Abstracts

Double vector-integral-equation method for microstrip-lines on photonic band-gap substrates

This paper presents a double vector-integral-equation (DOVIE) method for the modeling of integrated circuit components on artificial (photonic band-gap) substrates. The proposed computational method deals with the interaction of circuit components (continuous plane wave spectrum) and artificial materials (discrete plane wave spectrum, Floquet modes). The method of solution involves two stages of vector integral-equations. The first integral equation formulation is to find the Green's function for a PBG structure. A spectral-domain moment-method is applied to the second vector integral-equation to determine the fields or currents on the circuit components and the associated parameters of interest. Field solutions of microstrip lines on PBG substrates are discussed. The results of this work initiate research for many innovated microwave and millimeter-wave integrated components and devices.

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