

Professor Marcuvitz discussed the important case of propagation in spherically stratified media. Field representations of a radiating electromagnetic source in a spherically stratified medium may be effected by regarding either the radial or angular directions as transmission directions and the corresponding spectra possess different characters. The desirability of different representations becomes significant when the question of convergence rapidity is considered.

B. Friedman of New York University discussed the relationships between alternative formulations of the propagation problem for stratified media. A general method was described by which solutions obtained in eigenfunctions of the angular direction can be transformed into a solution in eigenfunctions of the radial direction.

IONOSPHERIC AND TROPOSPHERIC PROPAGATION

Two important applications of the general theory of stratified media are the propagation in troposphere and ionosphere where the index of refraction is considered to vary only in the vertical direction.

R. E. Langer of the University of Wisconsin discussed the application of the generalized WKB method to tropospheric propagation. The connection formulae were used to relate the solutions for trapped, leaky, and transitional modes, which occur when there is an inversion of the refractive index.

H. G. Booker discussed the theory of scattering of radio waves in the troposphere and ionosphere. A theory was developed for scattering from the E region based on a model of the fine structure of the ionosphere. Phenomena due to turbulence and local inhomogeneities were analyzed and shown to provide a good explanation of sporadic E observations. J. W. Cox suggested the possibility of combining this viewpoint and the thin layer hypothesis into a unified theory.

Two papers by O. E. H. Rydbeck and J. W. Cox presented theories of mode coupling in the ionosphere which would explain the appearance of the observed third trace (z-mode). Mr. Cox developed a theory along the lines of some recent work of T. L. Eckersley in which the existence of the third trace is explained by the coupling of the ordinary and extraordinary rays near the turning point of the former. This effect would be particularly significant in northern latitudes. Professor Rydbeck calculated the intensities for the z-trace and pointed out that to account for the observations it was necessary to consider the collisional frequencies and that the z-trace will occur whenever the collisional frequency is in the neighborhood of certain critical values.

Professor Rydbeck brought with him two films which were presented Tuesday evening showing the development of an ionosphere observatory in the far north of Sweden and recordings of ionospheric activity in the auroral regions. A running commentary by Dr. Rydbeck and the discussion by the audience contributed to making this rather unexpected event both instructive and entertaining.

GUIDED WAVES

R. B. Adler of Massachusetts Institute of Technology

discussed waves on inhomogeneous cylindrical structures. An analysis was given of some of the basic properties of exponential modes on passive structures in which the material constants of the medium vary over a cross section. Each mode is usually a TE-TM mixture. It is found that not all the conventional orthogonality conditions hold. Some characteristic features are that propagation constants for modes on a nondissipative structure cannot be complex and that if the system has no opaque confining boundary, the modes do not possess a true cutoff.

MATHEMATICAL PROBLEMS

Manuel Cerrillo, also of MIT, presented several general methods for evaluating frequently occurring integral expressions, associated with wave motion in dispersive media and the formation of transients.

H. Poritsky of General Electric Company discussed the integral expressions involved in the expansion of Weyl's Integral for harmonic spherical waves to spherical waves of arbitrary time variation.

Arrangements are presently being made for publication of the papers which were presented at the symposium. A bound volume entitled *Proceedings of the Symposium on Electromagnetic Waves* will be put out by Interscience publishers and will appear in the spring of next year.

L. Kraus, J. Lurye, J. Shmoys

MEETINGS TO BE HELD

SYMPOSIUM AT OAK RIDGE

The second annual Oak Ridge Summer Symposium, devoted this year to quantum and inorganic chemistry, will be held at Oak Ridge from August 21 to August 31 under the joint sponsorship of the Oak Ridge National Laboratory and the Oak Ridge Institute of Nuclear Studies. Last year's symposium was in modern physics. Included among those presenting papers will be Peter Debye of Cornell University, Henry Eyring of the University of Utah, H. S. Harned of Yale, Linus C. Pauling of the California Institute of Technology, and George Scatchard of the Massachusetts Institute of Technology. Additional information on the symposium may be obtained from the University Relations Division, Oak Ridge Institute of Nuclear Studies, P. O. Box 117, Oak Ridge, Tennessee.

RADIOISOTOPE INSTRUMENTATION

A two-week course in instrumentation for radioisotope work will be given by the special training division of the Oak Ridge Institute of Nuclear Studies from September 5 to 15. The course will be open to physicists, electrical engineers, and others specializing in instrumentation; a knowledge of nuclear radiation properties and experience in electronic instrument design will be a requirement. The number of participants will be limited to 40. A registration fee of \$25, payable on arrival at Oak Ridge, is charged for the course. Participants will be expected to pay their own living and traveling expenses. Further information may be obtained by writing to the Institute, P. O. Box 117, Oak Ridge, Tennessee.