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Behavior of settling ellipsoidal microparticles in homogeneous isotropic turbulence HOJUN LEE, CHANGHOON LEE, Yonsei University — Direct numerical simulations were conducted for the motion of heavy ellipsoidal particles in isotropic turbulence for an investigation of the effect of gravity on the behavior of ellipsoidal microparticles. For various Stokes numbers and gravity factors, we explore how particles rotation depends on fluid structures and gravitational force. The particle rotation comprises tumbling (rotating about the axis of rotation of a particle) and spinning (rotating perpendicular to tumbling). When the aspect ratio of the particle is low, the ratio of tumbling is large, and as the aspect ratio increases, the ratio of spinning increases. We found that gravity strongly affects the trajectory and the behavior of rotation of ellipsoidal particles. The preferential clustering pattern of the heavy ellipsoidal particles was different from that of spherical particles depending on the Stokes number and the aspect ratio of the particles.

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