Abstracts

An improved unimodal absorbing boundary condition for waveguide problems

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An improved unimodal absorbing boundary condition (ABC) is proposed by using one-dimensional (1-D) mode finite-difference time-domain (FDTD). In the unimodal ABC, an uniform auxiliary waveguide of input-output port should be introduced so that evanescent waves attenuate sufficiently. In this letter, the uniform auxiliary waveguide is simulated by 1-D mode FDTD rather than three-dimensional (3-D) FDTD which is used in the conventional unimodal ABC. Memory storage and CPU time are significantly reduced by applying the proposed ABC. A WG-90 rectangular waveguide with a thick asymmetric iris is analyzed by FDTD with the conventional modal ABC and the proposed ABC, and scattering parameters and computational efficiency are compared.

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