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Doping dependence of competing pairing channels in $Ba_{1-x}K_xFe_2As_2$[1] THOMAS BOEHM, FLORIAN KRETZSCHMAR, ANDREAS BAUM, MICHAEL REHM, DANIEL JOST, RAMEZ HOSSEINIAN AHANGHARNEJHAD, Walther Meissner Institut, RONNY THOMALE, University of Würzburg, CHRISTIAN PLATT, Stanford University, THOMAS MAIER, Oak Ridge National Laboratory, WERNER HANKE, University of Würzburg, BRIAN MORITZ, THOMAS DEVEREAUX, SLAC National Accelerator Laboratory, DOUGLAS SCALAPINO, University of California, Santa Barbara, SAURABH MAITI, PETER HIRSCHFELD, University of Florida, PETER ADELMANN, THOMAS WOLF, Karlsruher Institut für Technologie, HAI-HU WEN, Nanjing University, RUDI HACKL, Walther Meissner Institut — We study the doping dependence of competing pairing channels in the superconducting state of $Ba_{1-x}K_xFe_2As_2$ for $0.22 \leq x \leq 0.70$. Around optimal doping symmetry-resolved Raman spectra reveal the existence of two collective exciton-like Bardasis-Schrieffer modes in B_{1g}-symmetry below the gap edge. These modes correspond to two sub-leading pairing interactions of $d_{x^2-y^2}$ symmetry, which compete with the dominant s-wave interaction. The experimental doping dependence of the corresponding pairing strengths is compared with a functional renormalization group study and a spin-fluctuation based approach via the random-phase approximation. Both techniques yield good agreement with each other and the experiment. This provides evidence for repulsive spin-fluctuations to dominate the present system, not only generating the $s\pm$-wave ground state but also the BS modes.

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