Abstracts

Electromagnetic-Wave Propagation in the Shielded Ring Line

Y. Garault and C. Fray. "Electromagnetic-Wave Propagation in the Shielded Ring Line." 1974 Transactions on Microwave Theory and Techniques 22.2 (Feb. 1974 [T-MTT]): 92-99.

A theoretical analysis is presented of a periodic structure consisting of equally spaced perfectly conducting rings. The dispersion relation satisfied by the different modes of the shielded ring line is determined. This analysis shows that cylindrically symmetric modes identical with those of smooth guides and hybrid modes can travel in this periodical structure. The asymptotic values of the dispersion relation show the different properties of these hybrid modes. The EH/sub n1/ modes can be slow, fast, or can travel at light velocity according to the frequency. The EH/sub nq/ (q > 1) modes are fast modes and exchange their cutoff frequencies for particular values of the geometrical parameters of the structure. These theoretical predictions are verified experimentally by recording the dispersion characteristics of the first modes. For deflecting radio-frequency structures, the fundamental EH/sub 11/ mode is interesting. This deflection constant is measured on a pi/2 wave structure.

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