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Improved resuspension flux model based on local shear stress and particle Reynolds number[1] MRUGESH SHRINGARPURE, S. BALACHANDAR, University of Florida — The excess density imposed by suspended sediment drives turbidity currents. The dynamics of the flow is controlled by the rate at which these sediment particles are deposited and/or entrained from the bed. Resuspension flux or entrainment of sediment from the bed is an important aspect of all the mathematical models employed to study and simulate turbidity currents. However, a detailed mathematical description of all the physical process that lead to resuspension is not possible due its inherent complexity. In last several decades, through extensive research and detailed experiments and simulations, critical conditions for sediments to be mobilized have been reported. The abstraction of mobilized sediment to equivalent resuspension flux that is robust and truly based on local flow and bed conditions has not been formulated. Such a resuspension flux will be an improvement over the current models that are based on a correlation between average shear stress and the increase in the sediment load as a turbidity current propagates over a certain span of the bed. In this study we will present an improved model for resuspension flux which is a function of local bed shear stress and particle Reynolds number. This function incorporates the local kinematics of a particle lying on the bed along with turbulence characteristics of the flow such that a spatial average of shear stress and resuspension flux reconciles with the existing models proposed in the literature.

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Mrugesh Shringarpure
University of Florida

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