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Two-step simulation of velocity and passive scalar mixing at high Schmidt number in turbulent jets[1] K. JEFF RAH, GUILLAUME BLANQUART, California Institute of Technology — Simulation of passive scalar in the high Schmidt number turbulent mixing process requires higher computational cost than that of velocity fields, because the scalar is associated with smaller length scales than velocity. Thus, full simulation of both velocity and passive scalar with high Sc for a practical configuration is difficult to perform. In this work, a new approach to simulate velocity and passive scalar mixing at high Sc is suggested to reduce the computational cost. First, the velocity fields are resolved by Large Eddy Simulation (LES). Then, by extracting the velocity information from LES, the scalar inside a moving fluid blob is simulated by Direct Numerical Simulation (DNS). This two-step simulation method is applied to a turbulent jet and provides a new way to examine a scalar mixing process in a practical application with smaller computational cost.

[1]NSF, Samsung Scholarship

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