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Settling of inertial non-spherical particles in wavy flow[1] LAURA CLARK, Stanford University, MICHELLE DIBENEDETTO, Woods Hole Oceanographic Institution, NICHOLAS OUELLETTE, JEFFREY KOSEFF, Stanford University — We experimentally investigated the settling of plastic rods, disks, and spheres in wavy flows. We find that the vertical velocities of the particles are dependent on particle inertia and particle shape. We characterize particle inertia with a particle Reynolds number Re_p defined using the particle length and the vertical velocity of the local flow. Two factors that potentially contribute to the behavior of particle velocities are the relative velocities between particles and the flow and the manner in which particles sample the flow. We find that the average relative velocities between the particles and the flow remain constant with Re_p, even though the relative velocities of the rods vary more with orientation as Re_p increases. The variation of the particle velocities with Re_p can be explained instead by how the particles sample the flow, as each of the particle shapes nonuniformly sample the flow as a function of Re_p. Accounting for the variation of particle settling velocities with shape and inertia is necessary to improve the accuracy of model predictions of the transport of microplastics in the ocean.

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