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Transport of inertial anisotropic particles under surface gravity waves MICHELLE DIBENEDETTO, JEFFREY KOSEFF, NICHOLAS OUELLETTE, Stanford University — The motion of neutrally and almost-neutrally buoyant particles under surface gravity waves is relevant to the transport of microplastic debris and other small particulates in the ocean. Consequently, a number of studies have looked at the transport of spherical particles or mobile plankton in these conditions. However, the effects of particle-shape anisotropy on the trajectories and behavior of irregularly shaped particles in this type of oscillatory flow are still relatively unknown. To better understand these issues, we created an idealized numerical model which simulates the three-dimensional behavior of anisotropic spheroids in flow described by Airy wave theory. The particles response is calculated using a simplified Maxey-Riley equation coupled with Jefferys equation for particle rotation. We show that the particle dynamics are strongly dependent on their initial conditions and shape, with some some additional dependence on Stokes number.

Michelle DiBenedetto
Stanford University

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