

## Large Eddy Simulation of Rayleigh–Bénard Convection in an Infinite Fluid Layer

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A numerical study of Rayleigh–Bénard convection in an infinite fluid layer ( $Pr=0.71$ ) is performed using large eddy simulation (LES) of the Navier–Stokes equations with the Boussinesq approximation. We present results in a ‘hard turbulence’ regime ( $2.10^5 < Ra < 2.10^9$ ). The LES modelling uses the mixed scale diffusivity model, that we have originally developed in the case of the differentially heated cavity. This original subgrid diffusivity model is based on its own time-scale, so that the Reynolds analogy is not needed to be assumed. The main observation is the ability of the computations to reproduce the  $2/7$  scaling behavior over a large  $Ra$  range ( $2.10^5 < Ra < 2.10^8$ ) despite of the LES modelling. Moreover the regime transition towards the ‘ultra-hard regime’ is observed at  $Ra = 2.10^9$ .

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