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Renormalization group study up to two-loop order of an effective two-band model for iron-based superconductors[1] HERMANN FREIRE, VANUILDO DE CARVALHO, Federal University of Goias — We perform a renormalization group (RG) study up to two-loop order of an effective low-energy two-band model to describe some of the recently discovered iron-based superconductors. Our starting point is the itinerant electronic model proposed by Chubukov *et al.* [Phys. Rev. B **78**, 134512 (2008)], which displays two small, almost nested Fermi pockets with one hole pocket centered at $(0, 0)$ and one electron pocket centered at $\mathbf{Q} = (\pi, \pi)$ in the folded Brillouin zone. We then proceed to implement a two-loop RG calculation for this model of four-point vertex corrections, quasiparticle weight and several order-parameter susceptibilities in order to evaluate the robustness of one-loop RG results available in the literature with respect to including self-energy effects and higher-order quantum fluctuations.

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