

Abstract Submitted
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New analysis of the electronic excitations in the Mott insulator Nd_2CuO_4 using momentum-dependent intensity maps GUILLAUME CHABOT-COUTURE, Stanford University, JASON N. HANCOCK, Stanford University/SSRL, DIEGO M. CASA, Advanced Photon Source, ANL, PATRICK K. MANG, THOMAS GOG, Advanced Photon Source, ANL, MARTIN GREVEN, Stanford University/SSRL — Resonant inelastic X-ray scattering (RIXS) is a rapidly advancing technique that allows the measurement of electronic excitations in correlated-electron systems. In order to extend this technique, we developed a new circle to perform azimuthal rotations of the crystal. This allowed us to perform precise measurements of the electronic excitations as a function of the momentum transfer in the copper-oxygen planes and the incident photon polarization. As a result, we discovered that Cu K edge RIXS is at most weakly polarization dependent when the polarization is kept in the copper-oxygen planes. We used this new circle to determine the intensity variations of different energy-loss excitations across many Brillouin zones. These intensity maps as well as inelastic spectra measured at high-symmetry points in the Brillouin zone allow an improved analysis of the electronic-excitation spectral weight in this material. We discuss our findings in the context of past measurements on other cuprate systems.

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