Research potential of UARPES beamline

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The UARPES beamline is used to probe the electronic band structure of solids by using angle-resolved photoelectron spectroscopy (ARPES). The beamline has been designed for studying fine effects in band structures of solids including topological insulators, superconductors and other strongly correlated systems, Dirac-type systems, Rashba-type systems, graphene and similar 2D materials, semiconductor and metal surfaces, Weyl metals, thin films and quantum well systems, solids containing charge and spin density waves and others.

The measuring system provides users efficient ultra-high resolution angle-resolved photoelectron spectroscopy with 8-150 eV photon energy and soft x-ray photoelectron spectroscopy with up to 600 eV photon energy. A source of photons for the beamline is a quasiperiodic elliptically polarizing undulator (EPU) of Apple II type, allowing for full control over the photon beam polarization. The undulator radiation is monochromatized with Plane Grating Monochromator (PGM) or Normal Incidence Monochromator (NIM) which are available in range 12-600 eV and 8-20 eV, respectively. The heart of the end station is a hemispherical electron spectrometer VG SCIENTA DA-30L that can measure the 3D photocurrent map I(ϕ,θ,E) which is then converted to E(**k**) relation. Its angular resolution is 0.1° and its energy resolution is 1.8meV. The sample temperature can be stabilized in the range 7-500 K. The attached preparation chamber allows for sample preparation *in situ* and diagnostics of the surface structure of the sample (available techniques: LEED, AES, RGA, QCM). The preparation chamber is also prepared for quick and easy installation of user devices such as effusion cells or vacuum suitcases.

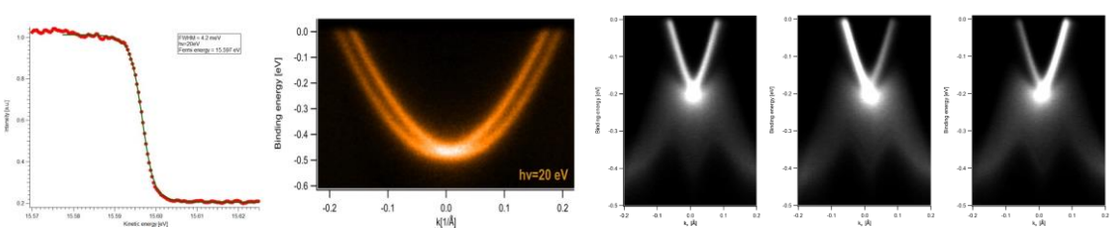

Figure 1. The Fermi step at 8 K on polycrystalline gold and fitted a convolution of the Fermi distribution and the Gaussian (a); Rashba spin split Au(111) surface band (b); illustration of the photoemission circular dichroism effect on Be_2Te_3 - data for: horizontal (c), left (d) and right (e) circular polarization of the photon beam.