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The energetics of stably stratified turbulence in the Boussinesq approximation SEUNGBUM JO, KEIKO NOMURA, JAMES ROTTMAN, University of California, San Diego — There has been a recent resurgence of interest in determining the consistency of the Boussinesq approximation to describe the coupling of the dynamics and thermodynamics of turbulent stratified flows. In particular, there is some debate over how energy is converted from internal to mechanical energy in this approximation. To gain some insight into these issues, we derive the evolution equations of the different forms of energy for Boussinesq stratified flows from the Lagrangian point of view. This analysis allows us better physical insight into these issues and allows us to show explicitly how energy is converted between internal and mechanical energy. The physical significance of these results will be discussed.

Seungbum Jo
University of California, San Diego

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