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The Turbulent/Non-turbulent Interface and Entrainment in a Boundary Layer KAPIL CHAUHAN, JIMMY PHILIP, NICHOLAS HUTCHINS, CHARITHA DE SILVA, IVAN MARUSIC, The University of Melbourne — The turbulent/non-turbulent (T/NT) interface in a zero pressure gradient turbulent boundary layer ($Re_\tau \approx 8000$) is examined using particle image velocimetry. The interface is detected using local turbulent kinetic energy and proves to be an effective method for boundary layers. Statistically the interface exhibits a normal distribution characterizing the intermittency and has a fractal dimension of about 2.32. The presence of a T/NT superlayer is corroborated by the presence of a jump for the conditionally averaged streamwise velocity across the interface. The steep change in velocity is accompanied by a discontinuity in the vorticity and a jump in the Reynolds shear stress, in agreement with the governing equations within the superlayer. The analysis of the data indicates that the boundary layer entraiment is characterized by two distinctive length scales which appear to be associated with a two-stage entrainment process.

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