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High Energy Magnetic Excitations in overdoped high Temperature Superconductors M. LE TACON, MPI FKF, G. GHIRINGHELLI, Politecnico di Milano, D.C. PEETS, MPI FKF, M. MORETTI-SALA, ESRF, S. BLANCO-CANOSA, MPI FKF, M. MINOLA, Politecnico di Milano, V. HINKOV, MPI-UBC center for Quantum Materials, R. LIANG, D. BONN, W. HARDY, UBC, C.T. LIN, MPI FKF, T. SCHMITT, SLS - PSI, L. BRAICOVICH, Politecnico di Milano, B. KEIMER, MPI FKF — Motivated by the search for the mechanism of high-temperature superconductivity, an intense research effort has been focused on the evolution of the spin excitation spectrum upon doping from the AF insulating to the superconducting (SC) states of the cuprates. Taking advantage of the recent developments of RIXS, we have shown that high energy magnetic excitations with dispersions and spectral weights similar to those of magnons in AF cuprates exist up to optimal doping. In the overdoped region, the normal state appears in many aspects similar to a Fermi liquid, and the available data on the magnetic excitations is rather limited. Inelastic neutron scattering work by Lipscombe et al. revealed the persistence of magnetic excitations up to 160 meV in an overdoped LSCO. This surprising result motivates us to investigate further the high energy magnetic excitations using RIXS in Ca-doped YBCO and Tl2201 compounds. We show that the high energy part of the excitation spectrum is essentially unaffected with hole doping, and that excitations up to 300 meV survive even at doping levels at which SC vanishes.

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