

Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Turbulence measurements in air near a heated vertical cylinder at high Raleigh number ABOLFAZL SHIRI, Chalmers University of Technology, Gothenburg, Sweden, WILLIAM K. GEORGE¹, CNRS, LML, Lille, France — Measurements are presented up to 4 m height of the temperature and velocity statistics along a heated vertical cylinder of diameter 0.15 m. The cylinder was heated by water flowing through it, and mounted inside a 1.2 m container through which the ambient flow could be controlled. The difference between the wall and ambient temperatures was approximately 40 degrees C resulting in a maximum Rayleigh number based on length, $Ra = g\beta\Delta T x^4 / \alpha\nu \approx 2.3 \times 10^{11}$. The velocity was obtained using two-component burst-mode LDA, while the temperature was measured using 1-micron platinum wires. Arrays of thermocouples were used to monitor the ambient and wall conditions. Particular attention has been given to the buoyancy and moment integral equations in order to evaluate the residual effects of stratification and co-flow.

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Date submitted: 08 Aug 2009

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