Abstract Submitted
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Modeling Sediment Transport under Waves DONALD SLINN, University of Florida — Modeling studies of the flux of sediment at the sea bed under energetic waves are presented. The transport of sediment is crucial to predicting many coastal engineering processes, such as erosion around structures and prediction of beach profiles. We model a two-phase system containing water and sediment particles approximated as a mixture having variable density and viscosity that depends on the local sediment concentration. We use a control volume approach on a three-dimensional staggered grid to solve the equations numerically. The expression for the stress-induced diffusion coefficient developed by Nir & Acrivos for sediment flow is used and the Richardson & Zaki relationship is used to the calculate sediment settling velocity as a function of concentration. The turbulent dynamics of an initially stationary densely packed sand layer are examined and model results are compared with experimental data collected in two lab experiments. The model also does a reasonable job of predicting concentration profiles and suspension properties across the bottom boundary layer.

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