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Effect of Orbital Nematicity on Superconductivity in the Iron Pnictides and Chalcogenides ANDRIY NEVIDOMSKYY, Rice University, RONG YU, Renmin University of China — Orbital ordering leading to the observed nematic phase in the iron-based superconductors has been firmly established in a variety of experiments. It is therefore important to investigate the effect of the orbital order on the superconductivity. To this end, we have performed strong-coupling calculation within the slave-boson approach to the multiorbital t-J_1-J_2 models for the iron-based superconductors. We report the phase diagram as a function of both electron/hole doping and the orbital ordering strength. We find that the amplitude of the otherwise dominant A_{1g} ($s\pm$) pairing channel diminishes as the strength of orbital ordering is increased, yielding to the B_{1g} ($d_{x^2-y^2}$) pairing channel. This effect is especially pronounced in the electron-doped case, with the d-wave pairing stabilized by the realistic values of the orbital splitting ~ 50 meV. While the d-wave pairing has not been conclusively observed in the iron-based superconductors, the competition between the s- and d-wave pairing found in the calculations may have ramifications for FeSe, KFe_2As_2 and $K_xFe_{2-y}Se_2$.

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