

Abstract Submitted
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Search for the “ultimate state” in turbulent Rayleigh-Bénard convection for Rayleigh numbers up to 4×10^{13} and Prandtl numbers near 0.8.¹ GUENTER AHLERS, UCSB, DENIS FUNFSCHILLING, CNRS Nancy, EBERHARD BODENSCHATZ, MPI for Dyn. and Self-org., Goettingen — Measurements of the Nusselt number Nu over the Rayleigh-number range $10^{10} < Ra < 4 \times 10^{13}$ for N_2 (Prandtl number $Pr = 0.72$) and SF_6 ($Pr = 0.78$ to 0.82) are reported. They were made at pressures up to 15 bars and near-ambient temperatures for a cylindrical sample of height $L = 2.2$ m and diameter $D = 1.1$ m in a new High-Pressure Convection Facility (HPCF) constructed at the Max Planck Institute for Dynamics and Self-Organization in Göttingen, Germany. The data can be represented well by a power law with an effective exponent of 0.31. They do not show the transition to an “ultimate regime” reported by Chavanne et al.

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Guenter Ahlers
UCSB

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