Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Large-eddy simulation of high Reynolds number gravity and turbidity currents SENTHIL RADHAKRISHNAN, MOHAMAD NASR-AZADANI, ECKART MEIBURG, UC Santa Barbara — Gravity and turbidity currents are compositional and particulate laden flows that originate due to the horizontal pressure gradient. High Reynolds number currents are expensive to compute using Direct Numerical Simulation (DNS). Large-eddy simulation (LES) that uses sub-grid parameterization and approximate wall boundary condition provide a cheaper alternative. We have implemented the dynamic Smagorinsky model for sub-grid parameterization and a wall-layer model based on the law of the wall. These parameterizations are employed to simulate gravity and turbidity currents in lock-exchange configuration at high Reynolds number representative of laboratory and field scale currents. We consider current propagation over a flat surface and also past a complex topography. Results from these simulations, in particular, the front evolution and deposit profiles for various values of settling velocity will be discussed.

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Date submitted: 01 Aug 2011 Electronic form version 1.4