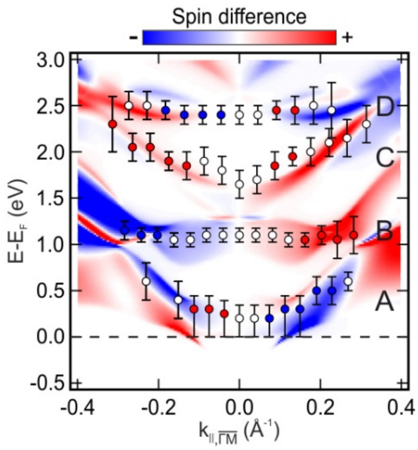
Montag, 15.05.2017 um 15.15Uhr
Ort: Seminarraum 87, Wilhelm-Klemm-Straße 10

Unraveling the Spin Structure of Unoccupied States in Bi2Se3

Christian Datzer
AG Donath
Physikalisches Institut

In topological insulators (TIs), spin-orbit coupling leads to the emergence of metallic topological surface states crossing the fundamental band gap. They exhibit a Dirac-cone-like dispersion with a helical spin structure. Bi2Se3(111) is the most prominent prototypical TI featuring a simple band structure with a single Dirac cone close to the Fermi level around the center of the surface Brillouin zone. Due to the interesting spin structure, TIs have emerged as promising materials in the field of spintronics and optospintronics. Ultrafast light pulses might pave a way to control spin currents. In this context, a profound knowledge about the dispersion and the spin polarization of both the occupied and the unoccupied electronic states is required. The authors present a joint experimental and theoretical study on the unoccupied electronic states of the topological insulator Bi2Se3. They discuss spin- and angle-resolved inverse photoemission results in comparison with calculations for both the intrinsic band structure and, within the one-step model of (inverse) photoemission, the expected spectral intensities. This allows them to unravel the intrinsic spin texture of the unoccupied bands at the surface of Bi2Se3.



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