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**Origin of the quasiparticle dispersion kinks in Bi-2212 determined from angle-resolved inelastic electron scattering**[1] SEAN VIG, ANSHUL KOGAR, Univ of Illinois - Urbana, VIVEK MISHRA, MIKE NORMAN, Argonne National Laboratory, GENDA GU, Brookhaven National Laboratory, PETER ABBAMONTE, Univ of Illinois - Urbana — The kink features in the low energy quasiparticle dispersion in cuprate superconductors have been extensively studied using angle-resolved photoemission spectroscopy (ARPES). The existence of these kinks is a signature of a renormalization of the fermionic quasiparticles due to coupling to some bosonic collective mode at a scale related to the kink energy. In this talk, I will present angle-resolved inelastic electron scattering studies of the bosonic collective excitations in optimally doped $Bi_2Sr_2CaCu_2O_{8+\delta}$. Performing a 2D momentum parameterization of these modes, we reconstruct the complete dynamical susceptibility, $\chi(q, \omega)$, which we use to perform a one-loop self energy correction to the quasiparticle dispersion. The result reproduces well the dispersion observed with ARPES, indicating that these excitations are the origin of the observed kinks. I will discuss the implications of our study for phonon vs. spin fluctuation interpretation of these effects.

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