

BioRef will be a time-of-flight reflectometer complementing the monochromator based V6 reflectometer at Hahn-Meitner Institute. Combined with an in-situ infrared spectrometer it will be optimised for soft matter applications at solid-liquid interfaces. A flexible double-chopper set-up together with a wavelength band chopper will enable the selection of well defined wavelength bands at different wavelength resolutions in order to optimize measurements with regard to the given application. The selection of different distances between the first choppers allow for choosing constant resolutions of $\delta\lambda/\lambda$ between 1% and 5% , while different frequencies of the choppers are intended to alter the used bandwidth. A width of the band of 4 Å up to 12 Å can be selected between a minimum wavelength of app. 3 Å and a maximum of 15 Å. Lower wavelength resolutions than 5% can be realised when giving up the constant resolution. A state-of-the-art 2D position sensitive ^3He detector will be used for the reflectivity measurements in horizontal scattering geometry. The time-of-flight mode is also chosen to realise the investigation of dynamic interface processes under shear and flow conditions. A q-range spanning 3 orders of magnitude and reflectivity measurements over 7 orders of magnitude are envisaged and their feasibility is supported by Monte Carlo simulations.

Keywords: neutron time-of-flight, neutron reflectivity, infrared spectroscopy

P01.08.59

Acta Cryst. (2008). A64, C189

The new polarised hot neutron single crystal diffractometer POLI-HEiDi at FRM II

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Polarised neutron diffraction is one of the most important tools to determine magnetic structures. One-dimensional neutron polarisation analysis is used to determine the directions of magnetic moments. In addition, the recently developed spherical neutron polarimetry (SNP) is very useful to investigate complex magnetic structures in detail. For instance, the non-diagonal terms of polarisation matrices measured in SNP give us important informations on chiralities and magnetic domains of magnetic structures. The new polarised neutron diffractometer POLI-HEiDi- currently under construction at the hot neutron source (SR 9) at FRM II -is dedicated to investigate complex magnetic structures by means of SNP. Two zero-field polarimeters, the Cryopad and the MuPAD, are available for this task and could be used with the new instrument. ^3He spin filters will be used for producing and analysing the neutron polarisation. New important parts and components for the polarised neutron diffractometer POLI-HEiDi were build and tested recently. In this report we will present these new components as well as the concept and design of the whole instrument. For 2008 the commissioning of the most important components like the detector-analyser unit Decpol, the zero-field sample environment Cryopad as well as the controlling electronics software is planned. Our project is carried out by the Institut fuer Kristallographie, RWTH Aachen University with financial support of the German Ministry of Education and Science (BMBF).

Keywords: neutron instrumentation, polarized neutron scattering, neutron spin filtering

P01.09.60

Acta Cryst. (2008). A64, C189

Polarimetric neutron spin echo spectroscopy

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Neutron Spin Echo spectroscopy (NSE) uses polarized neutrons and in turn polarization analysis is an intrinsic feature of NSE. However, the multifaceted dynamics of antiferromagnets and hellimagnets ask for more than the classical Neutron Spin Echo set-up (NSE). In these systems the magnetic interaction vector is complex and the neutron beam polarization is not necessarily flipped upon scattering but can rotate at any angle around or towards a specific direction. The only way to access the components of the scattered polarization that are transverse to the incoming polarization is to implement a zero-field area around the sample position. Here we present the feasibility test and first results of the Polarimetric NSE, a powerful technique which combines a variant of the Intensity Modulated NSE (IMNSE) and the Cryopad. The Cryopad is a zero-field polarimeter based on Meissner shields and mu-metal screens able to do the most generalized polarization analysis experiments measuring all theoretically possible pair-correlation functions at any point of the reciprocal space. On the other side, IMNSE is a powerful variant of NSE that disconnects completely the sample area from the precession area at the price of some intensity losses due to the addition of polarizer and analyzer devices. This new technique was successfully developed on the wide angle NSE spectrometer SPAN at the HMI and then implemented on IN15 at the ILL, where new results on the magnetic relaxation in MnSi, a reference hellimagnet were obtained.

Keywords: neutron spin echo, neutron polarization analysis, chirality

P01.08.61

Acta Cryst. (2008). A64, C189-190

The study of thermal diffuse scattering measured by pulsed neutron diffraction

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In this presentation, we will report the experimental results of the thermal diffuse scattering (TDS) around strong Bragg peaks in some analyzer crystals measured by pulsed neutron diffraction technique at near back scattering conditions and discuss the comparison of those experimental results with theoretical predictions. We measured the thermal diffuse scatterings around some analyzer crystals Bragg peaks; pyrolytic graphite PG(002),

