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Spatial correlation between large scales and height of small scales in a turbulent boundary layer SHAURYA SHRIVASTAVA, Indian Institute of Technology Kharagpur, THERESA ANN SAXTON-FOX, University of Illinois at Urbana-Champaign — In this study, the effect of large scales on the spatial organisation of small-scales in a turbulent boundary layer is investigated. Span-wise vortices in the outer layer are identified using the Triple Decomposition Method (Kol, V., 2007) from 2D particle image velocimetry (PIV) data. A novel curve-fitting technique was employed to capture the path followed by hairpin packets over an extended spatial domain, along which the small scales are organised. Using spectral analysis and conditional averaging, the height of small scales was found to be correlated with the large scale fluctuating velocity field, which is consistent with previous results. (Mathis et al., 2009; Chung and McKeon, 2010). Additionally, the distance between large scale velocity iso-contours and the path followed by hairpin packets is quantitatively found to be small.

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