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Light particle dispersion in stably stratified turbulence H.J.H. CLERCX[1], M. VAN AARTRIJK, TU/e — The trajectories of small inertial particles with densities of $O(\rho_f)$ in turbulent flows can be computed using the Maxey-Riley equation. By means of direct numerical simulations we study the dispersion behavior of these light particles in statistically stationary stably stratified turbulence. The importance of the different forces that are acting on the particles is examined. It strongly depends on the density ratio. For $\rho_p/\rho_f = O(1)$ most forces are of the same order of magnitude. With increasing density ratio the relative importance of the different forces with respect to the Stokes drag decreases. For $\rho_p/\rho_f = O(10)$ mainly the Stokes drag, gravity, the pressure gradient and the Basset force remain relevant. Furthermore, the effect of the different forces on the dispersion and preferential concentration behavior of light particles will be discussed. The results are compared with those obtained for heavy particles. The results for light and heavy particles show a strong resemblance when the Stokes number is used as the parameter to express the particle properties. Moreover, the similarities and the differences between the behavior of light particles in isotropic and in stratified turbulence will be considered.

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