

Abstract Submitted  
for the DFD10 Meeting of  
The American Physical Society

**Application of Immersed Boundary Method to DNS of Stratified Flows** NARSIMHA RAPAHA, SUTANU SARKAR, University of California San Diego — An immersed boundary method is implemented in a Navier-Stokes solver that uses a mixed RK3-ADI time integration scheme with the viscous terms treated implicitly. A predictor-corrector algorithm is used to solve the momentum equations on a collocated grid arrangement. Simulations are performed for flow past a sphere and the results, including separation angle, separation length, the vortex core position and the Strouhal frequency, agree closely with the literature. The present focus is on the numerical behavior of the solver in problems involving nonlinear internal tides on a model topography. Physical quantities of interest include the turbulent kinetic energy, turbulent dissipation rate, buoyancy flux as well as the energy flux and spectra associated with the propagating internal waves.

Narsimha Rapaka  
University of California San Diego

Date submitted: 06 Aug 2010

Electronic form version 1.4