

Abstract Submitted  
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**Behavior of small particles in isotropic turbulence in the presence of gravity** SEONGGEE CHO, CHANGHOON LEE, School of Mechanical Engineering, Yonsei University — The motion of small heavy particles in homogeneous isotropic turbulence in the presence of gravity is investigated using Direct Numerical Simulations (DNS) at moderate Reynolds number. The Lagrangian velocity and acceleration statistics of particles and of flow for a wide range of Stokes number, defined as the ratio of the particle response time to the Kolmogorov time scale of turbulence, were obtained for the direction of the gravity and normal direction, respectively. It is found that particles lose their correlation faster than the case without gravity. Then, a significant increase in the average settling velocity was observed for a certain range of Stokes number. Our focus is placed on gravitational effect on very small particles. Our simulations show that as the Stokes number reduces to zero, their mean settling velocity approaches the terminal velocity in still fluid, which is rather odd considering that the trajectory of a small particle approaches the trajectory of a fluid particle which does not settle. Detailed physical mechanism will be presented in the meeting.

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