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Fluctuating Vorticity in Turbulent Wall Layers RONALD PANTON, University of Texas — DNS data for the correlations of fluctuating vorticity in the streamwise $< \omega_x\omega_x >$, spanwise $< \omega_z\omega_z >$, and normal $< \omega_y\omega_y >$ directions is given in the various papers of Del Alamo, Jimenez, Zandonade, Moser, and Hoyas (PofF **15**, L-41; JFM, **500**,p135, PofF, **18**, 011702 at four Reynolds numbers. Previously, APS Bulletin **53,** 18, 2008 EA.00004, the inner wall region was considered. It was shown that the normal component profiles at different Reynolds numbers collapse together when scaled as $< \omega_y\omega_y > / (u_*^4/\nu^2)$. However, the other components, $< \omega_x\omega_x >$ and $< \omega_z\omega_z >$, require a two-term expansion of the form $F \sim F_0 + F_1 \cdot u_*/U$. The first term scaling as $< \omega\omega >_0 / ((u_*/\nu)^2 u_* U)$ and the second scaling as $< \omega\omega >_1 / (u_*^4/\nu^2)$. In the outer region a completely different scaling is required. An analysis of the matching behavior between the two regions shows that the common part is a function that decreases as $1/y$. This implies that in the outer region the proper scaling is $< \omega\omega > / [u_*^3/(h\nu)]$. Indeed, profiles of all three components collapse in the outer region in this variable. Furthermore, all three components show a marked tendency toward the same level and isotropic behavior.

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