

Abstract Submitted
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Crossover between two- and three-dimensional turbulence in spatial mixing layers LUCA BIANCOFIORE, Bilkent University — We investigate how the domain depth affects the turbulent behaviour in spatially developing mixing layers by means of large-eddy simulations (LES) based on a spectral vanishing viscosity technique. Analyses of spectra of the vertical velocity, of Lumley's diagrams, of the turbulent kinetic energy and of the vortex stretching show that a two-dimensional behaviour of the turbulence is promoted in spatial mixing layers by constricting the fluid motion in one direction. This finding is in agreement with previous works on turbulent systems constrained by a geometric anisotropy, pioneered by Smith, Chasnov & Waleffe [*Phys. Rev. Lett.*, **77**, 2467-2470]. We observe that the growth of the momentum thickness along the streamwise direction is damped in a confined domain. A full two-dimensional turbulent behaviour is observed when the momentum thickness is of the same order of magnitude as the confining scale.

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