

MAR13-2012-000433

Abstract for an Invited Paper
for the MAR13 Meeting of
the American Physical Society

ARPES studies of the superconducting gap symmetry of Fe-based superconductors

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The superconducting gap is the fundamental parameter that characterizes the superconducting state, and its symmetry is a direct consequence of the mechanism responsible for Cooper pairing. Here I discuss about angle-resolved photoemission spectroscopy measurements of the superconducting gap in the Fe-based high-temperature superconductors. I show that the superconducting gap is Fermi surface dependent and nodeless with small anisotropy, or more precisely, a function of momentum. I show that while this observation is inconsistent with weak coupling approaches for superconductivity in these materials, it is well supported by strong coupling models and global superconducting gaps. I also stress the importance of scattering and the lifetime of quasiparticles in evaluation the superconducting gap by angle-resolved photoemission spectroscopy and other experimental techniques.