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Effect of nematic order on the low-energy spin fluctuations in detwinned $BaFe_{1.935}Ni_{0.065}As_2$ WENLIANG ZHANG, HUIQIAN LUO, SHILIANG LI, Institute of Physics, CAS, J. T. PARK, MLZ, Technische Universität München — The origin of nematic order remains one of the major debates in iron-based superconductors. In theories based on spin nematicity, one major prediction is that the spin-spin correlation length at $(0,\pi)$ should decrease with decreasing temperature below the structural transition temperature T_s. Here we report inelastic neutron scattering studies on the low-energy spin fluctuations in $BaFe_{1.935}Ni_{0.065}As_2$ under uniaxial pressure. Both intensity and spin-spin correlation start to show anisotropic behavior at high temperature, while the reduction of the spin-spin correlation length at $(0,\pi)$ happens just below T_s, suggesting strong effect of nematic order on low-energy spin fluctuations. Our results favor the idea that treats the spin degree of freedom as the driving force of the electronic nematic order.

Wenliang Zhang
Chinese Academy of Sciences (CAS)

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