

## ARPES study of Ultrathin Fe Grown on Cu (001) surface

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The spin structure of Fe over layers on Cu (001), especially in region II is one of the unsolved problem for many years. We study the out - of - plane (OP) Fermi surfaces (FSs) of 7 monolayer Fe/Cu (001) films using angle resolved photo emission spectroscopy (ARPES). Ultrathin Fe was grown on Cu (001) substrate at room temperature and the experimental measurements were carried out at room temperature and low temperature. Fermi surfaces measured about  $\frac{1}{4}$  of the Brillouin Zone (BZ) using photon energies ranging from 170 eV to 280 eV. Our results confirmed that ferromagnetic signal at 7 ML Fe on Cu (001) is nearly zero. These results are consistent with our recent x-ray magnetic circular dichroism (XMCD) and surface magneto - optic Kerr effect (SMOKE) experiments. Based on our observations we have made a simple model of this system, which explains all the experimental results.