Effect of External Turbulence on the Evolution of a Towed Wake in a Stratified Environment ANIKESH PAL, SUTANU SARKAR, University of California, San Diego — Direct numerical simulation (DNS) is used to study the effect of external turbulence on the evolution of a towed turbulent wake in a stratified fluid. The simulations are carried out at a Reynolds number of 10,000, Froude number of 3 and Prandtl number of 1. The external turbulence is generated from a triply periodic rectangular domain in an auxiliary simulation performed to obtain turbulence with desired u'_{ext}/U_0, where u'_{ext} is the root mean square velocity of the external turbulence and U_0 is the maximum defect velocity of the pure towed wake. This field of external turbulence is added to the initial field of the towed turbulent wake. Simulations are performed for $u'_{ext}/U_0 = 0.10, 0.20$ and 0.30. The kinetic energy of the towed wake decays faster with progressively increasing values of u'_{ext}/U_0. This effect of external turbulence is found to be stronger in stratified flow relative to the neutral case. Although the horizontal spread of the stratified wake is enhanced owing to external turbulence there is little effect on the vertical spread.

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