Abstracts

Scattering of the TE/sub 01/ and TM/sub 01/ Modes on Transverse Discontinuities in a Rod Dielectric Waveguide -- Application to the Dielectric Resonators

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Our purpose is to determine the resonance frequency together with the radiation quality factor of dielectric resonators. To do that, the reflection and the scattering properties of the TE/sub 01/ and TM/sub 01/ modes, incident on an abruptly ended dielectric rod, are analyzed. After the building of the complete mode spectrum on each side of the discontinuity, the continuity relations in the discontinuity plane associated with the orthogonality properties lead to a coupled integral equation system. That one is solved by means of an iterative procedure, providing all the characteristics of the discontinuity (reflection or coupling coefficients, radiation losses). Then, these solutions are used to determine the resonant frequency and the radiation quality factor of cylindrical resonators which are considered as waveguide lengths between two interacting discontinuities.

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