
Flow of Incompressible Viscoelastic Fluids

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Flows of incompressible viscoelastic fluids often described by a system of nonlinear coupled equations of both parabolic and hyperbolic nature. They provide typical models for the so-called complex fluids and serious challenges from both the theory and computations. At the macroscopic level, the fluids obey the laws described by the Navier-Stokes equations for incompressible fluid dynamics with a part of the internal stress comes from contributions of microscopic structure and motions. In this lecture, we shall discuss some analytical results and open problems.