Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Effect of magnetic field on the spin resonance in $FeTe_{0.5}Se_{0.5}$ as seen via inelastic neutron scattering[1] JINSHENG WEN, GUANGYONG XU, ZHIJUN XU, ZHI WEI LIN, QIANG LI, YING CHEN, SONGXUE CHI, GENDA GU, JOHN TRANQUADA — Inelastic neutron scattering and susceptibility measurements have been performed on the optimally-doped Fe-based superconductor $FeTe_{0.5}Se_{0.5}$, which has a critical temperature, T_c of 14 K. The magnetic scattering at the stripe antiferromagnetic wave-vector $\mathbf{Q} = (0.5, 0.5)$ exhibits a "resonance" at $\sim$ 6 meV, where the scattering intensity increases abruptly when cooled below T_c. In a 7-T magnetic field, T_c is slightly reduced to $\sim$ 12 K, based on susceptibility measurements. The resonance in the neutron scattering measurements is also affected by the field applied along the $[1\bar{1}0]$ direction. The resonance intensity under field cooling starts to rise at a lower temperature $\sim$ 12 K, and the low temperature intensity is also reduced from the zero-field value. Our results provide clear evidence for the intimate relationship between superconductivity and the resonance measured in magnetic excitations of Fe-based superconductors.

[1]Work at Brookhaven National Laboratory is supported by U.S. Department of Energy Contract DE-AC02-98CH20886.

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Date submitted: 17 Nov 2009 Electronic form version 1.4