XVIII INTERNATIONAL CONFERENCE ON HYPERBOLIC PROBLEMS
THEORY, NUMERICS, APPLICATIONS
Málaga, June 20-24, 2022

From compressible Naveir–Stokes with nonlocal forces to Euler - relative entropy method

Aneta Wróblewska-Kamińska *

We show that weak solutions of degenerate Navier–Stokes equations converge to the strong solutions of the pressureless Euler system with linear drag term, Newtonian repulsion and quadratic confinement. The proof is based on the relative entropy method using the artificial velocity formulation for the one-dimensional Navier–Stokes system. The result is based on the joint work with Jose A. Carrillo and Ewelina Zatorska.

Moreover we will shortly discuss how to obtain general nonlinear aggregation-diffusion models, including Keller–Segel type models with nonlinear diffusions, as relaxations from nonlocal compressible Euler type hydrodynamic systems via the relative entropy method. This result is based on the joint work with Jose A. Carrillo and Yinping Peng.

References

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[2] J.A. Carrillo, Y. Peng, A. Wróblewska-Kamińska. Relative Entropy Method for the relaxation limit of Hydrodynamic models. *M*athematical Models for Collective Dynamics of Networks and Heterogeneous Media, 2020.

*Email: awrob@impan.pl