# Abstracts

## Application of the FD-TD Method to the Analysis of Circuits Described by the Two-Dimensional Vector Wave Equation

*W.K. Gwarek, T. Morawski and C. Mroczkowski. "Application of the FD-TD Method to the Analysis of Circuits Described by the Two-Dimensional Vector Wave Equation." 1993 Transactions on Microwave Theory and Techniques 41.2 (Feb. 1993 [T-MTT]): 311-317.*

In the paper a class of microwave circuits described by a two-dimensional vector wave equation is defined. It is proposed to refer to them as vector two-dimensional or 2-DV circuits to distinguish them from circuits described by a two-dimensional scalar wave equation (typically referred to as 2-D circuits). It is shown that the 2-DV class contains some types of planar circuits filled with anizotropic medium, two-dimensional waveguide discontinuities and circular waveguide discontinuities. Calculation of dispersion characteristics of inhomogeneously filled hollow waveguides is an eigenvalue problem belonging to the 2-DV class. Application of the finite-difference time-domain (FD-TD) method to the analysis of 2-DV circuits is described. The efficiency of this method is shown by means of several examples of various kinds of circuits.

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