Stability of equilibria to generalized Navier-Stokes-Fourier system

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In a given domain we consider a generalized Newtonian incompressible heat conducting fluid with prescribed nonuniform temperature on the boundary of the domain and with the no-slip boundary conditions for the velocity. We study stability of equilibria if no external body forces are applied to the fluid. In dependence on the growth of the constitutively determined part of the Cauchy stress we identify different classes of proper solutions that converge to the equilibrium exponentially in a suitable metric. Consequently, the equilibrium is nonlinearly stable and attracts all weak solutions from these classes. We also show that these classes of solutions are nonempty.