

Abstract Submitted
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Turbulent thermal convection with polymer additives and with smooth and rough top and bottom plates¹ KE-QING XIA, PING WEI, RUI NI, XIAO-MING LI, Department of Physics, The Chinese University of Hong Kong — We present an experimental study of heat transport in turbulent Rayleigh-Bénard (RB) convection with polymer additives made in two convection cells, one with a smooth top and bottom plates and the other with a rough top and bottom plates. For the cell with smooth plates, a reduction of the measured Nusselt number (Nu) was observed. For the cell with rough plates, however, an enhancement ($\sim 4\%$) of Nu of was observed when the polymer concentration is greater than 120 ppm. This increase in Nu is corroborated by an increased large-scale circulation (LSC) velocity in the same cell when polymers are added. In contrast, the LSC velocity in the smooth cell is found to be essentially the same with and without polymers. Results from local velocity field and energy dissipation rate measurements will also be presented.

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