Townsend’s similarity hypothesis applies to the intermittent region of a boundary layer\(^1\) GUILLEM BORRELL, JAVIER JIMENEZ, Universidad Politecnica de Madrid — The intermittent region of two boundary layers with different entrainment rates obtained by direct numerical simulation are compared at \( \delta_{99}^+ = 1500 \), one with the natural friction coefficient, and a second where the spreading rate is increased by 70% by a smooth volumetric force. The two flows are compared by thresholding the vorticity magnitude field, using a vorticity isosurface as a reference frame. Three regions can be observed in the conditional analysis. The two that are associated with the turbulent-nonturbulent interface match if \( u^+ \) is used as the unit for vorticity, where \( u^+ \) takes into account the additional friction caused by the forcing. The third one, where the two flows are not comparable, corresponds to the near-wall region where the force is applied. This result suggests that Townsend’s similarity hypothesis is also valid for the intermittent region of the boundary layer.

\(^1\)Funded by ERC, PRACE, CICYT and Spanish Ministry of Economy.