Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Superconducting gap structure in over-doped (Ba_{1-x},K_x)Fe_2As_2 (x =0.35, 0.47, 0.56, and 0.64) from London penetration depth measurements[1] SERAFIM TEKNOWIJOYO, KYUIL CHO, MAKARIY A. TANATAR, YONG LIU, THOMAS A. LOGRASSO, RUSLAN PROZOROV, The Ames Laboratory — Single crystals of (Ba_{1-x},K_x)Fe_2As_2 were extensively studied from the optimal doping to the very underdoped regime. However, overdoped regime was out of reach due to various issues with the crystal growth. Here we report London penetration depth measured in high quality single crystals of (Ba_{1-x},K_x)Fe_2As_2 with (x =0.35, 0.47, 0.56, and 0.64) that have T_c =30 K, 39 K, 32 K and 22 K, respectively. The study of the evolution from the optimally doped composition toward the end member, KFe_2As_2, is especially important, since the former is clearly a full isotropic gap material, whereas the latter is a d-wave superconductor. Our results suggest a gradual evolution from the full gap to the nodal gap with doping. The results will be discussed in terms of competing s- and d- channels in the general $s_\pm$ framework.

[1]This work was supported by the Department of Energy Office of Science, Basic Energy Sciences under Contract No. DE-AC02-O7CH11358.

Serafim Teknowijoyo
The Ames Laboratory

Date submitted: 13 Nov 2013 Electronic form version 1.4