Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Doping evolution of magnetization hysteresis in (Ba1-xKx)Fe2As2 single crystals: Crossover from the second magnetization peak to peak effect[1] YONG LIU[2], THOMAS LOGRASSO, Ames Lab — Magnetic hysteresis loops (MHLs) have been systematically measured in a series of (Ba1-xKx)Fe2As2 single crystals from underdoped x=0.177 to end member x=1 with applied magnetic fields parallel to c axis (H//c). The second magnetization peak (SMP) or fishtail effect was observed within the doping range $0.177 \leq x \leq 0.650$. Remarkably, with further increasing doping the SMP becomes narrow and emerges very close to the irreversible field (Hirr) for the samples $0.692 \leq x \leq 0.910$. The similar peak effect (PE) had been widely observed in various conventional or low Tc superconductors. Meanwhile, the magnetization curves change from symmetrical to asymmetric hysteresis loops, which suggests a dominant surface pinning instead of bulk pinning in the samples. Our findings demonstrate that (Ba1-xKx)Fe2As2 system is a very unique system that that links the SMP and PE by its doping dependence. Our results will lead to a better understanding of the underlying mechanisms for the origin of the SMP and PE.

[1]This work was supported by the U.S. Department of Energy (DOE), Office of Science, Basic Energy Sciences, Materials Science and Engineering Division.
[2]crystal growth, superconductivity, magnetism

Yong Liu
Ames Lab

Date submitted: 04 Nov 2015 Electronic form version 1.4