Abstracts

Surface Waves on Radially Inhomogeneous Cylinders

A. Vigants and S.P. Schlesinger. "Surface Waves on Radially Inhomogeneous Cylinders." 1962 Transactions on Microwave Theory and Techniques 10.5 (Sep. 1962 [T-MTT]): 375-382.

A characteristic equation and a cutoff equation are derived for higher order surface-wave modes on lossless isotropic cylinders with arbitrary radial permittivity variation. The derivation, based on the use of the fundamental matrix of a set of differential equations, reduces analytical work and results in expressions well suited for digital computer evaluation of surface-wave eigenvalues and mode spectra. The theory is applied in an investigation of HE/sub 21/ and EH/sub21/ mode propagation for a particular set of models for the radially varying permittivity. Typical results showing eigenvalue variation, dispersion characteristics and radial field variation, including experimental verification of dispersion characteristics, are shown. The method of analysis can be extended to anisotropic cylinders with permittivity a function of both radius and frequency.

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