

Book Review

Electron Waves and Resonances in Bounded Plasmas by Paul E. Vandenplas, \$11.50, 216 pp., John Wiley & Sons (1968).

Professor Vandenplas in this monograph has adequately summarized research on a problem "Electron Waves and Resonances in Bounded Plasmas" which he and many other workers have been investigating for more than ten years. The reader will find that theory and experiment are given equal treatment. After a formal introductory plasma physics course, this parallel treatment of a specialized topic will be a satisfying complement.

The topics covered include resonances of a plasma slab-condenser system, a hollow cylindrical plasma column, plasma covered antennas and resonance probes. A major emphasis of the book, however, is to discuss resonances found when electromagnetic waves are scattered from a slender plasma column (\vec{k} and \vec{E} perpendicular to the axis of the column) as the plasma density is varied. The resulting "Tonks-Dattner" resonance spectrum has been interpreted as being due to standing electron plasma waves trapped in some sense between the edge of the inhomogeneous plasma and a point where $\omega_{inc} \approx \omega_p(r)$. The exposition of this topic is fairly complete from a fluid model point of view. An extensive and fairly complete list

of references, even including some in 1968, appears at the end of the book.

Since the publication of this monograph, some interesting kinetic theory treatments of Tonks-Dattner resonances accompanied with experiments have appeared. These works coupled together with this excellent monograph should stimulate the reader to further investigation of this problem; which as yet, is not completely solved.

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About the Reviewer: Dr. Lonngren is an associate professor of electrical engineering at the University of Iowa who has been associated, from time-to-time, with Project Sherwood, the thermonuclear research endeavor at the Oak Ridge National Laboratory. Professor Lonngren completed his graduate studies at the University of Wisconsin in 1964. His research interests are in wave plasma interaction and in basic plasma physics.