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Rotation of non-spherical particles in turbulence of neutral buoyancy and large size[1] EVAN VARIANO, NIMISH PUJARA, ANKUR BORDOLOI, UC Berkeley — We explore the ways in which particle size and shape affects particle rotation. We consider rotation in the laboratory frame and in the particles local frame of reference. We use homogeneous isotropic turbulence whose Taylor microscale is similar to the particle size. Our data, as well as a new analysis of Stokes numbers, suggests that particle inertia prevents alignment with turbulent structures. The total angular velocity is nearly shape-independent, an observation which has been presented before. We offer an explanation for this behavior, based on an analysis of Jefferys equations for inertia-free point ellipsoids.

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