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Settling of almost neutrally buoyant particles in homogeneous isotropic turbulence MICHEL VAN HINSBERG, HERMAN CLERCX, FEDERICO TOSCHI, Eindhoven University of Technology — Settling of particles in a turbulent flow occurs in various industrial and natural phenomena, examples are clouds and waste water treatment. It is well known that turbulence can enhance the settling velocity of particles. Many studies have been done, numerically and experimentally to investigate this behavior for the case of heavy particles, with particle to fluid density ratios above 100. Here we investigate the case of almost neutrally buoyant particles, i.e. density ratios between 1 and 100. In the case of light particles the Maxey-Riley equations cannot be simplified to only the Stokes drag and gravity force as pressure gradient, added mass and Basset history force are important as well. We investigate the influence of these forces on the settling velocity of particles and show that the extra forces can both increase or decrease the settling velocity, depending on the combination of the Stokes number and gravity applied.

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