Abstracts

Circular Waveguide with Sinusoidally Perturbed Walls

O.R. Asfar and A.H. Nayfeh. "Circular Waveguide with Sinusoidally Perturbed Walls." 1975 Transactions on Microwave Theory and Techniques 23.9 (Sep. 1975 [T-MTT]): 728-734.

Uniform second-order asymptotic expansions are obtained for the propagation of TM waves in a perfectly conducting circular waveguide with sinusoidally perturbed walls using the method of multiple scales. The analysis concerns the interaction of two propagating modes satisfying the resonance condition imposed by the periodicity of the waveguide walls. Two cases of resonance are treated as well as the case of decoupled modes. In the first case resonance occurs whenever the difference between the wavenumbers of the two interacting modes is nearly equal to the wall wavenumber, while in the second case the difference is nearly equal to twice the wall wavenumber. The results of the theory are then applied to the design of a mode coupler.

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