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Numerical simulation of convective sedimentation using a two-way coupled Eulerian-Lagrangian model YI-JU CHOU, YUN-CHUAN SHAO, National Taiwan University, YI-CHUN YEH, National Taiwan Normal University — Numerical simulations of convective sedimentation are conducted using an Eulerian-Lagrangian (EL) model. The present EL model is a two-way coupled system that further accounts for added mass and volumetric effects, which makes it more suitable for solid-liquid suspension problems. By comparing with different modeling strategies, the present modeling results reveal the significant deviation from the traditional single-phase modeling results when concentration becomes dense. Moreover, comparison with the point particle representation demonstrates the importance of the volumetric effect in dense suspension problems. Settling of particle clouds in homogeneous and stratified background flow fields is investigated. The results show different transport patterns associated with different conditions of density and particle-induced stratification. The influence of the background stratification on convection of particle clouds is further discussed.

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