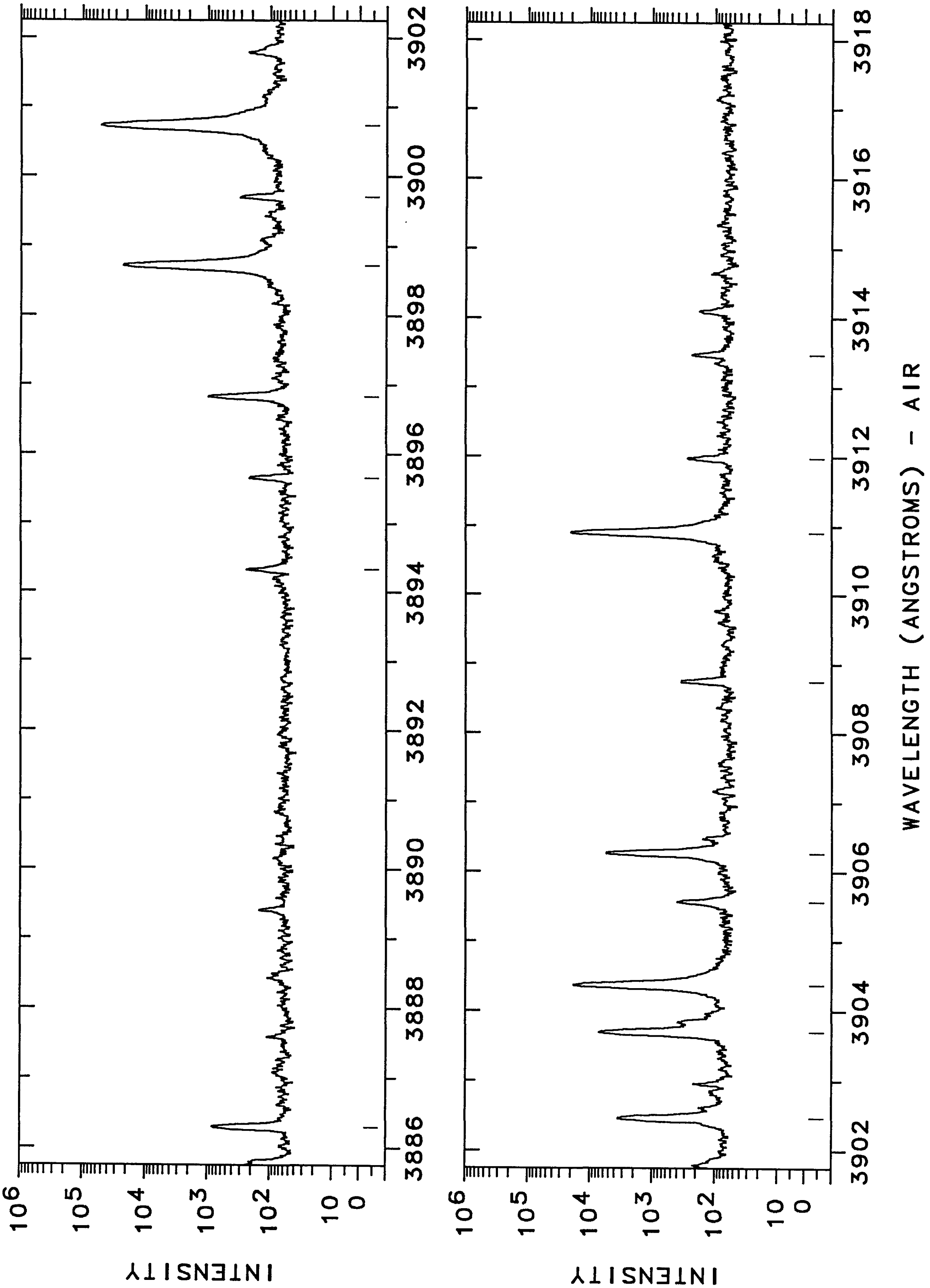
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3886.2823	25724.243		Fe I		Q
3894.33	25671.1	190	Pt II	117340- 91669	K
3895.6564	25662.344		Fe I		Q
3896.846	25654.51	940	Ne II		C
3898.7316	25642.103	23000 S	Pt I	59764- 34122	E
3899.7074	25635.687		Fe I		Q
3900.7228	25629.014	51000 S	Pt I	59751- 34122	E
3902.4512	25617.663	3400	Pt II	101199- 75581	36
3903.7085	25609.412	7100	Pt I	59731- 34122	E
3904.3823	25604.993	18000	Pt I	64141- 38536	E
3905.57	25597.2	350	Pt II	105794- 80197	K
3906.2788	25592.562	5500	Pt I	64128- 38536	E
3908.75	25576.4	300	Pt II	106434- 80858	K
3910.8955	25562.351	20000	Pt I	60884- 35321	E
3911.98	25555.3	230			
3913.47	25545.5	180			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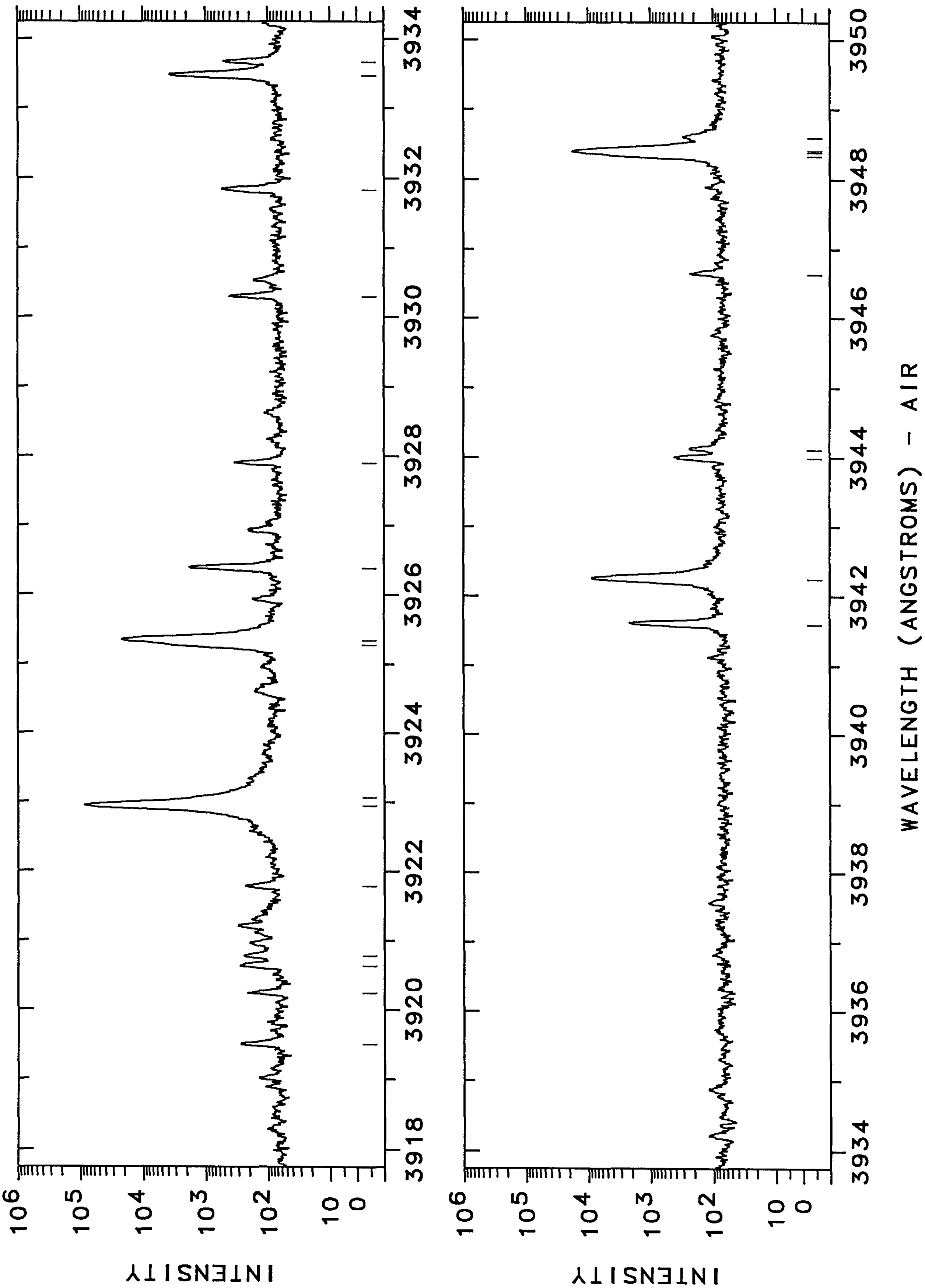
WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3919.50	25506.2	210			
3920.2580	25501.304		Fe I		Q
3920.63	25498.9	220			
3920.78	25497.9	190			
3921.79	25491.3	170			
3922.9559	25483.766	86000 C	Pt I	55640- 30156	E
3923.0660	25483.051	370 U			
3925.2718	25468.731	3500	Pt I	60790- 35321	E
3925.3359	25468.315	22000	Pt I	15501- 40970	E
3926.3831	25461.523	1700	Pt I	68121- 42660	N
3927.9199	25451.562		Fe I		Q
3930.2967	25436.170		Fe I		Q
3931.83	25426.3	480			
3933.465	25415.68	3700	Ne II		C
3933.66	25414.4		Ca II		
3941.5998	25363.230	2100	Pt I	62705- 37342	N
3942.262	25358.97	8600	Ne II		C
3943.99	25347.9		Al I		
3944.11	25347.1	180	Pt I	68006- 42660	N
3946.63	25330.9	170			
3948.3325	25319.981	3000 P	Pt I	13496- 38815	H
3948.3881	25319.625	14000 P	Pt I	13496- 38815	H
3948.4117	25319.474	4000 U	Pt I	13496- 38815	H
3948.59	25318.3	240	Pt II	46046- 71364	K



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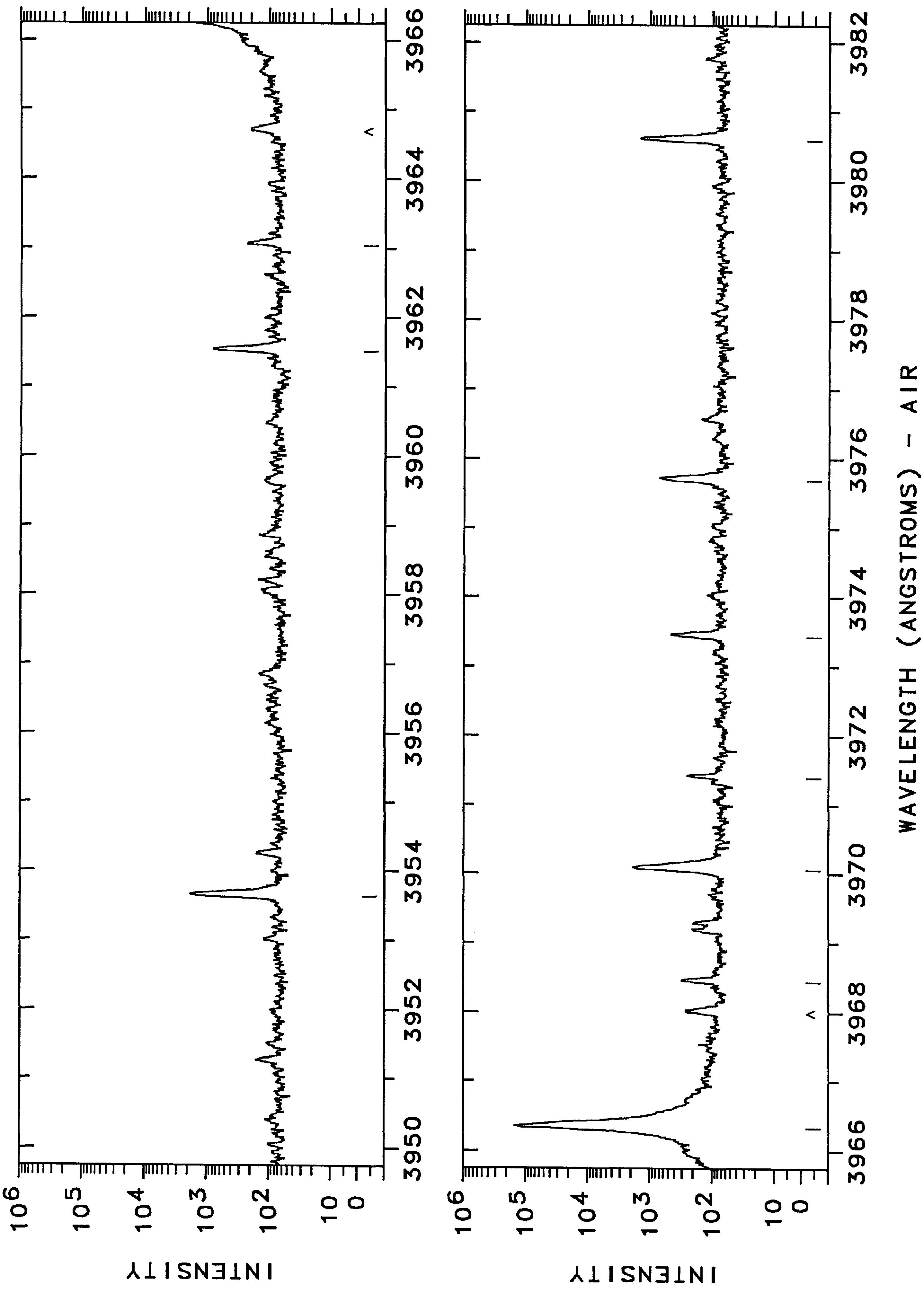
WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3953.6375	25286.008	1800	Pt I	15501- 40787	E
3961.51	25235.8		Al I		
3963.04	25226.0	170	Pt I	62567- 37342	N
3966.3570	25204.921	150000	Pt I	10116- 35321	E
3968.44	25191.7		Ca II		

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
3970.0530	25181.457	1800	Pt II	36484- 61665	16
3971.40	25172.9	190			
3973.458	25159.88	410	Ne II		C
3975.69	25145.8	640			
3980.6010	25114.731	1400	Pt I	26638- 51753	E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3982.26	25104.3	230	Pt II	105962- 80858	K
3982.87	25100.4	200			
3984.94	25087.4	300	Pt I	68275- 43187	N
3985.723	25082.46	1300	Ne II		C
3985.85	25081.7	170			
3990.27	25053.9	270			
3996.5674	25014.399	17000	Pt I	15501- 40516	E
3998.79	25000.5	250	Pt II	41434- 66434	K
3999.468	24996.26	1700	Ne II		C
4001.80	24981.7	220	Pt I	68169- 43187	N
4002.4834	24977.427	6100	Pt I	62567- 37590	N
4004.69	24963.7	260			
4009.0950	24936.236	2700	Pt I	62705- 37769	N
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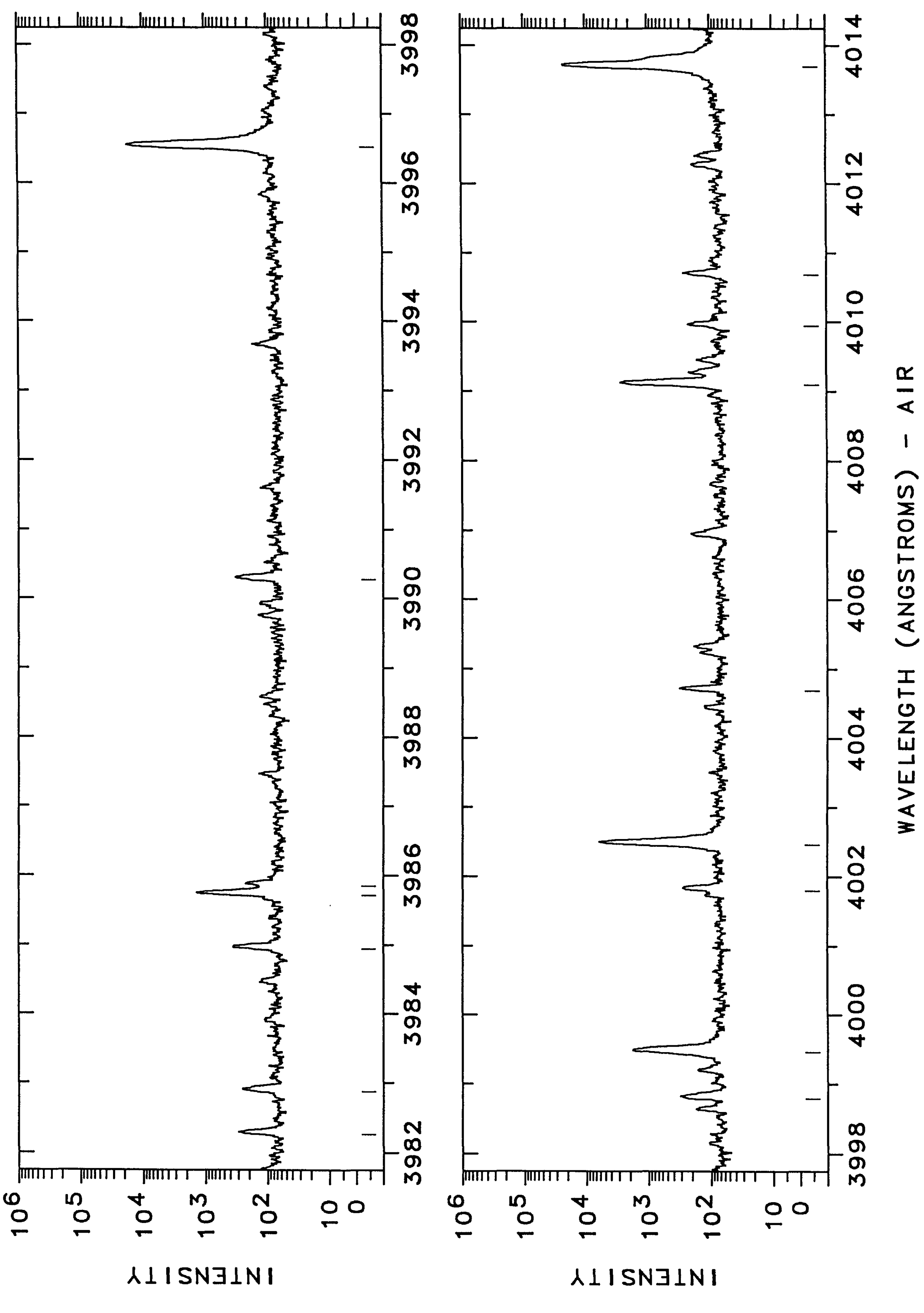
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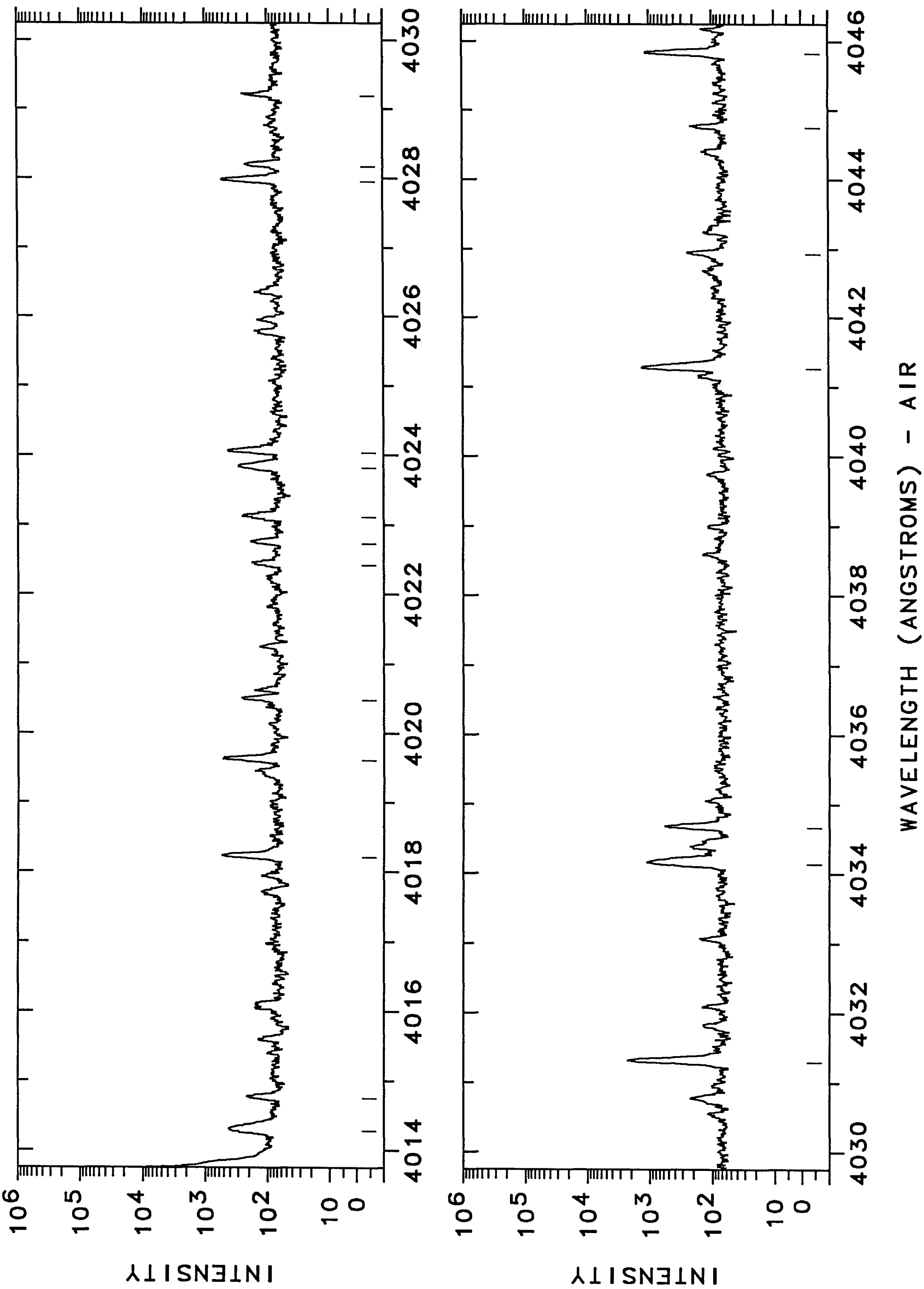
4014.3061	24903.866	360	Pt II	37877- 62781	30
4014.75	24901.1	160			
4018.21	24879.7	480	Pt I	65395- 40516	N
4019.61	24871.0	460	Pt I	65387- 40516	N
4020.48	24865.6	200			
4022.42	24853.6	110			
4022.73	24851.7	130			
4023.11	24849.4	190			
4023.8153	24845.014	230	Pt II	29030- 53875	17
4024.041	24843.62	370	Ne II		C

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
4027.95	24819.5	470	Pt I	16983- 41802	N
4028.17	24818.2	160			
4029.19	24811.9	180			
4031.2981	24798.898	2200	Pt I	62567- 37769	N
4034.14	24781.4	1100			
4034.66	24778.2	510			
4041.2943	24737.559	1300	Pt II	101199- 76461	42
4042.92	24727.6	180			
4044.75	24716.4	150			
4045.8124	24709.934		Fe I		Q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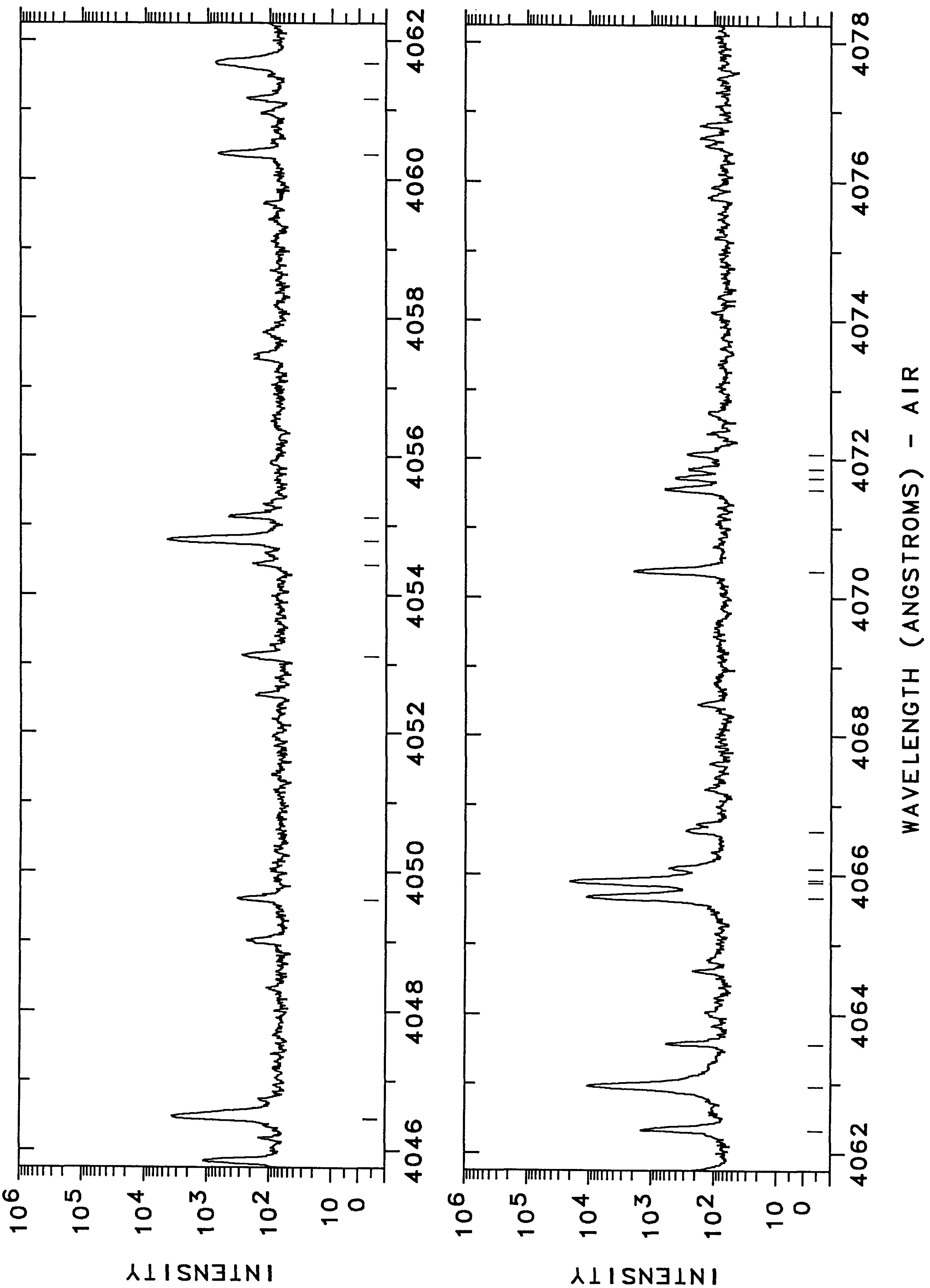
4046.4498	24706.042	2100 P	Pt II	36484- 61190	J
4046.4749	24705.889	1800 U	Pt II	36484- 61190	J
4049.60	24686.8	270			
4053.1114	24665.436	220	Pt II	96614- 71948	27
4054.43	24657.4	130			
4054.7658	24655.373	4400	Pt I	21967- 46622	E
4055.11	24653.3	400			
4060.36	24621.4	610	Pt I	18566- 43187	N
4061.16	24616.6	170	Pt I	65132- 40516	N
4061.6597	24613.526	690	Pt II	29261- 53875	18
4062.33	24609.5	1400			
4062.9730	24605.570	11000	Ne II		G

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
4063.5940	24601.810		Fe I		Q
4065.7046	24589.039	11000	Pt II	101199- 76610	22
4065.8895	24587.921	6000 U	Pt I	60884- 36296	H
4065.9283	24587.686	16000 P	Pt I	60884- 36296	H
4066.09	24586.7	460	Pt I	59908- 35321	N
4066.63	24583.4	220			
4070.3844	24560.769	1900	Pt I	59882- 35321	E
4071.55	24553.7	560			
4071.7379	24552.605		Fe I		Q
4071.85	24551.9	200			
4072.1002	24550.420	210	Pt I	59872- 35321	N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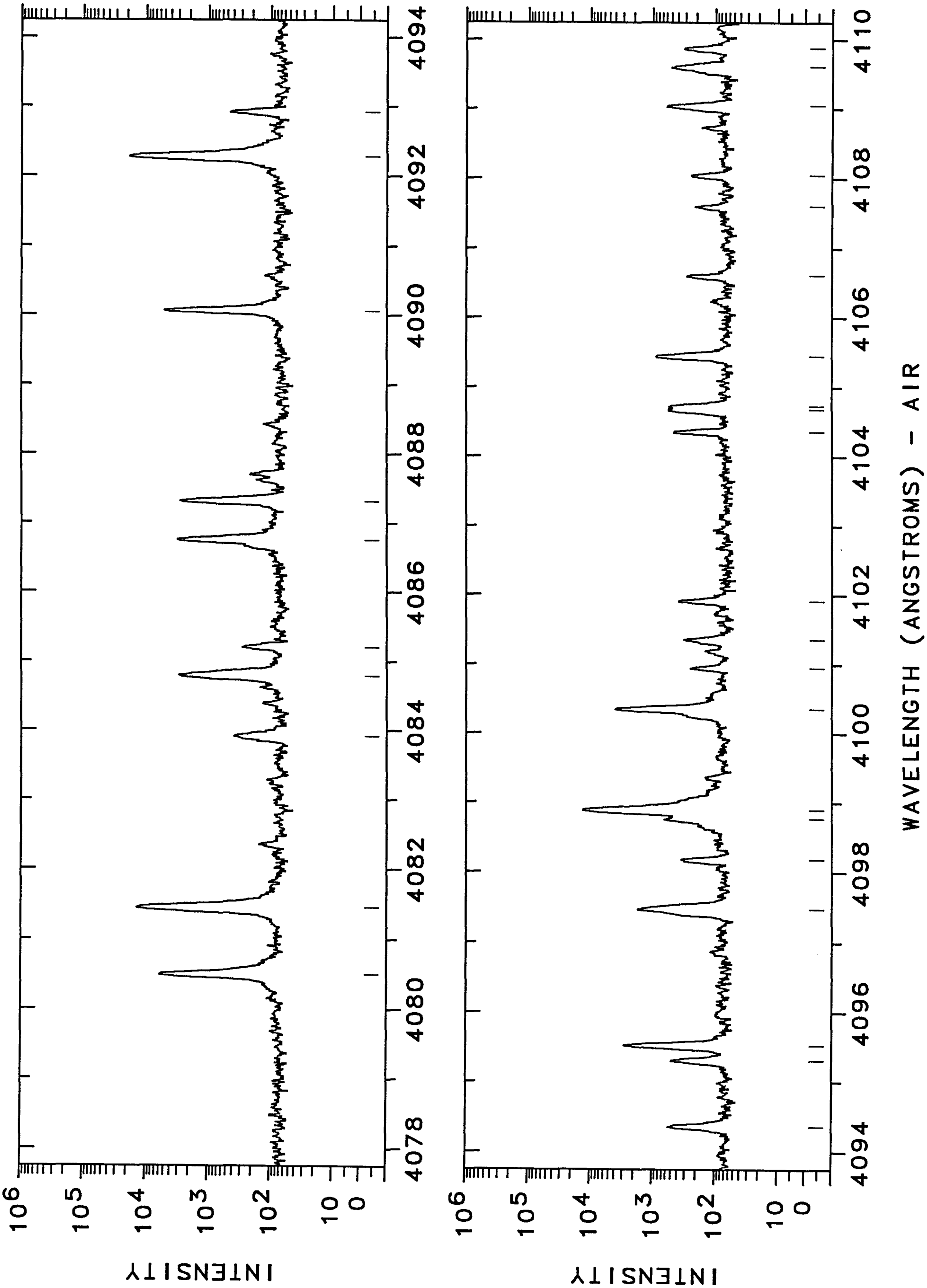
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
4080.516	24499.79	5900	Ne II		C
4081.4669	24494.080	14000 C	Pt I	60790- 36296	E
4083.9285	24479.316	330			
4084.7775	24474.229	2900	Pt I	64668- 40194	N
4085.21	24471.6	220			
4086.769	24462.30	3100	Ne II		C
4087.3313	24458.937	2800	Pt I	26638- 51097	E
4090.0628	24442.603	5100	Pt I	59764- 35321	E
4092.2522	24429.526	19000	Pt I	59751- 35321	E
4092.92	24425.5	400	Pt I	65395- 40970	N
4094.36	24416.9	490	Pt I	65387- 40970	N
4095.31	24411.3	430			
4095.5370	24409.933	2800	Pt I	59731- 35321	E
4097.48	24398.4	1700	Pt I	68831- 44432	N
4098.1807	24394.187	280			
4098.77	24390.7	590			

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
4098.864	24390.12	13000	Ne II		C
4100.354	24381.26	3900	Ne II		C
4100.95	24377.7	190			
4101.36	24375.3	260			
4101.928	24371.90	320	Ne II		C
4104.36	24357.5	400			
4104.68	24355.6	490			
4104.73	24355.3	490			
4105.4613	24350.927	820	Pt II	32237- 56587	16
4106.61	24344.1	220			
4107.60	24338.2	150	Pt I	65308- 40970	N
4108.05	24335.6	180			
4109.05	24329.7	550	Pt I	68275- 43945	N
4109.61	24326.3	450	Pt I	68759- 44432	N
4109.88	24324.7	250			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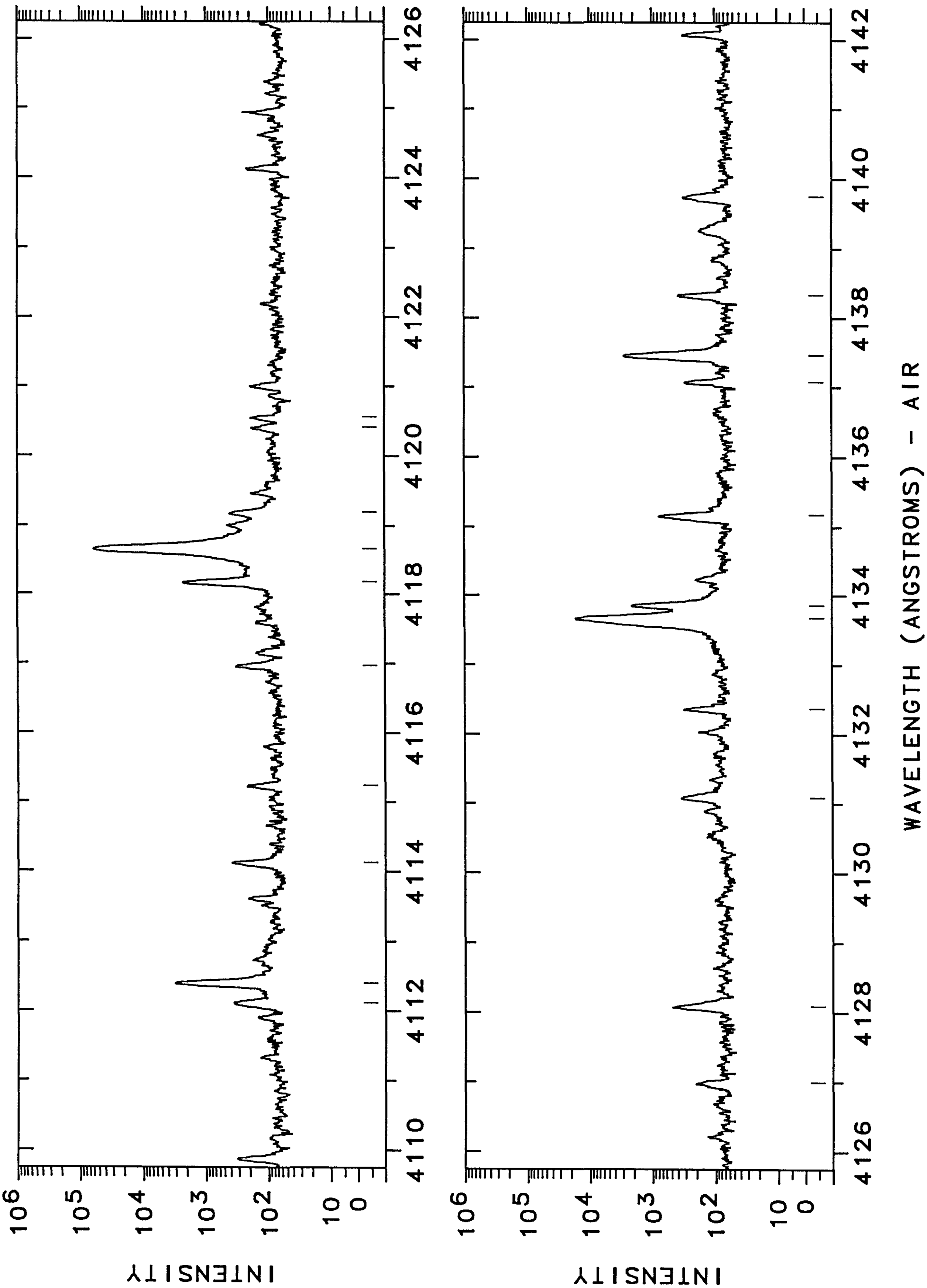
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
4112.12	24311.5	300	Pt I	64505- 40194	N
4112.395	24309.87	3000	Ne II		C
4114.13	24299.6	330			
4115.24	24293.1	160			
4116.97	24282.9	270			
4118.199	24275.61	2200	Ne II		C
4118.6745	24272.808	89000	Pt I	13496- 37769	E
4119.20	24269.7	350			
4120.41	24262.6	120			
4120.56	24261.7	130			
4127.00	24223.8	140	Pt I	68169- 43945	N

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
4128.09	24217.4	420			
4131.09	24199.9	280			
4132.38	24192.3	250			
4133.691	24184.63	17000	Ne II		C
4133.871	24183.58	2000	Ne II		C
4135.18	24175.9	710	Pt I	68121- 43945	N
4137.08	24164.8	230			
4137.47	24162.5	2700	Pt I	65132- 40970	N
4138.34	24157.5	320			
4139.75	24149.2	250	Pt I	68094- 43945	N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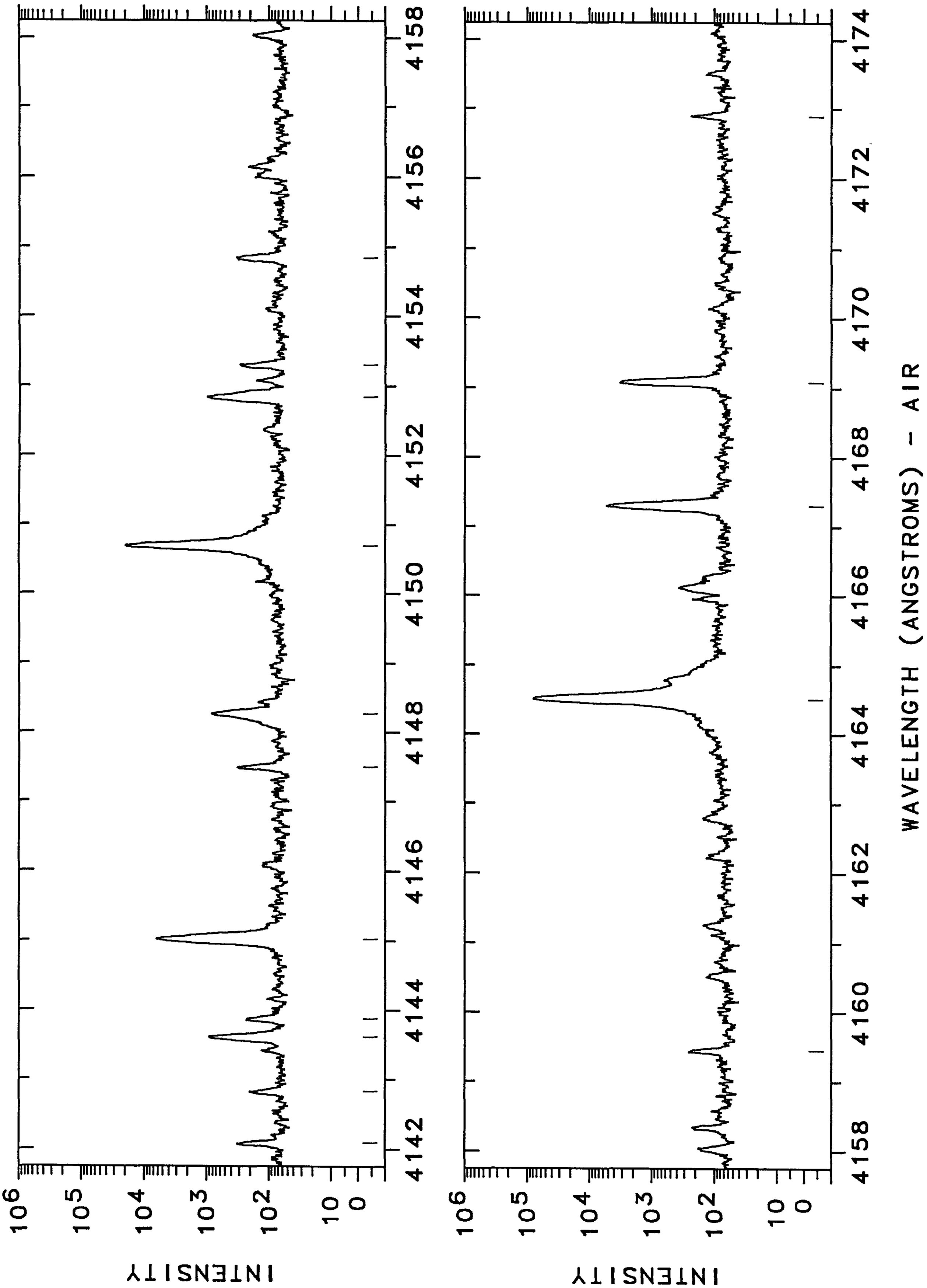
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
4142.09	24135.6	260			
4142.83	24131.3	150			
4143.61	24126.7	840	Pt I	68072- 43945	N
4143.8680	24125.240		Fe I		Q
4145.03	24118.5	6300	Pt I	64312- 40194	N
4147.50	24104.1	260			
4148.2820	24099.569	770	Pt II	32918- 57018	16
4150.6893	24085.592	20000	Ne II		G
4152.84	24073.1	920	Pt I	64267- 40194	N
4153.30	24070.5	240			
4154.84	24061.5	270	Pt I	68006- 43945	N
4159.45	24034.9	200			
4164.5491	24005.436	78000	Pt I	10116- 34122	E
4167.30	23989.6	5300	Pt I	64505- 40516	N
4169.08	23979.3	3100	Pt II	101517- 77538	K
4172.89	23957.5	180			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WAVELENGTH (ANGSTROMS) - AIR

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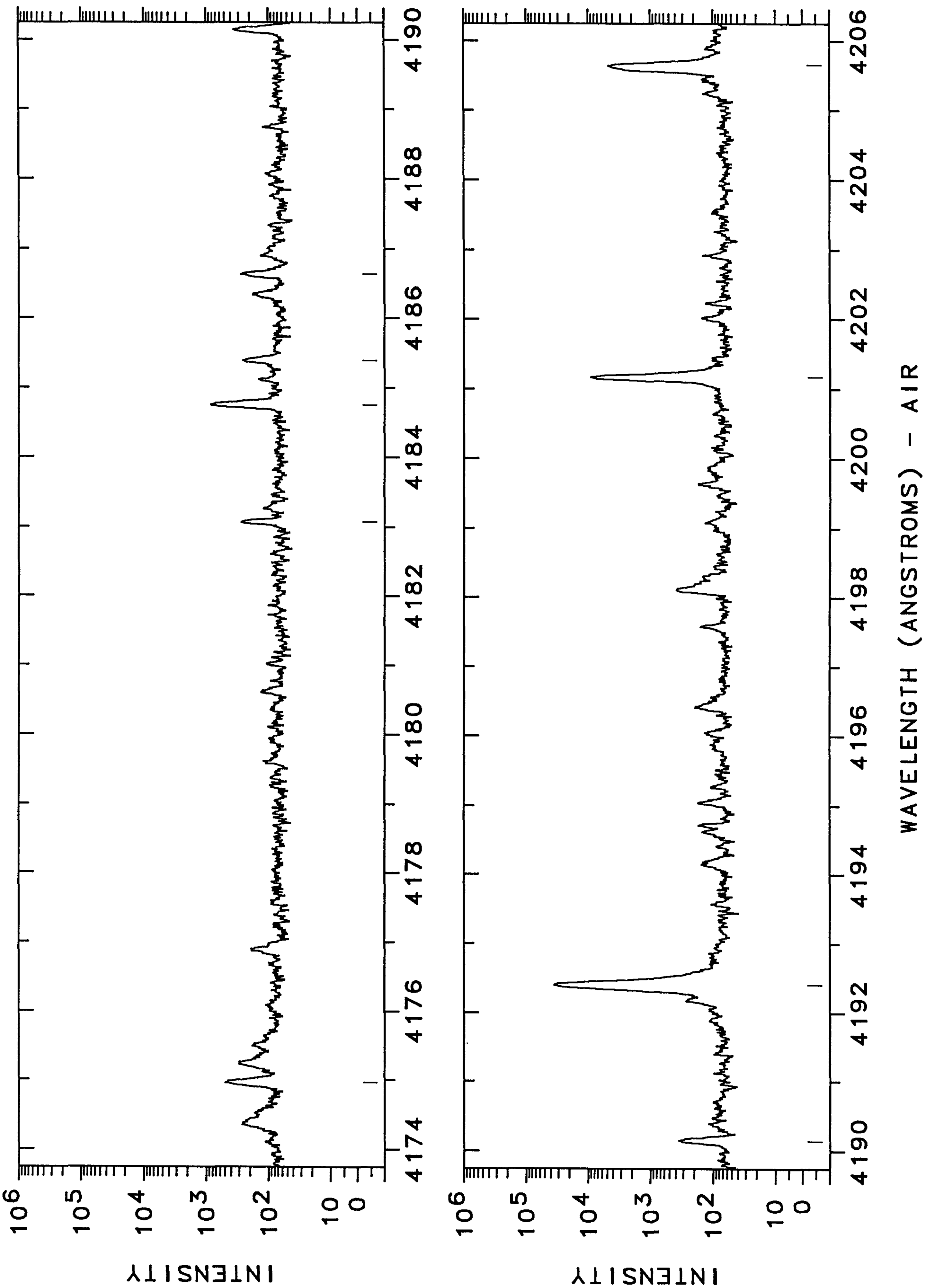
4174.96	23945.6	440			
4183.07	23899.2	220	Pt II	106434- 82535	K
4184.75	23889.6	780	Pt I	62705- 38815	N
4185.39	23885.9	200			
4186.662	23878.65	230	Ne II		C
4190.14	23858.8	300	Pt II	117340- 93482	K
4192.4231	23845.835	35000	Pt I	13496- 37342	E
4201.2102	23795.961	9200	Pt I	60640- 36844	E
4205.5937	23771.159	4700	Ne II		G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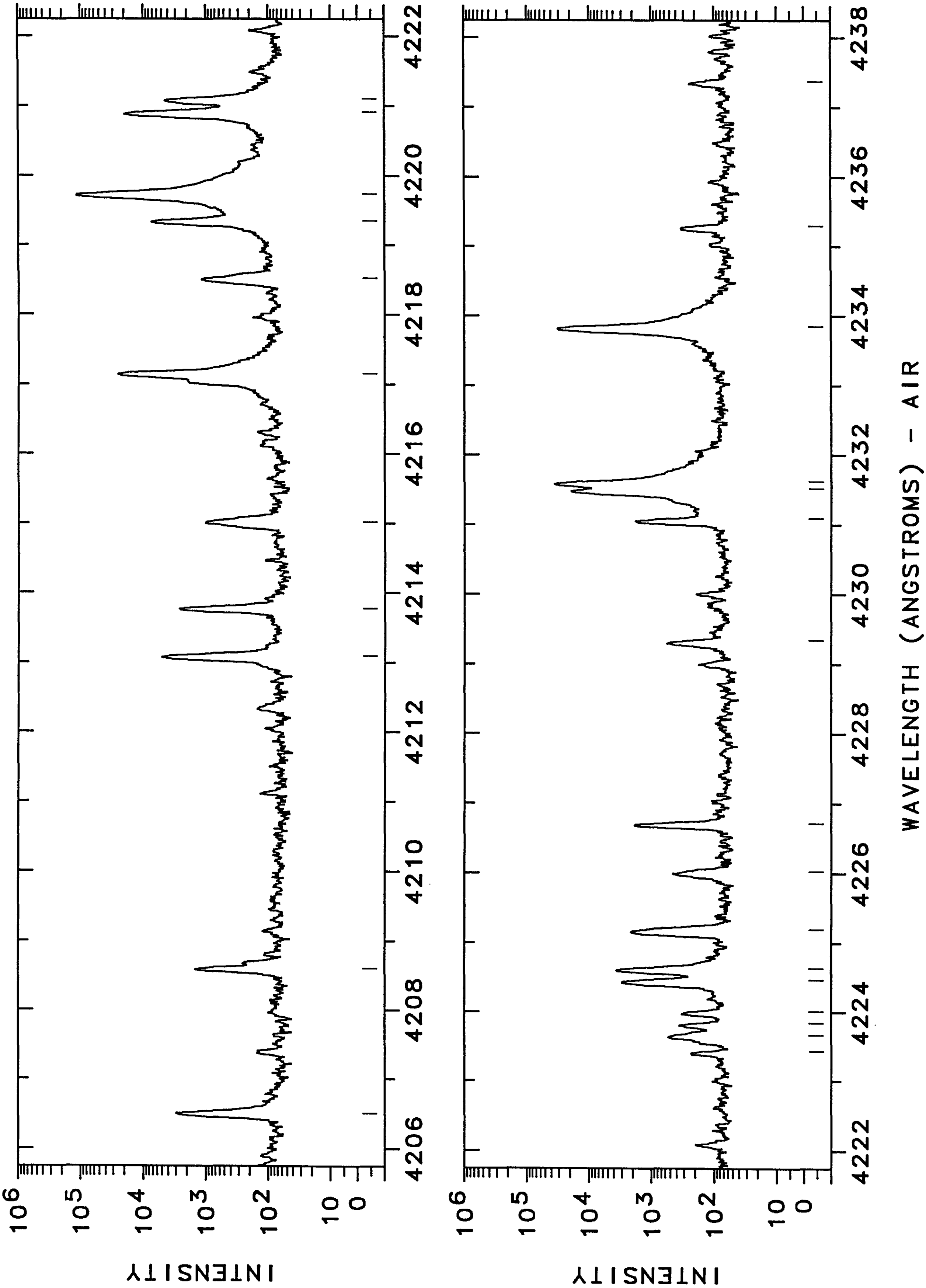
WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
4206.5022	23766.025	3000	Ne II		G
4208.60	23754.2	1400	Pt II	101517- 77763	K
4213.09	23728.9	5100	Pt I	60573- 36844	N
4213.77	23725.0	2600	Pt I	68169- 44444	N
4215.02	23718.0	970	Pt I	64505- 40787	N
4217.171	23705.90	26000	Ne II		C
4218.52	23698.3	1100	Pt I	64668- 40970	N
4219.369	23693.55	7300	Ne II		C
4219.7457	23691.438	120000	Ne II		G
4220.8932	23684.997	20000	Ne II		G
4221.0827	23683.933	4500	Ne II		G
4223.43	23670.8	180			
4223.6790	23669.376	480	Pt II	32918- 56587	A
4223.6790	23669.376	480	Pt II	54373- 78043	AK
4223.84	23668.5	300	Pt II	110158- 86489	K
4224.01	23667.5	270	Ne III		L
4224.473	23664.93	3000	Ne II		C
4224.642	23663.98	3600	Ne II		C
4225.20	23660.9	2100	Pt II	101199- 77538	K
4226.03	23656.2	400	Ne III		L
4226.72	23652.3		Ca I		
4229.34	23637.7	510	Ne III		L
4231.09	23627.9	1700	Pt I	68072- 44444	N
4231.5332	23625.443	20000	Ne II		G
4231.6363	23624.868	36000	Ne II		G
4233.8467	23612.534	32000	Ne II		G
4235.29	23604.5	280			
4237.37	23592.9	190	Pt I	65395- 41802	N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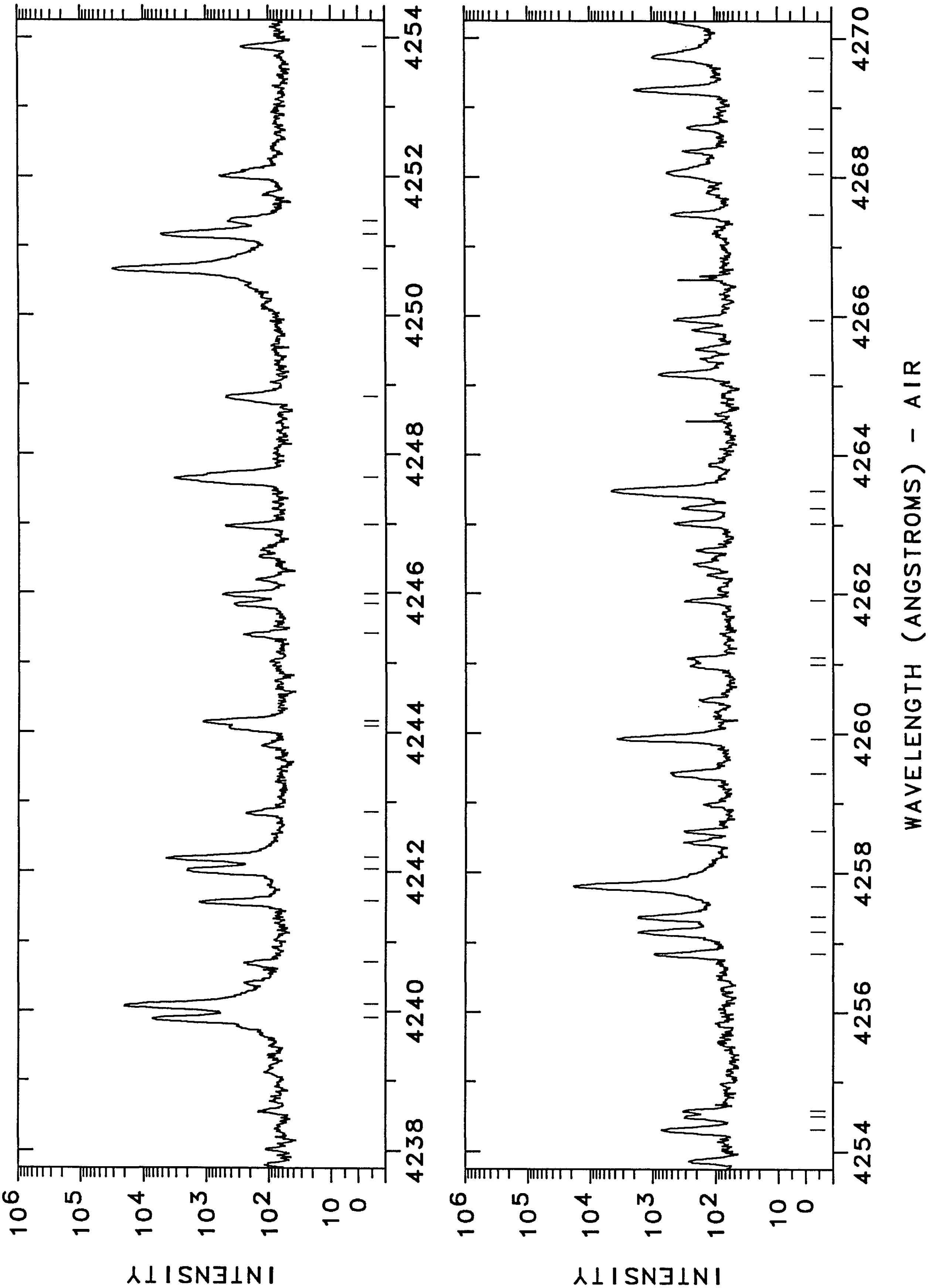
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
4239.9190	23578.717	7300	Ne II		G
4240.1049	23577.683	21000	Ne II		G
4240.72	23574.3	190	Pt I	68006- 44432	N
4241.59	23569.4	1200			
4242.040	23566.93	2100	Ne II		C
4242.2094	23565.987	4400	Ne II		G
4242.86	23562.4	180	Pt I	68006- 44444	N
4244.10	23555.5	390			
4244.17	23555.1	1100	Pt II	42031- 65587	K
4245.42	23548.2	200			
4245.85	23545.8	310			
4245.99	23545.0	500	Pt I	68275- 44730	N
4246.99	23539.5	450			
4247.6735	23535.673	3200	Pt I	64505- 40970	E
4248.83	23529.3	430			
4250.6462	23519.214	31000	Ne II		G
4251.17	23516.3	5100	Pt I	59812- 36296	N
4251.36	23515.3	390			
4253.87	23501.4	210			
4254.32	23498.9		Cr I		
4254.51	23497.9	250			
4254.59	23497.4	270			
4256.85	23484.9	900			
4257.180	23483.12	1700	Ne II		C
4257.395	23481.93	1700	Ne II		C
4257.8028	23479.683	19000	Ne II		G
4258.60	23475.3	270			
4259.43	23470.7	470			
4259.9310	23467.953	3800	Pt I	59764- 36296	E
4260.99	23462.1	200	Pt II	106434- 82972	K
4261.09	23461.6	220			
4261.91	23457.1	250	Ne III		L
4263.02	23450.9	400			
4263.24	23449.7	290			
4263.5022	23448.296	4600	Pt I	60790- 37342	E
4265.16	23439.2	750	Ne III		AL
4265.16	23439.2	750	Pt I	68169- 44730	AN
4265.95	23434.8	400			
4267.46	23426.5	440	Pt II	105962- 82535	K
4268.05	23423.3	520	Ne III		L
4268.36	23421.6	260			
4268.70	23419.7	220			
4269.2490	23416.733	1900	Pt I	26638- 50055	E
4269.72	23414.1	930			



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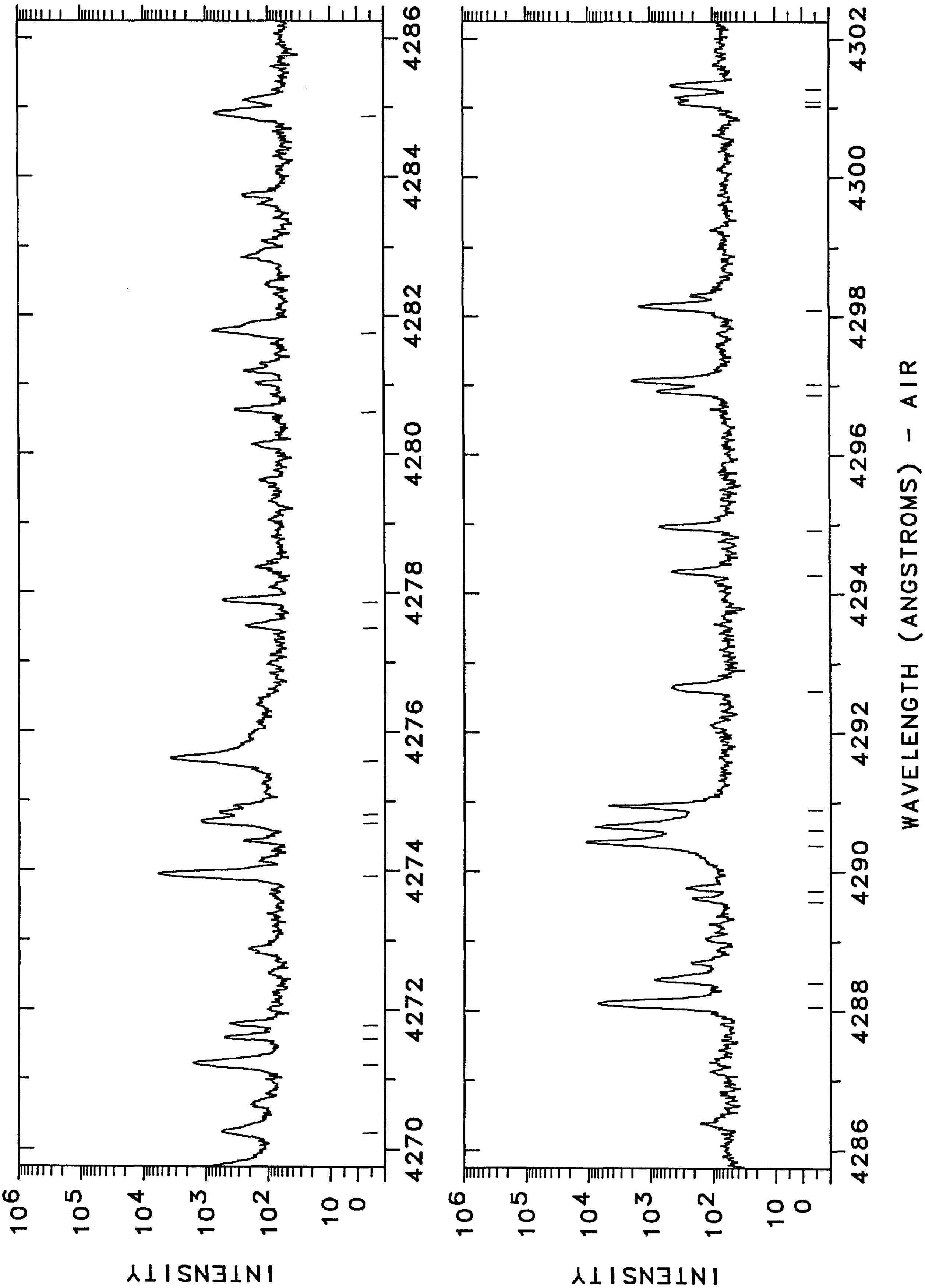
WAVELENGTH (ANGSTROMS) - AIR

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
4270.23	23411.4	510	Ne I		
4271.20	23406.0	1600	Pt I	63922- 40516	N
4271.58	23404.0	460			
4271.7604	23402.966		Fe I		Q
4273.92	23391.1	5800	Pt I	68121- 44730	N
4274.68	23387.0	1200			
4274.81	23386.3		Cr I		
4275.58	23382.1	3600	Ne I		
4277.49	23371.6	180			
4277.86	23369.6	500			
4280.60	23354.6	280			
4281.7393	23348.425	710	Pt I	13496- 36844	E
4284.87	23331.4	660			
4288.0507	23314.060	7100	Pt I	15501- 38815	E
4288.3866	23312.234	810	Pt II	37877- 61190	31

WAVELENGTH	WAVE NUMBER	INTENSITY	CLASSIFICATION		CODE
4289.57	23305.8	170			
4289.73	23304.9		Cr I		
4290.374	23301.44	11000	Ne II		C
4290.602	23300.20	8000	Ne II		C
4290.8991	23298.584	4700	Pt I	60640- 37342	E
4292.60	23289.4	410			
4294.27	23280.3	400			
4294.92	23276.8	670	Pt I	68006- 44730	N
4296.86	23266.3	710			
4297.01	23265.5	1900			
4298.096	23259.57	1500	Ne II		C
4301.02	23243.8	290			
4301.09	23243.4	320			
4301.27	23242.4	400	Pt I	26638- 49880	N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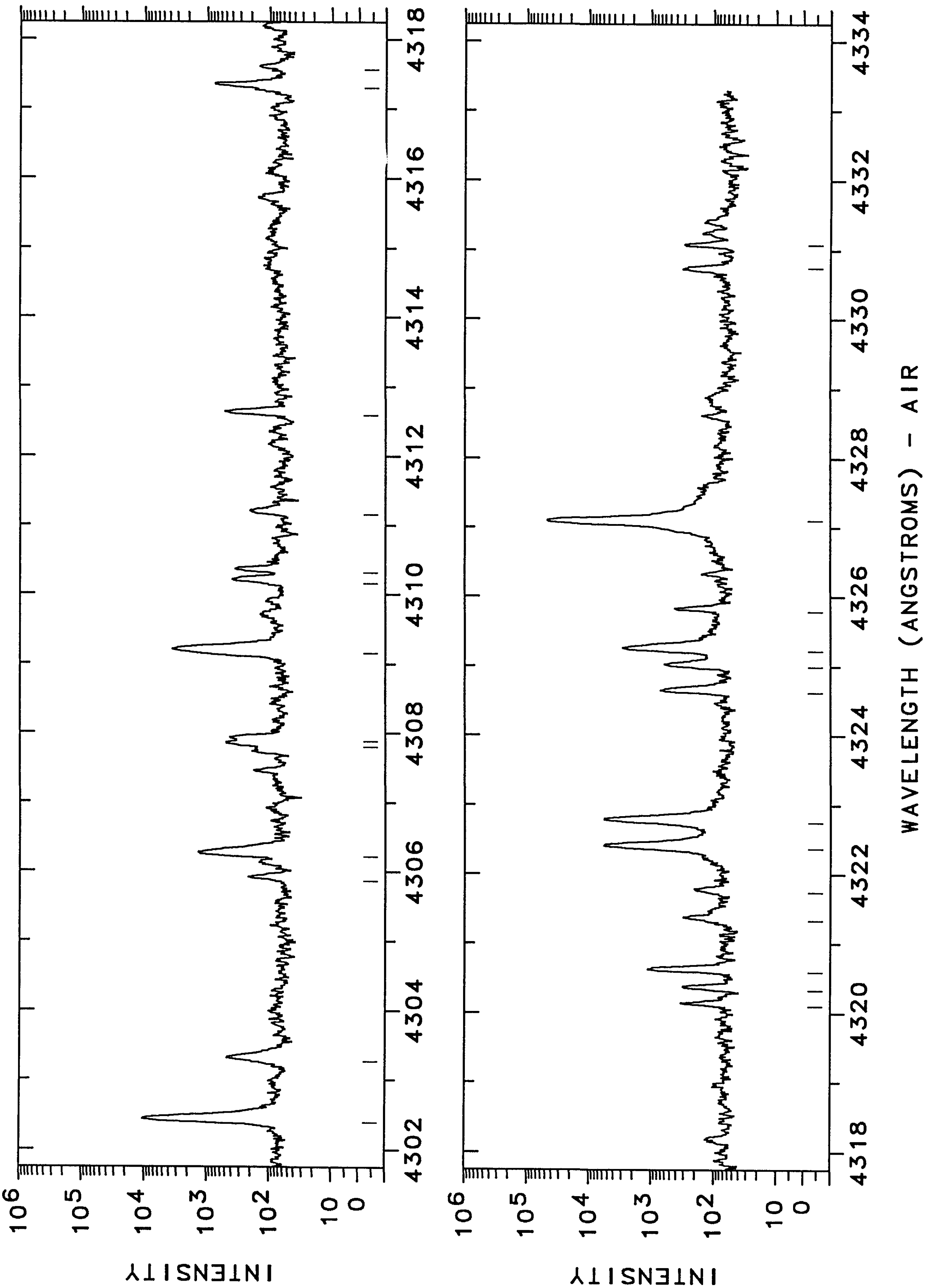
4302.4207	23236.193	430	Pt I	18566- 41802	E
4303.26	23231.7	430			
4305.87	23217.6	160			
4306.22	23215.7	1300	Ne I		
4307.80	23207.2	440	Pt II	116689- 93482	K
4307.9021	23206.628		Fe I		Q
4309.1759	23199.768	3600	Pt I	60790- 37590	E
4310.16	23194.5	340			
4310.31	23193.7	300			
4311.15	23189.1	150	Pt II	46046- 69235	AK
4311.15	23189.1	150	Pt II	105086- 81897	AK
4312.59	23181.4	470			
4317.30	23156.1	720	Pt II	101199- 78043	K
4317.56	23154.7	91			
4320.10	23141.1	280			
4320.33	23139.9	260			
4320.59	23138.5	1100	Pt II	105962- 82824	K
4321.33	23134.5	250	Pt I	63922- 40787	N
4321.74	23132.3	150			
4322.3727	23128.937	5800	Ne II		G
4322.7409	23126.967	5700	Ne II		G
4324.62	23116.9	650			
4324.99	23114.9	560	Pt I	60884- 37769	N
4325.235	23113.63	2900	Ne II		C
4325.7618	23110.816		Fe I		Q
4327.0533	23103.919	17000	Pt I	56784- 33680	E
4330.74	23084.3	70			
4331.08	23082.4	65	Pt II	106434- 83352	K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WAVELENGTH (ANGSTROMS) - AIR

Volume 97, Number 1, January–February 1992
Journal of Research of the National Institute of Standards and Technology

[J. Res. Natl. Inst. Stand. Technol. 97, 213 (1992)]

Energy Levels of Neutral Platinum

Volume 97 | Number 1 | January–February 1992

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All known energy levels of neutral platinum (Pt I) are presented, including 119 new levels based on analysis of recent comprehensive observations of the spectrum. These results are taken from a detailed analysis of the spectrum to be published in Journal de Physique II.

Key words: atomic spectroscopy; electronic configurations; energy levels; platinum.

Accepted: December 30, 1991

1. Introduction

An extensive analysis of the energy levels of neutral platinum (Pt I) based on new spectra recorded at the National Institute of Standards and Technology [1], at Kitt Peak National Observatory [2], and at Laboratoire Aimé Cotton has recently been prepared for publication elsewhere [3]. For completeness of the present special issue of the Journal of Research of the National Institute of Standards and Technology we list in Tables 1 and 2 the values of the Pt I energy levels. Full details of the analysis are given in Ref. [3].

[1] In association with Université Paris-Sud.

Table 1. Even energy levels of Pt I. The leading components of the eigenfunctions are derived from theoretical studies of the configuration groups $(5d+6s)^{10}$, $5d^96d$, $5d^97s$, $5d^97d$, and $5d^98s$. Where other configurations are indicated, the designations are empirical

Energy (cm^{-1})	J	Leading component
0.	3	$5d^96s\ ^3D$
775.892	2	$5d^96s\ ^1D$
823.678	4	$5d^86s^2\ ^3F$
6140.180	0	$5d^{10}\ ^1S$
6567.461	2	$5d^96s\ ^3D$
10116.729	3	$5d^86s^2\ ^3F$
10131.887	1	$5d^96s\ ^3D$
13496.271	2	$5d^96s\ ^1D$
15501.845	2	$5d^86s^2\ ^3F$
16983.492	0	$5d^86s^2\ ^3P$
18566.558	1	$5d^86s^2\ ^3P$
21967.111	4	$5d^86s^2\ ^1G$
26638.591	2	$5d^86s^2\ ^1D$
52379.375	3	$5d^97s\ ^3D$
52667.213	2	$5d^97s\ ^1D$
55640.623	5	$5d^86s7s\ (^3F_4,^3S_1)$
56784.325	4	$5d^86s7s\ (^3F_4,^3S_1)$
59591.82	1	$5d^96d\ ^3S$
59731.571	2	$5d^96d\ ^3P$
59751.177	4	$5d^96d\ ^3G$
59764.266	3	$5d^96d\ ^3D$
59782.853	1	$5d^96d\ ^1P$
59812.72	5	$5d^96d\ ^3G$
59872.140	3	$5d^96d\ ^1F$
59882.421	4	$5d^96d\ ^3F$
59908.170	2	$5d^96d\ ^1D$
60357.804	1	$5d^97s\ ^3D$
60573.69	0	$5d^96d\ ^1S$
60640.669	2	$5d^97s\ ^3D$
60790.393	3	$5d^86s7s\ (^3F_4,^3S_1)$
60884.001	4	$5d^86s7s\ (^3F_4,^1S_0)$
62567.995	3	$5d^98s\ ^3D$
62705.33	2	$5d^98s\ ^1D$
63922.22	3	
64128.722	5,4	
64141.155	6	$5d^86s6d\ (^3F_4,^3D)$
64182.29	2	
64222.379	7	$5d^86s6d\ (^3F_4,^3D_3)$
64267.43	5	$5d^86s6d\ (^3F_4,^3D)$
64312.78	4	$5d^86s6d\ (^3F_4,^3D)$
64330.53	6	$5d^86s6d\ (^3F_4)$
64379.155	5	$5d^86s6d\ (^3F_4)$
64505.839	3	$5d^86s7s\ (^3F_3,^3S_1)$
64668.46	4	$5d^86s6d\ (^3F_4,^3D)$
65132.91	2	$5d^97d\ ^3P$
65308.53	4	$5d^97d\ ^3G$
65339.93	5	$5d^97d\ ^3G$
65346.52	3	$5d^97d\ ^3F$
65361.63	1	$5d^97d\ ^1P$
65381.38	4	$5d^97d\ ^3F$
65387.03	3	$5d^97d\ ^3D$
65395.72	2	$5d^97d\ ^1D$
66967.965	5	$5d^86s8s\ (^3F_4,^3S_1)$
67342.66	4	$5d^86s8s\ (^3F_4,^3S_1)$
68006.95	3	$5d^96d\ ^3G$
68072.245	3	$5d^96d\ ^3F$
68094.74	2	$5d^96d\ ^3F$
68121.56	4	$5d^96d\ ^3G$
68169.42	2	$5d^96d\ ^1D$
68275.31	2	
68703.45	4	
68716.32	6	$5d^86s6d\ (^3F_4,^1D_2)$
68759.01	4	
68831.115	5	
68912.21	4	
68947.47	3	

Table 2. Odd energy levels of Pt I. The leading components of the eigenfunctions are derived from theoretical studies of the mixed group of configurations $5d^96p+5d^86s6p+5d^76s^26p+5d^97p$. Where other configurations are indicated, the designations are empirical

Energy (cm^{-1})	J	Leading component	Energy (cm^{-1})	J	Leading component
30156.854	4	$5d^86s6p$ (^{4}F)^{5}D	54839.206	3	$5d^86s6p$ (^{4}P)^{3}D
32620.018	2	$5d^96p$ ^{3}P	55009.37	4	$5d^86s6p$ (^{2}G)^{3}H
33680.402	5	$5d^86s6p$ (^{4}F)^{5}F	55216.828	1	$5d^96p$ ^{3}D
34122.165	3	$5d^96p$ ^{3}F	55536.276	3	$5d^86s6p$ (^{2}P)^{3}D
35321.653	3	$5d^86s6p$ (^{4}F)^{5}D	55984.51	5	$5d^86s6p$ (^{2}G)^{3}H
36296.310	4	$5d^86s6p$ (^{4}F)^{5}G	56288.65	4	$5d^86s6p$ (^{2}G)^{3}F
36781.551	6	$5d^86s6p$ (^{4}F)^{5}G	56670.20	2	$5d^86s6p$ (^{4}P)^{3}P
36844.710	1	$5d^96p$ ^{3}P	56794.43	5	$5d^76s^26p$ ^{4}F*^{3}G
37342.101	2	$5d^96p$ ^{3}P	57041.73	1	$5d^86s6p$ (^{4}P)^{3}P
37590.569	4	$5d^96p$ ^{3}F	57506.187	3	$5d^86s6p$ (^{2}G)^{3}F
37769.073	3	$5d^96p$ ^{3}D	57987.392	2	$5d^97p$ ^{3}P
38536.160	5	$5d^86s6p$ (^{4}F)^{5}F	58101.17	3	$5d^97p$ ^{3}F
38815.908	2	$5d^86s6p$ (^{2}D)^{3}F	58326.75	2	$5d^86s6p$ (^{2}P)^{3}D
40194.228	4	$5d^86s6p$ (^{4}F)^{5}F	58388.47	4	$5d^76s^26p$ ^{4}F*^{5}G
40516.243	2	$5d^86s6p$ (^{4}F)^{5}D	58482.14	3	$5d^97p$ ^{1}F
40787.857	2	$5d^86s6p$ (^{4}P)^{5}P	58780.80	1	$5d^97p$ ^{1}P
40873.529	0	$5d^86s6p$ (^{2}D)^{3}P	59127.72	2	$5d^86s6p$ (^{2}D)^{3}F
40970.165	3	$5d^86s6p$ (^{4}F)^{5}G	59346.33	4	$5d^97p$ ^{3}F
41802.744	1	$5d^86s6p$ (^{2}D)^{3}D	59462.28	2	$5d^97p$ ^{1}D
42660.058	3	$5d^86s6p$ (^{4}F)^{5}D	59492.41	4	$5d^97p$ ^{3}F
43187.836	1	$5d^86s6p$ (^{4}F)^{5}D	59686.20	3	$5d^76s^26p$ ^{4}F*^{5}G
43945.543	3	$5d^86s6p$ (^{4}P)^{5}P	59792.23	1	$5d^86s6p$ (^{4}P)^{3}S
44432.663	4	$5d^86s6p$ (^{4}F)^{5}G	59916.97	2	$5d^97p$ ^{1}D
44444.364	2	$5d^86s6p$ (^{4}F)^{5}F	59920.03	3	$5d^97p$ ^{3}D
44730.313	3	$5d^86s6p$ (^{2}F)^{3}D	60328.02	3	$5d^86s6p$ (^{4}F)^{3}F
45398.478	1	$5d^86s6p$ (^{4}P)^{5}P	60423.93	4	$5d^86s6p$ (^{2}G)^{3}G
46170.386	2	$5d^96p$ ^{3}F	60441.30	1	$5d^97p$ ^{1}P
46419.962	2	$5d^86s6p$ (^{4}P)^{5}D	61097.48	2	$5d^86s6p$ (^{2}G)^{3}F
46433.912	0	$5d^86s6p$ (^{4}P)^{5}D	61352.25	3	$5d^86s6p$ (^{2}G)^{3}F
46622.489	3	$5d^86s6p$ (^{2}F)^{3}D	61633.79	5	$5d^86s6p$ (^{2}G)^{3}G
46792.965	5	$5d^86s6p$ (^{4}F)^{3}G	61645.33	2	$5d^86s6p$ (^{2}G)^{3}F
46963.670	4	$5d^86s6p$ (^{4}P)^{5}D	61942.22	4	$5d^8(^3F_4)6s7p(^3P_0)$
47740.565	1	$5d^96p$ ^{1}P	62062.29	2	$5d^76s^26p$ ^{4}F*^{5}G
48351.94	4	$5d^86s6p$ (^{4}F)^{3}F	62106.38	3	$5d^86s6p$ (^{4}P)^{3}D
48535.596	2	$5d^86s6p$ (^{4}F)^{5}G	62321.92	3	$5d^86s6p$ (^{2}D)^{3}F
48779.337	3	$5d^86s6p$ (^{4}F)^{3}D	62510.36	4	$5d^8(^3F_4)6s7p(^3P_1)$
49286.116	3	$5d^86s6p$ (^{4}P)^{5}P	62659.30	2	$5d^86s6p$ (^{4}P)^{3}D
49544.565	1	$5d^96p$ ^{3}D	62835.58	5	$5d^8(^3F_4)6s7p(^3P_1)$
49880.883	2	$5d^96p$ ^{3}D	63067.47	1	$5d^86s6p$ (^{2}D)^{3}D
50010.155	4	$5d^86s6p$ (^{2}F)^{3}F	63167.33	3	$5d^8(^3F_4)6s7p(^3P_1)$
50055.313	1	$5d^86s6p$ (^{4}F)^{5}F	63352.91	6	$5d^8(^3F_4)6s7p(^3P_2)$
50299.385	5	$5d^76s^26p$ ^{4}F*^{3}G	63466.29	1	$5d^86s6p$ (^{2}P)^{3}P
50387.66	0	$5d^96p$ ^{3}P	63826.31	2	$5d^76s^26p$ ^{4}F*^{5}G
51097.529	3	$5d^86s6p$ (^{4}P)^{5}D	63945.05	5	$5d^8(^3F_4)6s7p(^3P_2)$
51286.946	2	$5d^86s6p$ (^{2}F)^{1}D	64248.95	2	$5d^86s6p$ (^{2}D)^{3}D
51545.544	3	$5d^86s6p$ (^{4}F)^{3}D	64319.385	4	$5d^8(^3F_4)6s7p(^3P_2)$
51753.317	2	$5d^86s6p$ (^{2}F)^{3}F	64515.68	2	$5d^76s^26p$ ^{4}F*^{5}G
52071.684	1	$5d^86s6p$ (^{4}P)^{5}D	64619.64	1	$5d^86s6p$ (^{4}P)^{3}D
52438.59	5	$5d^86s6p$ (^{2}F)^{3}G	64675.92	3	$5d^76s^26p$ ^{4}P*^{5}D
52520.13	4	$5d^86s6p$ (^{2}F)^{3}F	64904.25	3	$5d^8(^3F_4)6s7p(^3P_2)$
52708.365	2	$5d^86s6p$ (^{4}P)^{5}D	65306.80	1	$5d^95f$
53019.303	1	$5d^86s6p$ (^{2}F)^{3}D	65315.89	2	$5d^95f$
53665.25	1	$5d^86s6p$ (^{2}P)^{3}D	65318.95	6	$5d^95f$
53953.379	2	$5d^86s6p$ (^{2}P)^{3}P	65325.49	2	$5d^95f$
54011.150	3	$5d^86s6p$ (^{4}P)^{5}P	65331.20	3	$5d^95f$
54133.26	2	$5d^86s6p$ (^{4}P)^{5}S	65332.43	1	$5d^95f$
54178.47	4	$5d^86s6p$ (^{4}P)^{5}D	65333.25	4	$5d^95f$

Table 2. Odd energy levels of Pt I. The leading components of the eigenfunctions are derived from theoretical studies of the mixed group of configurations $5d^96p+5d^86s6p+5d^76s^26p+5d^97p$. Where other configurations are indicated, the designations are empirical—Continued

Energy (cm^{-1})	J	Leading component	Energy (cm^{-1})	J	Leading component
65336.49	3	$5d^95f$	67303.64	3,4	$5d^86s7p$
65339.66	4	$5d^95f$	67413.65	5,4	$5d^86s7p$
65341.92	5	$5d^95f$	68266.90	5	$5d^86s7p$
65510.22	3		68343.55	3,4	$5d^86s7p$
65697.70	2,1		68606.62	2	
65850.11	1		68657.42	3	
65852.56	4		70087.93	7	$5d^8(^3F_4)6s5f$
66198.85	2		70088.64	5,6	$5d^8(^3F_4)6s5f$
66432.56	1		70095.52	6	$5d^8(^3F_4)6s5f$
66927.43	2	$5d^97p(^2D_{3/2},^2P_{1/2})$	70099.57	5	$5d^8(^3F_4)6s5f$
67121.58	3	$5d^97p(^2D_{3/2},^2P_{3/2})$			

2. References

[1] J. E. Sansonetti, J. Reader, C. J. Sansonetti, and N. Acquista, J. Res. Natl. Inst. Stand. Technol., **97**, 1 (1992).
[2] R. J. Engleman, Jr., J. Opt. Soc. Am. **B2**, 1934 (1985).
[3] J. Blaise, J. Vergès, J.-F. Wyart, and R. J. Engleman, Jr., J. Phys. II, 1992 (in press).

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Volume 97, Number 1, January–February 1992
Journal of Research of the National Institute of Standards and Technology

[J. Res. Natl. Inst. Stand. Technol. 97, 217 (1992)]

Energy Levels of Singly-Ionized Platinum

Volume 97 | Number 1 | January–February 1992

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The analysis of Pt II is extended by using accurate wavelength measurements by Sansonetti et al. Forty-three new even and 104 new odd levels have been found. The Slater-Condon parametric method is used for the interpretation of the $5d^9$, $5d^8 6s$, and $5d^7 6s^2$ low even configurations and the $5d^8(7s+6d)$ high even configurations with root mean square deviations smaller than 80 cm^{-1}.

The importance of the $5d^8$–$5d^7 6s$ core interaction in interpreting the even-parity levels is stressed.

Key words: atomic spectroscopy; electronic configurations; energy levels; platinum.

Accepted: November 21, 1991

1. Introduction

The spectrum of platinum emitted by a hollow cathode lamp has been recently observed and measured [1]. The improved wavelengths of the classified lines led Reader et al. [2] to determine accurate energies for the known levels. The extensive line list comprised many unclassified lines. Their interpretation has been undertaken at Laboratoire Aimé Cotton in order to improve the knowledge of excited levels at the end of the $5d$-period.

The strong unclassified lines have been interpreted in the present work with the support of theoretical energy level predictions and a computer program to search for recurring energy differences in the list of observed wave numbers. The measured wave numbers of classified lines deviate from the differences between their initial and final levels by less than 0.050 cm^{-1} if the lines are not blended with other transitions. The energy levels are reported in Tables 2, 3, and 5, in which the 3-digit values are taken from Ref. [2]. The J-values of some levels have been changed and the newly classified lines led to slight modifications of their energies. The uncertainty of the levels depends on the intensities and spectral regions of their transitions. It ranges from 0.050 to 0.100 cm^{-1}. The classified lines are reported in Ref. [1].

2. Interpretation of the Low Even-Parity Configurations $5d^9$, $5d^8 6s$, and $5d^7 6s^2$

In 1977 [3], a systematic description of the even configurations $(5d+6s)^N$ was performed in the framework of the Slater-Condon parametric method. It was shown that configuration mixing was very important within these groups and led to the revision and limited extension of some analyses. In the absence of definite configuration assignments for many levels, the sum of the squared amplitudes represented 53% of all $5d^N$ levels from Lu II to Au II, 56% for $5d^{N-1}6s$ and only 27% for

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$5d^{N-2}6s^2$. In Pt II, all 21 levels found by Shenstone [4] were supported by the theoretical calculation, but six of his empirical *LS* designations did not correspond to the leading component of the eigenfunction. The $5d^76s^2$ configuration was limited to four known levels and the relevant energy parameters needed to be fixed or constrained. The present analysis was guided by the results of [3] and the number of levels of the $(5d+6s)^9$ group has been brought from 21 to 33. The present interpretation of the three configurations $5d^9$, $5d^86s$ and $5d^76s^2$ leads to improved parameter values, a number of constraints in the least-squares fitting process being now removed. The present set of parameters includes: a constant energy for all three configurations, A, the energy differences between configurations, $S(d^9\text{–}d^7s^2)$ and $S(d^8s\text{–}d^7s^2)$, all Slater integrals describing the electrostatic interactions within the studied group, the effective electrostatic parameters α_0 and β_0 as defined in the formalism of orthogonal operators [5], and finally, the usual spin-orbit parameters. These 18 parameters have been reduced to 13 adjustable ones by means of constraints detailed in Table 1. These constraints were derived from earlier studies of $(5d+6s)^N$ groups. The root mean square deviation is 73 cm^{-1}. The comparison of experimental and theoretical energies is given in Table 2. The theoretical data are limited to the theoretical energy E_{th}, the first component of the eigenfunction and the percentage of the components of the 3 configurations (squared amplitudes) in the eigenfunctions. The coefficients of the interaction parameter $R^2(5d^2,5d6s)$ in intermediate coupling show that $5d^86s\ ^2P_{1/2}$ and $5d^76s^2\ ^2P_{1/2}$ which are distant by 33700 cm^{-1} have a mutual repulsion of 7000 cm^{-1} and that four other levels of $5d^86s$ are shifted to lower energies by more than 2000 cm^{-1}.

Table 1. Fitted energy parameters (cm^{-1}) of the even configurations of Pt II. Standard deviations of the parameters are given in parentheses

Parameter	$5d^76s^2$	$5d^86s$	$5d^9$	$5d^86d$	$5d^87s$
A	58028 (65)			121854 (119)	112271 (66)
$S(5d^86s-5d^76s^2)$		−30621 (94)			
$S(5d^9-5d^76s^2)$			−51804 (117)		
$F^2(5d,5d)$	52391 (219)	50566 (202)		46155 (235)	46155 [g]
$F^4(5d,5d)$	39365 (318)	38754 (35)		39579 (541)	39579 [g]
$F^2(5d,6d)$				3544 (369)	
$F^4(5d,6d)$				1252 (405)	
$G^0(5d,6d)$				767 (46)	
$G^2(5d,6d)$				1256 (227)	
$G^4(5d,6d)$				1256 [e]	
$G^2(5d,6s)$		15354 (180)			
$G^2(5d,7s)$					1879 (247)
$R^2(5d^2,6s^2)$		16889 [b]			
$R^2(5d^2,5d6s)$	−20905 (242)h	−20277 [c]			
$R^2(5d6d,5d7s)$				2568	(302)
$R^2(5d6d,7s5d)$				942	(657)
α_0	15.1 [a]	15.1 (4.5)		115 (6.5)	115 [g]
β_0	−204 [a]	−204 (50)		−204 [f]	−204 [f]
ζ_{5d}	4607.1 (19)	4349.5 (21)	4092.0 [d]	4378 (18)	4335 (27)
ζ_{6d}				228 (17)	

[a] Parameters constrained to be equal in $5d^76s^2$ and $5d^86s$.
[b] The parameter $R^2(5d^2,6s^2)$ of the $5d^76s^2$–$5d^9$ interaction is held in a constant ratio with the $G^2(5d,6s)$ of $5d^86s$.
[c] Slater parameters $R^{(2)}(5d^2,5d6s)$ for $5d^86s$–$5d^9$ and $5d^86s$–$5d^76s^2$ interactions are held in a constant ratio.
[d] $\zeta(5d^76s^2)+\zeta(5d^9)=2\zeta(5d^86s)$.
[e] $G^2(5d,6d)=G^4(5d,6d)$.
[f] Held fixed to the fitted value of the lowest configurations.
[g] Held equal to the same parameter in $5d^86d$.
[h] Parameter for the $5d^76s^2$–$5d^86s$ interaction.

Table 2. Low even energy levels of Pt II. The theoretical energies E_{th} are those of the mixed configurations $5d^9$,$5d^86s$ and $5d^76s^2$ (designated A, B, and C in the first components of the eigenfunction)

E_{exp} (cm^{-1})	J	E_{th} (cm^{-1})	First comp. %	$5d^9$ %	$5d^86s$ %	$5d^76s^2$ %
0	5/2	16	A ^{2}D 90.7	90.7	7.6	1.7
4786.611	9/2	4862	B ^{4}F 96.6	0	100.	0
8419.822	3/2	8475	A ^{2}D 62.9	62.9	34.5	2.6
9356.274	7/2	9234	B ^{4}F 67.5	0	99.6	0.4
13329.227	5/2	13345	B ^{4}P 36.2	5.5	94.1	0.4
15791.276	3/2	15639	A ^{2}D 32.3	32.3	65.1	2.6
16820.894	5/2	16770	B ^{4}F 60.0	0.4	99.3	0.3
18097.715	7/2	18171	B ^{2}F 63.8	0	98.8	1.2
21168.684	3/2	21146	B ^{4}F 39.5	0.1	94.1	5.8
21717.260	1/2	21774	B ^{4}P 87.4	0	99.8	0.2
23461.503	5/2	23542	B ^{2}F 48.3	1.2	95.8	3.0
23875.553	3/2	23886	B ^{4}P 56.3	0.3	87.4	12.3
24879.480	9/2	24846	C ^{4}F 67.7	0	13.6	86.4
27255.687	1/2	27207	B ^{2}P 77.8	0	84.7	15.3
29030.479	7/2	28968	B ^{2}G 88.0	0	94.5	5.5
29261.967	9/2	29341	B ^{2}G 78.6	0	81.3	18.7
32237.007	3/2	32182	B ^{2}D 53.3	3.4	85.6	11.0
32918.561	5/2	32981	B ^{2}D 36.2	1.4	87.3	11.3
34647.221	7/2	34624	C ^{4}F 95.2	0	1.5	98.5
36484.028	5/2	36555	C ^{4}F 55.6	0.1	9.4	90.5
37877.792	3/2	37895	C ^{4}F 43.7	0.1	12.9	87.0
N 41434.11	5/2	41433	C ^{4}P 76.1	0.1	0	99.9
N 42031.85	3/2	41986	C ^{4}P 50.1	0	11.9	88.1
N 43737.40	9/2	43774	C ^{2}G 52.7	0	4.5	95.5
N 46046.43	1/2	46086	C ^{4}P 76.6	0	9.0	91.0
N 48591.04	11/2	48524	C ^{2}H 100.	0	0	100.
N 50564.60	7/2	50607	C ^{2}G 79.8	0	4.2	95.8
	1/2	53204	B ^{2}S 76.6	0	86.6	13.4
N 53749.63	3/2	53722	C ^{4}P 50.1	0	3.8	96.2
N 54373.47	5/2	54333	C $^2_3$D 53.5	0.1	2.5	97.4
N 58062.04	5/2	58072	C ^{2}F 81.7	0.1	3.9	96.1
N 58491.21	9/2	58518	C ^{2}H 68.1	0	0.6	99.4
N 60986.75	1/2	60939	C ^{2}P 65.8	0	20.0	80.0
N 64003.90	7/2	64001	C ^{2}F 83.7	0	1.3	98.7
	3/2	65221	C $^2_3$D 50.8	0.2	4.3	95.5
	3/2	77750	C $^2_1$D 88.5	0.9	0.4	98.7
	5/2	79860	C $^2_1$D 67.0	0.5	0.1	99.4

Note: N—new energy level.

3. The Predicted Low Configurations of Pt III

The spectrum of Pt III is still unknown but, for application to Pt II, its low energy levels can be predicted by means of the Slater-Condon method. By comparing the lowest energy levels of $5d^N$, $5d^{N-1}6s$ and $5d^{N-2}6s^2$ in Hf III ($N=2$) [6], W III ($N=4$) [7], Au III ($N=9$) [8] and Hg III ($N=10$) [9], one can reasonably assume that the excitation energies of $5d^76s$ $^5F_5$ and $5d^66s^2$ $^5F_5$ and $5d^66s^2$ $^5D_4$ levels above the ground level $5d^8$ $^3F_4$ are about 20000 and 60000 cm^{-1}, respectively. All other parameters needed for describing $(5d+6s)^8$ in Pt III may be obtained from regular trends investigated in second spectra [3] and in third spectra. The results of this preliminary study are summarized below.

For all J-values, the configuration $5d^8$ does not overlap the energy range of the $5d^76s$ and $5d^66s^2$ configurations, but this does not prevent configuration mixing. The effect of $5d^66s^2$ is a constant shift of about -800 cm^{-1} for all levels of $5d^8$ except $^3P_0$ and $^1S_0$, both shifted by -1400 cm^{-1}. The effect of the $5d^76s$–$5d^8$ mixing is more selective and is reported in the last column of Table 3. These shifts mean that the $5d^8$ parameters would certainly differ if fitted in the approximation of *isolated* configurations or in mixed groups $(5d+6s)^N$. The LS names are well defined except for the $J=2$ levels, for which $^3P_2$ is nowhere the leading component of

Table 3. Energy levels of Pt III $5d^8$ predicted in the parametric study of $(5d+6s)^8$

J	Energy cm^{-1}	$5d^8$ purity %	First comp. %	Second comp. %	Third comp. %	Shift (cm^{-1}) d^7s-d^8
4	0	98.8	^{3}F 94.7	^{1}G 4.0		−800
2	5547	94.4	^{1}D 41.1	^{3}P 37.7	^{3}F 16.3	−3350
3	9859	98.4	^{3}F 98.4	(^{2}F)^{3}F 1.1		−1000
2	14249	93.2	^{3}F 47.6	^{3}P 40.6	^{1}D 5.1	−3050
0	15127	93.4	^{3}P 81.5	^{1}S 11.9	(^{2}P)^{3}P 5.5	−3800
1	16700	89.7	^{3}P 89.7	(^{2}P)^{3}P 8.4		−4950
4	21675	89.8	^{1}G 86.0	(^{2}G)^{1}G 5.8	^{3}F 3.9	−2850
2	24760	92.5	^{1}D 48.0	^{3}F 33.9	^{3}P 10.7	−3200
0	46301	60.3	^{1}S 58.3	(^{2}P)^{3}P 28.0	(^{4}P)^{3}P 10.6	−1350

the eigenfunction. Since the second and third $J=2$ levels have respectively dominant $^3F_2$ and $^1D_2$ characters, the lowest $J=2$ level has been given the designation $^3P_2$ for identification purposes in the next step of the work.

4. Interpretation of the Upper Even Configurations

Nine high even levels were identified by Shenstone [4] as $5d^87s$ and $5d^86d$. One of these levels has now been rejected and the J-values of two revised. The three levels of $5d^88s$ and $5d^87d$ have not been confirmed. Thirty-two levels have been found between 101500 and 121700 cm^{-1}. The intensity of their transitions and some relatively large deviations $E_{exp}-E_{th}$ in the separate studies of these configurations led us to evaluate their mixing. The 21 integrals needed to describe the levels of $5d^87s+5d^86d$ were reduced to 15 adjustable parameters by means of constraints given in Table 1. The mixing of the lowest $J=1/2$ levels leads to a well-defined value for the interaction parameter $R^2(5d7s, 5d6d)$ and the final rms deviation is 79 cm^{-1}. As shown in Table 1, the values of the parameters $F^2(5d,5d)$ and α for $5d^8(6d+7s)$ differ significantly from those for $5d^76s^2$ and $5d^86s$; however, the parameters are well-defined in the least-squares fit. We consider this to be an effect of truncation problems discussed in Sec. 3. It seems likely that these inconsistencies would be corrected if all six configurations $(5d+6s)^87s+(5d+6s)^86d$ were studied together. This extended parametric study has not been undertaken because $5d^66s^27s$, $5d^66s^26d$ and $5d^76s6d$ are totally unknown and only two levels of $5d^76s7s$ are located so far. The predictions of our restricted study might well be unreliable and the theoretical energies of unknown levels have therefore not been reported here.

5. Odd Levels of Pt II

The lowest odd levels were attributed to $5d^86p$ by Shenstone [4]. This configuration is also known in other ions of the isoelectronic sequence through Bi VII [9–11]. The approximation of an *isolated* $5d^86p$ configuration, if valid, has been used for the theoretical study of Au III-Bi VII spectra. It does not hold for Pt II. In second spectra, the overlap of $5d^N6p$, $5d^{N-1}6s6p$ and $5d^{N-2}6s^26p$ requires a multiconfigurational treatment. In Hf II, Ta II, W II, Au II and Hg II [12], these low odd configurations had been interpreted with rms deviations smaller than 200 cm^{-1}. For unclear reasons, the rms deviation for Pt II is larger than 500 cm^{-1} and the designations reported in Table 4 are carefully limited to the lowest levels. Some of them might well be revised with further advances in the parametric interpretation. The $5d^76s6p$ configuration starts with the 62820 level, for which we explain the absence of decay to $5d^76s^2\,{}^4F_{9/2}$ by the selection rule on the strongly forbidden transition $6s6p\,{}^3P_0-6s^2\,{}^1S_0$. Most of the levels without designation belong to $5d^76s6p$ with some admixture of $5d^66s^26p$ for the highest energies.

6. Conclusion

The strongest unclassified lines of Pt II have been interpreted by extending the early analysis of Shenstone with the help of accurate wavelength measurements and parametric calculations of the main configurations. The number of levels has been brought from 29 to 72 in the even parity and from 71 to 174 in the odd parity. The theoretical study stresses the importance of the $5d^8-5d^76s$ interaction and, although somewhat preliminary, the parametric interpretation of the low odd levels indicates that all levels with $J=3/2$ through 11/2 below 79000 cm^{-1} have been found.

Table 4. Upper even levels of Pt II. The theoretical energies E_{th} are from the parametric study of $5d^86d+5d^87s$. The core term of $5d^8$ is indicated in parenthesis for $5d^86d$ only

E_{exp} (cm^{-1})	J	E_{th} (cm^{-1})	Designation	$5d^87s$ %	$5d^86d$ %	Leading LS comp.	%
95803.363	9/2	95837	$(^3F_4)7s_{1/2}$	99.8	0.2	$7s\ ^4F$	95
96614.352	7/2	96630	$(^3F_4)7s_{1/2}$	99.9	0.1	$7s\ ^2F$	66
101199.085	5/2	101199	$(^3P_2)7s_{1/2}$	97.6	2.4	$7s\ ^2D$	43
N 101517.59	3/2	101500	$(^3P_2)7s_{1/2}$	99.5	0.5	$7s\ ^2D$	46
N 104090.70	7/2	104210	$(^3F_4)6d_{3/2}$	0.9	99.1	$6d(^3F)^4D$	62
N 104410.05	11/2	104405	$(^3F_4)6d_{3/2}$	0	100.	$6d(^3F)^2H$	46
J 104636.905	9/2	104612	$(^3F_4)6d_{3/2}$	0.1	99.9	$6d(^3F)^4F$	36
104763.45	13/2	104698	$(^3F_4)6d_{5/2}$	0	100.	$6d(^3F)^4H$	95
N 104930.26	3/2	105955	$(^3F_4)6d_{5/2}$	0.7	99.3	$6d(^3F)^2P$	58
105066.347	11/2	105029	$(^3F_4)6d_{5/2}$	0	100.	$6d(^3F)^4G$	72
N 105086.83	7/2	105046	$(^3F_4)6d_{5/2}$	0.1	99.9	$6d(^3F)^2F$	61
105388.130	9/2	105413	$(^3F_4)6d_{5/2}$	0	100.	$6d(^3F)^2G$	48
N 105794.53	7/2	105739	$(^3F_3)7s_{1/2}$	98.9	1.1	$7s\ ^4F$	69
N 105962.52	5/2	105880	$(^3F_3)7s_{1/2}$	99.0	1.0	$7s\ ^4F$	59
J 106434.92	5/2	106430	$(^3F_4)6d_{5/2}$	1.1	98.9	$6d(^3F)^2D$	39
N 109346.33	3/2	109412	$(^3P_2)6d_{3/2}$	3.5	96.5	$6d(^1D)^2D$	37
N 109507.99	1/2	109472	$(^3P_2)6d_{3/2}$	43.8	56.2	$7s\ ^4F$	32
N 109527.87	5/2	109446	$(^3P_2)6d_{3/2}$	3.3	96.7	$6d(^1D)^2F$	37
N 109676.18	7/2	109676	$(^3P_2)6d_{3/2}$	0.2	99.8	$6d(^1D)^2G$	24
N 110020.85	1/2	110077	$(^3P_2)6d_{5/2}$	10.7	89.3	$6d(^1D)^2P$	40
N 110146.80	7/2	110061	$(^3P_2)6d_{5/2}$	0	100.	$6d(^1D)^2F$	23
N 110158.16	5/2	110261	$(^3F_2)7s_{1/2}$	94.6	5.6	$7s\ ^4P$	44
N 110257.49	9/2	110313	$(^3P_2)6d_{5/2}$	0.1	99.9	$6d(^1D)^2G$	45
N 110258.18	3/2	110356	$(^3F_2)7s_{1/2}$	93.9	6.1	$7s\ ^4F$	42
N 110408.02	3/2	110530	$(^3F_2)6d_{5/2}$	2.1	97.9	$6d(^1D)^2P$	39
N 111162.69	5/2	111075	$(^3P_2)6d_{5/2}$	1.6	98.4	$6d(^1D)^2D$	32
N 111371.71	1/2	111309	$(^3P_0)7s_{1/2}$	45.6	54.4	$7s\ ^4P$	33
N 112433.31	3/2	112371	$(^3P_1)7s_{1/2}$	90.9	9.1	$7s\ ^4P$	65
N 113119.61	1/2	113112	$(^3P_1)7s_{1/2}$	93.1	6.9	$7s\ ^2P$	76
N 114127.60	9/2	114088	$(^3F_3)6d_{3/2}$	0.1	99.9	$6d(^3F)^4H$	58
N 114256.30	7/2	114179	$(^3F_3)6d_{3/2}$	0	100.	$6d(^3F)^4G$	48
N 114455.05	5/2	114530	$(^3F_3)6d_{3/2}$	0.3	99.7	$6d(^3F)^4D$	40
N 114539.25	11/2	114549	$(^3F_3)6d_{5/2}$	0	100.	$6d(^3F)^4H$	63
N 114861.32	9/2	114823	$(^3F_3)6d_{5/2}$	0.1	99.9	$6d(^3F)^4G$	54
N 115060.84	5/2	115144	$(^3F_3)6d_{5/2}$	0.2	99.8	$6d(^3F)^2D$	31
N 116689.04	9/2		$5d^76s7s$				
N 117340.84	9/2	117404	$(^1G_4)7s_{1/2}$	98.7	1.3	$7s\ ^2G$	94
N 117493.46	7/2	117437	$(^1G_4)7s_{1/2}$	96.6	3.4	$7s\ ^2G$	92
N 119057.05	5/2	[a]					
N 121651.19	9/2		$5d^76s7s$				

[a] Undetermined identification; theoretical $J=5/2$ levels are calculated at 119011 and 119177 cm^{-1}.
Notes: N—new energy level.
J—revised J-value.

Table 5. Odd energy levels of Pt II

	E (cm^{-1})	J	Configuration	Designation
	51408.370	7/2	$5d^86p$	$(^3F_4)6p_{1/2}$
	53875.493	9/2	$5d^86p$	$(^3F_4)6p_{1/2}$
	56587.934	3/2	$5d^86p$	$(^3P_2)6p_{1/2}$
	57018.130	5/2	$5d^86p$	$(^3P_2)6p_{1/2}$
	60907.688	9/2	$5d^86p$	$(^3F_4)6p_{3/2}$
	61058.490	11/2	$5d^86p$	$(^3F_4)6p_{3/2}$
	61190.026	5/2	$5d^86p$	$(^3F_4)6p_{3/2}$[a]
	61665.485	7/2	$5d^86p$	$(^3F_4)6p_{3/2}$
	62781.658	1/2	$5d^86p$	$(^3P_2)6p_{3/2}$
	62820.489	9/2	$5d^76s6p$	$(^4F_{9/2},{}^3P_0)$
	63738.841	7/2	$5d^86p$	$(^3F_3)6p_{1/2}$
	64388.642	3/2	$5d^86p$	$(^3F_2)6p_{1/2}$
	64757.343	5/2	$5d^86p$	$(^3F_3)6p_{1/2}$[a]
N	65046.23	11/2	$5d^76s6p$	$(^4F_{9/2},{}^3P_1)$
	65351.069	5/2	$5d^86p$	$(^3P_2)6p_{3/2}$
	65587.115	1/2	$5d^86p$	$(^3P_0)6p_{1/2}$
	66028.014	3/2	$5d^86p$	$(^3P_2)6p_{3/2}$
	66434.315	7/2	$5d^86p$	$(^3P_2)6p_{3/2}$
N	67780.44	7/2	$5d^76s6p$	$(^4F_{9/2},{}^3P_1)$
J	69235.665	3/2	$5d^86p$	$(^3P_1)6p_{1/2}$
	69953.317	5/2	$5d^86p$	$(^3F_3)6p_{3/2}$
	70181.281	9/2	$5d^76s6p$	$(^4F_{9/2},{}^3P_1)$
	70379.023	5/2	$5d^86p$	$(^3P_1)6p_{3/2}$
N	71021.13	9/2	$5d^86p$	$(^3F_3)6p_{3/2}$
J	71314.594	7/2	$5d^86p$	$(^3F_3)6p_{3/2}$
N	71364.68	3/2	$5d^86p$	$(^3F_3)6p_{3/2}$
	71948.916	5/2	$5d^76s6p$	
	73026.380	3/2	$5d^86p$	$(^3F_2)6p_{3/2}$
	73431.346	9/2	$5d^86p$	$(^1G_4)6p_{1/2}$
	73761.739	7/2		
E,J	73999.85	5/2		
	74241.479	3/2	$5d^86p$	
N	74409.47	11/2	$5d^76s6p$	$(^4F_{9/2},{}^3P_2)$
	74619.107	5/2		
	74745.916	7/2		
	74754.823	1/2	$5d^86p$	$(^3F_2)6p_{3/2}$
	75184.880	7/2	$5d^86p$	$(^1G_4)6p_{1/2}$
N	75365.84	5/2		
	75581.422	3/2		
	76461.526	5/2		
	76610.046	3/2		
	77519.724	9/2		
N	77538.25	3/2		
N	77763.58	1/2		
E,J	78043.02	7/2		
N	78254.80	5/2		
N	78452.50	3/2		
	78906.492	9/2	$5d^76s6p$	$(^4F_{9/2},{}^3P_2)$
N	79092.09	3/2		
	79607.460	5/2		
N	79683.41	1/2		
N	80197.33	7/2	$5d^86p$	$(^1G_4)6p_{3/2}$
	80858.488	5/2		
N	81083.95	9/2	$5d^86p$	$(^1G_4)6p_{3/2}$
E	81897.71	7/2		
E,J	82535.79	5/2		
N	82692.28	9/2	$5d^76s6p$	
E	82824.00	3/2		
E,J	82972.72	3/2		
	83352.251	7/2		
N	83538.53	11/2	$5d^76s6p$	
	84182.633	9/2		
E,J	85700.27	9/2	$5d^76s6p$	
N	85775.64	11/2		
N	85826.57	7/2		
N	86489.76	5/2		
N	87204.35	3/2		
N	88110.30	3/2,(5/2)		
N	88173.46	7/2		
N	88589.53	7/2		
N	89095.05	3/2		
	89607.936	5/2		
E	89863.27	9/2		
N	90173.25	7/2,9/2		
N	90746.64	5/2		
N	91016.64	1/2,3/2		
N	91271.16	5/2		
N	91669.95	7/2		
N	92526.90	11/2	$5d^76s6p$	
N	92537.08	9/2		
N	92749.02	3/2		
N	92767.97	3/2		
N	93197.46	5/2		
N	93322.18	11/2	$5d^76s6p$	
	93336.287	7/2		
	93482.013	7/2		
E	94022.39	9/2		
N	94271.53	5/2		
N	94633.25	5/2		
N	94829.73	1/2,3/2		
N	94842.49	5/2		
N	95226.00	9/2		
N	95557.71	3/2		
N	95617.03	7/2		
E	95754.07	5/2		
N	96109.73	11/2		
N	96131.24	9/2		
N	96403.32	5/2		
N	96443.92	1/2		
N	97183.40	3/2		
	97630.600	7/2		
N	97786.55	3/2		
N	97792.75	5/2		
J	98186.971	7/2		
	98817.744	7/2		
N	99068.74	3/2		
	99209.011	5/2		
N	99471.02	1/2		
	99797.778	5/2		
N	100232.63	9/2		
	100239.421	5/2		
	100611.695	3/2		
	100795.666	3/2		
	100903.454	7/2		
N	101113.06	1/2		
	101341.867	7/2		
N	101394.01	1/2		
	101397.850	5/2		
J	101549.10	9/2		
	101618.459	11/2		

Table 5. Odd energy levels of Pt II—Continued

	E (cm⁻¹)	J	Configuration	Designation		E (cm⁻¹)	J	Configuration	Designation
	101916.930	5/2			N	107386.26	9/2		
	102086.034	9/2			N	107588.13	3/2		
	102414.857	5/2			N	108037.26	7/2		
N	102520.80	7/2			N	108038.05	3/2		
N	102613.05	11/2			N	108155.51	3/2		
N	102678.30	3/2			N	108322.40	7/2		
N	102872.20	7/2			N	108639.24	5/2		
N	103060.55	9/2			N	108672.51	1/2,3/2		
N	103421.16	3/2			N	108727.50	7/2		
	103463.310	5/2			N	108802.20	7/2,9/2		
	103517.132	7/2			N	109307.89	7/2		
N	103637.26	1/2,3/2			N	109528.23	3/2,5/2		
N	104092.10	3/2,5/2			N	109733.10	7/2		
N	104158.64	5/2			N	109753.67	5/2		
N	104548.13	3/2			N	110066.71	9/2		
N	104625.27	9/2			N	110085.70	3/2		
N	104831.58	9/2			N	110196.40	5/2		
N	105018.17	3/2			N	110202.39	7/2		
N	105042.36	5/2			N	110609.08	9/2		
N	105554.33	7/2			N	110638.00	5/2		
N	105597.33	5/2			N	110684.45	3/2		
N	105726.12	1/2			N	110762.77	7/2,9/2		
N	105896.50	3/2			N	111320.57	5/2		
N	106229.90	7/2			N	111354.67	7/2		
N	106852.84	3/2			N	111716.41	7/2,9/2		
N	106995.20	9/2			N	112247.69	9/2		
N	106996.55	7/2			N	113785.71	3/2,(1/2)		
N	107191.45	3/2,5/2			N	114880.48	5/2		

[a] These J-j characters are equally shared by the levels 61190 and 64757.
Notes: N—new energy level.
J—revised J-value.
E—revised energy value.

Acknowledgments

We are grateful to Dr. J. Reader and his coworkers for sending us several line lists of platinum as soon as they were completed. The theoretical calculations have been performed by means of the chain of programs written and maintained at Laboratoire Aimé Cotton by A. Bachelier and J. Sinzelle.

7. References

[1] J. E. Sansonetti, J. Reader, C. J. Sansonetti, and N. J. Acquista, J. Res. Natl. Inst. Stand. Technol. **97**, 1 (1992).
[2] J. Reader, N. Acquista, C. J. Sansonetti, and R. Engleman, Jr., J. Opt. Soc. Am. **B5**, 2106 (1988).
[3] J.-F. Wyart, Optica Pura Appl. **10**, 177 (1977).
[4] A. G. Shenstone, Philos. Trans. R. Soc. London, Ser. A **237**, 453 (1983).
[5] B. R. Judd, J. E. Hansen, and A. J. J. Raassen, J. Phys. B: Atom. Molec. Phys. **15**, 1457 (1982).
[6] P. F. A. Klinkenberg, Th. A. M. van Kleef, and P. E. Noorman, Physica **27**, 151 (1961).
[7] L. Iglesias, M. I. Cabeza, F. R. Rico, O. Garcia-Riquelme, and V. Kaufman, J. Res. Natl. Inst. Stand. Technol. **94**, 221 (1989).
[8] L. Iglesias, J. Res. Natl. Bur. Stand. (U.S.) **64 A**, 481 (1960); **70 A**, 465 (1966).
[9] C. E. Moore, Atomic Energy Levels, Natl. Bur. Stand. (U.S.) Circ. 467, (1959).
[10] Y. N. Joshi, A. J. J. Raassen, and B. Arcimowicz, J. Opt. Soc. Am. **B 6**, 534 (1989).
[11] A. J. J. Raassen, A. A. van der Valk, Y. N. Joshi, L. I. Podobedova, and A. N. Ryabtsev, J. Phys. B: Atom. Molec. Phys. **22**, 809 (1989).
[12] J.-F. Wyart and J. Blaise, Physica Scripta **42**, 209 (1990).

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News Briefs

General Developments

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NIST DEVELOPS TEST CHIP FOR MEASUREMENTS OF MMIC PACKAGES AND INTERCONNECTS

NIST scientists have invented a method for measuring the effect of a monolithic microwave/millimeter-wave integrated-circuit (MMIC) package or interconnect on microwave signals passing through it. This information is needed by MMIC designers to separate the effects of the package or interconnect from measurements intended to characterize a MMIC chip. The test vehicle is itself a microchip carrying a coplanar transmission line with a beam-lead diode that can be biased at different levels. To make measurements of packages or interconnects, this test chip replaces a MMIC chip. For example, to characterize a package designed to house and protect a single MMIC chip, the test chip would be mounted in a specimen of the package and connections made to it in, as nearly as possible, the same way that connections would be made to the MMIC chip. The bias for the diode would be applied directly through the radiofrequency connections of the package. Scattering parameter measurements would then be made at the coaxial connections of the package. The package effects then could be determined from the results of these measurements and a prior characterization of the diode.

The term interconnect as used here refers to a structure that transduces a microwave signal from one transmission medium to another. Examples include coaxial to coplanar waveguide, coaxial to microstrip, and microstrip to coplanar waveguide.

FIIA SYSTEM FIELD-TESTED FOR THEOPHYLLINE IN SERUM AT NIST

A new concept for the measurement of a wide variety of clinical analytes in blood serum, flow injection immunoassay (FIIA), has been recently developed by researchers at NIST. FIIA promises to improve measurements in three ways: by allowing the reuse of expensive antibody reagents, by increasing the assay sensitivities, and by providing the opportunity for automation. The FIIA system was successfully tested for the determination of serum theophylline, a drug which is administered for the treatment of asthma. The performance of the theophylline FIIA for a large number of samples was compared to a fluorescence-polarization immunoassay and to liquid chromatographic determination. There was excellent agreement among the three techniques.

The primary component of the FIIA system is a regenerable reactor column that has the antibody reagent bound to a bed of silica particles. This immobilization provides a site in the flowing system for the specific reaction with the antigen and stabilizes the expensive antibody component for hundreds of measurement cycles. Detection of the immunochemical interaction between the analyte and antibody is achieved by use of theophylline-tagged liposomes, submicroscopic particles capable of encapsulating thousands of fluorescent markers which can be released for detection in the flow system. This provides a very sensitive test that requires much smaller blood volumes than currently used assays, a definite advantage for monitoring therapy in small children. All steps in the assay sequence are automated using a flow injection system under computer control.

NON-METHANE ORGANIC COMPOUND (NMOC) GAS STANDARDS DEVELOPED TO SUPPORT ATMOSPHERIC MEASUREMENTS OF AUTO EMISSIONS

Scientists at NIST have developed a series of gas mixtures consisting of trace level concentrations of 15 different organic compounds in nitrogen. The compounds are constituents of automobile exhaust and have been identified as reactants in the formation of ozone. The standards are difficult to produce since some of the reference compounds are gases, while others are liquids under normal conditions. Because of the low concentration levels, approximately 5 parts per billion (ppb), special procedures had to be developed to accurately produce the mixtures and preconcentrate the organic constituents to allow detection for analysis.

These standards are required to better understand and follow the complex atmospheric chemistry of ozone formation. Ozone at high altitudes is essential to regulating the Earth's atmosphere. However, ozone at ground level is a pollutant that adversely effects human health and is a major contributor to plant and crop damage. Ground-level ozone is formed by complex interactions involving hydrocarbons, oxygen, and sunlight, and is one of the constituents of photochemical smog. Current concern with high pollution levels has caused environmental agencies to embark on studies to determine sources and levels of pollutants so that they might recommend remediation steps and then measure whether these steps are effective. The standards developed at NIST contain the hydrocarbon compounds involved in the reactions to form ozone and will be used to calibrate instruments for accurately measuring these components in the atmosphere.

TWO NEW NIST PRECISION MEASUREMENT GRANTS AWARDED FOR FY 92

Two new $30,000 NIST precision measurement grants have been awarded for fiscal year 1992. The recipients, Daniel J. Heinzen of the University of Texas at Austin and Carol E. Tanner of the University of Notre Dame, were selected from an initial group of 42 candidates. NIST Sponsors these grants to promote fundamental research in measurement science in U.S. universities and to foster contacts between NIST scientists and researchers in the academic community actively engaged in such work.

Heinzen's project, "Quantum-Limited Cooling and Detection with Stored Ions," involves new ion *trapping and cooling experiments with the aim of* extending recently developed quantum-limited cooling and detection techniques to a wider variety of ions and to protons and electrons. The ultimate goal is to increase the accuracy of mass ratio and electron and positron g-factor measurements to unprecedented parts in 10^{11}–10^{12} range.

Tanner's project, "Absolute Calibration of Atomic Parity Nonconservation Measurements," will focus on measuring the transition probability or strength of a particular transition in the cesium atom with an accuracy never before achieved. This will allow the detailed interpretation of new atomic parity non-conservation experiments in cesium, experiments that, because of their high accuracy and low-interaction energy, will probe the standard model of the weak interaction or force at a level that can test it critically and search for new physical effects.

SILICON PHOTODIODES OPERATE OVER 14 DECADES OF DYNAMIC RANGE

The improvements in commercial silicon photodiodes and operational amplifiers over the past several years permit optical power measurements over a wider dynamic range. In a recently published study, scientists at NIST analyzed in detail the origin of noise and drift in certain photodetector circuits and showed that, with the careful selection of components, a simple detector can operate over a dynamic range of 14 orders of magnitude. With a measurement time of 400 s, the electrical noise can be reduced to an equivalent photocurrent of 0.1 fA (fewer than 800 photons/s). At the other extreme, the same sensor without attenuation can measure mW of power.

This wide range of operation is important because the primary NIST radiometric standards have a much narrower range of operation and there is an operational need to transfer primary calibrations to other instruments with different sensitivities. The 14-decade detectors are well suited for this purpose. For example, laser-based facilities may be compared to lamp- and monochromator-based facilities. In one project, the 14-decade detectors facilitated the calibration of night-vision equipment against NIST incandescent lamp standards.

There are a large number of other applications where such a silicon photodiode circuit could replace large and expensive photomultiplier tubes, or inspire new, better, or less expensive products. There is an increasing demand for sensitive radiant power measurements in such diverse fields as chemiluminescence and bioluminescence, materials science (optical density and surface scatter), and optical communication.

X-RAY DIFFRACTION IMAGING OF ARTIFICIAL DIAMOND SINGLE CRYSTALS

Diamond single crystals possess many remarkable properties, such as the highest thermal conductivity and the highest hardness of any material. These properties make diamonds an attractive material for high technology applications such as laser and x-ray windows and high temperature electronic devices. Natural diamonds are recognizable individuals, each with its own set of defects. Since electronic properties are influenced by crystalline perfection, the properties of one crystal are not necessarily the same as those of another crystal. Therefore, the intrinsic properties of diamonds are difficult to determine by analysis of natural crystals.

The high temperature/high pressure process for growing single crystal diamond that was invented by a well known U.S. industrial firm in 1970 has improved to the point where single crystals can be grown that exceed the quality of naturally occurring crystals. These crystals may provide the best opportunity to establish the intrinsic properties of diamonds. In collaboration with this firm, scientists at NIST have been investigating the quality of artificial diamonds by x-ray diffraction imaging, and in particular the influence of isotopic concentration on crystal quality. Using the MSEL beamline at the National Synchrotron Light Source at Brookhaven National Laboratories, NIST scientists examined several natural type IIa (lowest nitrogen concentration) diamonds and several artificial type IIa and IIb (boron doped) diamonds with varying carbon^{-12} and carbon^{-13} isotope concentration. The results indicate that diamonds grown from pure ^{12}C stock can have a higher degree of crystallographic perfection than comparable crystals with isotopic concentrations identified to natural crystals.

SENSORS IDENTIFIED FOR POLYMER COMPOSITE PROCESSING

The driving force for process control sensors is the need for the U.S. polymer composites industry to improve the efficiency and reliability of fabrication to increase competitiveness. The most promising on-line sensor techniques are ultrasonic, dielectric, spectroscopic, and optical. NIST researchers identified and analyzed these process control methods in a report, Assessment of the State-of-the-Art for Monitoring Sensors for Polymer Composites (NISTIR 4514). Each sensor technique was evaluated for measurement speed, sampling geometry, sensitivity to different resins, effects of fiber type, interpretation of the data, and sensitivity to the manufacturing environment. The future for process control is very bright, but the major short-term needs are to build more rugged and reliable equipment that can withstand the harsh manufacturing environment and to develop better relationships between sensor data and the information needed for process control.

DAMAGE IDENTIFICATION IN CYCLICALLY LOADED PZT TRANSDUCERS

Catastrophic failure limits the application of brittle, ceramic materials; consequently, their fracture behavior has been intensely investigated. There exist a number of applications of ceramics, however, in which components are subjected to cyclic, rather than static or monotonically increasing, loads. One such application is the use of piezoelectric ceramics as transducers, in which the material undergoes large cyclic strains, often at resonance frequency. NIST investigations of lead zirconate titanate (PZT), a commercial transducer material, have shown that microcracks are generated during cyclic loading. These cracks do not link up at lower temperatures (e.g., at $T \sim 80$ °C) but, at higher temperatures, may cause hundreds of micrometers of crack extension, which can eventually lead to mechanical failure. If the temperature of the specimen under load is allowed to rise above ~ 100 °C, the material fails catastrophically. While these results explain the lower strengths of PZT driven at resonance frequency, the fracture process is not yet will understood. This understanding will be critical for the design of reliable, higher power devices.

NIST PARTICIPATES IN THE UNITED NATIONS ASSESSMENT OF THE INTERNATIONAL CFC TREATY

A NIST scientist was a principal author of a technology review report for the United Nations. This report assessed the impact of the planned phase-down of environmentally unacceptable chlorofluorocarbons (CFC) on chilled water systems for commercial building air conditioning. The Contracting Parties of the Montreal Protocol, signed in September 1988 and updated in London in 1990, will meet in Copenhagen in 1992. At that time, the group will likely make decisions for an accelerated phase-out of CFCs and new plans to phase-out partially halogenated compounds (HCFCs). This decision will be based on an extensive number of reports summarizing all current knowledge on ozone sciences effects, technology, and economics. The NIST scientist and representatives of the three largest air conditioning manufacturers assessed the technology of large building air conditioning. They concluded that: (1) no substitute is currently known for HCFC-22 or HCFC-123, and (2) currently used HCFCs and HFC-134a must be available until 2020 AD (the generation of current equipment lifetime) if alternatives exhibiting equal or better performance and acceptable system cannot be found.

NEW PUBLICATION FOCUSES ON MICROCOMPUTER-BASED EXPERT SYSTEM BUILDING TOOLS (ESBTs)

Recent years have seen substantial growth in the number of expert systems being developed and fielded in the microcomputer environment. To a great extent, this growth is due to the advent of ESBTs designed for use on microcomputers. Sometimes known as expert system shells, ESBTs are special-purpose software packages that are used to develop expert systems. NIST Special Publication 500-188, Guide to Expert System Building Tools for Microcomputers, provides system managers, planners, and potential expert system developers with a description of ESBTs for the microcomputer environment, identifying specific tool features and the capabilities they support.

GAMS TO BECOME COMPONENT OF HPCC DISTRIBUTED INFORMATION SYSTEM

NIST has been invited to participate in the High Performance Computing and Communications (HPCC) Distributed Information System project being organized by NASA. The system will integrate several software libraries and information systems, NIST's contribution being its Guide to Available Mathematical Software (GAMS) system. As part of this project, an X-window interface to the GAMS on-line software catalog will be developed, and data describing the net-lib software collection of Oak Ridge National Laboratories will be added to the GAMS database. The NIST scientist who leads the GAMS project, will also coordinate planning for ongoing user support for the integrated information system. A number of other organizations are also participating.

INDUSTRY/NIST TO DEVELOP AXLE INSPECTION SENSOR

An automobile manufacturer and NIST are working to produce a nondestructive evaluation (NDE) sensor for inspecting case hardened steel drive axles. Under a 2 year cooperative research and development agreement, an automobile industry engineer will collaborate with NIST scientists to develop electrical eddy current sensing technology to measure "case depth," or how deeply steel axles have been case hardened. Case hardening is a heat-treating process that carburizes metals by making the outer surface harder than the core. The NDE sensor will allow all axles to be tested, possibly replacing current destructive testing of a small fraction of axles produced. The cooperative effort is under the sponsorship of NIST's Office of Intelligent Processing of Materials, an agency-wide program for upgrading the quality of engineering materials and confirming their reliability in service. For information, contact Arnold Kahn, A163 Materials Building, NIST, Gaithersburg, MD 20899, 301/975-6146.

COMPUTER SECURITY BBS USER'S GUIDE PUBLISHED

The Computer Security Bulletin Board System User's Guide (IR4667), a 38-page manual offering step-by-step instructions for using the NIST Computer Security Division's electronic bulletin board system (BBS), is now available. The BBS offers federal agencies and the general public access to a variety of computer security information. Included are software reviews, publications, bibliographies, lists of organizations, an events calendar, and other government BBS numbers. To use the BBS, you need a modem and personal computer with communication software. Access the BBS by dialing 301/948-5717 (300-2400/8/N/1 or 300-2400/7/E/1) or 301/948-5140 (9600/8/N/1). If you can't access the BBS after verifying your communications hardware and software are operating correctly, call the voice line, 301/975-3359, and ask for the BBS system operator. The user's guide is for sale by the National Technical Information Service, Springfield, VA 22161. Order by PB 92-112390; price $17.

AMINO ACID, ION INTERACTIONS PROBED

A new basic chemistry project is spinning off useful tools for clinical laboratories and may eventually shed light on how living cells communicate. The project's long-term goal is the development of a standard reference database on the thermodynamic properties of amino acids, polypeptides, and proteins. A more immediate benefit is the creation of a set of Standard Reference Materials for pH buffer solutions. These are used by medical laboratories to assess the accuracy of blood chemistry analyses. Buffer solutions for pH 6.8 and 7.4 developed at NIST are more accurate than previous standards. Nearly ready is a third buffer of pH 7.8 that will complete the normal physiologic range for cells. The project next calls for determining the electrical conductivity and potential measurements of the essential amino acid glycine, as well as a simple polypeptide, glycylglycine. Completion of the long-term goal—an electrochemical database for amino acids, polypeptides, and proteins—could help biologists understand and model how nerve impulses travel throughout the body.

FIRST COMPILATION OF HIGH T_c PHASE DIAGRAMS

Under a cooperative program between NIST and industry, the American Ceramic Society (ACerS) has published Phase Diagrams for High T_c Superconductors. The volume, which contains 231 ceramic phase diagrams, was compiled by a team of experts under a NIST chemist and an ACerS guest scientist. Chemical systems are divided into two parts: alkaline earth, rare earth, copper, and oxygen diagrams; and alkaline earth, bismuth/lead, and copper oxygen diagrams. Often described as "road maps," the diagrams save individual producers from having to conduct research on the combination of two or more ceramic materials in various relationships and conditions. Data evaluations were conducted in the Phase Diagrams for Ceramists Data Center at NIST, one of 22 centers making up the National Standard Reference Data System. The volume is available for $70 ($62 for ACerS members) from the American Ceramic Society, 735 Ceramic Place, Westerville, OH 43081, 614/890-4700.

BULLETIN SURVEYS ELECTRONICS/ ELECTRICAL ABSTRACTS

Measurement programs in semiconductor microelectronics, signals and systems, electrical systems, and electromagnetic interference are among those described in the Technical Progress Bulletin, available now from NIST. The Bulletin covers programs that provide national reference standards, measurement methods, supporting theory and data, and traceability to national standards. It features abstracts of papers and other published works arranged by topic (with phone numbers of contacts). Semiconductor topics covered include silicon materials, insulators and interfaces, integrated circuit test structures, and photodetectors. Also in the Bulletin are sections on waveform, cryoelectronic, antenna, electromagnetic, and laser metrology. To receive the most recent issue, or to be placed on the Bulletin mailing list, write or call (stating professional affiliation or technical interest) EEEL, B358 Metrology Building, NIST, Gaithersburg, MD 20899, 301/975-2220.

NIST—INDUSTRY COLLABORATION DEMONSTRATES POTENTIAL FOR USE OF GARNET IN HIGH-FREQUENCY MAGNETIC FIELD SENSORS

A NIST scientist and a team of industry scientists have demonstrated that certain iron garnets possess a Faraday effect response at much higher frequencies than anticipated. The work grows out of measurements carried out and reported by NIST last year that showed the existence of a Faraday response for pure yttrium-iron-garnet (YIG) at frequencies as high as 700 MHz. The industry team had developed a theoretical model for domain wall movement in ferrimagnetic films and the relationship of this movement to Faraday frequency response. On learning of the NIST result, the industry team reported to NIST that the model suggested that other materials introduced into pure YIG should affect the frequency response. The industry team then arranged to provide NIST with selected iron garnet thick films for determination of their Faraday response with frequency. The results of NIST's transmission-line measurements showed reasonable agreement with the predictions of the theoretical model. The material properties that affect the frequency response are the saturation magnetization, the magneto-crystalline energy, and the damping constant associated with ferrimagnetic resonance. It appears that all of these may be adjusted (although not necessarily independently) by varying the composition of the garnet. The large Faraday rotation of the iron garnets makes them good candidates for compact, sensitive magnetic sensors. This work opens up a new range of applications for them. A publication describing this work is in preparation.

NEW CALCULATIONS OF DEMAGNETIZING FACTORS PUBLISHED

A former NIST guest researcher and two NIST scientists have completed a comprehensive study of the demagnetizing factors of circular cylinders, including a review of the literature. The results of this work have appeared in the July 1991 issue of the IEEE Transactions on Magnetics and constitute the first across-the-board update of material published some 50 years ago. The subject is important to researchers and engineers concerned with ferromagnetic and ferroelectric materials. Demagnetizing factors are used to correct experimental magnetic measurements on finite-sized samples to give data characteristic of the actual material. The demagnetizing factors for cylinders depend on both the cylinder's aspect ratio and the material's magnetic susceptibility. In contrast to earlier specialized treatments, the NIST work covers the entire range of susceptibilities, including infinite susceptibility (for ferromagnetic materials), zero susceptibility (for paramagnetic and diamagnetic materials), and negative susceptibilities (applicable to superconductors). Factors are reported to four significant figures with an accuracy of 1 percent.

NIST PUBLISHES CRITERIA FOR THE OPERATION OF SECONDARY CALIBRATION LABORATORIES FOR IONIZING RADIATION

NIST recently published Special Publication 812, Criteria for the Operation of Federally-Owned Secondary Calibration Laboratories (Ionizing Radiation). These criteria, for laboratories that calibrate instrumentation used to measure ionizing radiation, may be used for accreditation of a particular laboratory. They were developed by a group of 47 representatives of federally owned laboratories that perform instrument calibrations, and represent a consensus of those experts with regard to the conditions necessary for the assurance of quality. NIST actively supports the development of secondary calibration laboratories for ionizing radiation measurements through the Office of Radiation Measurement. This office serves as the coordinator between the NIST technical staff and the NIST accrediting body, the National Voluntary Laboratory Accreditation Program. This program is expected to accredit about eight laboratories within the next 2 years in such areas as calibration of survey instruments and irradiation of personnel dosimeters with alpha, beta, gamma, and x rays. These laboratories can then provide a high-quality link between the physical measurement standards maintained by NIST and those who make routine measurements at the field level.

NIST REFEREES AND PROVIDES STANDARDS FOR AN INTERNATIONAL INTERCOMPARISON OF ATMOSPHERIC RADON MEASUREMENTS

An international intercomparison of instruments used to measure trace atmospheric concentrations of radon was recently conducted at the Bermuda Biological Research Station. Measurements of radon in remote marine environments are used to obtain information on the temporal and spatial distributions which are in turn used to test and validate global models that simulate the transport and removal of trace atmospheric species. Unlike other chemical species, radon is an excellent tracer for such studies because it has a well-characterized source (large land masses) and only one principal "sink" (radioactive decay). NIST's radioactivity group participated and served as the referee for the intercomparison, and was responsible for providing standardized additions of radon concentration to the sampling tower used by the various participants for simultaneous measurements. The intercomparison included radon activity concentrations ranging from less than 50 atoms per L (at typical ambient levels) to over several hundred thousand atoms per L (0.001 Bq/L to 0.4 Bq/L). The participants were the U.S. DOE Environmental Measurements Laboratory; Centre des Faibles Radioactivities, Laboratoire CARS-CEA, France; the Australian Nuclear Science and Technology Organization; and Drexel University (U.S.A.). This exercise was the first such intercomparison of instruments used in different worldwide locations and will provide a common reference and intercalibration for data obtained from various world locations.

TECHNOLOGY TRANSFER PROGRAM BETWEEN NIST AND SEMATECH YIELDS NEW STANDARDS AND IMPROVES U.S. COMPETITIVENESS

NIST recently completed a joint development contract with Sematech to establish calibration procedures for ultraviolet (uv) light intensity measurements. NIST now provides a service for calibrating I-line (the 365 nm mercury line) radiometers used as detectors in photolithography systems. A direct benefit of this program was to demonstrate that the U.S.-manufactured, GCA I-line system, performs equivalently to its competitors. GCA can now offer its customers better control of their semiconductor production as a result of uv measurements that are traceable to a NIST standard. The weaknesses and strengths of I-line radiometers and the techniques used to calibrate them are identified in the Sematech technology transfer publication #91040516A-ENG.

NEW EDDY CURRENT INVERSION THEORY

A NIST scientist, in collaboration with the University of Surrey Physics Department, U.K., has developed a general theory of flaw reconstruction from eddy-current measurements. Based on this theory, multifrequency and variable probe-position impedance data can be processed to determine the three-dimensional geometry of discrete flaws—cracks or voids—in metals. The theory also permits the determination of an unknown continuous distribution of electrical conductivity. Thus far, reconstructions based on simulated multifrequency impedance data have verified the theory for a layered conductor, in which the thicknesses and conductivities of the individual layers were successfully predicted. Other potential applications of the inversion methodology include the nondestructive characterization of composite materials and the determination of the thickness of metallic coatings.

FLOW THROUGH POROUS MEDIA

NIST scientists have developed a method for measuring the permeabilities of fiber preforms which minimizes edge effects and maximizes the accuracy of flow and pressure measurements. The permeability to resin flow of fiber preforms, the reinforcement fabrics of polymer composite parts, is needed to accurately model mold filling in resin transfer molding. The NIST method uses saturated fabrics in one-dimensional flow geometries, and data are collected for flow in at least three directions in the case of an anisotropic fabric. From such measurements the in-plane permeability tensor is determined and flow in any in-plane direction through the fabric can be calculated. This method is currently being extended to measure the complete three-dimensional permeability tensor.

Collaborative work with a private company was undertaken to compare permeability data obtained by the NIST method with values measured in unsaturated radial flow experiments. The excellent agreement between the NIST predictions of the shape and progress of elliptical flow fronts in radial flow experiments and the experimental observations at the company indicated that the radial and one-dimensional flow experiments are geometrically consistent, and, therefore, can be combined in characterization studies to maximize efficiency.

CIB WORKSHOP ON FIRE MODEL VERIFICATION, SELECTION, AND ACCEPTANCE HELD AT NIST

The Committee on Fire (W14) of the International Council for Building Research Studies and Documentation (CIB) recently held a Workshop on Fire Model Verification, Selection, and Acceptance at NIST.

The workshop was designed to provide strategic guidance to the research community on knowledge needed for the verification of fire models and their international acceptance for use in fire safety engineering. The sessions covered: model quality and validity, supporting infrastructure needed, guidance for selection and use of models, and criteria and strategy for model acceptance.

The workshop attendees agreed that guide documents on model validation and on model documentation developed by ASTM should be reviewed by CIB for submission to ISO as bases for international standards. They also recognized the need for an internationally accepted method for organizing input data and large-scale test data for convenient use by fire model developers and users. The method should be developed for electronic distribution. The fire data management system conceived in the NIST fire program is a candidate. It was agreed that CIB should develop a 5 year coordinated program of research on the validation and use of fire models.

NORTH AMERICAN INTEGRATED SERVICES DIGITAL NETWORK (ISDN) USERS' FORUM (NIU-FORUM) RESULTS PUBLISHED

Two new publications document the work of the NIU-Forum, a NIST/industry collaboration established in 1988 to create a strong user voice in the implementation of ISDN technology. NIST Special Publication 500-194, ISDN Conformance Testing, Layer 1— Physical Layer, Part 1— Basic Rate S/T Interface, User Side, describes a set of test specifications, developed by NIU-Forum members, which test conformance of Terminal Equipment and Network Termination (NTs) to the ISDN Physical Layer at the S/T reference point, as defined in American National Standard (ANS) T1.605-1989. NIST Special Publication 500-195, North American ISDN Users' Forum Agreements on Integrated Services Digital Network, compiles the existing NIU-Forum agreements as of November 1990.

GLOSSARY OF COMPUTER SECURITY TERMINOLOGY PUBLISHED

NISTIR 4659, Glossary of Computer Security Terminology, presents a collection of terms and definitions used by various federal departments and agencies in their policies, standards, and other publications. Developed under the auspices of the National Security Telecommunications and Information Systems Security Committee and published by NIST as part of its efforts to disseminate federally sponsored work, the document provides multiple definitions to reflect the variations in use of these frequently encountered computer and communications security terms among the federal community.

SMALLEST ANTENNAS IMITATE INSECT COMMUNICATION

Using tools developed for fabricating electronic integrated circuits, NIST scientists have produced microantennas the size of a grain of sand and only 60 μm across (about the diameter of a human hair). At this tiny size, these "world's smallest" antennas can capture the extremely short (about 3 to 30 μm) wavelengths of infrared radiation. Their development paves the way for novel infrared detectors that rely on antennas to "see" images of heat radiating from all warm objects such as people, animals, and buildings. Such detectors have many applications, including satellite observation of Earth, astronomy, medicine, and national defense. There is evidence that insects evolved microantennas, similar to the NIST devices, to enhance their infrared pickup, allow them to see in darkness, and give them a survival advantage. The NIST work proves that such tiny insect structures can function efficiently for infrared wavelengths.

NEW OFFICE TO SPEED ROCKY MOUNTAIN TECH TRANSFER

To coordinate and intensify the commercialization of government-developed technology to industry in the Rocky Mountain region, NIST has established an Office of Research and Technology Applications (ORTA) at the U.S. Commerce Department's Boulder, CO Laboratories. The office will support the technology transfer efforts of scientists and engineers at the three laboratories—NIST, the National Oceanic and Atmospheric Administration's Environmental Research Laboratories (NOAA/ERL), and the National Telecommunications and Information Administration (NTIA)—by coordinating common on-site services, providing training in commercialization procedures, helping create Cooperative Research and Development Agreements (CRDAs), licensing federal patents, and improving dissemination of research results to the private sector.

NEW PUBLICATION ISSUED ON SECURITY IN ISDN

In this decade, Integrated Services Digital Network (ISDN) standards will provide worldwide digital communications service and play a key role in the transition to electronic documents and business transactions. Government and businesses are increasingly concerned with security in ISDN. Security in ISDN (NIST Special Publication 500-189), covers the standards needed to implement user security. ISDN security standards should take advantage of, and be compatible with, emerging standards for Open Systems Interconnection security, including confidentiality, access control, authentication, data integrity, and nonrepudiation. The challenge of ISDN security is to extend these concepts to all ISDN applications, including voice use of the public network. The 76-page publication provides a broad discussion of user security needs and suggests possible solutions. Available from the National Technical Information Service, Springfield, VA 22161 for $19 prepaid. Order by PB 92-116391.

CASE STUDY ON SOFTWARE RE-ENGINEERING

Software re-engineering involves the use of existing software and documentation to specify requirements, design, documentation, and production of software for a new computing platform. Software Reengineering: A Case Study and Lessons Learned (NIST Special Publication 500-193) targets managers and technical personnel in government and industry who need to understand concepts and issues of software re-engineering, the use of Computer-Aided Software Engineering (CASE) tools in the re-engineering process, and the application of this technology to organizational problems. A case study conducted by NIST and the Internal Revenue Service indicates that software re-engineering can be a cost-effective, viable solution for extending the lifetime of an application system. Technical information on the 39-page publication is available from Mary K. Ruhl at 301/975-2983. The publication is for sale by the National Technical Information Service, Springfield, VA 2161 for $17 (hard copy) and $9 (microfiche) prepaid. Order by PB 92-116417/AS.

MAGNETIC FIELD FACILITIES IN JAPAN EVALUATED

Japanese high magnetic field facilities for research on superconducting materials are capable of producing fields (both direct current and pulsed) comparable to the highest in the world, says a NIST researcher in a study prepared under the Japanese Technical Literature Act of 1986 (P.L. 99-382). Further, a concerted effort by Japan will result in a new magnetic facility capable of creating the world's highest dc field, 40 T, by 1993 (current highest is the U.S. limit at 31.8 T). The United States will not reach 45 T until new facilities are completed by 1995 or later, so research in this area must currently be performed in either Japan or Europe. The NIST report says most research on superconducting materials does not require the highest magnetic fields. However, critical properties such as current density and temperature must be perfected at such levels before promising new materials can be used. High Magnetic Field Facilities in Japan Related to Superconductivity Research (NISTIR 4593), is available for $17 prepaid from the National Technical Information Service, Springfield, VA 22161. Order by PB 91-240762.

TRAPPED ION EXPERIMENTS HIGHLIGHTED

Researchers in the field of trapped and stored atoms and ions will be interested in a new paper from the NIST ion storage group in Boulder, CO. The paper summarizes recent work in developing techniques for high-resolution spectroscopy using stored ions. Topics covered in the paper include beryllium hyperfine pressure shift, linear Paul traps, Penning trap density limitations, theory of Sisyphus cooling for a bound atom, observation of "atomic projection" noise, and subharmonic excitation of a single electron. For a copy of paper 49-91, Recent Experiments on Trapped Ions at the National Institute of Standards and Technology, contact Jo Emery, Div. 104, NIST, Boulder, CO 80303, 303/497-3237.

"MEETING THE CHALLENGE" NOW AVAILABLE ON VHS

A new videotape describing how NIST helps strengthen U.S. industry's competitiveness, advance science, and improve safety, health, and the environment was recently released. The 11 minute tape, "Meeting the Challenge," highlights research in biotechnology, precision measurement of atoms, intelligent processing of materials, automated manufacturing, the Integrated Services Digital Network, and the Malcolm Baldrige National Quality Award. Also featured are cooperative programs with the Ray Watson Co., Du Pont, and Hewlett-Packard. VHS copies are $12 (shipping included) and may be purchased from Video Transfer, Inc., 5709-B Arundel Ave., Rockville, MD 20852, 301/881-0270.

HIGH-PERFORMANCE COMPUTING ACT OF 1991 (S. 272) BECOMES LAW

On Dec. 9, the President signed into law S. 272, the High-Performance Computing Act of 1991—P.L. 102-194. NIST's responsibilities under the act include: developing and proposing standards and guidelines and developing measurement techniques and test methods for the interoperability of high-performance computing systems in networks and for common user interfaces to systems; developing benchmark tests and standards for high-performance computing and software; and developing and proposing standards and guidelines for assuring cost-effective security and privacy for sensitive information in federal computer systems.

NIST WORK PROMPTS INCREASED INTEREST IN ADVANCED PARTIAL DISCHARGE MEASUREMENT SYSTEMS AS DIAGNOSTIC TOOLS

The electric power industry is becoming increasingly interested in applying to practical diagnostic issues the results of the research on partial discharge measurements carried out by NIST scientists. It recently has sought sensors for physical parameters to be incorporated in its largest, most expensive high-voltage transformers to be able to operate the resulting "smart" devices as close to their limits as possible for the sake of efficiency. Conventional sensors develop limited data useful for predicting failure. The NIST research has demonstrated that partial discharge measurement systems can provide data for failure prediction, and the electric power industry is renewing its interest in these systems. A major contribution of the NIST work has been to uncover the basis for the nonstationary behavior of partial discharge phenomena, which frustrated previous attempts at reliable pattern recognition using conventional pulse-height analysis techniques.

PROTEIN MAPPING TECHNIQUES ADVANCE CANCER RESEARCH

A method based on two-dimensional electrophoresis and computerized image processing has been developed to map and characterize subtle changes in the protein composition of cancer cells when they are treated with chemotherapy drugs. This research was featured in a recent issue of Genetic Engineering News, one of the most widely read biotechnology news magazines. NIST scientists collaborated with researchers at the John Wayne Cancer Institute at St. John's Hospital in Santa Monica, CA, in this research, which is being used to identify specific proteins associated with the disease state. When the protein maps of untreated cells of skin cancer (melanoma) patients were compared with the maps of cells treated with chemotherapy drugs (e.g., interferon or tumor necrosis factor), it was discovered that the cells slowed down or stopped production of certain proteins and increased or began making other proteins in response to treatment. Attempts are being made to correlate the genetic expression of these proteins with the tumor gene products and the tumor suppressor gene products. This approach will prove valuable in monitoring the effects of drugs on tumor cells as well as providing insight into the molecular mechanisms of tumor growth and suppression.

ULTRACOLD ATOMIC COLLISIONS

Collisions of laser cooled and trapped atoms exhibit new and unusual effects at temperatures below 1 mK. Recent studies at NIST show that these collisions can be modeled by considering the relative motion of two atoms in a laser field and allowing this energy to dissipate by spontaneous photon emission. The equations of motion, called the optical Bloch equations and widely used in quantum optics, are normally not used to describe collisions. This theoretical formulation offers new insight into the novel mechanisms of ultracold collisions, treats intense laser modification of the collision dynamics, and provides a predictive tool for analyzing experiments. Good agreement is found between theory and current experiments on both Cs and metastable He traps. It is expected that predictions for other traps will soon be tested by experiments at NIST and other laboratories.

A MULTINATIONAL VIEW OF THE ACTIVE SUN

On Aug. 30, a major x-ray imaging and spectroscopic spacecraft was launched from the Kagoshima Space Center in Sagamihara, Japan. As reported Nov. 8 in Science, the satellite, now dubbed Yohkoh, has begun sending back spectacular pictures of solar activity viewed with unprecedented angular resolution and spectroscopic refinement. Developed by the Japanese space science agency, the spacecraft's principal instrumentation is a multinational project involving U.S., U.K., and Japanese research organizations.

Spectacular early results from the mission include remarkable high-resolution spectra being recorded and sent to Earth from a group of four Bragg crystal spectrometers (BCS) on Yokoh. These instruments, three trained on the He-like resonance lines of S, Ca, and Fe and one on H-like Fe, were developed jointly by the Naval Research Laboratory and NIST in collaboration with the Rutherford Appleton Research Laboratory and Imperial College in the United Kingdom.

The BCS instrument required both improved sensitivity and improved resolution in a package severely constrained in volume, mass, footprint, and power consumption in comparison with previous NASA missions. The overall design of BCS was a joint undertaking, with NIST responsible for the design, fabrication, testing, and alignment of the four large, 4×18 cm, germanium diffraction crystals, each bent to a particular radius of curvature between 5 and 15 m. The technology needed, the result of more than 2 decades of development for a wide range of applications, was fully exploited in preparing the crystals now in orbit.

Results already in hand indicate that the efforts were fully successful. Both the spectroscopic detail resolved and the instrumental sensitivity are in accord with expectations. Of particular note in this regard is that there is already evidence of rapid outward motion of flare material in the period of time before the flare manifests itself to the telescope.

QUALITY CONTROL IN RADIATION THERAPY

NIST and the U.S. Nuclear Regulatory Commission recently co-sponsored a workshop at NIST to examine calibration issues for the high-dose-rate (HDR) iridium-192 radioactive sources used in cancer therapy. Over 100 of these computer-controller source-insertion devices are now used in the United States for the treatment of approximately 6,000 patients per year. A national strategy is needed for calibrating these sources to allow uniform specification of source strength by source manufacturers, instrument manufacturers, secondary calibration laboratories, and hospital medical physicists. The sources have activities more than 100 times higher than the low-dose-rate iridium-192 seeds for which NIST offers calibrations. The goal of the workshop was to define the requirements for NIST and the secondary calibration laboratories, and to explore the standardization methods and transfer instruments appropriate to each level. Based on discussions held at the workshop, NIST will begin to develop an appropriate national primary dosimetry standard. The workshop provided the medical physics community, the health-care industry, and regulators with a snapshot of quality control and standards-related issues in HDR iridium-192 cancer therapy.

MERGED-BEAMS TECHNIQUE FOR ABSOLUTE ELECTRON-ION EXCITATION MEASUREMENTS DEMONSTRATED

The combination of a merged-beams and an electron-energy-loss technique has permitted ground-breaking absolute measurements of a cross section for electron-impact excitation of a multiply-charged atomic ion. Highly charged atomic ions are pervasive and critical elements in high-temperature plasmas (fusion, astrophysical, laser, and others). Their structure, dynamics, and interactions with other particles are, despite the crying need for data as well as fundamental understanding, generally not well known. Experimental information on electron-impact excitation of multiply-charged ions is particularly scarce—almost all past measurements involved singly-charged ions and a very restricted set of transitions for which fluorescence from excited states could be used as the detector. This new collisions technology, combined with the availability of abundant ions from advanced ion sources, permits greatly enhanced signals (merged rather than crossed beams) and detection efficiencies (all electrons involved rather than just some photons) compared with that attainable with traditional ion sources and crossed-beams collision geometries. The first measurements that demonstrated the power of this new technique involved the third ionic stage of silicon, but an entirely new spectrum of measurements has now been proven feasible. A key element in the new technique is a real-time charged-particle beam probe that can be used both as a beam diagnostic and to quantitatively determine the beam density distribution in all three dimensions.

NEW PUBLICATION FOCUSES ON COMPUTER SECURITY INCIDENT RESPONSE

Increased threats to computer security have prompted government agencies and industry organizations to augment their computer security efforts. NIST Special Publication 800-3, Establishing a Computer Security Incident Response Capability (CSIRC), provides advice and assistance on initiating an efficient and timely response to computer security-related incidents such as computer viruses, unauthorized user activity, and serious software vulnerabilities. The guide discusses some of the considerations in establishing a CSIRC and the organizational, technical, and legal issues connected with a CSIRC operation. Efficient and cost-effective, a CSIRC is a proactive approach to computer security, one that combines reactive capabilities with active steps to prevent future incidents.

NIST COLLABORATION ON FRICTION CHARACTERIZATION OF ULTRA-LOW SPEED TURNING MACHINES

Two mechanical engineers from a major U.S. university recently completed a 3 month research project at NIST in collaboration with a NIST statistician. The project goal was to improve the precision of high-performance grinding where a machining defect called sub-surface damage is a major problem. The basic hypothesis is that this damage occurs due to impact type chip removal in the machining process. Such impact chip removal is avoided by machining in the ductile regime, which translates to a very slow and well-regulated speed control problem. Such low speeds accentuate the effect of friction and its unpredictable nature. To study this problem, off-line statistically designed experiments involving factors affecting friction were conducted. The data collected were analyzed to understand the friction characterizations and develop appropriate model structures for on-line control. Details of this collaborative research will appear as a NIST internal report.

A CATALYST PACKAGE FOR LUBRICANT OXIDATION (ASTM SEQUENCE IIIE ENGINE TEST)

The Standard Reference Materials Program announces the availability of RM 8501, a Catalyst Package for Lubricant Oxidation. The material is intended for use in a modified thin-film uptake test developed for use with oils for the ASTM Sequence IIIE Engine Test.

The thin-film oxygen uptake test identified in ASTM D4742 was originally developed to evaluate the oxidation stability of automotive crankcase lubricants under conditions similar to ASTM engine sequence 111D test. The test used fuel fractions and mixed metal catalysts to simulate the chemical environment in an operating automotive engine. Recently, ASTM Sequence 111E test was developed to replace the 111D test. The 111E test defines a new oil category having improved performance and requires an increased oxidation severity. This is achieved by using a smaller oil charge and increased blow-by to oil charge ratio.

The oxidation induction times for seven IIIE oils were determined by both the modified thin-film oxygen uptake test and differential scanning calorimetry using RM 8501. The test conditions for the correlation between the two measurements are given in the Report of Investigation.

The RM includes five ampoules each of four components: an oxidized/nitrated fuel fraction; a nitroparaffin model compound; a metal naphthenates mixture containing lead, iron manganese, and tin in a 20:2:1:1 weight ratio; and distilled water. Each is contained in a sealed ampoule, which should be thoroughly shaken before opening and sampled immediately after opening in order to maintain the RM integrity.

REFERENCE MATERIALS 8589 AND 8590– FLUID CRACKING CATALYSTS (8589) AND HIGH SULFUR GAS OIL FEED (8590)

The Standard Reference Materials Program announces the availability of two reference materials (RMs), 8589 and 8590, intended for use in determining the activity of Fluid Cracking Catalysts (FCC) as specified in the American Society for Testing and Materials Microactivity Test D3907-87. RM 8589 consists of six 50 g units of equilibrium FCCs, one each of RR1 through RR6, while RM 8590 consists of 946 mL of the High Sulfur Gas Oil Feed (Amoco Oil No. FCC 893).

These RMs are intended for use primarily by the petroleum refining industry and catalyst suppliers to this industry. They were prepared and characterized through a cooperative program between NIST and the ASTM Committee D32 on Catalysts. The six FCCs comprising RM 8589 are characterized for the weight percent conversion of gas oil, RM 8590, in a microactivity unit. Results given are the consensus values from an interlaboratory study after modification for nonuniform data according to ASTM Standard Practice E 691.

Calibration Services

NEW HUMIDITY MEASUREMENTS PUBLICATION AVAILABLE

The National Weather Service, the semiconductor industry, and food processors all keep a watchful eye on humidity with a variety of sophisticated instruments. When these instruments need calibration, industry and government scientists turn to a specially designed lab at NIST that compares the instruments' performance against the most accurate humidity standards available. A new 61-page publication describing NIST calibration services for humidity measurements has been compiled. The new document is a combined and condensed version of earlier reports on NIST's primary and secondary standards for humidity measurement. The two-part document covers NIST's standard hygrometer and two-pressure humidity generator. NIST Calibration Services for Humidity Measurement is available from the National Technical Information Service, Springfield, VA 22161. Order by PB 92-112499; price is $19 in print or $9 on microfiche.

Standard Reference Materials

STANDARD REFERENCE MATERIAL 1414– LEAD-SILICA GLASS HIGH-TEMPERATURE RESISTIVITY

The Standard Reference Materials Program announces the availability of SRM 1414, Lead-Silica Glass for High-Temperature Resistivity. SRM 1414 is intended for use in glass resistivity measurements. The SRM is a lead-silica glass (4×4×12 cm bar) certified for resistivity at a series of temperatures in the molten range of 950-1300 °C. Additional information is also given on the glass composition, refractive index, and dispersion.

STANDARD REFERENCE MATERIAL 2695– FLUORIDE IN VEGETATION

The Standard Reference Materials Program announces the availability of SRM 2695, Fluoride in Vegetation (timothy grass). This SRM is intended for use in monitoring fluoride in vegetation used as cattle forage, for which there are annual, bimonthly, and monthly regulatory limits in the range of 40-80 parts per million (ppm). Animals normally ingest small amounts of fluoride in their rations with no harmful effects. However, excessive fluoride ingestion can cause specific dental and skeletal lesions, and in severe cases, adversely influence the productive performance of domestic animals. Uncontaminated plant material typically contains less than 5 ppm.

The SRM is supplied as 25 g each of a low and high level sample. The low-level concentration of 64.0 ppm is in the range of the regulatory limits, which varies somewhat between states, while the high-level concentration of 277 ppm exceeds all regulatory limits.

Certification measurements were made using a number of methods, including the Association of Official Analytical Chemists (AOAC) and Intersociety method for the semi-automated determination of fluoride based on calorimetric alizarin measurement following fusion and microdistillation.

STANDARD REFERENCE MATERIAL 885–REFINED COPPER

The Standard Reference Materials Program announces the availability of SRM 885, Refined Copper. The intended use of this SRM is for calibration of instruments and the evaluation of methods used in determining sulfur and oxygen in pure copper or related materials. SRM 885 will be used primarily by copper producers employing a continuous casting process in producing high purity copper rod or wire products. It is certified for sulfur and oxygen contents of 0.0018 percent and 0.013 percent, respectively, and has been analyzed for trace element impurities such as antimony, arsenic, bismuth, iron, lead, nickel, silver, tin and zinc.

The SRM is in the form of pins approximately 13 mm long and 3 mm in diameter, having a mass just under 1 g.

AROMATIC HYDROCARBONS IN TOLUENE (NOMINAL CONCENTRATION 60 μg/mL)

The Standard Reference Materials Program announces the availability of SRM 2260, Aromatic Hydrocarbons in Toluene. The SRM is intended primarily for use in calibrating chromatographic instrumentation and for use in evaluating analytical methods used to determine aromatic hydrocarbons (AHs). The SRM consists of five 2 mL ampoules, each containing approximately 1.2 mL of the AHs in toluene solution. Because of the volatility of toluene, certified values are not applicable to material, unless analysis is initiated immediately (under 5 min) after opening the ampoule.

SRM 2260 is certified for the actual concentrations of 23 AHs, all present in the toluene at a nominal concentration of 60 μg/mL. The concentration of one additional AH is not certified but is given for information. The actual concentrations were determined both gravimetrically in preparing the solution and chromatographically on the prepared solution.

TWO NEW SRMs FOR OPIATES IN URINE CERTIFIED

NIST has an ongoing program, in cooperation with the College of American Pathologists, to provide the drugs-of-abuse testing community with urine-based reference materials. Scientists at NIST recently have completed work on two new SRMs for drugs of abuse in urine. SRM 2381 is a freeze-dried human urine material with certified concentrations of free morphine and codeine at three levels. Certification was accomplished by use of two independent methods. One was a gas chromatography/mass spectrometry (GC/MS) procedure, similar to the procedures used in drug testing laboratories to confirm and quantify these analytes in samples that test positive in preliminary screening analyses. The other involved liquid chromatography/mass spectrometry (LC/MS) with a different sample preparation procedure. The certified concentrations bracket the cutoff concentration level set by the National Institute of Drug Abuse for determining both morphine and codeine abuse and thus permit laboratories to validate the accuracy of their methods in this critical concentration range.

The second material, SRM 2382, has three certified levels of morphine glucuronide in freeze-dried human urine. Much of the morphine excreted by opiate users is in the form of the glucuronide. Laboratories testing urine specimens for opiates must release the morphine from the morphine glucuronide prior to accurately measuring the morphine present. The quantitative release of morphine has been identified as a major problem area in accurate drug analysis. This SRM will allow laboratories to test their methods for releasing the morphine on samples with known concentrations. Certification of SRM 2382 required the use of a different procedure for releasing morphine for each of the analytical techniques used for the measurements. Enzymatic hydrolysis was used with the GC/MS method and acid hydrolysis was used with LC/MS. Careful studies at NIST found the two hydrolysis procedures to provide comparable results.

STANDARD REFERENCE MATERIAL 1048, CUP FURNACE SMOKE TOXICITY STANDARD

The Standard Reference Materials Program announces the availability of SRM 1048, Cup Furnace Smoke Toxicity Method Standard. The SRM is intended for use in calibrating the NIST Cup Furnace Smoke Toxicity Method for assessing the acute inhalation toxicity of combustion products. The SRM consists of eight sheets of acrylonitrile-butadiene-styrene (ABS) copolymer, each approximately 254 mm square and 0.76 mm thick. The quantity is sufficient for calibration of the test method four times.

Certified values for LC_{50} and N-gas in flaming and nonflaming modes are provided at 30 min and 30 min plus 14 d post exposure periods. The values are based on three separate series of tests and statistical evaluation of the resultant data.

STANDARD REFERENCE MATERIALS 1271 AND 2171 LOW-ALLOY STEEL (Ni-Cr-Cu-Mo)(HSLA 100)

The Standard Reference Materials Program announces the availability of SRMs 1271 and 2171, Low-Alloy Steel issued in both disk and chip forms. The steel is identified as HSLA 100 (Ni-Cr-Cu-Mo) and is primarily intended for use in optical emission and x-ray spectrometric analyses (disk) or in chemical methods (chip). SRM 1271 is issued in the form of a disk approximately 35 mm in diameter by 19 mm thick, while SRM 2171 is issued as 150 g of chips, sized between 0.50 and 1.18 mm (or between 16 and 35 mesh).

Certification was performed in cooperation with ASTM. In addition to Ni, Cr, Cu, and Mo, the SRMs are certified for C, Mn, P, S, Si, V, Al and Nb.

STANDARD REFERENCE MATERIAL 2193, CALCIUM CARBONATE pH STANDARD

The Standard Reference Materials Program announces the availability of SRM 2193, Calcium Carbonate pH Standard. This commercially available calcium carbonate, selected specifically for its extremely low level of metal impurities, is certified only with respect to pH values and not for composition. The SRM is supplied as a 30 g unit of finely powdered material. It is intended for calibration of pH measuring systems at pHs above 11.0.

The SRM is used to prepare a freshly filtered saturated solution (0.0202 molal) of calcium hydroxide as instructed on the certificate. The pHs of the resulting solution are certified at 12 temperatures from 0 to 50 °C, based on EMF measurements of cells without liquid junction, using hydrogen gas and AgCl/Ag electrodes. Two-point calibration is recommended for high alkalinity measurements and is accomplished using SRM 2193 in conjunction with SRM 187 (borax).

STANDARD REFERENCE MATERIALS 862 AND 1242, HIGH-TEMPERATURE ALLOY L 605

The Standard Reference Materials Program announces the availability of SRMs 862 and 1242, the chip and disk forms of High-Temperature Alloy L 605. The chips are intended primarily for use in chemical methods of analysis, while the disks are for use in optical emission and x-ray spectrometric methods. SRM 862 is issued as a unit of 100 g of chips sized between 0.35 and 0.85 mm (or between 46 and 20 mesh). SRM 1242 is issued as a disk approximately 35 mm in diameter and 19 mm thick.

SRMs 862 and 1242 are certified for 13 elements: the primary constituents Co, Cr, W, Ni, Fe, and Mn, and the trace constituents C, P, S, Si, Cu, V, and N. Certification was performed in cooperation with ASTM.

STANDARD REFERENCE MATERIAL 1976, INSTRUMENT SENSITIVITY STANDARD FOR X-RAY POWDER DIFFRACTION

The Standard Reference Materials Program announces the availability of SRM 1976 for use in calibration of powder x-ray diffraction intensity as a function of 2 angle (instrument sensitivity) and to provide comparability of measurements between laboratories. The SRM consists of a sintered high-purity alumina plate approximately 45 mm on a side and 1.6 mm thick. The material was selected for consistency of microstructure.

The SRM is certified for the absolute variation of intensity of the [104] reflection, 12 relative intensities determined throughout the 2 range of x-ray diffraction goniometers, and the lattice parameters. Proper use of the SRM requires measurement of test equipment intensities according to one of the two procedures used for certification of the SRM.

STANDARD REFERENCE MATERIAL 2261, CHLORINATED PESTICIDES IN HEXANE (NOMINAL CONCENTRATION 2 μg/mL)

The Standard Reference Materials Program announces the availability of SRM 2261, a solution of 15 chlorinated pesticides in hexane. It is intended primarily for use in research and in health and environmental monitoring. This SRM is one of a series of pesticide and PCB SRMs produced and/or characterized in cooperation with other U.S. government agencies, including NOAA and the EPA. Certified pesticide values are based on the equally weighted means of the gravimetric concentration from the preparation of the solution and the measured concentration from the chromatographic analysis of the solution. The following pesticide compounds are present in the solution at a nominal concentration of 2 g/mL: hexachlorobenzene, gamma-HCH, heptachlor, aldrin, heptachlor epoxide, cis-chlordane, trans-nonachlor, dieldrin, mirex; 2,4′-DDE; 4,4′-DDE; 2,4′-DDD; 4,4′-DDD; 2,4′-DDT; 4,4′-DDT. The SRM is supplied as a unit of five 2 mL ampoules, each containing approximately 1.2 mL of solution.

BROCHURES OFFER QUICK GLIMPSE OF CHEMISTRY SRMs

A series of NIST brochures offers easy-to-read descriptions of Standard Reference Materials (SRMs) for verifying the accuracy of hundreds of chemical measurements. The set of eight brochures lists SRMs for agriculture and food science, clinical laboratories, environmental laboratories, gases, industrial hygiene, marine science, microprobe and scanning electron microscope measurements, and spectrometric analysis. Examples of how these measurements can be used include: food manufacturers measuring cholesterol, minerals, and trace elements in their products; environmental regulators monitoring air, water, and soil pollution; and medical labs measuring drugs of abuse or verifying the accuracy of blood chemistry analyses. The eight chemistry SRM brochures, part of a series of 16 on select SRMs, are available singly or as a set from the Standard Reference Materials Program, Building 202, Rm. 204, NIST, Gaithersburg, MD 20899, 301/975-6776.

STANDARD REFERENCE MATERIAL 131e—LOW CARBON SILICON STEEL

The Standard Reference Materials Program announces the availability of a low-alloy steel, Standard Reference Material (SRM) 131e, which is certified for carbon and sulfur. SRM 131e was developed in cooperation with the American Society for Testing and Materials.

The SRM is intended primarily for use in calibrating or verifying accuracy of analyses performed using carbon/sulfur analyzers. The SRM is in chip form, with the chips sized between 0.5 and 1.0 mm sieve openings. The certified concentrations of carbon and sulfur are 0.0035 and 0.0004 weight percent, respectively.

STANDARD REFERENCE MATERIAL (SRM) FOR MAGNETIC TAPE CARTRIDGE DRIVES AND MEDIA NOW AVAILABLE

SRM 3202 is now available for public sale. The SRM will be used by manufacturers of 12.7 mm (1/2 in), 972 ft/mm (24,689 ft/in) magnetic tape cartridge drives and media as specified in interchange standards x3.180 and ISO 9661. SRM 3202 will provide the manufacturers with a reference for several magnetic properties including output signal amplitude, typical field, overwrite, and resolution.

Calendar

March 2–6, 1992
IEEE P1157 MEDICAL DATA INTERCHANGE (MEDIX)

Location: National Institute of Standards and Technology
Gaithersburg, MD

Purpose: To specify and establish a robust and flexible communications standard for exchange of data between heterogeneous healthcare information systems.
Topics: User requirements, framework, information model methods, clinical laboratory information model, registration/ADT information model, pharmacy information model, finance/statistics information model, communication model methods, mapping, OSI profiles, executive committee, education/publicity.
Format: Workshop.
Audience: Iindividuals with an interest in the following areas: User requirements for healthcare data interchange, healthcare information modeling, data interchange formats for healthcare data, OSI in healthcare, Semantics and knowledge representation as applied to the electronic patient record, prototype development of MEDIX systems.
Sponsors: NIST and the Institute of Electrical and Electronics Engineers.
Contact: Jack Harrington, Hewlett-Packard Company, 175 Wyman St., Waltham, MA 02254-9030, 617/290-3517.

March 2–6, 1992
IEEE P1073 MEDICAL INFORMATION BUS (MIB)

Location: National Institute of Standards and Technology
Gaithersburg, MD

Purpose: To provide an international standard for open systems communication in healthcare applications primarily between bedside medical devices and clinical information systems, optimized for the acute care setting.
Topics: Progression of the individual MIB documents.
Format: Workshop.
Audience: Individuals with an interest in the following areas: User requirements for medical data interchange, medical device information modeling, data interchange language for healthcare data, OSI in healthcare, prototype development of MIB systems.
Sponsors: NIST, and the Institute of Electrical and Electronics Engineers.
Contact: Jack Harrington, Hewlett-Packard Company, 175 Wyman St., Waltham, MA 02254-9030, 617/290-3517.

March 4–6, 1992
NIST WORKSHOP ON THE ELECTRONIC EXCHANGE OF FINGERPRINT IMAGES

Location: Holiday Inn Hotel
Gaithersburg, MD

Purpose: To finalize the text for the draft of the forthcoming American National Standards Institute (ANSI) standard Data Format for the Interchange of Fingerprint Information.
Topics: Review of past workshops, current status of the draft standard, finalization of the draft text, current status of the FBI's ITN and IAFIS systems.
Format: Workshop.
Audience: Law enforcement agencies, vendors, consultants.
Sponsors: NIST.
Contact: Dana Grubb, A61 Technology Building, NIST, Gaithersburg, MD 20899, 301/975-2915.