TECHNISCHE UNIVERSITÄT WIEN

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EINLADUNG zum IFP-SEMINAR

Resonant Inelastic X-ray Scattering of Transition Metal Oxides

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Host:	Atsushi Hariki
Termin:	30. Oktober 2018, 16:00 Uhr
Ort:	Institut für Festkörperphysik, TU Wien
	Wiedner Hauptstraße 8-10, 1040 Wien
	Seminarraum DC rot 07 (roter Bereich, 7. OG)

New developments in resonant inelastic x-ray scattering (RIXS) will be discussed. First an introduction is given of the interpretation of x-ray absorption resonances [1,2]. In 2p3d RIXS one scans through the 2p XAS edge and measures the low energy excitations, including phonons, magnons, dd-excitations and charge transfer. The 100 meV resolved 2p3d RIXS spectra of ruby (Cr3+ in Al2O3), Fe3O4 and LaCoO3 will be discussed [3-6]. The present experimental resolution of 30 to 100 meV allows the detailed observation of the electronic structure, including the determination of crystal field parameters, covalency parameters and spin-orbit coupling, but also the momentum dependence of magnons and other low energy excitations. Related to the RIXS measurements is the analysis of Fluorescence yield (FY) detected x-ray absorption spectra (XAS), including the intrinsic deviations of FY-XAS spectral shape from the XAS spectrum that is important for XMCD [7] and also for measurements with x-ray free electron lasers [8,9].

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[1] Core Level Spectroscopy of Solids
Frank de Groot and Akio Kotani (Taylor & Francis CRC press, 2008)
[2] Download the x-ray spectroscopy simulation software at http://www.anorg.chem.uu.nl/CTM4XAS/
[3] Huang et al. Nature Comm. 8, 15929 (2017).
[4] Tomiyasu et al. Phys. Rev. Lett. 119, 196402 (2017)
[5] Wang et al. Phys. Rev. B. 98, 035149 (2018)
[6] Hunault et al., J. Phys. Chem A. 122, 4399 (2018)
[7] Liu et al. Phys. Rev. B. 96, 054446 (2018)
[8] F.M.F. de Groot, Nature Chemistry 4, 766 (2012)
[9] Mitzner et al. J. Phys. Chem. Lett. 4, 3641 (2013)
