

Spin Excitations Studied by Resonant Inelastic X-ray Scattering

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Magnetic order results from the exchange interaction among neighbouring moments at the interatomic scale. A microscopic description of magnetism requires thus the determination of both the atomic moments and their interaction. Both quantities concur to give the energy elementary spin excitations, i.e. magnons or spin waves, and of their dispersion. And, ultimately, to the dynamical susceptibility. This class of experiments has been the exclusive realm of inelastic neutron scattering for about half century. But since a few years, resonant inelastic X-ray scattering (RIXS) has been demonstrated to be effective for the determination of magnon dispersion in selected materials, mostly based on transition metals. I will explain why the choice of the absorption resonance is the key for these experiments and I will present some important examples concerning mostly antiferromagnetic materials, such as cuprates [1,2,3], NiO [4], iridates [5], ruthenates [6].

References

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