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Pressure dependence of the nematic spin correlations in detwinned $BaFe_{1.97}Ni_{0.03}As_2$[1] WENLIANG ZHANG, XINGYE LU, Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, JITAE PARK, Heinz Maier-Leibnitz Zentrum, Technische Universität München, Garching, Germany, PENGCHENG DAI, Department of Physics and Astronomy, Rice University, Houston — In the paramagnetic tetragonal phase of $BaFe_{2-x}Ni_xAs_2$, inelastic neutron scattering shows a spin excitation anisotropy emerges at a temperature well above the structure transition temperature (T_s) [1], consistent with the onset of in-plane resistivity anisotropy [2]. However, how the applied uniaxial strain, which artificially breaks the four-fold symmetry, influences the observed anisotropy is still unclear. Here we studied the pressure dependence of the nematic spin correlations in detwinned $BaFe_{1.97}Ni_{0.03}As_2$. We find that the spin excitation anisotropy temperature (T^*) is largely enhanced when changing the pressure from a mediate level ($\sim$ 8MPa) to a high level ($\sim$ 15MPa) [3]. Our results suggest the T^* may be not a characteristic temperature where the system transit to a nematic phase, but a temperature the nematic fluctuations can reach under a uniaxial stress.

[1] Xingye Lu et al., Science 345, 657-660 (2014)
[2] J. H. Chu et al., Science 329, 824-826 (2010)
[3] Wenliang Zhang et al., unpublished manuscript (2015).

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