ON THE ASYMPTOTIC BEHAVIOUR OF SOLUTIONS TO THE NAVIER-STOKES EQUATIONS FOR COMPRESSIBLE NONLINEAR VISCOUS FLUIDS

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The main goal of this paper is to study the asymptotic behaviour of solutions to the Navier-Stokes equations for compressible nonlinear viscous fluids on Orlicz spaces. We would like to prove the strong convergence (in Orlicz spaces) of the density to a function ρ_∞ which satisfies an appropriate rest state. The reason why we used Orlicz spaces is to obtain the convergence independently on dimension. In the first part we prove the existence of a solution of the problem $\nabla \cdot v = f$, where $f \in L^\infty(\Omega)$. In the second part we test Navier-Stokes equations in pressure term with an appropriate function using the existence result from the first part to be able to study the asymptotic behaviour of the density.