Reynolds number measurements for turbulent Rayleigh-Bénard convection with $0.17 < Pr < 0.88$[1] JAMES HOGG, GUENTER AHLERS, UC Santa Barbara — We report Reynolds-number measurements from space-time cross-correlation functions of shadowgraph images taken of turbulent Rayleigh-Bénard convection in a cylindrical cell of height $L = 9.5$ mm and aspect ratio $\Gamma = 10.6$. The fluids were pure gases with Prandtl-numbers $Pr \approx 0.7$ and gas mixtures with $0.17 \leq Pr < 0.7$. The Rayleigh-number range was $10^5 \leq Ra \leq 10^8$. The elliptic approximation of He and Zhang[2] was used to calculate the mean flow velocity U and the rms fluctuation velocity V. For this system U was close to zero, and the Reynolds number Re_V based on V had Ra- and Pr-dependences consistent with the Grossmann-Lohse model.[3]

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[2]G.-W. He and J.-B. Zhang, Phys. Rev. E, **73**, 055303 (2006).
[3]S. Grossmann and D. Lohse, Phys. Rev. E, **66**, 016305 (2002).

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