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Non-equilibrium phase transition in reconstituted acto-myosin cortices NIKTA FAKHRI, Massachusetts Institute of Technology-MIT, ENAS ABU SHAH, University of Oxford, MAYA MALIK-GARBI, Technion-Israel Institute of Technology, FRED C. MACKINTOSH, Vrije Universiteit Amsterdam, KINNERET KEREN, Technion-Israel Institute of Technology, CHRISTOPH F. SCHMIDT, Georg August University Goettingen — The cortical actin cytoskeleton is a quasi 2-D active material in which dynamics are dominated by rapid actin turnover and myosin-driven contractility. Here we present a reconstituted model system that emulates these processes in artificial cell-like compartments. By tuning physical and chemical parameters, we induce a non-equilibrium phase transition. We characterize the local dynamics of these reconstituted cortices by tracking embedded single-walled carbon nanotubes (SWNTs). We create high-resolution maps of the contractile actomyosin flows in a homogenous and during transition to an inhomogeneous steady state. We find evidence that connectivity percolation drives the non-equilibrium phase transition.

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