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Double-Diffusive and Gravitational Instabilities in Particle-laden River Outflows PETER BURNS, ECKART MEIBURG, UC Santa Barbara — When a sediment-laden river flows into the salty ocean, various instabilities may arise. In an initially static environment, these instabilities can be due to either double-diffusive or gravitational effects. As a function of the governing Peclet numbers and the particle settling velocity, we investigate via linear stability analysis under which conditions each instability mode dominates, and when the modes coexist. We find that the settling velocity has a non-monotonic effect on the temporal instability growth rates. While small settling velocities can serve to increase the growth rate of the instability, larger settling velocities are found to reduce the growth rate.

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