Parallel Implementation of the Wave-Equation Finite-Difference Time-Domain Method Using the Message Passing Interface

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Abstract

The parallel implementation of the Wave Equation Finite Difference Time Domain (WE-FDTD) method, using the Message Passing Interface system, is presented. The WE-FDTD computational domain is divided into subdomains using one-dimensional topology. Numerical simulations have been carried out for a line current source radiating in two-dimensional domains of different sizes and performed on a network of PCs interconnected with Ethernet. It has been observed that, for large computational domains, the parallel implementation of the WE-FDTD method provides a significant reduction in the computation time, when compared with the parallel implementation of the conventional FDTD algorithm.