MUDPACK: Multigrid Software for Elliptic Partial Differential Equations

Fortran Code with OpenMP Directives for Shared Memory Parallelism

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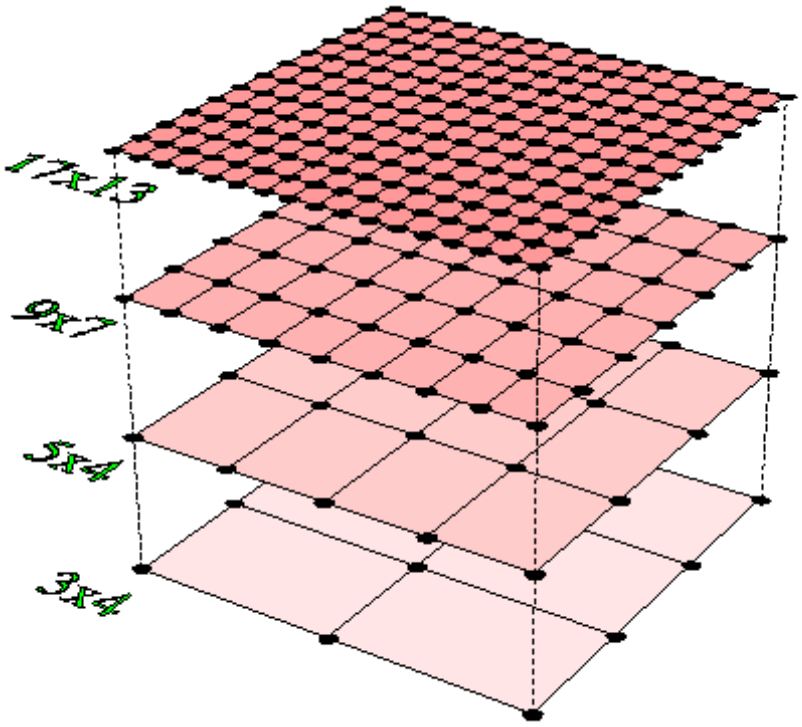

Convergence at the top, highest-resolution grid is greatly accelerated by relaxation sweeps on the coarser sub-grids that lie below.

Abstract

MUDPACK was first released in 1990, and has remained at version 5.0.1 the past five years. It is a collection of portable, mostly Fortran 77 subprograms (the code also employs a few Fortran 90 extensions). Its purpose is the efficient solving of linear elliptic Partial Differential Equations (PDEs) -- both separable and nonseparable -- using multigrid iteration. MUDPACK solvers can achieve parallel speedup via OpenMP directives in the 5.0.1 subroutines, but the user will need to activate the directives by providing appropriate OpenMP compiler options when the library and application are built. Speedup is dependent on problem size and characteristics of the shared multi-processor platform where the code is compiled and run.