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More on the asymptotic state of high Reynolds number, smooth-wall turbulent flows DALE PULLIN, California Institute of Technology, ANTHONY LEONARD, California Institute of Technology — This is an update of a hypothesis (Pullin, Inoue & Saito, *Phys. Fluids*, 2013) concerning the asymptotic state of some canonical, smooth-wall turbulent flows. There it was argued, based on the extrapolation to arbitrarily large Reynolds numbers (Re_τ) of both the log-wake law for the mean velocity profile, and also of Townsend-Perry scaling for streamwise turbulent velocity fluctuations, that over almost all of the turbulent-flow layer, turbulent velocity fluctuations on outer scales asymptotically decline with increasing Re_τ. Presently this is extended to include vorticity fluctuations using scaling proposed by Panton (*Phys. Fluids*, 2009). This suggests that, at least for turbulent channel flow, the asymptotic state consists of vanishingly-small turbulent velocity fluctuations but unbounded enstrophy ($\overline{\omega^2}$) fluctuations on outer scales, over almost the whole turbulent-flow domain.

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