Abstracts

Microwave Properties of Slabs of Uniformly Magnetized Material Filling the Cross Section of a Rectangular Waveguide Operating in TE/sub NO/ Modes

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The microwave properties of a slab of uniformly magnetized material filling the cross section of an infinite, lossless rectangular waveguide operating only in TE/sub NO/ modes are discussed analytically. The material is assumed to have a scalar permittivity and a permeability describable by a tensor of the Polder form. A dc magnetic field is applied normal to the broad wall of the waveguide. Two cases are treated in detail. 1) The slab is placed against a metal shorting wall. 2) The slab is placed with empty waveguide on each side. A general analytical solution is obtained for both cases. Numerical values are computed for MnF/sub 2/, an easy-axis antiferromagnet. The computed values for the second are compared with values calculated on the basis of a plane-wave approximation and with experimental data. Applications of the technique to experimental measurements are described.

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