Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Geometrical properties and scaling of the turbulent-nonturbulent interface in boundary layers[1] GUILLEM BORRELL, Universidad Politécnica de Madrid, JAVIER JIMÉNEZ, Universidad Politecnica de Madrid — The turbulent-nonturbulent interface of a boundary layer at $Re_\theta = 1500 - 6500$ is analyzed by thresholding the vorticity magnitude field. The value of the threshold, whithin the range spanning the topological transition from smooth to turbulent, is considered a parameter, and the resulting surface is processed. Its geometrical properties like the relative position to the wall, the fractal dimension or the genus change significantly within the range spanning the topological transition, but the width of the transition scales well with Re_τ when outer units for the vorticity magnitude ($|\omega|^+/\sqrt{\delta_{99}^+}$) are used. The properties of the flow relative to the position of the surface are analyzed within the same range of thresholds, using as a definition of distance the radius of the smallest sphere centerd at the point and touching the surface. That definition works for arbitrarily complex surfaces. The properties of the flow at a given distance to the surface also depend on the threshold, but the average vorticity jump close to the surface scales with the Kolmogorov length, while the average vorticity jump away from the surface scales with the boundary layer thickness.

[1]Funded by ERC, PRACE, CICYT and Spanish Ministry of Economy.

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Date submitted: 01 Aug 2013 Electronic form version 1.4