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**Energetics of vertical fluid particle dispersion in stably stratified turbulence** JAMES ROTTMAN, SEUNGBUM JO, KEIKO NOMURA, University of California, San Diego — The vertical dispersion of fluid particles in stably stratified turbulence is investigated. We present an analysis framework which describes the associated flow energetics in the Lagrangian frame. The available potential energy (APE) density is a locally defined quantity associated with nonequlibrium displacement. The equilibrium potential energy (EPE) density is defined accordingly and represents the minimum energy required to change the particle equilibrium height. The corresponding evolution equations elucidate the key sequence of processes and clarify previous interpretations of the transport mechanisms. The analysis shows that in the case of stationary flow, the rate of mean square displacement is equal to the rate of mean square equilibrium displacement which is given by the scalar dissipation rate. A dispersion model is developed and compared with previous models.

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