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Numerical Investigation of the Scaling and Structure of Stratified Turbulent Wakes PETER J. DIAMESSIS, J. ANDRZEJ DOMARADZKI, GEOFFREY R. SPEDDING, University of Southern California — Large Eddy Simulation based on the subgrid scale (SGS) estimation model and truncated Navier-Stokes dynamics is used to study the stratified turbulent wake of a towed sphere. The efficient and spectrally accurate investigation of a broad range of Reynolds numbers, $Re \in [5 \times 10^3, 10^5]$, and Froude numbers, $Fr \in [4, 64]$ is made possible through use of a parallelized spectral multidomain penalty method model. The efficacy of the SGS model is assessed through comparison with available laboratory profiles and timeseries of turbulence quantities. Results on non-equilibrium regime duration and late- wake power law exponents are summarized for the full range of governing parameters. Finally, the effect of Reynolds number on the structure of the vorticity and internal wave fields is discussed.

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