Abstracts

Propagation of Linearly Polarized Electromagnetic Waves in Dense Magneto-Plasmas

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The theoretical problem discussed here is best illustrated by Figure 1. We wish to find the propagation constant of electromagnetic waves down a parallel-plane waveguide filled with a plasma magnetized parallel to the conducting planes and perpendicular to the direction of propagation. The geometry of this problem is shown in this figure along with the relationship of the components of the dielectric constant K, K, and K/sub o/ to the plasma parameters. If the boundary value problem for this case is solved under the assumption of no variation of the fields in the "x" direction, three solutions are obtained. Two of these solutions can be shown to be related to the well known "ordinary" and "extraordinary" waves in an infinite plasma. The third solution has no counterpart in an infinite medium.

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