

INTERNATIONAL CONFERENCE ON RAYLEIGH-BÉNARD TURBULENCE

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Program

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Department of Physics, The Chinese University of Hong Kong

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December 11, 11:00 – 11:30

Logarithmic Temperature Profiles in the Ultimate Regime of Thermal Convection*

Siegfried Grossmann and **Detlef Lohse**

Physics of Fluids Group, University of Twente, The Netherlands

We report on the theory of logarithmic temperature profiles in very strongly developed thermal convection in the geometry of a Rayleigh-Bénard cell with aspect ratio $\Gamma = 1$ and discuss the degree of agreement with the recently measured profiles in the ultimate state of very large Rayleigh number flow. The parameters of the log-profile are calculated and compared with the measure ones. Their physical interpretation as well as their dependence on the radial position are discussed.

* S. Grossmann and D. Lohse, Phys. Fluids, in press (2012).

December 11, 11:30 – 11:50

Logarithmic Temperature Profiles in Rayleigh-Bénard Convection

Erwin P. van der Poel, Rodolfo Ostilla, Siegfried Grossmann and Detlef Lohse

Physics of Fluids Group, University of Twente, The Netherlands

Recently, Ahlers et al. [1] experimentally and numerically found logarithmic temperature profiles not only in the ultimate regime of turbulence, but also in the “classical regime” for Rayleigh numbers as low as $1e10$. In this talk we will try to rationalize this surprising behavior, based on a novel viewpoint of plume-driven flow.

[1] Ahlers, G., Bodenschatz, E., Funfschilling, D., Grossmann, S., He, S., Lohse, D., Stevens, R.J.A.M. & Verzicco, R., PRL 109, 114501 (2012).