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Fluctuating Vorticity in Turbulent Boundary Layers RON PANTON, University of Texas — Profiles of fluctuating vorticity from the channel flow DNS (Del Alamo, et al. (P of F **15**, L-41; JFM, **500**, p135, P of F, **18**) are correlated in Panton (Phys. Fluids, **21**, 2009). In the inner region, a two-term expansion represents the vorticity profiles; $\langle\omega\omega\rangle^{\#} = \langle\omega\omega\rangle^{\#}_{0} + \langle\omega\omega\rangle^{+}_{1} u_\tau/U_0$. The scaling $\langle\omega\omega\rangle^{\#}_{0} = \langle\omega\omega\rangle_{0}/(u_\tau^3 U_0/\nu^2)$ for inactive motions applies only to the streamwise and spanwise components. This term is zero for the normal vorticity component. The scrubbing of the inactive motions over the wall generates vorticity, which is a maximum at the wall, and diffuses to about $y^+ = 50$ before it decays. The fluctuating wall shear stress is due entirely to this motion, and the stress ratio (rms/mean) depends on *Re*. The second scaling $\langle\omega\omega\rangle^{+}_{1} = \langle\omega\omega\rangle_{1}/(u_\tau^4/\nu^2)$, the same scaling as the Reynolds shear stress, is active motions. These motions are zero at the wall, peak about $y^+ = 13$–20, and fall to zero about $y^+ = 400$. The outer region is correlated by a third scaling using the Kolmogorov time scale; $\langle\omega\omega\rangle\ /(u_\tau^3/\delta\ \nu)$. Matching between the inner and outer regions has an overlap law (common part) of $\sim C/y^+$ or $\sim C/Y$ for all components. In this paper DNS boundary layer data of Schlatter et al. (Phys. Fluids, **21,** 2009) is correlated in the manner previously used for channel flows.

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