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High Rayleigh number simulations in a cylinderical cell with aspect-ratio 1/3 ERWIN P. VAN DER POEL, University of Twente, ROBERTO VERZICCO, University of Rome, Tor Vergata, DETLEF LOHSE, University of Twente — The results of DNS simulations of Rayleigh-Bénard convection with Ra up to 10^{12} in a cylindrical geometry with aspect-ratio 1/3 are presented. The simulations were carried out on a PRACE tier 0 grant illustrating the size of the computational task, which required millions of CPU hours. With $\mathrm{Pr} = 0.7$ these simulations match the new experimental setup build in the "U-boat of Göttingen." We show global quantities such as the heat transport as well as local time-averages. The boundary layer profile and the strength of the large scale circulation are studied and movies of horizontal cross-section of the bulk and the boundary layer are shown.

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