Abstracts

An efficient FDTD algorithm for the analysis of microstrip patch antennas printed on a general anisotropic dielectric substrate

In this paper, an efficient three-dimensional finite-difference time-domain (FDTD) approach based on the D-, E-, and H-fields is proposed to handle arbitrary anisotropic dielectric media; and, particularly, the way of imposing the electric-wall boundary condition on the surface of perfect electric conductors is discussed in detail. By combining the proposed FDTD approach with the material-independent perfectly matched-layer absorbers, the performance of a line-fed microstrip patch antenna deposited on general anisotropic dielectric substrate is investigated. The scattering parameters of the antenna as a function of the rotation angle of the optical axis of the anisotropic substrate are presented for the first time. Numerical results demonstrate how the resonant frequencies of the antenna are influenced by the anisotropy.

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