Abstracts

A new absorbing boundary condition structure for waveguide analysis

K. Naishadham and Z. Lin. "A new absorbing boundary condition structure for waveguide analysis." 2000 Transactions on Microwave Theory and Techniques 48.1 (Jan. 2000 [T-MTT]): 147-152.

The existence of evanescent waves and waves near cutoff frequencies limits the accuracy of the fields computed in waveguides using the finite-difference time-domain method, and prompted several researchers to design complicated boundary conditions, including combinations of perfectly matched layers and Higdon's higher order absorbing boundary conditions (ABCs). Instead, we employ a terminating structure in which the lateral walls are made absorbing in addition to the longitudinal walls. The undesirable lateral waves at the normal boundary interface are slowed down and effectively attenuated in the lateral walls, while the propagating waves are absorbed in the longitudinal walls. Numerical calculations for pulse excitation of a rectangular waveguide, using the simple Mur's first-order ABC, demonstrate the usefulness of the method.

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