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The turbulence boundary of a temporal jet¹ MARKUS HOLZNER, Institute of Environmental Engineering, ETH Zurich, Zurich, Switzerland, MAARTEN VAN REEUWIJK, Department of Civil and Environmental Engineering, Imperial College London, London, UK — We study the turbulence boundary of temporal plane jet at Reynolds number $Re=5000$ obtained from a direct numerical simulation. The analysis is based on statistics conditioned on the enstrophy spanning 24 orders of magnitude and identifying essentially irrotational fluid outside the jet to fully turbulent fluid in the jet core. At the jet boundary we find a viscous superlayer (VSL) that envelopes the turbulence. We further identify a turbulent core region (TC) and a buffer region connecting the VSL and the TC. The BR shows many similarities with the turbulent-nonturbulent interface (TNTI), although the TNTI seems to extend into the TC. The BR thickness is about 10 Kolmogorov length scales or half a Taylor length scale, which implies that intense turbulence and viscosity-dominated regions are in close proximity to each other.

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