

Abstract Submitted
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Orbital characters of the iron-pnictides¹ DONGLAI FENG, Fudan University — The orbital degree of freedom plays an important role in the physics of iron-based high-temperature superconductors and their parent compounds. For example, possible orbital ordering has been associated with the spin density wave, and we recently found that the superconducting gap sizes are different at the same Fermi momentum for two bands with different spatial symmetries. We studied the orbital characters of the electronic structure in optimally electron-doped $\text{BaFe}_{1.85}\text{Co}_{0.15}\text{As}_2$ by exploiting the polarization-sensitivity of the orbitals in angle resolved photoemission spectroscopy. The orbital characters of the low energy electronic structure and Fermi surface in three dimensional momentum space are determined. Our results indicate that the previous orbital assignments of band structure calculations are just partially correct. Particularly, the contributions of the d_{xy} and $d_{x^2-y^2}$ orbitals were not right. Our results lay the foundation for constructing realistic microscopic models of iron-based superconductors. Furthermore, we studied the transport properties and electronic structure of magnetically detwinned NaFeAs , and AEFe_2As_2 . We identify the roles of various orbitals in the spin density wave formation.

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