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Direct Numerical Simulations of a Stratified Self-Propelled Wake
KYLE BRUCKER, SUTANU SARKAR, University of California San Diego — Direct Numerical Simulations (DNS) of a self-propelled wake subject to stratification are utilized to study the characteristics of the mean flow and turbulence fluctuations in the wake. Results include wake height, wake width, peak defect velocity, r.m.s. velocity fluctuations and turbulent fluxes, $\langle u_i u_j \rangle$ and $\langle u_i \rho \rangle$. Buoyancy is found to decrease the vertical growth of the wake, suppress vertical fluctuations, and lead to internal wave emission. The lack of existing numerical and experimental studies of a truly momentumless wake precludes comparing the present results with prior studies, as was done by us for the towed wake. Differences between the case of the towed wake and the self-propelled case will be highlighted and discussed.

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