Contribution ID: **360** Type: **Talk**

【702】Yet another approach to tackle the phase problem of diffraction experimentally

Thursday 29 August 2019 14:30 (30 minutes)

Standard diffraction experiments are routinely used to investigate the (PERIODIC) structure of materials. However, they only yield information on the amplitudes while the phase information is lost ('phase problem' of diffraction).
In this talk we will experimentally demonstrate by the example of a simple one-dimensional holographic grating how the entire information - amplitude and phase - of the Fourier components for this periodic structure can be retrieved. The wavelength of scattered radiation is intentionally chosen much smaller than the grating spacing so that diffraction occurs in the nonstandard multi-wave regime. By employing the so-called rigorous coupled wave analysis to model the angular dependence of the diffraction efficiencies we are able to determine the refractive-index profile (= the structure) of the holographic grating completely.

Authors: FALLY, Martin (University of Vienna, Austria); KLEPP, Jürgen (Uni Wien); Dr KOHLBRECHER, Joachim (Laboratory for Neutron Scattering and Imaging, Paul Scherrer Institut); GUO, Jinxin (University of Electro-Communications Tokyo & Beijing University of Technology); TOMITA, Yasuo (University of Electro-Communications Tokyo)

Presenter: FALLY, Martin (University of Vienna, Austria)

Session Classification: Quantum Beam Science: bio, materials and fundamental physics with neutrons and X-rays