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Statistical description of the main modes of Rayleigh-Benard convection JOHANNES LUELFF, WWU Muenster — Rayleigh-Benard convection, which is the buoyancy-induced movement of a fluid enclosed between two horizontal plates, is an idealized setup to study thermal convection. The temperature fluctuations of the fully turbulent case are of special interest, which we are investigating by a statistical description coupled with a mode projection ansatz. To this end, we characterize the statistics of temperature fluctuations by investigating the probability density function (PDF) of temperature with the help of DNS data. This gives us insights into the mean dynamics of the convecting fluid. We then apply a projection of the data onto the main modes by using the POD ansatz. Thereby, we can determine the modes with the major influence on the mean dynamics and the coherent structures in the convection cell.

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