Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

**Anisotropy and Vortex Pinning of Heavy Ion irradiated $SmFeAsO_{0.8}F_{0.15}$ and $BaFe_2(As_{1-x}P_x)_2$ Crystals**[1] WAI-KWONG KWOK, LEI FANG, CARLOS CHAPARRO, YING JIA, ULRICH WELP, ALEXEI KOSHELEV, SHAOFEI XU, Argonne National Laboratory, GEORGE CRABTREE, Argonne National Laboratory and University of Illinois at Chicago, JANUSZ KARPINSKI, ETH, Zurich — We report specific heat and magnetization measurements on $SmFeAsO_{0.8}F_{0.15}$ and $BaFe_2(As_{1-x}P_x)_2$ single crystals irradiated with high energy heavy ions of 1.4GeV Pb to dose matching fields up to 4 Tesla. We find a nearly one half reduction in the superconducting anisotropy and doubling of the irreversibility field in $SmFeAsO_{0.8}F_{0.15}$after irradiation and virtually no change in the zero-field superconducting transition temperature. In both $SmFeAsO_{0.8}F_{0.15}$ and $BaFe_2(As_{1-x}P_x)_2$ crystals, we find a substantial increase in the critical current determined from SQUID and micro-Hall probe magnetization measurements. Pinning force analysis on proton and heavy ion irradiated pristine overdoped $BaFe_2(As_{1-x}P_x)_2$ crystals indicates presence of induced $\Delta T_c$-type pinning defects in these samples.

[1]Work supported by the US DoE-BES funded Energy Frontier Research Center (LF, CC, YJ, GWC), and by Department of Energy, Office of Science, Office of Basic Energy Sciences (WKK, UW, AEK, SFZ), under Contract No. DE-AC02-06CH11357

Wai-Kwong Kwok
Argonne National Laboratory

Date submitted: 28 Nov 2011 Electronic form version 1.4