Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Multiband, Strong coupling and Strong Correlations in $Ba_{1-x}K_xFe_2As_2$ single crystals. Mind the (nodal) gap! FRÉDÉRIC HARDY, Karlsruher Institut für Technologie, IFP, 76021 Karlsruhe, Germany, DAI AOKI, CEA Grenoble, SPSMS-INAC, 38054 Grenoble, France, THOMAS WOLF, Karlsruher Institut für Technologie, IFP, 76021 Karlsruhe, Germany, CARLEY PAULSEN, Institut Néel, CNRS-MCBT and Université Joseph Fourier, 38042 Grenoble, France, ROBERT EDER, ANNA BÖHMER, ROLF HEID, Karlsruher Institut für Technologie, IFP, 76021 Karlsruhe, Germany, MARTIN JACKSON, Institut Néel, CNRS-MCBT and Université Joseph Fourier, 38042 Grenoble, France, ROBERT A. FISHER, Lawrence Berkeley National Laboratory, Berkeley CA 94720, USA, CHRISTOPH MEINGAST, Karlsruher Institut für Technologie, IFP, 76021 Karlsruhe, Germany — We report an exhaustive thermodynamic study (heat capacity, magnetization, thermal expansion) of the normal- and superconducting-state properties of the entire $Ba_{1-x}K_xFe_2As_2$ series. We show that strong correlations develop with increasing hole concentration indicating the possible proximity to an orbital-selective Mott transition predicted by theory. In the superconducting state, these single crystals exhibit strong multiband and paramagnetic effects and we give evidence of a strong-to-weak-coupling crossover that occur near the concentration where the electron sheets disappear. Our data show no evidence for a symmetry change, from *s* to *d*-wave, of the superconducting state. Dissimilarities with the $Ba(Fe_{1-x}Co_x)_2As_2$ series are emphasized.

Frédéric Hardy
Karlsruher Institut für Technologie, IFP, 76021 Karlsruhe, Germany

Date submitted: 14 Nov 2013 Electronic form version 1.4