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The Effect of the Prandtl Number on the Turbulent Wake in a Stratified Fluid MATTHEW DE STADLER, SUTANU SARKAR, University of California San Diego, KYLE BRUCKER¹, Science Applications International Corporation — Direct Numerical Simulations are employed to study the effect of the Prandtl number on the towed wake in a stratified fluid. Historically, the majority of stratified wake simulations are performed at a Prandtl number of 1 due to the high numerical cost of simulating larger Prandtl numbers. This makes the assumption that the Prandtl number makes only a small difference in the behavior of the wake. It is well known that the Prandtl number impacts the scale of fluctuations but it is not known how the coupling between kinetic and potential energy at different Prandtl numbers will impact the lifetime of the wake. These numerical simulations were designed to improve understanding of this aspect of the wake evolution. Data is presented for a number of mean and turbulent quantities such as the wake width, wake height, peak defect velocity, velocity fluctuations and turbulent fluxes. Simulations were conducted at a Reynolds number of 10,000 for a range of Prandtl numbers: 0.2, 1, 7, where 7 is a reasonable value for the ocean.

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