BOUNDARY LAYERS FOR THE NAVIER-STOKES EQUATIONS OF COMPRESSIBLE HEAT-CONDUCTING FLOWS WITH CYLINDRICAL SYMMETRY

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Abstract. We consider the Navier-Stokes equations for viscous compressible heat-conducting fluids with cylindrical symmetry. Our main purpose is to study the boundary layer effect and convergence rates as the shear viscosity μ goes to zero. We show that the boundary layer thickness and a convergence rate are of order $O(\mu^\alpha)$ with $0 < \alpha < 1/2$ and $O(\sqrt{\mu})$ respectively, thus extending the result for isentropic flows to non-isentropic flows. As a byproduct, we also improve the convergence result on the vanishing shear viscosity limit.

This is joint work with Jianwen Zhang (Xiamen University).