

Abstract Submitted  
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**Periodic dynamics of pairs of sedimenting discs** RAHUL CHAJWA, NARAYANAN MENON<sup>1</sup>, SRIRAM RAMASWAMY<sup>2</sup>, TIFR Centre for Interdisciplinary Sciences, 21 Brundavan Colony, Osman Sagar Road, Narsingi, Hyderabad 500 075, India — We study the sedimentation in the Stokes regime of pairs of discs released with a variety of orientations relative to each other and to gravity. The orientation of a settling disk is coupled with the translational degree of freedom. Hydrodynamic interactions between settling disks produces richer dynamics than is possible with sedimenting spheres [S. Jung et al., PRE 74, 035302 (2006), S. Kim, Int J Multiphase Flow 11, 699 (1985), Goldfriend et al. <http://arxiv.org/abs/1502.00221>]. We demonstrate the classes of dynamics that follow from a variety of initial conditions, but focus on the periodic oscillations in position and orientation that result when two discs are released parallel to each other with their normals coaxial and in the horizontal plane. We report experiments that study the frequency, wavelength, and amplitude of the periodic flutter as a function of initial separation between the discs. We analyze the motions within a model that combines the hydrodynamics of single discs with a simplified model of their interaction that includes low order terms of appropriate symmetry. This allows us to examine the initial conditions that demarcate periodic from non-periodic dynamics.

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