Preface

During the past few years radio scientists have come to recognize the importance of nonlinear processes that may occur during the propagation of electromagnetic waves through the ionosphere. The growing interest in these processes suggested that a conference dealing with such problems would be timely. We further hoped that the proceedings of the conference would stimulate research in these important phenomena.

The papers in this issue are some of those presented at the Conference on Nonlinear Processes in the Ionosphere held in Boulder, Colorado, December 16 and 17, 1963. Some sixty scientists from around the world attended this conference. It was jointly sponsored by the Voice of America and the National Bureau of Standards. Because of space limitations we have not been able to include all of the contributions to the conference. A more complete set of papers from the conference has appeared in National Bureau of Standards Technical Note No. 211, Volumes 1–6, available from the U.S. Government Printing Office, Washington, D.C., 20402.

DONALD H. MENZEL,
Guest Editor

ERNEST K. SMITH, JR.,
Guest Editor

Other Papers Presented at the Conference on Nonlinear Processes in the Ionosphere [1]

On some resonance phenomena near the gyrofrequency obtained during the propagation of a radiowave in plasma (ionosphere). M. Cutolo, NBS Technical Note No. 211, vol. 2.

Ionospheric cross-modulation at the geomagnetic equator. W. K. Klemperer, NBS Technical Note 211, vol. 3.

Interaction of an antenna with a hot plasma and the theory of resonance probes. J. A. Fejer, NBS Technical Note 211, vol. 3; Radio Sci. J. Res. NBS/USNC–URSI, **68D,** No. 11 (Nov. 1964).

Ionospheric wave interaction using gyro-waves. Part I. The night-time lower E-region. R. A. Smith, NBS Technical Note 211, vol. 4.

Nonlinear propagation of electromagnetic waves in magnetoplasmas. Mahendra S. Sodha and Carl J. Palumbo, NBS Technical Note 211, vol. 4.

A solution method for cold plasma. R. E. Hartle and J. J. Gibbons. NBS Technical Note 211, vol. 4.

Nonlinear interaction coefficients for electrons in nitrogen and air. A. V. Phelps, NBS Technical Note 211, vol. 5.

Nonlinear effects in radiation generation through the coupling of electron beams with diffraction gratings. Winfield W. Salisbury, NBS Technical Note 211, vol. 5.

Use of radio transmitters to decrease D-region electron density. Paul Molmud, NBS Technical Note 211, vol. 6.

Nonlinear ionospheric two-plasma processes. Joseph E. Rowe, NBS Technical Note 211, vol. 6.

Concluding Remarks by Ernest K. Smith, Jr., and D. T. Farley, Jr., NBS Technical Note 211, vol. 6.

Artificially stimulated VLF emissions. R. A. Helliwell, Stanford University, Palo Alto, Calif.

Natural VLF emissions. Roger M. Gallet, CRPL–NBS.

Plasma resonances observed by Alouette satellite. Wynne Calvert, CRPL–NBS.

Plasma instability in the whistler-mode caused by a gyrating electron steam. T. F. Bell and O. Buneman, Stanford Electronics Laboratory, Stanford University.

Ionospheric wave interaction using gyro-waves. Part II. The D-region.

R. A. Smith, The University of New England, Armidale, N.S.W., Australia.

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[1] Copies of these particular papers are not available from the Conference Organization; however, in some cases they may be obtained directly from the authors at the addresses indicated. The NBS Technical Note 211, volumes, 1 through 6 may be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402.