

Abstract Submitted
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Electronic structure of ultrathin films of Co on Cu(775) stepped surfaces using high-resolution photoemission spectroscopy¹ SHANCAI WANG, JERRY DADAP, MEHMET YILMAZ, KEVIN KNOX, NADER ZAKI, RICHARD OSGOOD, Columbia University, TONICA VALLA, PETER JOHNSON, Brookhaven National Laboratory — We perform high-resolution photoemission spectroscopy, using the U13UB UV line at the NSLS, to study the electronic structure of bare and low-coverage Co on Cu(775) stepped surfaces. Despite the relatively wide terrace widths, the bare surface shows clear evidence of umklapps due to the step edges; this behavior is sharpened in the presence of very low Co coverage due to step pinning. We also measure the dispersion for electron emission along and perpendicular to the steps and obtain an exchange splitting energy for the lower Co d-bands at 16 and 25 eV photon energies. The splitting energy reaches a value of as low as ~ 0.4 eV, which is considerably smaller than that obtained for both Co and Co/Cu(111) surfaces. In addition, the typical widths of the spin states are larger than those obtained for the other surfaces, indicating the increased scattering channels arising from the strong influence of the steps.

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