Abstracts

Radial Line Transducer (Short Papers)

E. Sawado. "Radial Line Transducer (Short Papers)." 1982 Transactions on Microwave Theory and Techniques 30.11 (Nov. 1982 [T-MTT]): 2049-2050.

The purpose of this paper is to give a new excitation method of a radial-electromagnetic wave by a metallic cylinder with elliptical cross section. It was ascertained that the radial wave propagates in a medium of permeability of quantity μ/sub perp/. The quantity μ/sub perp/ is given by μ/sub perp/ = (μ² - kappa²)/μ, where μ and kappa are the diagonal and nondiagonal components of the tensor permeability of a gyrotropic medium, respectively. The radial wave has interesting properties that this mode has not cutoff below the critical frequency omega = gamma(BH)/sup 1/2/, where omega is the angular frequency, gamma = 1.76 x 10/sup 7/ ((oe s)/sup -1/ in CGS unit), B = μ/sub 0/(H + M/sub s/), the magnetic flux density, H the magnetic field, and M/sub s/ the saturation magnetization. Ganguly and Webb presented an initial theory and some experiments for a magnetostatic surface wave single bar transducer. These investigations have concluded that the lowest operating frequency of Ganguly-type delay line is gamma(BH)/sup 1/2/. Below this cutoff, no surface modes can exist. In view of the above, investigation of a radial wave type delay line should produce developments in low frequency microwave (0.5 to 1.5 GHz) applications.

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