

Abstract Submitted
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Study of magnetic fluctuations and nematic phase transition in BaFe_2As_2 ¹ XU LUO, Argonne National Laboratory, VALENTIN STANEV, University of Maryland, BING SHEN, Argonne National Laboratory, XINSHENG LING, Brown University, WAI-KWONG KWOK, ULRICH WELP, Argonne National Laboratory, ARGONNE NATIONAL LABORATORY TEAM, BROWN UNIVERSITY TEAM, UNIVERSITY OF MARYLAND TEAM — We used high resolution AC micro-calorimetry and SQUID magnetometry to study the phase transitions in BaFe_2As_2 single crystals. A pronounced peak observed in the specific heat at $T_N \sim 132\text{K}$, together with a step in the magnetization at the same temperature signifies the AFM/Structural transition in BaFe_2As_2 . Annealing treatment of the sample shifts the peak in specific heat to 137K and reduces its width to $\sim 0.8\text{K}$ (FWHM). A thorough investigation of the specific heat up to 220K revealed no discernible, additional phase transitions above a typical background noise level of 5 to 10×10^{-4} for $\Delta C/C$. However, strong in-plane magnetic fluctuations were observed to persist to as high as 180K in magnetization, which provide a possible explanation for previous reports of a nematic phase transition.

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