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Phase diagram of p-orbital attractive fermions in a two-dimensional optical lattice THEJA DE SILVA, Georgia Regents University — We study multi-orbital system of polarized fermions on a two-dimensional square lattice with attractive on-site interaction. We assume that the atoms are loaded to the lattice such that the s-orbital is completely filled and dynamic of the system is determined by the p-orbital atoms. By including the four-site square plaquette interaction term generated from the directional tunneling dependence at half filling, we derive an effective spin-Hamiltonian using forth order perturbation theory at the strongly interacting limit. We then use a variational mean field approach to map out the phase diagram.

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