

Abstract Submitted  
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**Coupling Between Translational and Orientational Order in Fiber Suspensions**<sup>1</sup> ALEXANDRE FRANCESCHINI, EMMANOUELA FILIPPIDI, Center for Soft Matter Research, New York University, ELISABETH GUAZZELLI, IUSTI-CNRS UMR 6595 - Polytech Marseille - Aix-Marseille University, DAVID PINE, Center for Soft Matter Research, New York University — Suspensions of non-Brownian fibers under a small oscillatory shear flow find a random but completely reversible state, called “random organization”: at each period, the non-hydrodynamic interactions modify both the orientation and positions of fibers, until a reversible configuration is found. As observed in sphere suspensions, there is a nonequilibrium absorbing phase transition when the strain is increased above a concentration-dependant threshold. The transient time, during which the activity decays algebraically, has a diverging duration; critical exponents are consistent with Manna universality class. Above the threshold, fibers get progressively aligned towards the vorticity and a reversible steady state is eventually found for a range of strain. This behavior is specific to fiber suspensions. We study whether or not these oriented reversible states are critical states. We experimentally evaluate the angles distribution of fibers in both vertical and horizontal planes and discuss the relation between these distributions and the existence of a reversible state.

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