

Supplementary Material

Bosonic spectrum of correlated multiband system, $\text{BaFe}_{1.80}\text{Co}_{0.20}\text{As}_2$, obtained via infrared spectroscopy

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Measured DC resistivity of Co-doped Ba122 ($\text{BaFe}_{1.80}\text{Co}_{0.20}\text{As}_2$) as a function of temperature

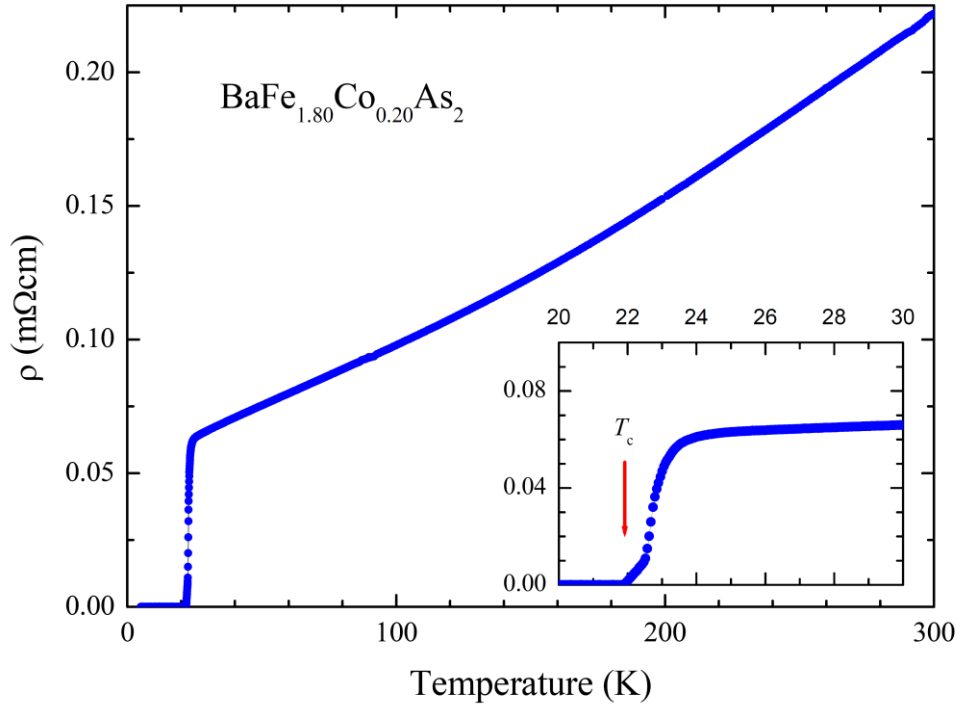


Figure S1: DC resistivity as a function of temperature, measured using a 4-probe measurement technique. The SC transition temperature (T_c) is 22.0 K.

Bosonic spectra of K-doped Ba122 ($\text{Ba}_{0.49}\text{K}_{0.51}\text{Fe}_2\text{As}_2$)

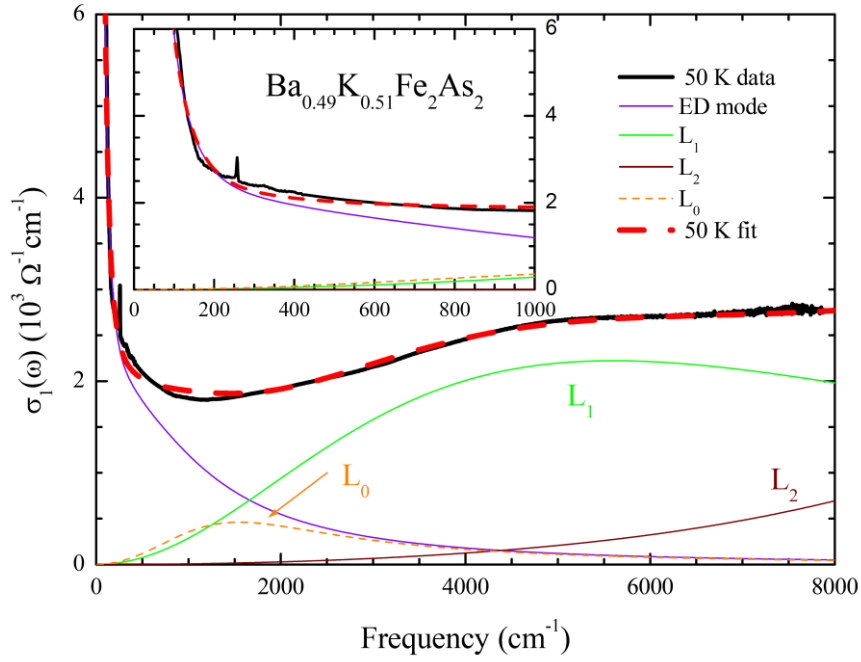


Figure S2: Data and fit of $\text{Ba}_{0.49}\text{K}_{0.51}\text{Fe}_2\text{As}_2$ at 50 K (normal state) using the extended Drude-Lorentz model analysis. These are published data and fit of $\text{Ba}_{0.49}\text{K}_{0.51}\text{Fe}_2\text{As}_2$ at 50 K (normal state) reproduced from ref. [18] in the main text. Here we added one more Lorentz mode (L_0) for a better comparison with Co-doped Ba122 system.

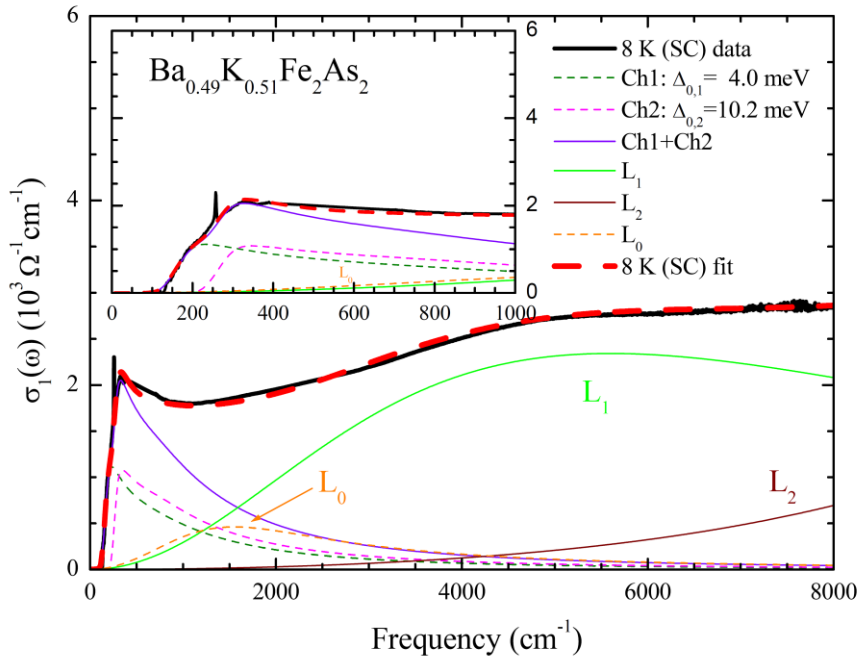


Figure S3: Data and fit of $\text{Ba}_{0.49}\text{K}_{0.51}\text{Fe}_2\text{As}_2$ at 8 K (SC state) using the two-parallel-channel approach. These are the published data and fit of $\text{Ba}_{0.49}\text{K}_{0.51}\text{Fe}_2\text{As}_2$ at 8 K (SC state) reproduced from ref. [20] in the main text. Here, we provide data and fit in a wide spectral range for a better comparison with the Co-doped Ba122 system.

Bosonic spectra of K-doped Ba122 ($\text{Ba}_{0.49}\text{K}_{0.51}\text{Fe}_2\text{As}_2$) at 8 K and 50 K

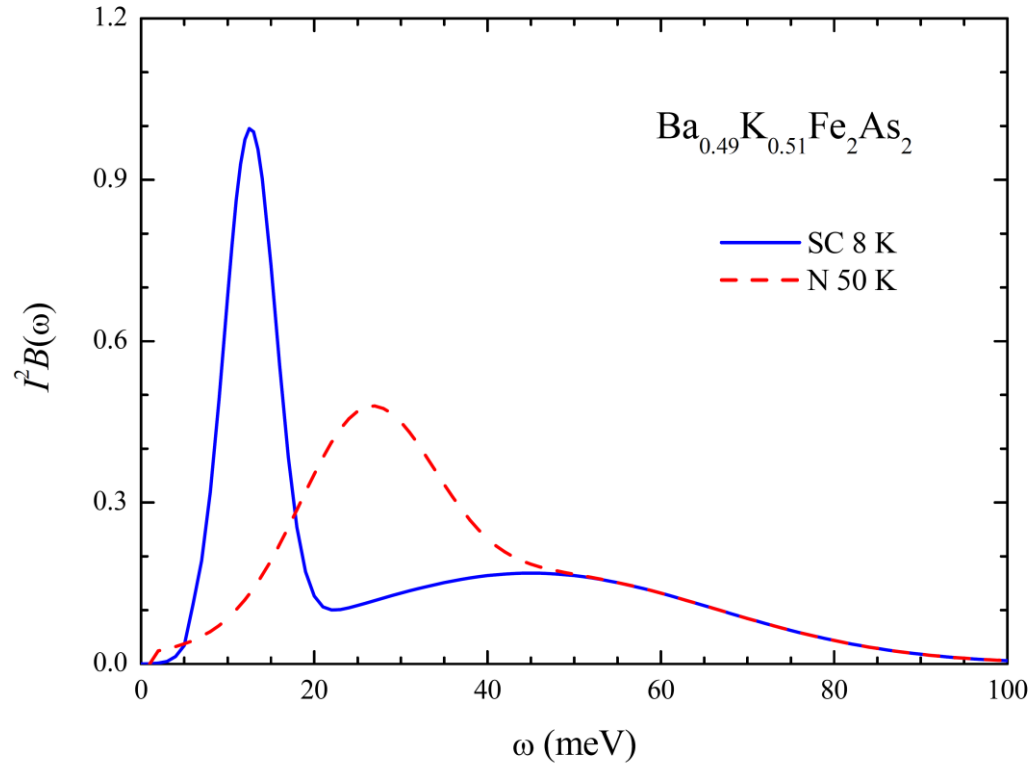


Figure S4: Bosonic spectra of $\text{Ba}_{0.49}\text{K}_{0.51}\text{Fe}_2\text{As}_2$ at 8 K (SC state) and 50 K (normal state) reproduced from refs. [18] and [20] in the main text.