Reynolds number measurements for turbulent Rayleigh-Bénard convection with $0.17 < Pr < 0.88$. 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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