Abstract Submitted
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Properties of long-running submerged turbidity currents[1] SANTIAGO ZUNIGA, Instituto Balseiro, Universidad Nacional de Cuyo, Argentina and University of Florida, USA, JORGE SALINAS, University of Florida, NADIM ZGHEIB, Lebanese American University, MARIANO CANTERO, Instituto Balseiro, Universidad Nacional de Cuyo, Argentina, S. BALACHANDAR, University of Florida — Turbidity currents are sediment-laden flows that travel along sloping surfaces, typically the submarine bottom. They are driven by the density difference between the current and the deep layer of quiescent ambient fluid above them. The interaction of the current with the bottom may result in the generation of sedimentary features on the seafloor called bedforms, and the interaction with the ambient fluid causes sediment-free fluid entrainment into the current. In this work we focus our attention on the flow dynamics of the body of turbidity currents moving on non-erodible beds and the turbulent interaction between the near-wall layer and interfacial layers. For this we use a combination of highly resolved direct numerical simulations (approx. 113 million grid points) and large eddy simulations (approx. 20 million grid points) of spatially evolving turbidity currents in a long domain, of length equal to 150 times the inlet height. The flows are simulated using the spectral element method with the open-source computational fluid dynamics solver Nek5000. We assess the effect of bed slope, settling velocity of the sediment (i.e., sediment size) and bottom boundary conditions for both sub and super-critical regimes.

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