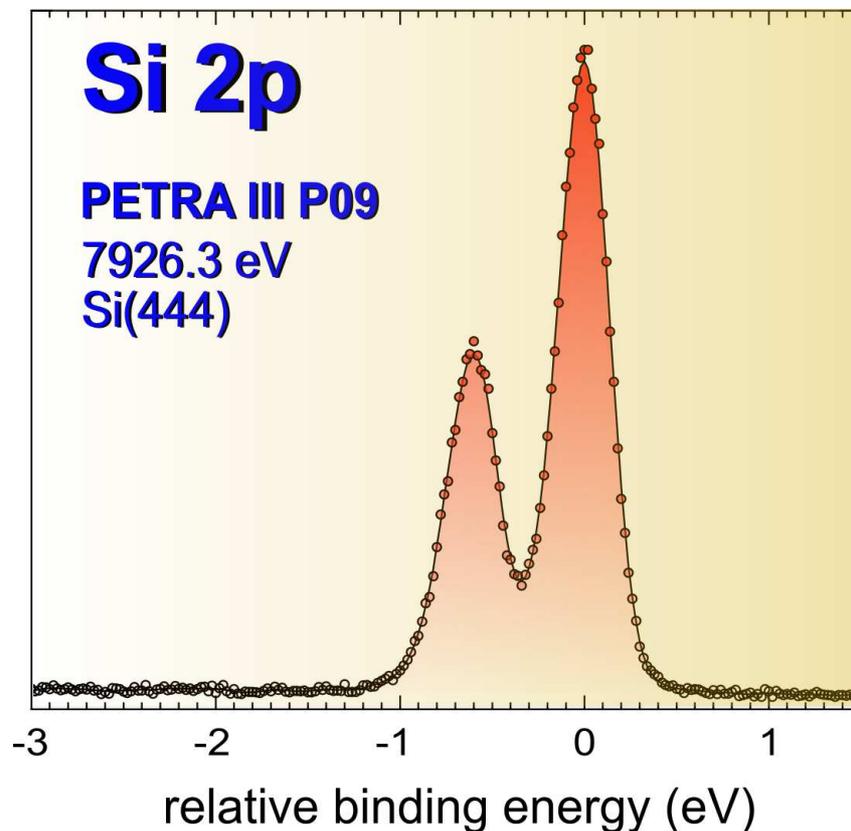


# HAXPES on the beamline P09 at PETRA III

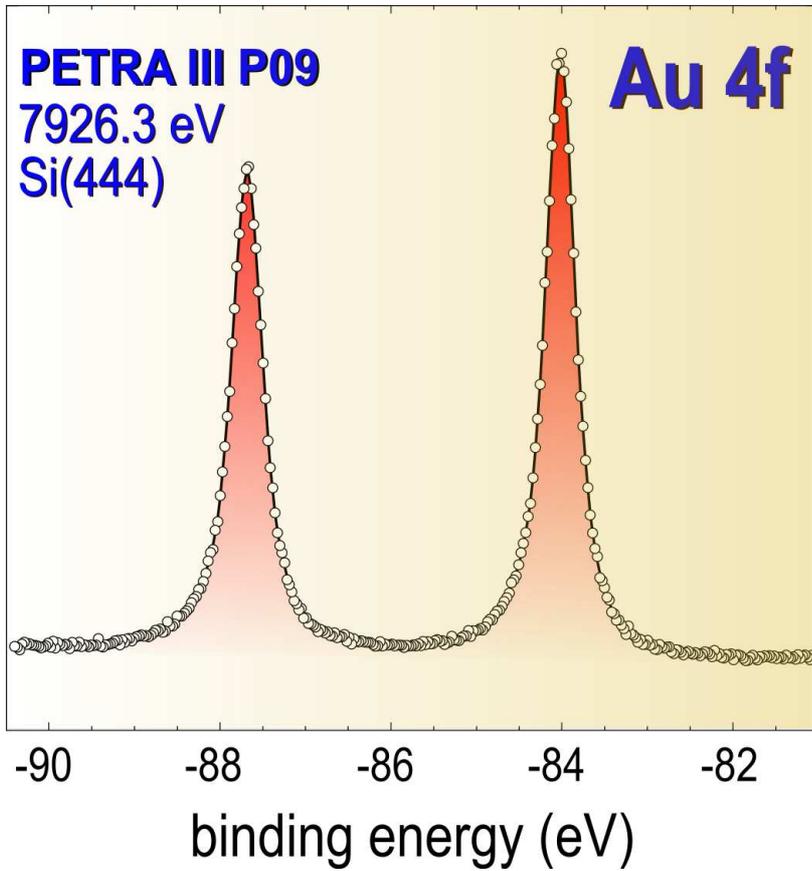
## Technical Notes

For revealing properties of bulk and interface structures, Hard X-ray Photoelectron Spectroscopy (HAXPES) is expected to be used increasingly in the near future, due to the decreased surface- and increased bulk sensitivity. In addition, using grazing incidence photons, HAXPES can provide extreme surface sensitivity. In grazing incidence geometry, at and near the angle of total external x-ray reflection, one makes use of the excitation of the photoelectrons by an evanescent wave near the sample surface. The gain of photoelectron intensity in grazing incidence geometry in respect to a 45° geometry is typically a factor of 9.

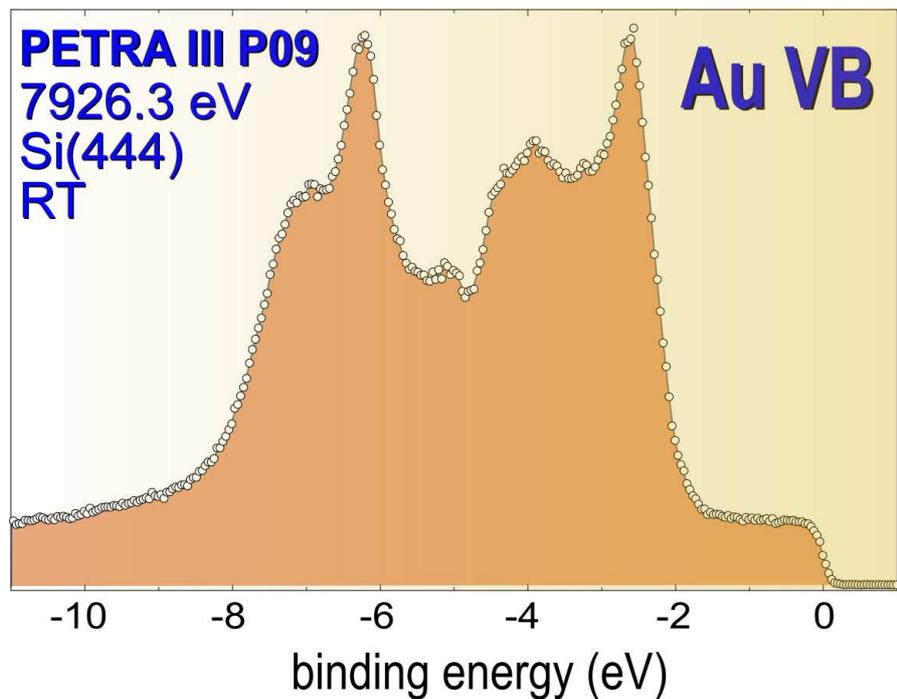
The HAXPES chamber at the P09 photoelectron spectroscopy beamline from PETRA III is equipped with a SPECS PHOIBOS 225 HV hemispherical analyzer that allows the detection of electrons with kinetic energies up to 15 keV. The instrument is equipped with a low noise 3D-DLD Delayline detector from Surface Concept, which is ideally suited for the low count rates typically encountered in high resolution experiments. The grazing incidence geometry was tested at 7.926 keV measuring on a Si and Au sample. The photon energy width is brought down to 50 meV using a Si (311) monochromator and Si (444) post-monochromator.



The high resolution capability of the PHOIBOS 225 HV analyzer and the P09 beamline was demonstrated by HAXPES measurements on Silicon (100). The spin orbit splitting of the Si 2p states is clearly resolved. Data courtesy of Andrei Hloskovskyy, Sebastian Thieß and Wolfgang Drube, PETRA III, Hamburg, Germany



The high resolution capability of the PHOIBOS 225 HV analyzer and the P09 beamline was demonstrated by HAXPES measurements on Au. Data courtesy of Andrei Hloskovskyy, Sebastian Thieß and Wolfgang Drube, PETRA III, Hamburg, Germany



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