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Two-dimensional dispersion of image electrons on C_{60} thin films on Au(111) and Cu(111) DANIEL QUINN, University of Minnesota, Dept. of Chemistry, GREGORY DUTTON, CHAD LINDSTROM, XIAOYANG ZHU — Two-photon photoemission (2PPE) has been used for many years to investigate occupied and unoccupied electronic states in clean and adsorbate-covered metal substrates. In this report, femtosecond 2PPE is employed to investigate charge transfer across a metal/organic-semiconductor interface and electronic structure in the thin film overlayer. Monolayer films of C_{60} have been grown using organic molecular beam deposition in ultrahigh vacuum on Au(111) and Cu(111) substrates. Such films represent a model system consisting of a metal/organic- semiconductor interface. Due to slightly different interatomic spacing in the two substrates, the epitaxial C_{60} films grow as $C_{60}(4 \times 4)$/Cu(111) or $C_{60}(2\sqrt{3} \times 2\sqrt{3})$R30°/Au(111). These distinct overlayers have previously been established by low energy electron diffraction and scanning tunneling microscopy experiments. By studying angle-resolved 2PPE, dispersion of image electrons in the conduction band along the surface plane can be measured directly. The fact that the C_{60} overlayer is rotated by 30 ° in the Au(111) case with respect to the Cu(111) case leads to distinct dispersion characteristics which correspond to different cuts in the two-dimensional band structure of the C_{60} thin film. Application of an *s*-band tight binding model leads to a reasonable quantitative fit.

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