

Abstract Submitted  
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**Heat flux and local temperature measurements in extremely small aspect ratio turbulent Rayleigh-Bénard convection**<sup>1</sup> KE-QING XIA, The Chinese University, LI-YUAN REN, The Chinese University of Hong Kong — We report measurements of local temperature fluctuations and the heat flux in cylindrical convection cells of diameter  $\sim 20$  cm and heights 1-m and 2-m respectively (aspect ratio  $\Gamma = 0.2$  and  $0.1$ ). It is found that local temperature fluctuations exhibit a Gaussian distribution even at cell center and it appears to be independent of positions along the central axis of the cell. It is also found that the mean temperature has a linear profile across the height of the cell. The Nusselt number (Nu) measured with both copper and aluminum plates show that the effect of the plates' finite thermal conductivity is very small in this system. The scaling of Nu with Ra exhibits a local exponent that varies continuously from less than  $1/3$  to larger than  $1/3$  over the range of Ra from  $3 \times 10^{10}$  to  $1 \times 10^{13}$ .

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