Existence of weak solutions to the Navier-Stokes equations for steady compressible non-Newtonian fluids

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Abstract

We show that there exists a weak solutions to steady, compressible non-Newtonian Navier-Stokes system on a bounded, two- or three-dimensional domain. Assuming the viscous stress tensor is monotone satisfying a power-law growth with power r and the pressure is given by ϱ^γ, we construct a solution provided that $r > \frac{3d}{d+2}$ and γ is sufficiently large, depending on the values of r.