

Abstract Submitted
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Signature of charge density wave excitations in Bi2212 via ultrahigh resolution RIXS¹ WEI-SHENG LEE, LAURA CHAIX, SLAC - Natl Accelerator Lab, GIACOMO GHIRINGHELLI, YINGYING PENG, Politecnico di Milano, Italy, MAKOTO HASHIMOTO, BRIAN MORITZ, SLAC - Natl Accelerator Lab, KURT KUMMER, NICK BROOKES, ESRF, France, YU HE, SUDI CHEN, Stanford University, S. ISHIDA, HIROSHI EISAKI, AIST, Japan, LUCIO BRAICOVICH, Politecnico di Milano, Italy, ZHI-XUN SHEN, THOMAS DEVEREAUX, WEI-SHENG LEE, SLAC - Natl Accelerator Lab — Low energy excitations in heavily underdoped $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8$ crystals were investigated using resonant inelastic soft x-ray scattering (RIXS) measurement at the Cu L3-edge with an ultrahigh energy resolution of 40 meV. In the quasi-elastic region, an incommensurate charge density wave (CDW) with a wavevector of 0.3 reciprocal lattice units are observed, confirming the existence of a CDW in this compound. Importantly, we observe signatures of dispersive CDW excitations that emanate from the CDW wavevector and intersect with bond-stretching phonons, causing an intensity anomaly at a wavevector away from the CDW wavevector. Temperature dependent measurement will also be discussed.

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