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Inelastic neutron scattering studies on spin excitations of Fe Pnictides JUN ZHAO, Department of Physics and Astronomy, The University of Tennessee, DAO-XIN YAO, Department of Physics, Purdue University, SHILIANG LI, Department of Physics and Astronomy, The University of Tennessee, TAO HONG, Neutron Scattering Science Division, Oak Ridge National Laboratory, YING CHEN, SUNG CHANG, WILLIAM RATCLIFF, JEFF LYNN, NIST Center for Neutron Research, National Institute of Standards and Technology, HERBERT MOOK, Neutron Scattering Science Division, Oak Ridge National Laboratory, GENFU CHEN, JIANLIN LUO, NANLIN WANG, Institute of Physics, Chinese Academy of Sciences, ERICA CARLSON, JIANGPING HU, Department of Physics, Purdue University, PENGCHENG DAI, Department of Physics and Astronomy, The University of Tennessee & Neutron Scattering Science Division, Oak Ridge National Laboratory
— We used inelastic neutron scattering to study the evolution of spin excitations in the FeAs superconductors and their parent compounds. We show here not only the antiferromagnetic order is suppressed by the doping; the spin excitations also change dramatically with doping. We observed sharp spin-wave excitations in the antiferromagnetically ordered parent compound. Based on the observed dispersion relation, we estimate the effective magnetic exchange coupling using a Heisenberg model. We also studied the spin excitation spectrum in the superconducting sample and its relationship to the superconductivity.

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