Abstracts

Full Wave Analysis of Microwave Monolithic Circuit Devices Using a Generalized Yee-Algorithm Based on an Unstructured Grid

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A generalized Yee-algorithm is presented for the temporal full-wave analysis of microwave monolithic integrated circuit (MMIC) devices. This algorithm has the significant advantage over the traditional Yee-algorithm in that it is based on unstructured and irregular grids. Thus, using the generalized Yee-algorithm, MMIC devices that contain curved conductors or complex geometries can be more accurately and conveniently modeled using standard automatic grid generation techniques. The generalized Yee-algorithm is based on the time-marching solution of the discrete form of Maxwell's equations in their integral form. A correction scheme is introduced that is stable, maintains second-order accuracy, and maintains the divergenceless nature of the flux densities. Furthermore, by structuring the algorithm as a series of sparse matrix-vector multiplications, the generalized Yee-algorithm can be efficiently implemented on vector or parallel high performance computers.

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