Abstracts

A straightforward method for the FDTD analysis of quasi-optical arrays of active devices

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A method for the finite-difference time-domain (FDTD) analysis of quasi-optical circuit arrays of active devices is presented in this paper. To analyze active devices such as varactor diodes and MESFETs, this method creates a set of field-state central finite-difference equations, and all the field and state variables are solved simultaneously at the same FDTD time step. It will be shown in this paper that this formulation is simple and straightforward. The analyses of quasi-optical back-to-back varactor tripler and MESFET oscillator arrays have been performed to show different applications of this method. Excellent agreements have been obtained among the results from this simulation method, analytical solutions and commercial software, and experimental measurements to show the validity of this method.

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