

Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

An experimental study of flow reversals in turbulent Rayleigh-Bénard convection in rectangular cells¹ SHI-DI HUANG, RUI NI, KE-QING XIA, Department of Physics, The Chinese University of Hong Kong — We present an experimental study of reversals of the large-scale circulation (LSC) in turbulent Rayleigh-Bénard convection. The experiment was conducted in two rectangular cells with the heights and lengths being equal and fixed at 12.6 cm while the widths being 3.84 cm and 2.56 cm, corresponding to lateral aspect ratios Γ being 0.3 and 0.2, respectively. It is found that reversals of the LSC occur more frequently in the $\Gamma = 0.2$ cell than they do in the $\Gamma = 0.3$ cell. The increased temperature fluctuations in the bulk indicates that there are more plumes going through the bulk flow due to the shear effects from the sidewall, which results in a less stable LSC thus more frequent flow reversals.

¹This work was supported by RGC of Hong Kong SAR (No. CUHK404409 and CUHK403811).

Ke-Qing Xia
Department of Physics, The Chinese University of Hong Kong

Date submitted: 01 Aug 2012

Electronic form version 1.4