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Study of convective overturns and mixing in a near-bottom, oscillating turbulent flow PRANAV PUTHAN[1], MASOUD JALALI[2], Univ of California - San Diego, VAMSI CHALAMALLA, Univ. of North Carolina Chapel Hill, SUTANU SARKAR, Univ of California - San Diego — Mixing, due to convective overturns, in a stratified fluid column is studied using a large-eddy simulation (LES) numerical technique. An oscillating pressure gradient on a slope sets up an oscillating flow that acts on the background stratification to generate a density overturn as the flow reverses from down to upslope through zero velocity. In the present problem, the pressure gradient for later time is set to zero at this zero-velocity point, and the pathway to turbulence from the density overturn is quantified. The results are compared to those of a case where the oscillating pressure gradient is maintained throughout the cycle. Implications are drawn to the applicability of Thorpe-scale estimation of the turbulent dissipation rate from density overturns in the case of wave breaking by convective instability.

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