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Quasiparticle dynamics across the multiple superconducting gaps in the electron doped $\text{BaFe}_{1.85}\text{Co}_{0.15}\text{As}_2$ YUHANG REN, YU GONG, TETIANA NOSACH, Physics, Hunter College, the City University of New York, L. J. LI, G. H. CHAO, ZHUAN XU, Physics, Zhejiang University, China — Understanding the nature of the low-lying electronic structures is extremely important in establishing the microscopic origin of superconductivity in iron pnictides. In this work, we used the time-resolved optical spectroscopy to study the quasiparticle dynamics in high-quality single crystals of electron-doped superconductor, $\text{BaFe}_{1.85}\text{Co}_{0.15}\text{As}_2$ (BFCA). We show that the electron-doped BFCA is a multi-gap s-wave superconductor. Moreover, we reveal that the electron-phonon interaction alone is not strong enough to induce a superconducting phase transition in BFCA, and a new attractive pairing mechanism is necessary. Our results support a picture of electron pairing via AF fluctuations and point to the possibility that the FeAs-family of superconductors and the high-Tc cuprates may share a similar spin mediated pairing mechanism

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