Abstract Submitted
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Oscillatory shear of non-colloidal fiber suspensions ALEXANDRE FRANCESCHINI, EMMANOUELA FILIPPIDI, NYU, Dept Phys, Ctr Soft Matter Res, New York, NY 10003 USA, ELIZABETH GUAZZELLI, Aix Marseille Univ U1, IUSTI, CNRS, UMR Polytech Marseille 6595, F-13453 Marseille 13, France, DAVID PINE, NYU, Dept Phys, Ctr Soft Matter Res, New York, NY 10003 USA — Concentrated suspensions of non-colloidal fibers under slow periodic strain undergo a phase transition from an absorbing state to an active fluctating state. Fiber trajectories are reversible in the absorbing state and irreversible in the fluctuating state. The activity, measured by the translational diffusivity between successive periods, vanishes in the absorbing state but reaches a finite value in the fluctuating state. We show that the transition is controlled by a collision cross-section, which is a function of the strain amplitude, concentration and fiber orientation. Over the course of an experiment, the activity drives the orientation toward the vorticity, subsequently reducing the cross section. We evaluate the influence of the control parameter decay on the phase transition and then focus on the fluctuating state dynamics.

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