

Abstract Submitted
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Superconductivity without hole-pocket in electron-doped FeSe: analysis beyond the Migdal-Eliashberg formalism HIROSHI KONTANI, YOUICHI YAMAKAWA, Nagoya Univerisity — The high- T_c mechanism absent of hole-pockets in heavily electron-doped FeSe is one of the key unsolved problems in Fe-based superconductors. To attack this issue, we study the higher-order many-body effect called the vertex correction (VC) that has been neglected in conventional Migdal-Eliashberg (ME) gap equation. Due to the VC, the dressed effective Coulomb interaction possesses nontrivial spin and orbital-dependences. In FeSe, we find that (i) the VC not only induces the orbital fluctuations, but also strongly magnifies the orbital-fluctuation-mediated pairing interaction. In addition, (ii) sizable pairing glue is given by the exchange of the orbital+spin composite fluctuations. Because of both important beyond-ME effects, which are caused by the interplay between orbital and spin fluctuations, the anisotropic s_{++} -wave state in heavily electron-doped FeSe is satisfactorily explained. The proposed hole-pocket-less pairing mechanism would be important for various Fe-based superconductors.

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