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Non-equilibrium relaxation properties of vortex lines in disordered type-II superconductors[1] HIBA ASSI, ULRICH DOBRAMYSL, MICHEL PLEIMLING, UWE C. TÄUBER, Department of Physics, Virginia Tech — Technological applications of type-II superconductors require a deep understanding of the properties of vortex matter in these disordered systems. This involves a careful investigation of the relaxation properties of interacting vortex systems, subject to randomly placed point or correlated columnar pinning sites, from an initial out-of-equilibrium state. We model the vortices in the London limit as interacting elastic lines, and employ a Langevin molecular dynamics algorithm to simulate their dynamics. We aim to disentangle the effects of flux line interactions and pinning centers, and to compare the system's relaxation features in the presence of point or columnar disorder. Furthermore, we consider experimentally more realistic initial conditions by applying magnetic field quenches, i.e., suddenly adding or removing vortex lines. We study various two-time correlation functions to study magnetic field quenches, and carefully analyze finite-size effects on the system relaxation.

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