Abstract Submitted
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Dynamics of turbidity currents: Ambient fluid entrainment and basal drag[1] JORGE SALINAS, University of Florida, MRUGESH SHRINGARPURE, ExxonMobil Upstream Research Company, MARIANO CANTERO, Instituto Balseiro, National Council of Scientific and Technical Research (CONICET), S. BALACHANDAR, University of Florida — Turbidity currents are sediment laden flows that run along inclined or horizontal surfaces. They are driven by the excess hydrostatic pressure resulted from the density difference between the current carrying sediment and the clear ambient fluid. The amount of particles carried is influenced by the strong coupling between turbulence and suspended sediment. In this work we perform direct numerical simulations (DNS) of spatially evolving, spanwise- homogeneous turbidity currents. We focus our attention on the process of entrainment of clear ambient fluid that happens at the interface between the current and the ambient layer. Moreover, the study of basal drag is performed. Turbidity currents have been studied in the past by means of layer-averaged equation models, which make use of several closure models. Two of these models are the entrainment assumption and the basal drag model. In this work we analyze the dependence of these models with the flow parameters (bulk Richardson and Reynolds numbers) together with the settling velocity of the sediment. We pay attention to the regime where the bulk properties of the flow vary slowly, called normal condition. Furthermore, we analyze the effect of acceleration/deceleration of the flow away from normal condition.

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Jorge Salinas
University of Florida

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