Abstracts

On the Mode Coupling in Longitudinally Magnetized Waveguiding Structures

J. Mazur and M. Mrozowski. "On the Mode Coupling in Longitudinally Magnetized Waveguiding Structures." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 159-165.

The propagation in waveguiding structures containing gyromagnetic material with longitudinal magnetization is analyzed in terms of the coupling between modes having different symmetry properties. It is found that the wave supported by a symmetrical structure of two coupled guides is a combination of the even and odd modes propagating in an isotropic structure. The gyromagnetic medium causes the coupling between the modes, and the energy of the wave is periodically transferred from one mode to another, which in turn results in the exchange of energy between guides. The mathematical model proposed here explains the operation of novel nonreciprocal devices which have been investigated experimentally by other researchers.

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