

Abstract Submitted
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Dispersion of heavy particles in isotropic turbulence JAEDAL JEONG, KYONGMIN YEO, CHANGHOON LEE, Yonsei University, Korea — Particle-laden turbulence is frequently observed in nature such as in the atmosphere or the ocean as well as in many engineering flows. Recently, airborne micro or nano-scale particles in the atmosphere draw much attention from environmental societies since such small particles cause a lot of environmental problems in the industrialized areas. In order to predict dispersion of small particles, we have to understand the mechanism by which laden particles disperse in turbulent environment. In this study, we carried out direct numerical simulation of isotropic turbulence with particles under the Stokes drag assumption for a spherical particle. We consider only one-way interaction so that modification of turbulence by the particles is not taken into account. Particularly, we investigate the evolution of flow variables along the trajectory of a heavy particle with and without the influence of gravity. Comparative study of statistics between Lagrangian fluid dispersion and heavy particle dispersion is made. These results can be used in the development of a stochastic model for particle dispersion. Detailed results including correlation or time scales associated with dispersion will be presented in the meeting.

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