Abstracts

A New Model for Microwave Characterization of Composite Materials in Guided-Wave Medium

S. Lefrancois, D. Pasquet and G. Maze-Merceur. "A New Model for Microwave Characterization of Composite Materials in Guided-Wave Medium." 1996 Transactions on Microwave Theory and Techniques 44.9 (Sep. 1996 [T-MTT]): 1557-1562.

A method of determining the permittivity and the permeability of heterogeneous materials from microwave measurement in a coaxial line or in a rectangular waveguide is presented. Fluctuations are observed in the curves of the transmission and reflection coefficients measured in a guided space cell which are caused by the propagation of modes higher than lowest order. The measuring cell containing the sample is represented by an unperturbed line in series with resonators which model the coupling between the sample and the measurement cell for each higher mode resonating inside the sample. Finally, the intrinsic characteristics of the material are computed from the data for the unperturbed line. Results for several composite materials and measurement cells are presented to demonstrate the capabilities of this model.

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