

Abstract Submitted  
for the DFD15 Meeting of  
The American Physical Society

**Flipping and scooping of curved 2D rigid fibers in simple shear: the Jeffery equations** DARREN CROWDY, Imperial College London — The dynamical system (or “Jeffery equations”) governing the orbits of a curved rigid two-dimensional fiber in simple shear is derived in analytical form. The study is motivated by the need to understand the dynamics of isolated non-axisymmetric rod-like particles in simple flows for use in suspension modeling. Solutions of the dynamical system are shown to display the “flipping” and “scooping” recently observed in computational studies of three-dimensional fibers using linked rigid rod and bead-shell models [Wang *et al.*, *Phys. Fluids*, **24**, (2012)]. Indeed the equations we derive are expected to be the same ones governing curved 3D slender fibers executing motions in the plane of shear.

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Date submitted: 24 Jul 2015

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