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Minimal two-band model for the superconducting iron oxypnictides CHAO-XING LIU, Tsinghua University, SRINIVAS RAGHU, XIAO-LIANG QI, Stanford University, DOUGLAS SCALAPINO, University of California, Santa Barbara, SHOUCHENG ZHANG, Stanford University — Following the discovery of the Fe-pnictide superconductors, LDA band structure calculations showed that the dominant contributions to the spectral weight near the Fermi energy came from the Fe 3d orbitals. The Fermi surface is characterized by two hole surfaces around the Γ point and two electron surfaces around the M point of the 2 Fe/cell Brillouin zone. Here, we describe a 2-band model that reproduces the topology of the LDA Fermi surface and exhibits both ferromagnetic and $q = (\pi, 0)$ spin density wave (SDW) fluctuations. We argue that this minimal model contains the essential low energy physics of these materials.

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