Abstracts

Time-domain wavelet Galerkin modeling of two-dimensional electrically large dielectric waveguides

M. Fujii and W.J.R. Hoefer. "Time-domain wavelet Galerkin modeling of two-dimensional electrically large dielectric waveguides." 2001 Transactions on Microwave Theory and Techniques 49.5 (May 2001 [T-MTT]): 886-892.

The time-domain wavelet-Galerkin method based on Daubechies' compactly supported scaling functions of high regularity has been applied to the analysis of two-dimensional dielectric slab waveguides that have typical dimensions and material parameters of optical integrated waveguide components, and the results are compared with those obtained with the conventional finite-difference time-domain method. It has been found that the proposed method allows discretization with a much coarser grid than the conventional time-domain analysis techniques due to its local sampling and highly linear numerical dispersion properties. A series of numerical experiments demonstrates the capability of the method to simulate the wave propagation of electrically large inhomogeneous media with reduced computational expenditure.

❑ Return to main document.