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Evidence for phononic pairing in extremely overdoped "pure" d-wave superconductor Bi2212 YU HE, Department of Applied Physics, Stanford University, Stanford, CA, MAKOTO HISHIMOTO, Stanford Synchrotron Radiation Lightsource, SLAC, CA, DONGJOON SONG, HIROSHI EISAKI, AIST, Japan, ZHI-XUN SHEN, Department of Applied Physics, Stanford University, Stanford, CA
— Recent advancement in High Tc cuprate superconductor research has elucidated strong interaction between superconductivity and competing orders. Therefore, the mechanism behind the 'pure' d-wave superconducting behavior becomes the next stepping stone to further the understanding. We have performed photoemission study on extremely overdoped Bi2212 single crystal synthesized via high pressure method. In this regime, we demonstrate the much reduced superconducting gap and the absence of pseudogap. Clear gap shifted bosonic mode coupling is observed throughout the entire Brillouin zone. Via full Eliashberg treatment, we find the electron-phonon coupling strength capable of producing a transition temperature very close to Tc. This strongly implies bosonic contribution to cuprate superconductivity's pairing glue.

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