Abstracts

Dispersion of time domain wavelet Galerkin method based on Daubechies' compactly supported scaling functions with three and four vanishing moments

The wavelet-Galerkin method for time-domain electromagnetic field modeling based on Daubechies' compactly supported wavelets proposed by Cheong et al. (see ibid., vol. 9, no. 8, p. 297-299, 1999) has been extended to the use of the scaling functions with three and four vanishing wavelet moments together with the approximate shifted interpolation property. The numerical dispersion properties of the methods are precisely investigated and compared with those of other wavelet-based and finite-difference methods. It was found that Daubechies' scaling functions with larger number of vanishing moments generally give higher accuracy while maintaining the comparable computational expenditure.

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