

Elementary Magnetic Excitations probed by Resonant Inelastic X-ray Scattering

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Resonant Inelastic X-ray Scattering (RIXS) provides direct access to elementary charge, spin and orbital excitations in complex oxides.

As a technique it has made tremendous progress with the advent high-brilliance synchrotron x-ray sources.

The fundamental question that arises is to precisely which low-energy correlation functions RIXS is sensitive.

I will show that depending on the experimental RIXS set up, the measured charge dynamics can include charge-transfer, d-d and orbital excitations [1,2]. RIXS also allows probing spin dynamics, in particular magnons and bi-magnons dispersions [3,4]. Based on these observations, I will discuss the novelties that RIXS reveals on the spin dynamics of High T_c cuprates [5].

[1] Van den Brink and Van Veenendaal, EPL 73, 121 (2006).

[2] Forte et al., PRL 101, 106406 (2008).

[3] Braicovich et al., PRL 102, 167401 (2009).

[4] Ament et al., PRL 103, 117003 (2009).

[4] Braicovich et al., PRL 104, 077002 (2010).