Abstracts

A New Aperture Admittance Model for Open-Ended Waveguides (Feb. 1994 [T-MTT])

S.S. Stuchly, C.L. Sibbald and J.M. Anderson. "A New Aperture Admittance Model for Open-Ended Waveguides (Feb. 1994 [T-MTT])." 1994 Transactions on Microwave Theory and Techniques 42.2 (Feb. 1994 [T-MTT]): 192-198.

A new model for the aperture admittance of open-ended waveguide structures radiating into a homogeneous, lossy dielectric is presented. The model is based on the physical and mathematical properties of the driving point admittance of passive, stable one-port networks. The model parameters, which depend upon the geometry of the waveguide and aperture, are determined from a relatively small number of computed admittances. This computed data is obtained by a full-wave moment method solution and, hence, includes the effects of radiation and energy storage in the near field and the evanescent waveguide modes. The accuracy of the numerical method is demonstrated by comparison with measured values. As an example, the model parameters are determined for the coaxial-line geometry. The accuracy of the model, for both the direct and inverse problem, is verified and a rigorous sensitivity and uncertainty analysis is performed. The new model has important applications in the field of dielectric spectroscopy.

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