

Solving the Incompressible Navier-Stokes Equations on Overlapping Grids

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Abstract: Some of the issues involved in solving the incompressible Navier-Stokes equations on overlapping grids will be discussed. The equations are solved in a split-step fashion to second and fourth order accuracy using a pressure-Poisson approach. Appropriate boundary conditions for higher-order accuracy and for implicit time stepping will be described. The importance of adding a divergence damping term will be shown. An efficient version of the flow solver is being developed that uses multigrid to solve both the pressure equation and the implicit time-stepping equations. Special attention has been taken to handle cartesian component grids in an efficient manner.