Abstract Submitted
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**Effect of field quenches on the relaxation dynamics of vortex lines in disordered type-II superconductors**[1] HIBA ASSI, Department of Physics, Virginia Tech, ULRICH DOBRAMYSL, Mathematical Institute, University of Oxford, MICHEL PLEIMLING, UWE TÄUBER, Department of Physics, Virginia Tech — Understanding the dynamics of vortex matter in disordered type-II superconductors is vital for material optimization in technological applications. We model the vortices in the London limit as interacting elastic Lines subject to point-like or extended pinning centers, and employ a Langevin molecular dynamics algorithm to simulate their dynamics. We consider experimentally-motivated initial conditions and analyze the effects of sudden magnetic field changes on the non-equilibrium relaxation dynamics of this system. A magnetic field quench is accomplished by instantaneous addition or removal of vortices from the sample. We disentangle the effects of the competing repulsive vortex interactions and pinning to sample defects, and compare the system's relaxation properties in the presence of either randomly-placed point disorder or correlated columnar defects by investigating the two-time mean square displacement and height-height autocorrelation function, the mean radius of gyration, and the fraction of pinned line elements.

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