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Magnetic Excitations in $FeSe_xTe_{1-x}$ LELAND HARRIGER, OLIVER LIPSCOMBE, UTK, PENGCHENG DAI, UTK/ORNL, TAO HONG, KAROL MARTY, HFIR, SONGXUE CHI, JEFF LYNN, NCNR — The role of magnetism in high Tc superconductors has been widely debated. A "resonance" in the inelastic magnetic scattering in cuprates that tracks Tc is strong evidence that a relationship does exist. This resonance has now been seen in the iron arsenide superconductors as well, further strengthening theories that seek to correlate magnetism with superconductivity. Magnetism in both the pnictide and cuprates begins as a parent antiferromagnetic (AF) ground state. The resonance appears with superconductivity with a center that grows in energy upon doping but remains fixed at the Q = (0.5, 0.5) antiferromagnetic wavevector of the parent. At first glance, scattering in the superconducting $FeSe_xTe_{1-x}$ series appears to mimic that seen in the iron arsenides and cuprates; exhibiting both an AF ground state and resonance mode. However, the resonance in this system is peculiar in that it exists not at the Q = (0.5, 0, 0.5) wavevector of its AF parent but back at the (0.5, 0.5) position of the pnictides and cuprates. In this talk, I will discuss neutron scattering experiments that map out the evolution of spin excitations as spectral weight shifts from the Q = (0.5, 0, 0.5) to the Q = (0.5, 0.5) position with doping and contrast it with the scattering seen in other compounds.

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