

Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Refined measurements on the structure of thermal boundary layers in turbulent Rayleigh-Benard convection¹ ANDRE THESS, RONALD DU PUIITS, CHRISTIAN RESAGK, Ilmenau University of Technology — We present highly resolved temperature measurements at a large- scale Rayleigh-Benard experiment simultaneously undertaken at the top and the bottom plate using small microthermistors. For the first time the temperature measurements have been complemented by local heat flux measurements at the surface of both horizontal plates using special heat flux sensors. The experimental facility used for this purpose is an adiabatic cylinder with an inner diameter of $D=7.15$ m filled with air. An electrical heating plate at the bottom and a free hanging cooling plate at the top trigger the convective flow. The work reported here is limited to the $H=6.30$ m where the shape of the global flow is well known. We will discuss results of measurements of profiles of the mean temperature and compare the behaviour of the top and bottom boundary layers.

¹Supported by the Deutsche Forschungsgemeinschaft

Andre Thess
Ilmenau University of Technology

Date submitted: 30 Jul 2009

Electronic form version 1.4