

Abstract Submitted
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Dispersion of inertial particles in stably stratified turbulence M. VAN AARTRIJK, H.J.H. CLERCX, TU/e: Dept. of Physics, Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven, The Netherlands — The dispersion of heavy particles in statistically stationary stably stratified turbulence is studied by means of direct numerical simulations. The distribution of the particles over the domain clearly shows the effect of preferential concentration. This particle distribution reflects the anisotropy of the flow. Large-scale horizontal structures can be seen, whereas in vertical direction thin, sheared layers are observed. It is found that with increasing stratification the effect of preferential concentration decreases. Also single-particle dispersion displays different behavior in horizontal and vertical directions. In horizontal direction its behavior for inertial particles is very similar to that for fluid particles. An increased long-time behavior ($O(t^2)$) is found compared to the classical diffusive regime ($\propto t$) in isotropic turbulence. In vertical direction, however, with increasing inertia the long-time dispersion is clearly enhanced compared to that of fluid particles. The typical plateau found for vertical fluid particle dispersion becomes less pronounced and the transition to a final linear diffusion limit sets in at earlier times.

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