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Fast Analysis of Cylindrical Waveguide Discontinuities Based on a Closed Form Generalized Scattering Matrix Mode Matching Technique
Anastasios P. Orfanidis, George A. Kyriacou and John N. Sahalos 1

A mode matching scheme for the analysis of concentric cylindrical waveguide step discontinuities is proposed. An analytical evaluation of the involved coupling integrals is performed which results in a very fast and accurate method. The formulation is theoretically verified for the special case of a dominant mode excitation, while different excitations are numerically verified. The results obtained from the analysis of various structures are in a very good agreement with measurements and results given by other investigators. The speed and accuracy of the proposed method make it appropriate to be included within microwave network synthesis algorithms.

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