Abstracts

Resonance Characteristics of Whispering-Gallery Modes in an Elliptic Dielectric Disk Resonator (Short Papers)

Y. Kogami, Y. Tomabechi and K. Matsumura. "Resonance Characteristics of Whispering-Gallery Modes in an Elliptic Dielectric Disk Resonator (Short Papers)." 1996 Transactions on Microwave Theory and Techniques 44.3 (Mar. 1996 [T-MTT]): 473-475.

This paper presents a novel calculation method for resonance characteristics of an elliptic dielectric disk resonator. In the elliptic resonator, electromagnetic energy propagates as a whispering gallery (WG) mode along the edge region of the dielectric disk. In the novel analysis, a local propagation constant of the WG mode at each point of the elliptic disk edge is represented by a propagation constant of a WG mode in a circular disk whose radius of curvature, material constants, and thickness are equal to those of the elliptic disk. Therefore, we can easily calculate the resonance characteristics of the elliptic dielectric disk resonator by applying a conventional technique for the circular dielectric disk. The calculated results of the resonant frequencies and field distribution are well confirmed by experiments.

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