Oral presentation

MagStREXS: new possibilities to study magnetic structures through resonant elastic X-ray scattering

P. J. Bereciartua[1], S. Francoual[1], J. Rodríguez-Carvajal[2], F.-E. Picca[3]

[1]Deutsches Elektronen-Synchrotron DESY, Notkestraße 85, Hamburg, Germany, [2]Institut Laue-Langevin ILL, 71 avenue des Martyrs, Grenoble, France, [3]SOLEIL, L'Orme des Merisiers, Saint-Aubin, France

pablo.bereciartua@desy.de

Resonant Elastic X-ray Scattering (REXS) is a powerful technique successfully employed to investigate a wide range of phenomena both in solids and thin films [1-3]. The particular combination of diffraction and spectroscopy features of this experimental approach allows the study of different charge, spin, and orbital orderings.

The beamline P09 [4] at PETRA III (DESY) is dedicated to the REXS technique, and one of the main research topics at the beamline is the application of this technique to the study of magnetic structures. This is achieved by combining different experimental capabilities implemented at P09, like a small incident beam, a high photon flux, a full control of the incident polarization and the possibility of determining the polarization of the scattered X-ray beam.

However, the analysis of magnetic data collected in a REXS experiment is very intricate and the lack of any tool to facilitate such analysis slows down and even prevents the achievement of proper results. To overcome this difficulty, there is an ongoing project at P09 beamline to develop MagStREXS: a crystallographic software to analyse magnetic structures based on REXS diffraction data. The aim of MagStREXS is to simplify the analysis of this type of data to the non-specialist in the field.

In this talk some basic ideas about the REXS technique will be presented, together with the different experimental possibilities available at beamline P09 for the application of this technique to the study of magnetic structures. The main part of the presentation will be dedicated to the program MagStREXS and the most relevant features implemented until now, introducing some examples of magnetic structures investigated with this software in the field of strongly correlated systems.

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