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Dynamics of Topological Defects in Supersolids CHI-DEUK YOO, ALAN T. DORSEY, Department of Physics, University of Florida — There has been a growing consensus that topological defects present in supersolids, such as vortices and dislocations, may play an important role in explaining the experimental results of solid helium-4 at low temperatures. In this work we study the dynamics of topological defects in isotropic supersolid films. First, we derive the effective action for vortices and dislocations by integrating out the environmental degrees of freedom from both the superfluid and the lattice. This provides us with effective frequency-dependent inertial masses of vortex and dislocation. Second, we investigate the classical and quantum dissipative creep of a vortex and a dislocation in the presence of a model pinning potential by using the derived action. This work is supported by the NSF.

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