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INSTITUT FÜR
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Institute of Applied Physics
vormals/formerly
Institut für Allgemeine Physik



Wiedner Hauptstraße 8-10/E134, 1040 Wien/Vienna, Austria – Tel: +43 1 58801 13401 / Fax: +43 1 58801 13499 – E-mail: office@iap.tuwien.ac.at / <http://www.iap.tuwien.ac.at>

IAP-SEMINAR

EINLADUNG

Termin: **Dienstag, 4.5.2010 um 16:00 Uhr**
Ort: **Technische Universität Wien,
Institut für Angewandte Physik,
Seminarraum 134A, Turm B (gelbe Leitfarbe), 5. OG
1040 Wien, Wiedner Hauptstraße 8-10**

Vortragender: **Dr. Hugo Dil**
Physik-Institut, Universität Zürich/CH

Thema: **Spin- and angle-resolved photoemission on low dimensional
Rashba systems**

Kurzfassung

Combining an angle-resolved photoelectron spectrometer equipped with a three-dimensional spin polarimeter [1] and a new two-step fitting routine [2] we can measure absolute spin polarization vectors for individual bands intersected in a particular set of ARPES data[3]. This procedure is crucial when analyzing strongly overlapping peaks or weak signals sitting on a large unpolarized background, especially in the presence of non-collinear spins. It is robust against strong intensity variations due to matrix element effects because it references the spin polarization contribution of each band to the measured peak intensity.

The method is applied to two-dimensional systems where spin-orbit effects lead to spin splittings and complex momentum-dependent spin structures. Presented case studies include surface alloys of Bi and Pb on Ag(111) that show a giant Rashba effect [2], as well as ultrathin Pb layers on Si(111) [4], where by introducing the electron spin as an additional tag Rashba splittings of less than 10 meV could be resolved. Further it will be shown how this powerful technique can be applied to increasingly complex systems, such as topological insulators [5] or their one-dimensional parent compounds [6].

References:

- [1] M. Hoesch et al., J. Elec. Spec. Rel. Ph. **124**, 263 (2002)
- [2] F. Meier et al., PRB **77**, 165431 (2008)
- [3] For a review see: J. H. Dil, Journal of Physics: Cond. Mat. **21**, 403001 (2009)
- [4] J. H. Dil et al. PRL **101**, 266802 (2008)
- [5] D. Hsieh et al. Science **323**, 919 (2009)
- [6] J. W. Wells et al. PRL **102**, 096802 (2009)

*Alle interessierten Kolleginnen und Kollegen sind zu diesem Seminar
(45 min mit anschließender gemeinsamer Diskussion) herzlich eingeladen.*

*U. Diebold e.h.
(Seminar-Chairperson)*

*H. Störi e.h.
(LVA-Leiter)*

