Existence of strong solutions to a class of compressible non-Newtonian Navier-Stokes equations

Martin Kalousek
Institute of Mathematics, Czech Academy of Sciences, Prague, Czech Republic
kalousek@math.cas.cz

Abstract

We discuss the local-in-time existence of a strong solution to the generalized compressible Navier-Stokes equation for arbitrarily large initial data. The existence of the solution is obtained by the maximal L^p–L^q–regularity theorem for linearized equations which is proven with help of the Weis multiplier theorem. The result, published in [2], can be seen as generalization of the work of Shibata and Enomoto [1] to compressible non-Newtonian fluid.

Keywords: non-Newtonian fluids, the Weis theorem, L^p-theory.

References

[1] Enomoto, Y. and Shibata, Y.: On the $\mathcal{R}$-sectoriality and the initial boundary value problem for the viscous compressible fluid flow. Funkcial. Ekvac., 56(3):441–505, 2013.

[2] Kalousek, M., Mácha, V. and Nečasová, Š.: Local-in-time existence of strong solutions to a class of the compressible non-Newtonian Navier–Stokes equations. Math. Ann. 384, 1057–1089, 2022.