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Heisenberg Model Analysis on Inelastic Powder Neutron Scattering Data Using Pure and K doped BaMn2As2 samples[1] MEHMET RAMAZANOGLU, Istanbul Techinal Univiversity, A. SAPKOTA, A. PANDEY, D. JOHNSTON, ALAN GOLDMAN, A. KREYSSIG, Ames Lab. Iowa State Univ., Ames, IA, 50011, D. ABERNATHY, J. NIEDZIELA, M. STONE, Oak Ridge NAtional Lab., TN, 37831, R.J. MCQUEENEY, Ames Lab. Iowa State Univ., Ames, IA, 50011 — Low temperature powder inelastic neutron scattering measurements (INS) were performed on powders of Ba(1-x)KxMn2As2 with x=0(BMA),0.125 and 0.25. BMA is a G type antiferromagnet (AFM) which has local magnetic modulations bridging between the pnictide and cuprate superconductors. Hole doping (K) introduces more metallic behavior. The magnetic contribution to the intensities were retrieved by subtracting the estimated phonon background obtained at high momentum transfers from the raw. The resultant estimated magnetic intensities were analyzed by using damped harmonic oscillator model. The K doping effects create a broadening in the magnetic peak profiles consistent with expected weak FM fluctuations. We also analyzed the INS data using a powder integration routine which is based on J1-J2-Jz Heisenberg Model. The Monte Carlo integration technique is used to obtain the powder-averaged S(Q,E) for a series of Js. The representative values (with lowest chi-squared) obtained for BMA are in agreement with previous results. The values obtained for K doped samples were found in the close proximity to the parent ones. Overall we conclude that the original AFM structure seen in BMA retained its character even in the K doped samples with minimal differences.

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