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Spin Correlations in Superconducting $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$ ¹

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Elastic and inelastic neutron scattering are used to study the spin correlations in superconducting $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$. Measurements on the antiferromagnetically ordered parents of this system [1] show a strongly anisotropic spin-wave velocity. Here we report [2] measurements of the magnetic excitations in a the superconducting composition, $x=0.065$, up to 80 meV and show that a similar anisotropy persists for superconducting compositions. The dispersive mode measured here connects directly with the spin resonance previously observed in this compound. When placed on an absolute scale, our measurements show that the local- or wavevector- integrated susceptibility is larger in magnitude than that of the ordered parents over the energy range probed. I will discuss the interpretation of our results in terms of the electronic structure and possible fluctuating nematic order.

[1] S. O. Diallo, *et al.* Phys. Rev. Lett. **102**, 187206 (2009); J. Zhao , *et al.* Nat. Phys. **5**, 555 (2009).

[2] Lester *et al.* Phys. Rev. B **81**, 064505 (2010); unpublished.

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