Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Caloric determination of the anisotropic phase diagram of $BaFe_2(As_{1-x}P_x)_2$ crystals[1] WAI-KWONG KWOK, ULRICH WELP, CARLOS CHAPARRO, LEI FANG, ALEXEI KOSHELEV, Argonne National Laboratory — We report specific heat measurements on a series of $BaFe_2(As_{1-x}P_x)_2$ single crystals with phosphorous contents ranging from optimal doping (x$\sim$0.3, T_c = 29.5 K) to highly overdoped (x$\sim$0.6, T_c = 11K). We find a sharp superconducting transition at T_c for all doping levels, a suppression of the ΔC-step at $T_c$with increasing doping and enhanced magnetic field dependence at higher doping. The phase diagrams determined from specific heat data show a decrease of dH_{c2}/dT with increasing doping and a nearly constant superconducting anisotropy of $\Gamma \sim$2.5. Our results will be compared with the proposed "universal" scaling of $\Delta C_p/T_c$ and dH_{c2}/dT due to quantum criticality and non Fermi liquid behavior [1] and due to strong pair-breaking and non-magnetic interband scattering [2], respectively.

[1] J. Zaanen, Phys. Rev. B 80, 212502 (2009)
[2] V. G. Kogan, Phys. Rev. B 80, 214532 (2009)

[1]This work was supported by DOE-BES under Contract No. DE-AC02-06CH11357.

Wai-Kwong Kwok
Argonne National Laboratory

Date submitted: 24 Nov 2010 Electronic form version 1.4