

Fast Solvers for numerical solutions of Stokes/Navier-Stokes systems on hybrid meshes and its parallelization

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ABSTRACT

In this talk, we will present our results on the numerical solutions for the Stokes/Navier-Stokes equations. The methods we used are mainly based on M. Wabro's previous work of the AMG solver for the FEM numerical solutions of the incompressible Navier-Stokes Equations. Most of his results can be directly applied to our problem from algebraic point of view. We extend his method to the hybrid meshes and show the LBB conditions for the Stokes problem on the hybrid meshes. Several currently used smoothers for this saddle point problem will be discussed. After that, we will present a simple parallel solver for the Stokes problem using MPI communication Library Toolbox. Finally, we would present some numerical results using our methods.