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Reorientation of elongated particles at density interfaces AMIN DOOSTMOHAMMADI, AREZOO ARDEKANI, University of Notre Dame — The settling rates of particles and organisms in oceanic environments can be considerably affected by approaching density interfaces. The presence of density gradients have been correlated to important environmental phenomena such as accumulation of marine snow particles and intense biological activities. Although many of these settling particles and organisms are of elongated shapes, the current knowledge of settling through density interfaces centers around spherical particles. Here, we uncover the role of the density gradient in changing the orientation of elongated particles. By using direct numerical simulations, we demonstrate that unlike the homogeneous fluid, the presence of density gradients tend to turn the elongated particle so that its broadside is parallel to the direction of the gravity. We provide a phenomenological description of the underlying physics by characterizing deflection of isopycnals and generation of buoyancy induced vortices.

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