Onset of Motion and Dynamic Reordering of a Vortex Lattice

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Abstract

Time resolved transport measurements on a driven vortex lattice in an undoped $2H$-$NbSe_2$ crystal show that the response to a current pulse is governed by healing of defects as the lattice evolves from stationary to moving steady state, and that the response time reflects the degree of order in the initial vortex state. We find that stationary field cooled vortex lattices become more ordered with decreasing temperature and identify a temperature below which a qualitative change in the response from step-wise and slow to smooth and fast signals the disappearance of topological defects.

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