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Electronic Structure of High-T_c Iron-Pnictide Superconductors from the Strong Correlation Limit[1] JOSE RODRIGUEZ, California State University at Los Angeles — A two-orbital t-J model for a square lattice of iron (pnictide) atoms that includes magnetic frustration and Hund's rule coupling is studied in the limit where inter-orbital hopping of holes is prohibited. A hidden half-metal phase is predicted at weak enough Hund's rule coupling, where holes move coherently through opposing ferromagnetic spin arrangments that are assigned to each orbital. In particular, two Fermi surface hole pockets centered at zero momentum that have unrenormalized Fermi velocities are predicted. Next, the same model is studied at the quantum critical point that separates the hidden ferromagnet from the commensurate spin-density wave (cSDW), where low-energy spinwaves disperse anisotropically away from cSDW wave numbers. Composite hole-spinwave excitations result in "shadow" hole Fermi surfaces that are centered at cSDW wave numbers. We explore the possibility that these "shadow" bands are intrinsically diffuse enough that they simulate electron bands. Last, determinations of the low-energy spectrum of one hole by numerical exact diagonalization confirms the existence of degenerate ground states at momenta $(0, 0)$ and $(\pi, 0)$ at a quantum critical point.

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