Abstract Submitted
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Doping Dependence of Resonant spin excitations in $Ba_{1-x}K_xFe_2As_2$[1] RAYMOND OSBORN, STEPHAN ROSENKRANZ, JOHN-PAUL CASTELLAN, FRANK WEBER, EUGENE GOREMYCHKIN, DUCK-YOUNG CHUNG, ILYA TODOROV, HELMUT CLAUS, Argonne National Laboratory, MERCOURI KANATZIDIS, Northwestern University, TATIANA GUIDI, Rutherford Appleton Laboratory — The observation of a resonant spin excitation at $\omega = 14$meV in $Ba_{0.6}K_{0.4}Fe_2As_2$ [Nature **456**, 930 (2008)] provided the first phase-sensitive evidence of extended $s_\pm$ symmetry in the iron arsenide superconductors. We will discuss subsequent measurements of the doping dependence of the dynamic magnetic susceptibility in $Ba_{1-x}K_xFe_2As_2$ from $x = 0.2$ to 0.9 using inelastic neutron scattering from polycrystalline samples. The resonance is observed below T_c at all values of x centered on the Γ-M point at $Q \approx 1.2$Å^{-1}, but it progressively broadens and weakens in the overdoped regime. We will discuss the scaling of the resonance energy with T_c and compare the Q- dependence with theoretical estimates based on the evolution of the Fermi surface with hole doping.

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