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Dissipative Transport of a Bose-Einstein Condensate in an Optical Speckle Disorder Potential SATYAN BHONGALE, Rice University, PAATA KAKASHVILI, NORDITA, Sweden, HAN PU, Rice University, CARLOS BOLECH, University of Cincinnati — We provide a theoretical model for understanding the hydrodynamic transport of Bose-Einstein condensates through optical-speckle disorder potentials. Analytic expressions are derived to describe the dissipative mechanism, in the limit that the depletion of the condensate induced by the speckle potential may be neglected. Comparison of our theoretical predictions, with the experimental data for large-amplitude dipole oscillations of the condensate, show striking qualitative agreement, allowing for precise quantification of the various time scales. Thus, the adeptness of our model, to correctly capture the essential physics of dissipation in such transport experiments, is established.

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