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Incommensurate itinerant antiferromagnetic excitations and spin resonance in the $FeTe_{0.6}Se_{0.4}$ superconductor DIMITRI ARGYRIOU, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany, A. HIESS, Institut Max von Laue-Paul Langevin, Grenoble, France, A. AKBARI, I. EREMIN, M.M. KORSHUNOV, Max-Planck-Institut für Physik komplexer Systeme, Dresden, Germany, J. HU, B. QIAN, Z. MAO, Tulane University, New Orleans, LO, Y. QIU, NIST Center for Neutron Research, NIST, Gaithersburg, MD , C. BROHOLM, Institute for Quantum Matter and Department of Physics and Astronomy, The Johns Hopkins University, Baltimore, Maryland 21218 USA, W. BAO, Department of Physics, Renmin University of China, Beijing 100872, China — We report on inelastic neutron scattering measurements that find incommensurate itinerant like magnetic excitations in the normal state of superconducting $FeTe_{0.6}Se_{0.4}$ (Tc=14K) at an incommensurate wave-vector $\mathbf{Q_{inc}} = (\mathbf{1/2} \pm \epsilon, \mathbf{1/2} \mp \epsilon)$ with ϵ=0.09(1). In the superconducting state only the lower energy part of the spectrum shows significant changes by the formation of a gap and a magnetic resonance that follows the dispersion of the normal state excitations. We use a four band model to describe the Fermi surface topology of iron-based superconductors with the extended $s(\pm)$ symmetry and find that it qualitatively captures the salient features of these data.

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