

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

The Magnetic Excitations in Optimal Doped $\text{BaFe}_2(\text{As}_{0.7}\text{P}_{0.3})_2$ ¹
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Rice University — High temperature superconductivity in iron based superconductors emerges near the boundary of static antiferromagnetic order which is suppressed by doping or pressure. Although spin fluctuations may be responsible for superconductivity, there is still no consensus on the mechanism. As a unique system in 122-type iron pnictides, the phosphorus doping in the arsenic position in BaFe_2As_2 does not induce external carrier and impurity scattering, but the maximum $T_c = 30\text{K}$. We have carried out inelastic neutron scattering experiment on Time of Flight Spectrometers, and mapped out the whole spin fluctuation up to 300mev. Our results are consistent with the combined DFT and DMFT calculation results, which confirm that pnictogen height is correlated with the electron-electron correlation strength and consequently the effective bandwidth of magnetic excitations in iron pnictides.

¹Support from MOST and U.S. NSF

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Date submitted: 06 Nov 2015

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