

Abstract Submitted
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Regimes of sediment-turbulence interaction and guidelines for simulating the multiphase bottom boundary layer¹ JUSTIN FINN, MING LI, University of Liverpool — Characterizing the interaction of mobile sediments with a turbulent boundary layer driven by waves and/or currents represents an important scientific and engineering challenge. To approach this, Balachandars scaling relations for particle Reynolds number and Stokes number (IJMF, vol. 35, pg 801110, 2009) are recast in terms of Shields parameter, Θ , particle Galileo number, Ga , and particle-to-fluid density ratio, s . This allows the modified Shields diagram to be partitioned into at least five regimes, where distinct primary mechanisms of sediment-turbulence interaction can be identified. Additionally, practical guidelines for selecting an appropriate multiphase modeling strategy for direct and large eddy simulation (DNS/LES) of the bottom boundary layer are proposed based on the results.

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