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Laser-Based ARPES Study on Superconducting Gap of Optimally-Doped (Ba0.6K0.4)Fe2As2 Superconductor JIANWEI HUANG, Institute of Physics, Chinese Academy of Science, CHUANGTIAN CHEN COLLABORATION, ZUYAN XU COLLABORATION — The determination of the superconducting gap and its symmetry are important in understanding the underlying superconductivity mechanism in the iron-based superconductors. However, the results on the superconducting gap in a prototypical iron-based superconductor $(Ba_{0.6}K_{0.4})Fe_2As_2$ remains controversial after eight years of extensive investigations. Here we report our high resolution laser-based angle-resolved photoemission (ARPES) measurements on the superconducting gap of an optimally-doped $(Ba_{0.6}K_{0.4})Fe_2As_2$ superconductor. With ultra-high energy and momentum resolutions from our new generation laser-based ARPES system, we have carried out precise measurements of the superconducting gap and its temperature and momentum dependences in $(Ba_{0.6}K_{0.4})Fe_2As_2$. Our results provide a unified picture for the superconducting gap in $(Ba_{0.6}K_{0.4})Fe_2As_2$ superconductor and solve a long-standing controversy. They also put an upper limit on the anisotropy of the superconducting gap in the iron-based superconductors.

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