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Non-Local Geometry of High Reynolds Number Wall-Bounded Turbulence using Tomographic Particle Image Velocimetry CALLUM ATKINSON, Laboratory Turbulence Research in Aerospace and Combustion, MICHEL STANISLAS, Laboratoire de Mecanique de Lille, JULIO SORIA, Laboratory Turbulence Research in Aerospace and Combustion — Three-dimensional fields resulting from tomographic particle image velocimetry (Tomo-PIV) measurements in the buffer region of a fully developed flat plate turbulent boundary layer at $\mathrm{Re}_\theta = 7800$ and 11800 are examined to extract statistics on the geometry and spatial distribution of large-scale coherent structures in wall bounded turbulence. Fields of $470^+ \times 70^+ \times 470^+$ and $920^+ \times 140^+ \times 920^+$ wall units are examined at a distance of $y^+ = 8$ to 55 and $y^+ = 15$ to 100 from the wall for $\mathrm{Re}_\theta = 7800$ and 11800, respectively. Pattern recognition methods are used to extract and classify the structures. Results are compared with Stereo-PIV and direct numerical simulations of a boundary layer at $\mathrm{Re}_\theta = 1950$. The enstrophy, dissipation and kinetic energy associated with each of these structures are considered.

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