

Review of: "Spin-excitation anisotropy in the nematic state of detwinned FeSe"

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Potential competing interests: The author(s) declared that no potential competing interests exist.

This work is studying the origin of nematicity of FeSe above T_c .

Using the technique of RIXS, the authors have unambiguously revealed that the high energy spin excitations and their nematicity persist far higher energy than the orbital splitting energy scale, and concluded that the origin of the nematicity is the local spins rather than the orbital d.o.f. or any itinerant electronic d.o.f.

The experiments and data are done convincing and the interpretation is reasonable. The obtained result is important to understand the interplay between the high T_c superconductivity and nematicity of the Fe-based superconductors.

I recommend the current paper for publication, in general. However, I have a few questions that the authors are advised to clarify before the final submission.

Q1. At the end of the main text, the authors said: " The local moment-based understanding,, suggest that the largest spin spectral weight is associated with the incoherent electronic excitations induced by the underlying electron correlations."

Here the authors vaguely mix the local moment picture and the itinerant electron picture, which made the main conclusion of the paper suddenly obscure. I advise the authors to clarify this.

Q2. In the supplement, the theoretical model part, the authors said that their spin model is based on SU(3) spin. I think it should be SU(2). Better to be checked out.