Abstracts

Resonant Modes of a Dielectric Rod Resonator Short-Circuited at Both Ends by Parallel Conducting Plates

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This paper describes a generalized study for the resonant modes of a dielectric rod resonater placed between two parallel conducting plates. Dielectric and conductor losses are ignored. It is shown that there are two resonant states in this resonator, trapped and leaky states. In order to determine the cutoff and resonat frequencies in the trapped state, numerical results are given for the cutoff conditions and dispersive characteristics of a dielectric rod waveguide. The field patterns for the hybrid modes are also presented. For the resonant modes in the leaky state, it is shown to be useful to introduce a complex angular frequency. Numerical results are given for the various modes with different values of the dielectric constant. Generalized mode charts covering both states and including the cutoff conditions are presented. The existence of both states has been verified by experiments.

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