

Einladung zum
Laser- und Quantenoptikseminar

Am Freitag, 21.04.2017, um 10:00 Uhr
Raum 46-387/388

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Rapid 3D Mapping of Fermi Surface and Fermi Velocity
by means of Time-of Flight k -Microscope

The electronic structure of solids is a key element in materials research and –design. All transport and thermodynamical quantities of the electron system of a material strongly depend on the Fermi surface and velocity v_F . Angular-resolved photoemission (ARPES) is a well-known conventional tool to study the electronic structure. In the present talk a new way of performing ARPES on solids will be demonstrated by means of *momentum microscopy* in the soft X-ray range. The presentation will be focused on the performance of the *momentum microscope* namely rapid 3D mapping of Fermi surface and evaluation of Fermi velocity of tungsten [1]. High-resolution imaging of the *Fourier plane* of a cathode lens is combined with *time-of-flight* (ToF) energy recording, yielding maximal parallelization. The field of view in k -space exceeds the first Brillouin zone, the energy range comprises several eV. Tunable soft X-rays allow variation of the momentum component perpendicular to the surface via direct transitions to free-electron-like final states. The new approach directly yields the 4D spectral density function $\rho(E_B; \mathbf{k})$ (weighted by the photoemission cross section), with $\sim 10^8$ resolved data points.

[1] K. Medjanik et al., *Nat.Mater.*10.1038/NMAT4875 (2017).

Der Gast wird betreut von JProf. Dr. B. Stadtmüller
GÄSTE SIND HERZLICH WILLKOMMEN!