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High Rayleigh number simulations in a slender laterally periodic domain ROBERTO VERZICCO, Dept. Industrial Engineering, Universita' di Roma Tor Vergata, ERWIN VAN DER POEL, DETLEF LOHSE, Department of Physics, Mesa+ Institute, and J. M. Burgers Centre for Fluid Dynamics, University of Twente, 7500 AE Enschede, The Netherlands — The results of three-dimensional DNS simulations of Rayleigh-Bénard convection with Ra up to 10^{13} in a laterally periodic geometry with progressively decreasing aspect-ratios are presented. We show global quantities such as the heat transport as well as local time-averages and vertical profiles. It is observed that the heat transport for laterally unconfined geometries can be computed at relatively small aspect-ratios whose value decreases with Rayleigh number. This is beneficial in terms of computational cost, as the total simulated domain gets smaller. The boundary layers profiles are studied and movies of horizontal cross-section of the bulk and the boundary layer are shown.

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