

We investigate properties of solutions of systems of nonlinear partial differential equations describing evolutionary flow of certain class of generalized Newtonian fluids including in particular various variants of the power-law models. We study the problem with perfect slip boundary conditions. The nonlinear elliptic operator, which is related to the stress tensor, has a p -potential structure. We focus especially on the case $p = 2$. The main part of the work deals with regularity of second space derivatives and overcoming new difficulties connected with usage of considered boundary conditions.