Abstract Submitted
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Free flux flow: irradiation-induced effects and restricted geometries[1] O. GAFAROV, J.A. ALEXANDER, A.A. GAPUD, University of South Alabama, D.K. CHRISTEN, Oak Ridge National Laboratory (retired), J.Z. WU, University of Kansas — The field-dependent core size of magnetic flux quanta – fluxons – in the mixed state of Type II superconductors has a distinctive effect on free flux flow (FFF), the dissipative motion of fluxons in the absence of pinning. These core size effects have been previously observed by confirming a modification to the traditional Bardeen-Stephen flux-flow (BSFF) model by Kogan and Zelezhina (KZ) using high-density transport currents in weak-pinning, isotropic, low-T_c compounds. Further exploration to provide insight into these phenomena are proposed: (1) Irradiation-induced effects on carrier scattering: FFF is affected by the electronic structure of the normal flux-core states; there is interest in how the flux dynamics could be altered by the modification of core states using low-level irradiation as a tool for incremental control of carrier scattering. (2) Restricted-geometry flux flow: Simulations of granular flow via FFF had been proposed previously; specifically, there is interest in observing the dynamics of flux flow through a narrow channel that has a two-dimensional "hopper" geometry, for comparison with known results from granular-flow studies.

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