Abstracts

Dyadic Green's Functions for Integrated Electronic and Optical Circuits (Short Papers)

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Layered structures play an important role in both integrated microwave circuits and optical integrated circuits. Accurate prediction of device behavior requires evaluation of fields in the system. An increasingly used mathematical formulation refies on integral equations the electric field in the device is expressed in terms of the device current integrated into an electric Green's function. Details of the development of the specialized Green's functions used by various researchers have not appeared in the literature. We present the development of general dyadic electric Green's functions for layered structures; this dyadic formulation allows extension of previous analyses to cases where currents are arbitrarily directed. The electric-field Green's dyads are found in terms of associated Hertzian potential Green's dyads, developed via Sommerfeld's classic method. Incidently, boundary conditions for electric Hertzian potential are utiltzed; these boundary conditions, which have been a source of confusion in the research community, are developed in full generality. The dyadic forms derived herein are reducible in special cases to the Green's functions used by other workers.

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