Pinning time statistics for vortex lines in disordered environments[1] UWE C. TAUBER, Department of Physics, Virginia Tech, ULRICH DOBRAMYSL, University of Oxford, MICHEL PLEIMLING, Department of Physics, Virginia Tech — We study the pinning dynamics of magnetic flux (vortex) lines in a disordered type-II superconductor. Using numerical simulations of a directed elastic line model, we extract the pinning time distributions of vortex line segments. We compare different model implementations for the disorder in the surrounding medium: discrete, localized pinning potential wells that are either attractive and repulsive or purely attractive, and whose strengths are drawn from a Gaussian distribution; as well as continuous Gaussian random potential landscapes. We find that both schemes yield power law distributions in the pinned phase as predicted by extreme-event statistics, yet they differ significantly in their effective scaling exponents and their short-time behavior.

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