Abstracts

Rigorous Multimode Network Representation of Capacitive Steps

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Capacitive steps discontinuities are the basic components of many waveguide devices of common use, and several models have been developed for their characterizations. The multimode equivalent network formulation presented in this paper provides a new, simpler and more flexible representation of the step. The method leads to a frequency independent integral equation that is solved numerically by using the Method of Moments. From the solution, a frequency independent multimode impedance coupling matrix is computed. The coupling matrices of a number of cascaded steps can then be combined in a global matrix, so that a wide class of waveguide devices can be analyzed with only one inversion per frequency point. The results obtained from the method presented here are compared with measured data, showing very good agreement. A comparison of the runtimes of the code developed with a typical mode-matching solution is performed, showing that the code based on the multimode network formulation is substantially more efficient.

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