Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Sorting Category: 09.8 (E)

77Se NMR Study of KxFe2-ySe2-zSz DAVID TORCHETTI, MINGXUAN FU, TAKASHI IMAI, Department of Physics and Astronomy, McMaster University, H.C. LEI, C. PETROVIC, Condensed Matter Physics and Materials Science Department, Brookhaven National Laboratory — We will present a ^{77}Se NMR study of the superconducting properties of the recently discovered $K_xFe_{2-y}Se_2$ ($T_c \sim 33$ K), in a temperature range of 4 to 250 K [1]. Our Knight shift data reflect the progressive decrease in uniform spin susceptibility with temperature, in analogy with FeSe and iron-arsenide systems. Nuclear spin-lattice relaxation rate data shows no Hebel-Slichter coherence peak, nor any enhancement of antiferromagnetic spin fluctuations (AFSF) toward T_c. We have also conducted ^{77}Se NMR measurements on $K_xFe_{2-y}Se_{0.4}S_{1.6}$ (non-superconducting) and $K_xFe_{2-y}Se_{1.2}S_{0.8}$ ($T_c \sim 21$ K) to study the effect of sulphur substitution in this superconductor [2]. Sulphur applies a chemical pressure on the lattice, because it has the same valence as Selenium but less than half the ionic radius. We again measure NMR Knight shift and nuclear spin-lattice relaxation rate $1/T_1$, and find that both are suppressed with S substitution. We will discuss these results in comparison with $K_xFe_{2-y}Se_2$.

[1] D. Torchetti et. al., PRB 83, 104508 (2011)
[2] D. Torchetti et. al., arXiv:1111.2552 (2011)

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[X] Prefer Oral Session
[ ] Prefer Poster Session

Date submitted: 01 Feb 2012 Electronic form version 1.4