

Abstract Submitted
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Experiments and simulations of low Re sphere wakes with and without stratification¹ XINJIANG XIANG, KEVIN CHEN, TRYSTAN MADISON, GEOFFREY SPEDDING, University of Southern California — Bluff body wakes in both stratified and unstratified background have been studied extensively due to their geophysical and naval applications. A global map showing the dependence of near-wake structures behind a towed sphere on initial Reynolds number and Froude number, has been provided by Lin et al. (*J. Fluid Mech.*, 240, 315-354, 1992) and Chomaz et al. (*J. Fluid Mech.*, 254, 1-21, 1993). Here full-field measurements of the sphere wakes in both homogeneous and linearly stratified ambient are provided by simulations and experiments, at Reynolds number $Re \leq 1000$ and Froude number $Fr \geq 0.5$. In a homogeneous fluid, the structural transitions with increasing Re are consistent with previous studies. The stratified results from simulations and experiments are in good agreement. Stratified wakes undergo similar transitions with decreasing Fr for Re in current range, except that similar transitions occur at larger Re as Fr decreases, thus making the wake structure at high Re, low Fr similar to that at low Re, high Fr .

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