Abstracts

Parallel implementation of the steepest descent fast multipole method (SDFMM) on a Beowulf cluster for subsurface sensing applications

We present the parallel, MPI-based implementation of the SDFMM computer code using a thirty-two node Intel Pentium-based Beowulf cluster. The SDFMM is a fast algorithm that is a hybridization of the method of moments (MoMs), the fast multipole method (FMM), and the steepest descent integration path (SDP), which is used to solve large-scale linear systems of equations produced in electromagnetic scattering problems. An overall speedup of 7.2 has been achieved on the 32-processor Beowulf cluster and a significant reduced runtime is achieved on the 4-processor 667 MHz Alpha workstation.

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