

Wide-Band Network Modeling of Interacting Inductive Irises and Steps

T.E. Rozzi and W.F.G. Mecklenbrauker. "Wide-Band Network Modeling of Interacting Inductive Irises and Steps." 1975 Transactions on Microwave Theory and Techniques 23.2 (Feb. 1975 [T-MTT]): 235-245.

Methods of field and network theory are jointly applied to the problem of deriving wide-band models for interacting inductive irises and steps in standard and oversize lossless rectangular guides. The resulting equivalent network is a cascade of lumped multiports, described by means of their reactance matrix, given in the canonical Foster's form, and of several parallel transmission lines, connecting the interacting discontinuities. The required frequency band and the accuracy of the model can be prescribed at will. The features of the approach are: the solution of the field problem yields a reactance matrix with monotonic convergence properties; small matrices only need be manipulated; the frequency dependence is explicit, so that the field analysis need not be repeated at each frequency point; a true network model (and not a "spot frequency" equivalent circuit) is produced, which is prerequisite for exact synthesis.

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