



Contribution ID: 20

Type: Poster

The High Resolution Diffraction Beamline P08

The beamline P08 is situated at the 3rd generation synchrotron radiation source PETRA III in Ham-burg, Germany and is operational since fall 2009. It is designed for investigations on surfaces, nano- and microstructures, liquid interfaces, Langmuir monolayers and also bulk samples with an emphasis on diffraction and scattering methods and in situ capabilities.

P08 is an undulator beamline with beam properties adjustable over a wide range using the high heat load double crystal monochromator, the large offset monochromator, and 2 sets of compound re-fractive lenses in the optics hutch at a focal distance of ~ 30 m and in the experimental hutch at ~ 2 m. Using the different lens sets P08 can be run in four basic modes of operation: without any lenses, in collimation mode using the first lens set for beam collimation, in 1:1 focusing mode using the first lens set for focusing the beam, and a microfocusing mode (μM) using a combination of lens set. The beam size can be varied between $1500 \times 1000 \mu\text{m}^2$ and $20 \times 2 \mu\text{m}^2$. The photon energy can be tuned in a range from 5.4 and 29.4 keV with a flux between 1011 and 1012 photons per sec-ond.

In the experimental hutch three instruments are available. A high precision 6-circle diffractometer with Eulerian cradle is dedicated to investigations of hard condensed matter samples. It can fit sam-ple environments up to 30 kg weight with a precision of 0.0005° and wobble of $20 \mu\text{m}$. It is mainly used for structural investigations of thin films, surface structures, and nanoparticles and wires on solid support as well as strain/stress measurements.

A diffractometer specialized for liquid scattering called LISA has been established in cooperation with the group of O. Magnussen and B. Murphy (CAU Kiel). This instrument allows changing the incident angle of the x-rays on the samples without moving the sample. It can host a broad range of in situ sample environments such as Langmuir troughs or electrochemical cells and offers diffraction and scattering over a wide q-range in-plane and out-of-plane.

An instrument for grazing incidence diffraction from a Langmuir trough at a fixed incident angle was recently installed at the beamline. Using a quartz mirror the beam is reflected down to the liquid surface. The diffraction pattern is collected by a Mythen strip detector with a Soller collima-tor. In this setup background scattering can be suppressed very efficiently.

Please select the related topic from the list below

Instrumentation and methods

Primary author: BERTRAM, Florian (Deutsches Elektronen-Synchrotron (DESY))

Co-authors: Mr KIRCHHOF, René (Deutsches Elektronen-Synchrotron (DESY)); SHEN, Chen (Deutsches Elektronen-Synchrotron DESY); Dr DEY, Arka (Deutsches Elektronen-Synchrotron (DESY)); Dr BHARATIYA, Bhaveshkumar (Deutsches Elektronen-Synchrotron (DESY))

Presenter: BERTRAM, Florian (Deutsches Elektronen-Synchrotron (DESY))

Session Classification: Poster session