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Magnetic Fluctuation and Anisotropy in High-Tc Iron Pnictides QUAN YIN, MYUNG JOON HAN, WARREN E. PICKETT, SERGEY Y. SAVRASOV, University of California, Davis — Using first-principle density functional theory calculations combined with tight-binding method, dynamical mean field theory, and linear response theory, we extensively investigated the electronic structures and magnetic interactions of nine ferropnictides representing three different structural classes. The calculated magnetic interactions are found to be short-range, and the nearest (J_{1a}) and next-nearest (J_2) exchange constants follow the universal trend of $J_1/2J_2 \sim 1$, despite their extreme sensitivity to the z-position of As. This suggests magnetic frustration as the key factor in stabilizing the superconducting ground state. The calculated spin wave dispersions show strong magnetic anisotropy in the Fe plane, in contrast to cuprates.

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