Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Antiferromagnetic Spin Fluctuations and Pseudogap Behavior in $Ca(Fe_{1-x}Co_x)_2As_2$ Studied by ^5As NMR[1] JINFANG CUI, Ames Laboratory and Chem. Dept., Iowa State University, SHENG RAN, SERGEY BUD'KO, PAUL CANFIELD, YUJI FURUKAWA, Ames Laboratory and Dept. of Phys. and Astro., Iowa State University — ^{75}As NMR measurements of single-crystalline $Ca(Fe_{1-x}Co_x)_2As_2$ have been carried out for four different doping concentration crystals (x = 0.023, 0.028, 0.033, 0.059) annealed at 350°C [1]. Co-doped $CaFe_2As_2$ is a compound in 122 family of iron-pnictide superconductors with three principle phases exhibited: paramagnetic (PM), antiferromagnetic (AFM) and superconducting (SC) states. The magnetic phase transition to AFM state occurs at T_N =180K at x=0 and is suppressed to T_N =53K for x=0.028, which is accompanied by a structural phase transition from tetragonal to orthorhombic phases. ^{75}As NMR was used to study the low energy spin dynamics via Knight shift (K) and spin-lattice relaxation rate ($1/T_1$) measurements. From our analysis of the temperature dependence of both K and $(T_1T)^{-1}$ in x=0.028 (T_N =53K), 0.033 (T_c =9K) and 0.059 (T_c =10K), we found a gradual decrease of AFM spin fluctuations below T^* =88K for x=0.028, 72K for x=0.033 and 41K for x=0.059, respectively, indicating the possible pseudogap behavior in spin excitation spectrum in the system.

[1] S. Ran, et al., Phys. Rev. B 85, 224528 (2012)

[1]Supported by USDOE under the Contract No. DE-AC02-07CH11358

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Date submitted: 13 Nov 2014 Electronic form version 1.4