

Z-Transform Implementation of the Perfectly Matched Layer for Truncating FDTD Domains

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Abstract:

A simple algorithm for implementing the perfectly matched layer (PML) is presented for truncating finite difference time domain (FDTD) computational domains. The algorithm is based on incorporating the Z-transform method into the PML FDTD implementation. The main advantage of the algorithm is its simplicity as it allows direct FDTD implementation of Maxwell's equations in the PML region. In addition, the formulations are independent of the material properties of the FDTD computational domain. Numerical examples are included to demonstrate the effectiveness of these formulations.

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