Abstracts

Dielectric Resonator-Microstrip Interactive Circuit Analysis and Design Using Integral Equation Techniques

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Dielectric resonators (DR's) are widely used in microwave/millimeter-wave technologies. In this paper, the coupling between a dielectric resonator and a microstrip circuit is studied. To analyze this problem, an integral equation is developed for the current distribution on the microstrip circuit. The Green's function used in this integral equation is the Green's function of the field in a layered medium modified by adding a term corresponding to the DR-scattered field. This field is produced by equivalent electric and magnetic sources assumed to be on the DR's surface. An efficient numerical method is applied which gives an approximation of the field near the resonant frequency of the DR. The results clearly show the effect of the DR on the microstrip circuit's current distribution and provides a thorough insight into the coupling mechanism. The coupling parameters can be estimated from the current distribution. The efficiency of the method as well as its flexibility in dealing with a general configuration of the DR and microstrip circuit makes it promising for CAD applications.

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