

LadHyX Seminar – May 27th, 10:45

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When particles do not fall: Decoupling gravity from inertial particles and turbulence.

Isolating the role of gravity in particle-laden turbulent flows remains challenging because gravitational settling and particle inertia are intrinsically linked through slip. To disentangle these effects, controlled experiments in microgravity are performed, where sustained settling is suppressed. A water-based facility generating homogeneous and isotropic turbulence is operated in the Dryden Drop Tower at Portland State University, providing 2.1 s of microgravity during which 4D Lagrangian particle tracking simultaneously measured fluid tracers and finite-size inertial particles. Slip velocity, particle Reynolds number, and acceleration statistics of these inertial particles are compared between terrestrial and microgravity conditions.