Driven magnetic vortices in a type-II superconductor: Relaxation following sudden parameter quenches

HARSHWARDHAN CHATURVEDI, Department of Physics, VA Tech, ULRICH DOBRAMYSŁ, Mathematical Institute, University of Oxford, MICHEL PLEIMLING, UWE TÄUBER, Department of Physics, VA Tech — Type-II superconductors in the mixed phase display complex non-equilibrium phenomena governed by competing energy, length, and time scales. We model the magnetic vortices in the extreme London limit as interacting elastic lines. We employ a Langevin Molecular Dynamics algorithm to study the non-equilibrium relaxation behavior of relevant two-time correlation functions in the presence of point or columnar pinning centers. We consider the effects of sudden external control parameter quenches at non-zero external driving currents, as the vortex system relaxes towards a new non-equilibrium steady state.

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