Abstracts

Scattering analysis by the multiresolution time-domain method using compactly supported wavelet systems

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We present a formulation of the multiresolution time-domain (MRTD) algorithm using scaling and one-level wavelet basis functions, for orthonormal Daubechies and biorthogonal Cohen-Daubechies-Feauveau (CDF) wavelet families. We address the issue of the analytic calculation of the MRTD coefficients. This allows us to point out the similarities and the differences between the MRTD schemes based on the aforementioned wavelet systems and to compare their performances in terms of dispersion error and computational efficiency. The remainder of the paper is dedicated to the implementation of the CDF-MRTD method for scattering problems. We discuss the approximations made in implementing material inhomogeneities and validate the method by numerical examples.

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