

Abstract Submitted
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Temperature Evolution of Local Pairing & Electron-Boson Coupling in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ ¹ KENJIRO K. GOMES, ABHAY PASUPATHY, AAKASH PUSHP, COLIN PARKER, Department of Physics, Princeton University, GENDA GU, Brookhaven National Laboratory, SHIMPEI ONO, CRIEPI, Japan, YOICHI ANDO, ISIR, Osaka University, ALI YAZDANI, Department of Physics, Princeton University — Recently, we have shown using variable temperature scanning tunneling microscopy measurements that the pairing in high-Tc superconductor $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ persists in nanoscale regions at temperatures above Tc. [1] Using the ability to track the same atomic location with temperature, we have examined the evolution of the electronic states from well below Tc to above the temperature at which the pairs first form locally. We will present these results for an overdoped sample. Using these measurements we extract the evolution of the pairing gap with temperature and show that pairing gaps at different atomic sites close at different temperatures. Our technique also allows us to quantitatively analyze the local electron-boson coupling for different atomic sites with different pairing strengths. Our results show that there is no connection between the variation of the gap magnitude and the bosonic mode associated with the “dip-hump” feature in the spectra. [1] Gomes et al. Nature 447, 569–572 (2007).

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