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【190】 Beating speed limits for Abrikosov vortices in superconducting thin films via edge-barrier engineering

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The maximal vortex velocities v^* are limited by the flux-flow instability (FFI) and contain information on the scattering mechanisms of charge carriers in the samples. However, the nucleation of FFI does not necessarily occur in the entire sample but can have a local character. Here, we demonstrate that the v^* in superconducting MoSi films with smooth edges can exceed v^* in films with rough edges by an order of magnitude. Our findings indicate that the energy relaxation times deduced from v^* values should be treated with consideration of the microscopic properties and fabrication-induced features of the samples.

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