Usefulness and limits of equilibrium mappings for confined active particles

YAOUEN FILY, APARNA BASKARAN, MICHAEL HAGAN, Brandeis Univ — Predicting the response of active particles to external potentials is notoriously difficult. Gaussian colored models have recently allowed some progress, including a systematic way to map an active system onto an equilibrium one. When the external potential represents hard walls, another approach exists, which tracks the dynamics along the walls. I will compare the analytical predictions of these two approaches with each other and with numerical simulations of various active particles (Gaussian colored noise, active Brownian, run-and-tumble) and discuss what they tell us about the scope of equilibrium mappings for active particles in external potentials.

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