

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Neutron Scattering Study of Low Energy Magnetic Excitation in superconducting Te-vapor annealed under-doped FeTeSe ZHIJUN XU, University of Maryland and NIST Center for Neutron Research, J. A. SHNEELOCH, GUANGYONG XU, Brookhaven National Laboratory, MING YI, UC Berkeley, YANG ZHAO, University of Maryland and NIST Center for Neutron Research, D. M. PAJEROWSKI, MASAAKI MATSUDA, Oak Ridge National Laboratory, GENDA GU, J. M. TRANQUADA, Brookhaven National Laboratory, R.J. BIRGENEAU, UC Berkeley, J. W. LYNN, NIST Center for Neutron Research — To study the interplay between magnetism and superconductivity, we have performed neutron scattering measurements on a group of Te vapor annealed single crystal FeTe_{1-x}Se_x (T_c ~ 11-13K) samples. The Te vapor annealed process is found to reduce/remove the excess Fe in the as-grown sample and make the under-doped originally non-superconducting sample become good superconducting sample. Our neutron scattering studies have mapped the magnetic excitation in the (HK0) plane in these compounds. A spin resonance can be observed at incommensurate wavevectors away from (0.5,0.5). The change of low energy magnetic excitations with temperature suggests a possible phase with SC and NSC coexist on a microscopic level.

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Date submitted: 09 Nov 2016

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