Abstracts

Relationship between the compact complex and real variable 2-D FDTD methods in arbitrary anisotropic dielectric waveguides

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The relationship between the compact complex and real variable 2-D FDTD methods used for the analysis of guided modes of arbitrary anisotropic dielectric waveguides is investigated. Situations for the permittivity tensor with different non-zero elements are discussed. It is found that in certain cases the complex 2-D FDTD method cannot be reduced to the real variable one. This, in turn, reveals that the real variable 2-D FDTD method has limitation when applied to arbitrary anisotropic dielectric waveguides. In addition, numerical results show that using the complex impulse in the excitation is not an essential condition, even for a purely complex 2-D FDTD method.

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