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Magnetic degeneracy and hidden metallicity of the spin density wave state in ferropnictides ILYA EREMIN, Max-Planck Instiute for Physics of Complex Systems, ANDREY CHUBUKOV, University of Wisconsin-Madison — We analyze spin density wave (SDW) order in iron-based superconductors and electronic structure in the SDW phase. We consider an itinerant model for Fe-pnictides with two hole bands centered at $(0,0)$ and two electron bands centered at $(0,\pi)$ and $(\pi,0)$ in the unfolded BZ. A SDW order in such a model is generally a combination of two components with momenta $(0,\pi)$ and $(\pi,0)$, both yield (π,π) order in the folded zone. Neutron experiments, however, indicate that only one component is present. We show that $(0,\pi)$ or $(\pi,0)$ order is selected if we assume that only one hole band is involved in the SDW mixing with electron bands. A SDW order in such 3-band model is highly degenerate for a perfect nesting and hole-electron interaction only, but we show that ellipticity of electron pockets and interactions between electron bands break the degeneracy and favor the desired $(0,\pi)$ or $(\pi,0)$ order. We further show that stripe-ordered system remains a metal for arbitrary coupling. We analyze electronic structure for parameters relevant to the pnictides and argue that the resulting electronic structure is in good agreement with ARPES experiments. We discuss the differences between our model and $J_1 - J_2$ model of localized spins.

Ilya Eremin
Max-Planck Instiute for Physics of Complex Systems

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