

On flows of fluids described by an implicit constitutive relation

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We present the results on flows of incompressible fluids in which the deviatoric part of the Cauchy stress and the symmetric part of the velocity gradient are related through an implicit equation. Although we restrict ourselves to responses characterized by a maximal monotone graph, the structure is rich enough to include power-law type fluids, stress power-law fluids, Bingham and Herschel-Bulkley fluids, etc. We are interested in the development of (large-data) existence theory for internal flows subject to no-slip boundary conditions. We shortly mention about the method of Lipschitz approximations of functions in Orlicz spaces and present the cases where the use of Lipschitz approximations is not necessary; then the methods are simpler and allow one to include the general N -functions into the analysis.