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LES-ODT Simulations of Turbulent Reacting Shear Layers ANDREAS HOFFIE, TAREK ECHEKKI, North Carolina State University — Large-eddy simulations (LES) combined with the one-dimensional turbulence (ODT) simulations of a spatially developing turbulent reacting shear layer with heat release and high Reynolds numbers were conducted and compared to results from direct numerical simulations (DNS) of the same configuration. The LES-ODT approach is based on LES solutions for momentum on a coarse grid and solutions for momentum and reactive scalars on a fine ODT grid, which is embedded in the LES computational domain. The shear layer is simulated with a single-step, second-order reaction with an Arrhenius reaction rate. The transport equations are solved using a low Mach number approximation. The LES-ODT simulations yield reasonably accurate predictions of turbulence and passive/reactive scalars' statistics compared to DNS results.

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