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Internal shear layers and interfaces in turbulent boundary layers CHARITHA DE SILVA, JIMMY PHILIP, DOUGAL SQUIRE, NICHOLAS HUTCHINS, IVAN MARUSIC, Univ of Melbourne — We examine regions of concentrated shear in turbulent boundary layers that are observed to demarcate patches of relatively uniform streamwise momentum. To this end, we employ particle image velocimetry databases that span over a decade of Reynolds numbers ($Re_\tau = \mathcal{O}(10^3 - 10^4)$) which are tailored to capture the larger spatial features in the order of the boundary layer thickness, but with adequate spatial resolution to resolve most structural features. These databases are also complimented by experiments with enhanced spatial resolution in the order of the Kolmogorov scale, albeit over a narrow spatial extent. Our analysis quantitatively characterises several recurrent structural features, together with their associated scaling arguments. The Reynolds number dependence of these features is also investigated. Preliminary comparisons are also drawn between the observed edges of uniform momentum zones to the turbulent/non-turbulent interface at the edge of the boundary layer.

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