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Pairing strength and gap functions in multiband superconductors: 3D effects[1] ANDREAS KREISEL, YAN WANG, PETER HIRSCHFELD, Department of Physics, University of Florida, Gainesville, FL 32611-8440, USA, THOMAS MAIER, Center for Nanophase Materials Sciences and Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831-6494, USA, DOUGLAS SCALAPINO, Department of Physics, University of California, Santa Barbara, CA 93106-9530, USA — We examine the superconducting pairing symmetry in Fe-based superconductors using spin-fluctuation pairing theory. It has been shown in multi-orbital models that the different matrix elements of the pairing vertex are essential in determining the symmetry. In our approach we perform a 10-orbital spin-fluctuation calculation to account for the full matrix elements and the 3 dimensional character of the bandstructure which is most important in the systems under consideration (LiFeAs and $K_xFe_{2-y}Se_2$). Our approach contains both, the deviations from tube-like Fermi surface that also allows different pairing strengths in the z-direction, and the hybridization of the Fermi surface. Starting from the tight-binding Hamiltonian corresponding to the real crystal cell, we find several competing 3D gap structures and compare with ARPES experiments.

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