

# **Replica symmetry breaking in trajectories of a driven Brownian particle**

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We study a Brownian particle passively driven by a field obeying the noisy Burgers equation. We demonstrate that the system exhibits replica symmetry breaking in the path ensemble with the initial position of the particle being fixed. The key step of the proof is that the path ensemble with a modified boundary condition can be exactly mapped to the canonical ensemble of directed polymers.

This work was done in collaboration with M. Ueda. See Phys. Rev. Lett. 115, 080605 (2015) for the detail.