

PETRA III Variable Polarization XUV Beamline P04 Users Meeting

Thursday 12 June 2014

Registration - L202 in building 48e (12:30-13:00)

Status reports - L202 in building 48e (13:00-14:30)

time	title	presenter
13:00	Facility Status PETRA III	SEECK, Oliver
13:30	Report on beamline P04 at PETRA III	VIEFHAUS, Jens

Coffee break - L202 in building 48e (14:30-15:00)

User reports - L202 in building 48e (15:00-16:30)

time	title	presenter
15:00	ASPHERE III at P04: Towards combined momentum, spin, and position resolved photoelectron spectroscopy	KALLAENE, Matthias
15:30	Fast-XPS measurements for synthesis and investigation of advanced materials at beamline P04 (PETRA III, DESY).	BABENKOV, Sergey
15:50	Graphene formation on cubic SiC - perspectives for mass production	ARISTOV, Victor
16:10	Advanced materials studies at P04	MOLODTSOVA, Olga

Coffee break - L202 in building 48e (16:30-17:00)

User reports - L202 in building 48e (17:00-18:30)

time	title	presenter
17:00	Opportunities for Photoemission Experiments on Deposited Size Selected Clusters at P04	BAEV, Ivan
17:30	Magnetism of size-selected cobalt mono-, di- and trimers on Cu(100)	BEECK, Torben
18:00	The resonant soft x-ray diffractometer at P04: First results	SCHUESSLER-LANGEHEINE, Christian

Poster session - L202 in building 48e (18:30-20:00)

time	title	presenter
18:30	Poster session	Various

Dinner - L202 in building 48e (20:00-22:00)

Final

as of 10 June 2014

Friday 13 June 2014

User reports - L202 in building 48e (08:30-10:30)

time	title	presenter
08:30	Innershell photoionization of atomic ions employing the photon-ion merged-beams technique at PIPE	SCHIPPERS, Stefan
09:00	Absorption Spectroscopy on small Molecules and metal-alloy Clusters	KLUMPP, Stephan
09:30	COLTRIMS at P04	JAHNKE, Till
10:00	Photon-induced fluorescence-spectrometry experiments at the P04	KNIE, André

Coffee break - L202 in building 48e (10:30-11:00)

User reports - L202 in building 48e (11:00-13:00)

time	title	presenter
11:00	Coherence measurements at P04	SKOPINTSEV, Petr
11:30	Soft X-ray holographic Microscopy	BAGSCHIK, Kai
12:00	Versatile X-ray Microscopy Endstation for the XUV Beamline P04 at PETRA III	WILHEIN, Thomas
12:30	Time-resolved soft X-ray microscopy of magnetic nanostructures at the P04 beamline of PETRA III	WESSELS, Philipp

Lunch break - L202 in building 48e (13:00-14:00)

User reports - L202 in building 48e (14:00-15:30)

time	title	presenter
14:00	ChemRIXS to probe the electronic state of chemical systems in liquid phase	YIN, Zhong
14:30	Ptychographical imaging of biological samples at P04	ROSE, Max
15:00	In-situ UHV growth studies using grazing incidence scattering	ROTH, Stephan V.

Open discussion and meeting summary - L202 in building 48e (15:30-16:00)

time	title	presenter
15:30	P04 users meeting summary	VIEFHAUS, Jens

1 - Photoionization and photofragmentation of multiply charged Lu₃N@C₈₀^{q+} 80 ions

Poster session

Presenter: Mr. HELLHUND, Jonas (IAMP / University Gießen)

P O S T E R

Photoionization and Photofragmentation of Lu₃N@C₈₀^{q+} (q = 1; 2; 3) endohedral fullerene ions has been studied using the new Photon-Ion spectrometer at PETRAIII (PIPE). Solid endohedral fullerene material was evaporated inside an ECR ion source. The generated ions were mass/charge selected and the ion beam was merged with the photon beam from PETRAIII beamline P04. Product-ion yields normalized to ion current and photon flux, i.e., relative cross sections, were measured as a function of photon energy. The experimental photon-energy range was 270 - 1700 eV. This range comprises the energies for 1s ionization of carbon and nitrogen as well as for 3d-ionization of lutetium.

The measured spectra exhibit clear signatures of carbon K-shell excitation, but no signs of excitation or ionization of encapsulated N or Lu producing vacancies in the 1s and 3d shells, respectively, have been observed. This is in contrast to recent findings for photo fragmentation of Xe@C₆₀⁺ [1] at energies of 60 -150 eV. We speculate that the carbon cage and the encaged Lu₃N molecule completely disintegrate into relatively small fragments after absorption of one energetic photon.

[1] R. A. Phaneuf et al., Phys. Rev. A 88, 053402 (2013).

2 - Traptor - A radiofrequency ion trap for PIPE

Poster session

Presenter: Dr. KLUMPP, Stephan (Universität Hamburg)

Poster

3 - ASPHERE III at P04: Towards combined momentum, spin, and position resolved photoelectron spectroscopy

Poster session

Presenter: Mr. QUER, Arndt (University of Kiel)

Poster

ASPHERE III is a newly developed BMBF funded angle-, position-, and spin-resolving photoelectron spectrometer that fully exploits the unique capabilities of the variable polarization soft X-ray beamline of PETRA III. Combining a highly efficient Scienta R4000 photoelectron analyzer with the brilliant, widely tunable (250–3000 eV), and highly monochromatic photon beam of the beamline and, complementary, with the monochromatized beam of a VUV-He- and Xe-plasma source, the experimental setup enables the direct comparison between bulk and surface electronic structures of solids. Since the analyzer can be rotated around the sample by a UHV goniometer, complete three-dimensional band structures and Fermi surfaces can be determined without sample rotation at a spatial resolution given by the synchrotron spot size (ultimately <1 μm). Moreover, the measured momentum- and position-resolved electronic structure can directly be connected with the geometric structure determined by XPD from the same spot on the sample and by STM and LEED from the same sample surface. In addition, the installed 3D-Mott spin detector enables the investigation of the momentum-dependent magnetic properties that can be compared to complementary atomic-site specific XMCD and XLD measurements. All spectroscopic investigations can be performed in situ and in real time during sample temperature changes controlled with a He-flow cryostat as well as during deposition of alkali and transition metals on sample surfaces.

4 - Photoelectron-Photoion Coincidence Experiments on Halomethane Molecules

Poster session

Presenter: Mr. DENIS, Anielski (MPIK, DESY)

We have measured the molecular-frame photoelectron angular distributions (MFPADs) for inner-shell photoionization of the halomethanes CH₃F, CH₃I, and CF₃I in the gas-phase. Using our new double-sided velocity map imaging (VMI) spectrometer optimized for electron-ion coincidence measurements of high-kinetic energy electrons, we are able to determine MFPADs for photoelectrons up to 300 eV. For these high kinetic energies, the MFPADs are dominated by diffraction effects that encode information on the molecular geometry in the MFPADs.

5 - In-situ realtime spectroscopy of topological insulator surfaces

Poster session

Presenter: SEIBEL, Christoph

Poster

6 - Experiments at mK temperatures and high magnetic fields

Poster session

Presenter: BEECK, Torben (Institut für Experimentalphysik, Universität Hamburg)

Poster

7 - Photon-induced fluorescence-spectrometry

Poster session

Presenter: KNIE, André

poster

8 - Angle-resolved spectroscopy of electronemission from chiral molecules

Poster session

Presenter: Dr. RUDOLPH, Jan (Institut für Atom- und Molekülphysik, Universität Gießen)

poster

9 - The PERCIVAL Soft X-ray Imager

Poster session

Presenter: MARRAS, Alessandro (DESY)

PERCIVAL is a Soft-X-ray detector under development as a collaboration between DESY, STFC, ELETTRA and DIAMOND. The goal of the collaboration is to provide the scientific community with a large pixellated detector featuring both a large dynamic range and a good spatial resolution, and having characteristics compatible with low-energy FEL and synchrotron sources.

10 - Cold and controlled molecules for X-ray diffraction and absorption experiments

Poster session

Presenter: Dr. TRIPPEL, Sebastian (CFEL)

We are developing innovative methods to obtain full control over large molecules in the gas phase. This includes the translational and rotational motions as well as quantum state selection. The isolated and controlled molecules serve as ideal targets for X-ray experiments on single molecules. First results on the ionization of indole and indole water clusters will be presented in terms PEPICO maps.

11 - Optical control of the 2nd step Auger cascade in photoexcited Ne 1s-1np

Poster session

Presenter: Dr. ALBERTO, De Fanis (European XFEL)

In a two-color experiment (XUV+VIS) with a coincidence setup based on an electron magnetic bottle and an ion mass spectrometer, we have studied how the presence of the VIS radiation ($h\nu_{\text{VIS}}=2.4\text{eV}$) changes the energy spectra for the 2nd step Auger by varying the temporal delay between XUV and VIS pulses. The selected case is Ne 1s, but the situation is general and can be applied to other systems.

12 - High-resolution Soft X-ray Holographic Imaging @ P04, PETRA III

Poster session

Presenter: BACH, Judith

Poster

13 - Molecular cross section oscillations over a large photon energy range measured at P04 beamline

Poster session

Presenter: HARTMANN, Gregor