Buoyancy effects in the spatially-evolving wake of a sphere at Re=3,700 MATTHEW DE STADLER, SUTANU SARKAR, University of California San Diego — Direct numerical simulation is used to simulate spatially-evolving flow past a sphere in a stratified fluid. A Cartesian grid is used along with an immersed boundary method to represent the sphere inside the domain. The Reynolds number of 3,700 is chosen so that the wake behind the sphere is turbulent. The emphasis of the present study is on the near to intermediate wake as buoyancy effects become dominant. A comparison is made between an unstratified wake and a wake at a Froude number of 3. Statistics of interest include the defect velocity, wake dimensions, turbulence intensities, mean kinetic energy, turbulent kinetic energy and associated budgets. Visualizations of the vortical structures in the wake and the internal wave field will also be provided and discussed.

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