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On the thickness of the turbulent/nonturbulent interface in shear layers CARLOS DA SILVA, RODRIGO TAVEIRA, IST/IDMEC Technical University of Lisbon, Portugal — In free shear flows the flow field can be divided into two regions: the outer region where the flow is irrotational and the inner region where the flow is turbulent. The two regions are separated by a sharp interface: the turbulent/nonturbulent (T/NT) interface. The thickness of this interface has been observed to be between the order of the Kolmogorov or the Taylor micro-scale in several experimental and numerical works. We show that the thickness of the T/NT interface is equal to the radius of the large scale vortices (LVS) nearby this region. Direct numerical simulations (DNS) of planar jets at Reynolds numbers ranging from $Re_\lambda = 60 - 140$ using different initial conditions, and DNS of shear free irrotational/isotropic turbulence shows that the mean shear and the Reynolds number affect the T/NT interface thickness insofar as they define the radial dimension of the LVS near the T/NT interface, thus defining its thickness.

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