

# Stability properties of the solutions to the isentropic compressible Navier-Stokes equations in 1D

Marta Strani

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## Abstract

In this talk I will discuss some results on the long-time dynamics of the solutions to the isentropic Navier-Stokes equations for compressible fluids with a density-dependent diffusion in a bounded interval of the real line.

In particular, I will firstly discuss the stability properties of the (unique) stationary solution by means of the construction of a suitable Lyapunov functional for the system. Subsequently, I will present some results on the asymptotic behavior of the time-dependent solutions, showing how they (slowly) converge towards the aforementioned steady state by firstly developing into a layered function and then by drifting towards it in an exponentially long time interval.

These results are partially contained in [1, 2].

## References

- [1] Mascia, C., Strani, M.; *Slow motion for compressible isentropic Navier-Stokes equations*, preprint.
- [2] Strani, M.; *Existence and stability properties of the steady state for the compressible isentropic Navier-Stokes equations*, *Comm. Math. Sci.* (2022), 20(1), 231–264.