Abstracts

Twofold Mur's first-order ABC in the FDTD method

In this paper, it is shown that the reflection error of Mur's first-order absorbing boundary condition (ABC) can be canceled effectively by applying the ABC twice to an electromagnetic (EM) field on two diagonally neighboring nodes on the x-t, y-t and t-t planes. Following this idea, we have developed a twofold Mur's first-order ABC (TMFABC), which is efficient to absorb both propagative and evanescent EM waves and very convenient for implementation to multilayered structures. TMFABC improves Mur's first-order ABC more effectively at lower frequencies. This is very important because most energy of a high-speed pulse is concentrated at lower frequencies.

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