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Side wall effects in turbulent thermal convection RICHARD J.A.M. STEVENS, DETLEF LOHSE, University of Twente, ROBERTO VERZICCO, University of Rome — Research in thermally driven convective turbulence has always been trying to achieve the highest Rayleigh number (Ra) as various natural heat transfer phenomenon involve very high Ra. Since seemingly equivalent experiments with the same Ra and Prandtl Pr numbers and cell aspect–ratio (Γ) have not given the same heat transfers in the high–end of Ra, it has been conjectured that neglected details, like the finite conductivity of horizontal plates and sidewall, could play a role. It has indeed been shown that corrections for the heat leakage through the sidewall and for the finite thermal conductivity of the plates must be considered, although none of them could fully explain the differences among the experiments. Ahlers et al. recent experiments suggest that a factor that could trigger different heat transfers regimes is the temperature *outside* the cell. Indeed, in real experiments the sidewall is isothermal, but in most models it is assumed to be adiabatic. In our numerical simulations we now allow for an isothermal sidewall and assess the behavior of the system in presence of a conductive sidewall. We discuss the differences between an ideal set–up with perfectly adiabatic side walls and systems with an isothermal sidewall or a sidewall with finite thickness and heat conductivity.

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