Abstract Submitted
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Magneto-transport and magnetization studies on thermally activated flux flow in iron-based superconductors[1] MARTIN NIKOLO, Saint Louis University, XIAOYAN SHI, Dept. of Phys. & Natl. High Magnetic Field Lab, Florida State Univ., EUN SANG CHOI, Appl. Supercond. Ctr.& Natl. High Magnetic Field Lab, Florida State Univ., JIANYI JIANG, JEREMY WEISS, ERIC HELLSTROM, Appl. Supercond. Ctr. & Natl. High Magnetic Field Lab, Florida State Univ. — We study the magneto-transport properties of three iron-based high temperature superconductors, polycrystalline samples, $Ba(Fe_{0.95}\ Ni_{0.05})_2As_2$ (T_c = 20.4 K), $Ba(Fe_{0.94}\ Ni_{0.06})_2As_2$ (T_c = 18.5 K), and $Ba(Fe_{0.91}Co_{0.09})_2As_2$ (T_c = 25.3 K) in magnetic fields of up to 18 T. The thermally activated magnetic flux behavior was retrieved by plotting lnρ vs. $1/T$ (ρ and T are resistivity and temperature, respectively) and obtaining the activation energies U_0 for flux motion near T_c. We show a 3-D plot of the distribution of U_0 as a function of T and magnetic field H. We apply the WHH model by measuring dH_{c2}/dT at T_c to estimate the upper critical field $H_{c2}(T = 0)$; we estimate the coherence length $\xi(T = 0)$. We study the broadening of resistive transition as a function of the applied magnetic field and compare it to Tinkham's prediction for high-T_c materials.

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