

Abstract Submitted
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Neutron Scattering Study of the Fe Oxypnictide Superconductors $\text{NdFeAsO}_{1-x}\text{F}_x$ and $\text{LaFeAsO}_{0.87}\text{F}_{0.13}$ ¹ YIMING QIU, NIST Center for Neutron Research and Univ. of Maryland, WEI BAO, QINGZHEN HUANG, TANER YILDIRIM, JASON SIMMONS, MARK GREEN, YING CHEN, JEFF LYNN, MAIKO KOFU, SEUNGHUN LEE, T. WU, G. WU, XIANHUI CHEN — We report the neutron scattering studies of $\text{NdFeAsO}_{1-x}\text{F}_x$ ($x=0, 0.2$)[1] and $\text{LaFeAsO}_{0.87}\text{F}_{0.13}$ [2]. In NdFeAsO , there is a tetragonal to orthorhombic structural transition at $T_S \approx 150$ K, where an anomaly in resistivity also occurs. A long range magnetic order with the wave-vector $(1/2, 1/2, 0)_T$ forms below $T_N = 1.96$ K. This long range order is dominated by the rare earth Nd ions, however, both the Nd and smaller Fe moments contribute to the antiferromagnetic structure. Neither the magnetic ordering nor the structural distortion occurs in the superconducting samples $\text{NdFeAsO}_{0.80}\text{F}_{0.20}$ and $\text{LaFeAsO}_{0.87}\text{F}_{0.13}$ at temperatures down to 1.6 K. In $\text{LaFeAsO}_{0.87}\text{F}_{0.13}$, no magnetic-resonance peak was observed in the superconducting state at 1.6 K. Two phonon peaks at 12 and 17 meV were observed, consistent with theoretical calculation. Reference: [1] Y. Qiu et al., arXiv:0806.2195 accepted by PRL(2008) [2] Y. Qiu et al., Phys. Rev. B 78, 052508(2008)

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