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Metal-to-Insulator Transition in Multi-Orbital Models for $\mathbf{A_xFe_ySe_2}$ RONG YU, QIMIAO SI, Department of Physics and Astronomy, Rice University, Houston, TX 77005 — The degree of electron correlations remains a central issue in the iron-based superconductors. Compared to other compounds, the newly discovered $A_xFe_ySe_2$ family is unique in some aspects: the Fermi surface consists of only electron pockets, while T_c is as high as 30 K ; the superconducting compound is close to an antiferromagnetically insulating phase with a large magnetic moment. These features suggest that the $A_xFe_ySe_2$ system contains stronger electron correlations than pnictides.To investigate the correlation effects in $A_xFe_ySe_2$, we study the metal-to-insulator transition in multi-orbital models for this system using slave-spin mean-field method. We show that when electron correlations are tuned, the system undergoes a metal-to-Mott-insulator transition at commensurate electron filling. We also find that the Mott insulator is close to an orbital-selective Mott phase in the phase diagram.

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