Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Local structural disorder and superconductivity in $\mathbf{K}_x\mathbf{Fe}_{2-y}\mathbf{Se}_2$ HYEJIN RYU, HECHANG LEI, Brookhaven National Lab, A.I. FRENKEL, Yeshiva University, C. PETROVIC, Brookhaven National Lab — We report significantly enhanced magnetic moment on $K_xFe_{2-y}Se_2$ single crystals after post-annealing and quenching process. In $K_xFe_{2-y}Se_2$ unit cell, there are two Fe sites, Fe1 which has higher symmetry with longer average Fe-Se bond length, and Fe2 which has lower symmetry with shorter average Fe-Se bond length. Temperature dependent X-ray absorption fine structure (XAFS) analysis results on quenched and as grown $K_xFe_{2-y}Se_2$ materials show that quenched $K_xFe_{2-y}Se_2$ materials have increased average Fe-Se bond length and decreased static disorder. This result indicates that occupancy of Fe1 sites increased after post-annealing and quenching process. This result provides clear evidence that Fe1 sites carry higher magnetic moment than Fe2 sites.

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Date submitted: 27 Nov 2011 Electronic form version 1.4