

Abstract Submitted
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Interplay of orbital ordering and magnetism in the parent compounds of the iron pnictides ANDRIY NEVIDOMSKYY, Physics and Astronomy, Rice University — The neutron scattering experiments on the parent compounds of the 122 family of the iron pnictide superconductors show a pronounced orthorhombic anisotropy in the spin wave spectra [1], also observed in resistivity measurements on detwinned crystals [2,3]. Orbital ordering of the d_{xz} and d_{yz} orbitals may be a possible explanation for this behaviour [4]. In this work, we establish the effect of orbital ordering on the magnetism and study their interplay through a combination of the first-principles band theory calculations and phenomenological analysis in the framework of the Landau theory. This enables us to establish the coupling between the orbital and magnetic degrees of freedom in these materials. Consequences for the symmetry of the superconducting order parameter are discussed.

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