Contribution ID: **139** Type: **Poster**

High-Flux XAFS-Beamline P64 at PETRA III

Monday, 17 September 2018 17:45 (15 minutes)

Beamline P64 is dedicated to XAFS-experiments which require high flux like QEXAFS on the 10ms time-scale, EXAFS of highly diluted systems, and resonant high-resolution x-ray emission spectroscopy. We will present the optical set-up of the beamline (undulator, monochromators, mirrors, detectors), characteristics of these components, describe different operation modes for EXAFS-scans (continuous versus step-scans), and show some typical data from the first 2 years of user operation.
The time required for one energy scan varies from 10ms (QEXAFS) to 1200s (measurements of highly diluted systems). In the first case, the undulator is tapered in order to broaden its energy spectrum, and a special monochromator oscillates with a frequency of 50Hz while the intensities of the detectors and the angle of the monochromator are measured simultaneously with 2MHz. In the latter case, monochromator and undulator move together from one energy-point to the next, and the intensities are recorded (step-scan). This type of scan is applied for highly diluted samples in combination with a 100-element energy-dispersive Ge-Detector. Conventional continuous scans take 60-300s.
So far, users have performed experiments in the fields of solid state physics, catalysis, bio-chemistry, biology, and environmental sciences with different sample environments like cryostats, electro-chemical cells, capillary-reactors, with liquid jets, or as conventional pellets in air.

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Session Classification: Poster session 1

Track Classification: P1 Instrumentation and methods