Equilibration and Dynamic Phase Transitions of a Driven Vortex Lattice

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We report on the observation of two types of current driven transitions in metastable vortex lattices. The metastable states, which are missed in usual slow transport measurements, are detected with a fast transport technique in both field-cooled and zero field-cooled vortex lattices n pure 2H-NbSe 2 The transitions are seen by follow ng the evolution of these states when driven by a current. At low velocities we observe an equilibration transit on from a metastable to a stable state, followed by a dynamic crystallization transition at high velocities.