Overlayer Quantum Well States

Application Notes

Angle-resolved one-photon photoemission was used to investigate angular resolved photoemission from Ag overlayers on Cu(111).
Confinement of electrons often leads to strongly modified physical properties. In a thin film, electrons can be confined by an energy band gap or by symmetry or wave vector-dependent gap in the substrate on one side, and the vacuum barrier on the other, leading to the formation of discrete quantum-well states that can be probed directly by ARPES.

The surface has been analyzed using a PHOIBOS 150 analyzer with the 2D-CCD Detector at **1 eV kinetic energy and 20 eV pass energy**. Using this setting the energy **window of the detector is 1.4 eV wide**. The 4th harmonic of a laser system (hn = 5.8 eV) is used to excite the electrons.

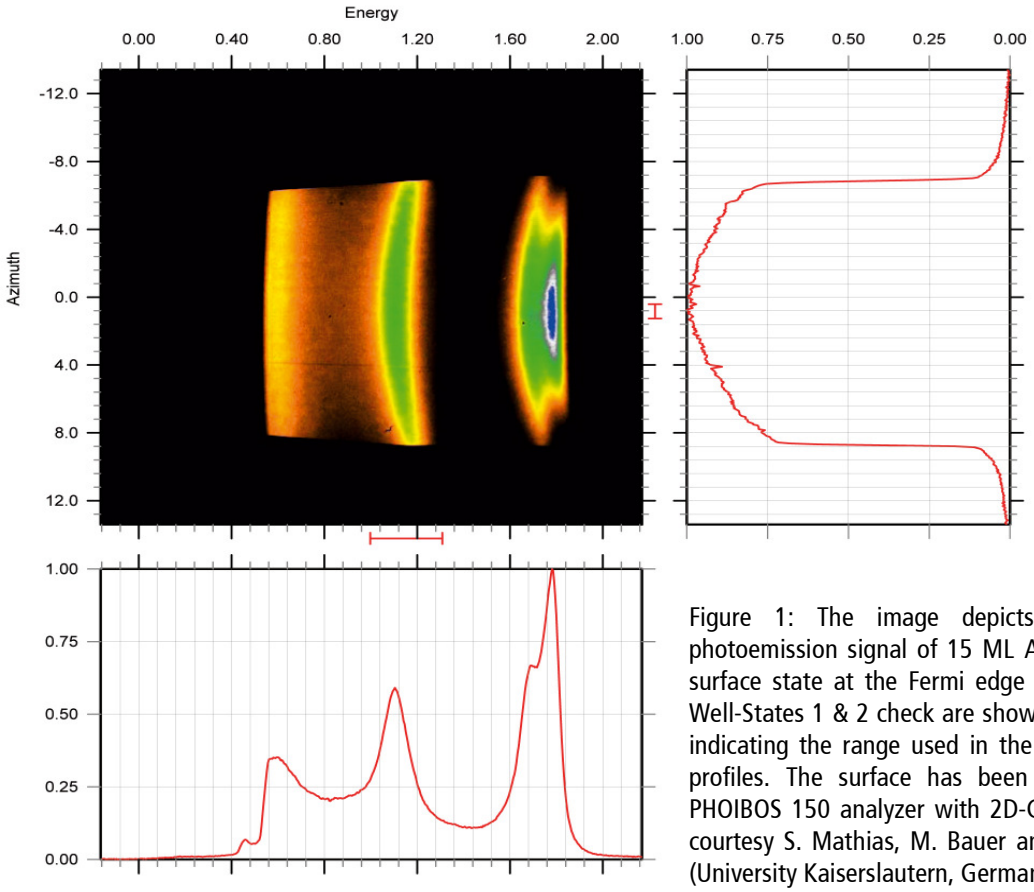

Figure 1: The image depicts the one-photon photoemission signal of 15 ML Ag on Cu(111). The surface state at the Fermi edge and the Quantum-Well-States 1 & 2 check are shown. The red markers indicating the range used in the summation of the profiles. The surface has been analyzed using a PHOIBOS 150 analyzer with 2D-CCD Detector. Data courtesy S. Mathias, M. Bauer and M. Aeschlimann (University Kaiserslautern, Germany).

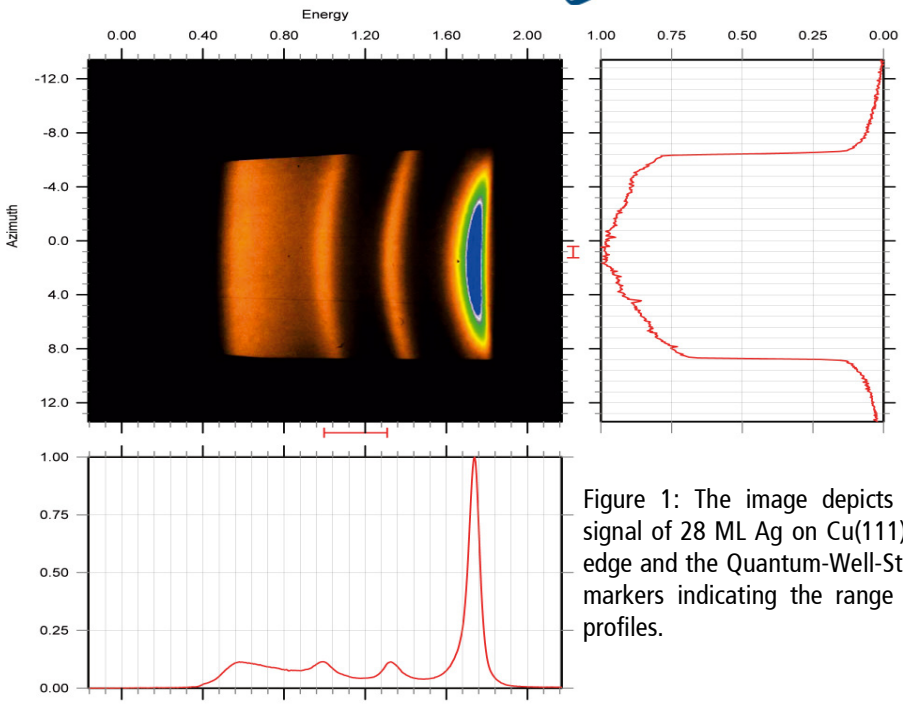

Figure 1: The image depicts the one-photon photoemission signal of 28 ML Ag on Cu(111). The surface state at the Fermi edge and the Quantum-Well-States 1,2 & 3 are shown. The red markers indicating the range used in the summation of the profiles.

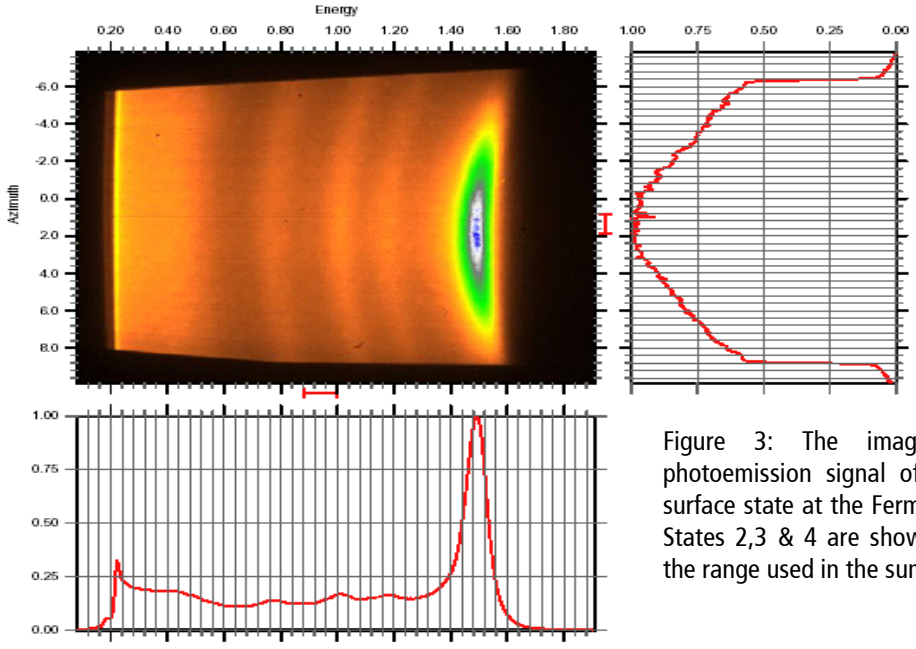

Figure 3: The image depicts the one-photon photoemission signal of 40 ML Ag on Cu(111). The surface state at the Fermi edge and the Quantum-Well-States 2,3 & 4 are shown. The red markers indicating the range used in the summation of the profiles.

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