

Abstract Submitted
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Entrainment in sediment laden flows¹ JORGE SALINAS, MRUGESH SHRINGARPURE, University of Florida, MARIANO CANTERO, Instituto Bal-seiro, S. BALACHANDAR, University of Florida — The process of entrainment in classical problems of plumes, jets and wakes has been studied extensively. In this work we are interested in understanding the entrainment process in particle laden gravity currents. This process is influenced by the stable stratification produced by suspended particles. Moreover, particle settling can produce detrainment. We have analyzed two different kinds of flows. First, we have studied the problem of entrainment of a sediment layer sequestered at the bottom of a pressure-driven turbulent channel flow. These kinds of conditions are characteristic of river flows moving over erodible beds. This scenario leads to entrainment of sediment mass only, and we present the self-similar transient process of particle entrainment and the approach to a Roussian profile at long times. The effect of settling velocity on this process has been studied. In the second scenario, we study the entrainment process in the body of sub-marine turbidity currents. In this case the flow is driven by the density difference produced by sediment. Because the ambient is quiescent, we are able to study the process of entrainment of both mass (sediment) and momentum (turbulence). The effect of settling velocity of sediment particles and Richardson number on entrainment is studied.

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Jorge Salinas
University of Florida

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