

Abstract Submitted  
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**Coexistence of orbital degeneracy lifting and superconductivity in iron-based superconductors**<sup>1</sup> HU MIAO, PIERRE RICHARD, SHANGFEI WU, JUN MA, TIAN QIAN, LINGYI XING, XIANCHENG WANG, CHANGQING JIN, HONG DING, Institute of Physics, Chinese Academy of Sciences, CHUNGPIN CHOU<sup>2</sup>, LIMIN WANG, WEI KU, Condensed Matter Physics and Materials Science Department, Brookhaven National Laboratory, ZIQIANG WANG, Department of Physics, Boston College — In iron-based superconductors, local orbital fluctuations have been proposed to be directly responsible for the structural phase transition and closely related to the observed giant magnetic anisotropy and electronic nematicity. However, whether superconductivity can emerge from, or even coexist with orbital fluctuations, remains unclear. Here we report the angle-resolved photoemission spectroscopy observation of the lifting of symmetry-protected band degeneracy, and consequently the breakdown of local tetragonal symmetry in the SC state of  $\text{Li}(\text{Fe}_{1-x}\text{Co}_x)\text{As}$ . Supported by theoretical simulations, we analyse the doping and temperature dependences of this band-splitting and demonstrate an intimate connection between ferro-orbital correlations and superconductivity.

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