

COMPUTATIONAL RESULTS FOR FLOWS OF IMPLICITLY CONSTITUTED FLUIDS

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Abstract

In this talk we consider incompressible fluids described by a general implicit relation between extra part of the stress tensor S and symmetric part of the velocity gradient D in the form $G(S, D) = 0$. Particularly, we look at three models: simple Stokes, power-law Stokes and plastic Bingham. In all cases constitutive relation for the stress is given as a separate equation. Besides standard boundary condition like Dirichlet no-slip we also consider a threshold boundary condition formulated in implicit way analogous to the implicit constitutive relation. We investigate several variants of the mixed finite element discretizations with respect to its advantages in numerical solution.