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**Instability Phenomena in Stratified, Particle-laden Flow** PETER BURNS, UC Santa Barbara, LUTZ LESSHAFFT, Ecole Polytechnique, ECKART MEIBURG, UC Santa Barbara — When a layer of particle-laden water is placed above clear water of different temperature and salinity, various instabilities may arise. Depending on the specific density configuration, distinct convection patterns (“fingering” vs. “leaking”) have been reported from experiments (Parsons et al. 2001, Maxworthy 1999). We present linear stability results for such situations, with a focus on the role of particle settling. The effect of the settling velocity on the temporal instability growth rates is investigated in combination with various salinity distributions. The nonlinear evolution of the resulting instability structures is studied via DNS. Using linear analysis, DNS and experimental literature we hypothesize various mechanisms in an attempt to explain the occurrence of “leaking” and “fingering.” Current nonlinear results will be presented in an effort to fully explain the “leaking” mode.

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