Application of the generalized fluctuation-dissipation theorem on a sheared suspension[1] EMMANOUELA FILIPPIDI, ALEXANDRE FRANCES-CHINI, DAVID PINE, Center for Soft Matter Research, New York University —
We explore the validity of the generalized fluctuation-dissipation theorem for steady-state systems (proposed by Prost, Joanny and Parrondo, PRL 103, 090601 2009) in an experimental system: a suspension of non-colloidal spheres under slow periodic strain. The system is out-of-equilibrium and typically undergoes a phase transition from an active fluctuating to an absorbing state as the strain amplitude is decreased. It is a good candidate for applying the proposed theory since it has Markovian dynamics and fluctuating steady states. The control parameters are the applied strain amplitude and its volume fraction and fluctuations of proper observables such as the individual particle locations can be readily measured. Perturbations of the control parameter of strain can lead in new steady states after a transient response, which in turn can be correlated with the fluctuating observable, thus providing a way of verifying the validity of the proposed version of the generalized fluctuation-dissipation theorem.

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