

Abstract Submitted
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Nearly Isotropic Critical Currents in SmFeAs(O,F) in High Magnetic Fields BERTRAM BATLOGG, Solid State Physics, ETH Zurich, PHILIP MOLL, Solid State Physics, ETH Zurich, Switzerland, ROMAN PUZNIAK, Institute of Physics, Polish Academy of Sciences Warsaw, Poland, FEDOR BALAKIREV, NHMFL, LANL, Los Alamos, NM, LUIS BALICAS, NHMFL, Tallahassee, FL, JANUSZ KARPINSKI, NIKOLAI ZHIGADLO, Solid State Physics, ETH Zurich, Switzerland — The layered structure of SmFeAs(O,F) naturally raises questions about the electronic anisotropy of this 55K superconductor. To investigate the transport anisotropy, we performed electric 4-probe measurements on Focused Ion Beam (FIB) cut single crystals with sub- μm^2 cross-section, with current along and perpendicular to the FeAs layers. The normal state resistivity is indeed anisotropic ($\rho_c/\rho_{ab} \approx 2$ at RT, ≈ 10 at 50K) and consistent with the calculated Fermi velocity anisotropy. In contrast, the dissipation in high fields below T_c is more isotropic. The critical current densities at 4K are nearly isotropic and very high ($> 2 \cdot 10^6$ A/cm²), and up to 14 T, they are almost independent of the field orientation and strength. These values agree well with magnetization measurements. Additional measurements to much higher fields are presented.

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