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【112】Disentangling charge and spin excitations and their evolution in the phase diagram of Bi2Sr2CaCu2O8+x superconducting cuprate

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Whether the magnetic excitations in doped cuprates are described by paramagnons or the continuum of charge and spin excitations of correlated electrons is still controversial. Recent RIXS studies with azimuthal-dependent measurements for polarization analysis demonstrated how charge and spin nature of the low-energy excitations can be resolved, providing thereby a way to study their properties separately. Here we studied the evolution of the charge and spin components of the excitations by azimuthal-dependent RIXS in the phase diagram of Bi2Sr2CaCu2O8+x. Possible renormalizations by superconductivity of both kinds of excitations are explored by comparing their changes above and below Tc. Our results help to elucidate the nature of the magnetic excitations in cuprates and their possible correlations to superconductivity.

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