

# Disentangling charge and spin excitations in RIXS spectra and their evolution in the phase diagram of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ superconducting cuprate

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The knowledge of the elementary excitations is vital for understanding the physics of superconducting cuprates. Nowadays, Resonant Inelastic X-ray Scattering (RIXS) plays an increasingly important role in studying various excitations especially the spin excitations in cuprates. However, the interpretation of the measured excitations is still controversial. One obstacle is that the measured low-energy excitations in doped cuprates are usually of mixed charge and spin character, making the correct assignment of the spectral profile to individual excitations difficult. Using the recent proposed azimuthal dependent RIXS measurement, we resolved the accurate spectral profiles of the charge and spin excitations in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ , and studied their doping and temperature responses separately in the phase diagram. These results help to elucidate the nature of the spin and charge excitations in doped cuprates and their possible correlations to the superconductivity.

## Position

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