

Abstract Submitted
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Turbulent mixing in stratified wall-bounded turbulent flows¹ SUBHAS VENAYAGAMOORTHY, FARID KARIMPOUR, Colorado State University — The focus of this study is to investigate the effect of density stratification in wall-bounded turbulent flows. For a steady fully developed stably stratified channel flow, we invoke the equilibrium assumption between the turbulent kinetic energy production rate (P), dissipation rate (ϵ) of the turbulent kinetic energy (k) and the turbulent potential energy dissipation rate (ϵ_{PE}) to highlight a number of pertinent issues that have direct implications for predicting turbulent mixing. Simple formulations for the momentum and scalar diffusivities are proposed based on the irreversible flux Richardson number and the turbulent Prandtl number. Comparisons with data of direct numerical simulation of stably stratified channel flow show remarkable agreement. These findings could be useful for modeling stratified channel flows.

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