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Anisotropic Particles in Fluid Flow[1] MONICA KISHORE, Haverford College, NICHOLAS T. OUELLETTE, Yale University, JERRY GOLLUB, Haverford College — Anisotropic particles are common in natural flows. In previous work [1] the dynamics of neutrally buoyant finite-sized spherical particles with Stokes numbers up to 0.08 were examined in 2D flows with Reynolds numbers of 72-220. Here, we extend this work to neutrally buoyant, high-aspect-ratio anisotropic particles of mm to cm length in a 2D cellular flow. The particle trajectories and orientations are tracked simultaneously with the underlying velocity field, which is measured using much smaller tracer particles. These methods allow us to compare the relative velocity and orientation of anisotropic particles to various features of the flow field. We find, for example, that the long axes of the particles preferentially align with the instantaneous direction of maximum compression, and that this alignment increases with particle aspect ratio. [1] N.T. Ouellette, P.J.J. O'Malley, and J.P. Gollub, Phys. Rev. Lett. 174504 (2008).

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