Abstract Submitted
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Temperature Evolution of Spin Fluctuations in FeAs[1] A. PODLESNYAK, G. EHLERS, Quantum Condensed Matter Division, ORNL, Oak Ridge, TN 37831, USA, S. TÓTH, Laboratory for Neutron Scattering and Imaging, PSI Villigen & Laboratory for Quantum Magnetism, EPFL, Lausanne, Switzerland, K. GOFRYK, A.S. SEFAT, Materials Science and Technology Division, ORNL, Oak Ridge, TN 37831, USA — The discovery of superconductivity (SC) in iron pnictides has opened a new stage in SC research. The superconducting state appears in iron pnictides with doping in metallic parent compounds. This is an important difference to the cuprates, which exhibit SC near a correlated insulating state. Therefore, the nature of the magnetism in the simplest iron pnictide - binary FeAs - is of fundamental importance for understanding the interplay between localized and itinerant magnetism and superconductivity in these materials. We use inelastic neutron scattering to map spin wave excitations in the monoarsenide FeAs at temperatures above and below the antiferromagnetic transition $T_N \sim 70$ K. We find magnetic excitation spectrum near the Néel temperature to be strongly different from the spectrum in the ground state. Near the transition temperature, magnetic fluctuations clearly indicate two-dimensional character in an intrinsically three-dimensional (3D) system. On the other hand, at low temperature, spin waves in FeAs are anisotropic 3D, suggesting a crossover from two-dimensional to three-dimensional character.

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