Abstracts

Distinctions Between Gyroelectric and Gyromagnetic Media in Rectangular Waveguide (Correspondence)

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Gas plasmas and ferrites become anisotropic when placed in a magnetostatic field. Waveguides containing these media may be termed, respectively, as gyroelectric and gyromagnetic. In this correspondence we compare these waveguides when the magnetostatic field is transverse to the direction of wave propagation. In particular, we discuss the difference in the TE/sub 0,n/ modes of rectangular waveguides. Although the partial differential equations for the longitudinal fields in the two waveguides are duals, the essential difference lies in the boundary conditions. The result is that in gyroelectric waveguides the general solution, in exact or approximate form, for the higher order modes is necessary. This result is unlike that for the gyromagnetic case in which the restricted TE/sub 0,n/ solutions are adequate for analysis of practical problems.

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