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Modeling Gravitational Settling of Inertial Particles in Turbulent Like Flow SATHYANARAYANA AYYALASOMAYAJULA, SOHAM BANERJEE, Indian Institute of Technology Bhubaneswar, ZELLMAN WARHAFT, Cornell University — Gravitational settling of inertial particles in a turbulent fluid is an important aspect of many natural and engineering flows. The recent experiments of Good et al 2012, *J. Fluid Mech*, 694, and earlier experiments reveal the presence of two effects, loitering and fast-tracking that modulate the gravitational settling rates of the inertial particles in a turbulent flow. The equivalent DNS simulations of Ireland & Collins 2012, *J. Fluid Mech*, 704, in many respects show good agreement with the experiments but the magnitude of loitering and fast-tracking is much smaller. The Vortex model of Ayyalasomayajula et al 2008, *Phys. Fluids*, 095104, was earlier used to study the inertial particle acceleration statistics in turbulent like model flow to explain the reduced inertial particle accelerations. The Vortex model is again used here in this current study to better understand the nature of fast-tracking and loitering effects for a turbulent like fluid flow. We present results where the parametric variation of fluid flow intensity (analogous to changing Re), Stokes numbers and gravity is performed and the relative changes of loitering and fast-tracking effects are studied. We offer possible explanations for the discrepancy between the experiments and DNS also.

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