

## The Rayleigh–Bénard problem for compressible fluid flows

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We consider the physically relevant fully compressible setting of the Rayleigh–Bénard problem of a fluid confined between two parallel plates, heated from the bottom, and subjected to the gravitational force. Under suitable restrictions imposed on the constitutive relations we show that this open system is dissipative in the sense of Levinson, meaning there exists a bounded absorbing set for any global-in-time weak solution. In the second part of the talk we discuss also the motion of a compressible viscous fluid in a container with impermeable boundary subject to time periodic heating and under the action of a time periodic potential force. We show the existence of a time periodic weak solution for arbitrarily large physically admissible data. The talk is based on two papers [1, 2].

### References

- [1] E. Feireisl, A. Świerczewska-Gwiazda, The Rayleigh–Bénard problem for compressible fluid flows, to appear in *ARMA*.
- [2] E. Feireisl, P. Gwiazda, A. Świerczewska-Gwiazda, Time periodic motion of temperature driven compressible fluids, to appear in *Math. Annalen*.