

Abstract Submitted
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Townsend's similarity hypothesis applies to the intermittent region of a boundary layer¹ 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_τ^2/ν is used as the unit for vorticity, where u_τ 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.

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Guillem Borrell
Universidad Politecnica de Madrid

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