

**Electronic States Localized at Surface Defects on Cu(755)
Studied by Angle-Resolved Ultraviolet Photoelectron Spectroscopy
at SORIS Beamline**

Koji Ogawa, Koji Nakanishi and Hidetoshi Namba

Abstract

“Regularly stepped” and “defective” surfaces of Cu(755) were prepared by low- and high-temperature annealing of a clean specimen, respectively. Electronic states on both surfaces were studied by means of angle-resolved ultraviolet photoelectron spectroscopy using synchrotron radiation. On defective Cu(755), we found a new photoelectron peak due to surface defects just below the Fermi level. High activity to oxygen adsorption of the defect state was revealed.

Angle-resolved ultraviolet photoelectron spectroscopy using synchrotron radiation has been applied for the study of low-dimensional electronic states on Cu(755) stepped surface [=6(111)x(100)]. A prominent surface-state peak is observed with maximum binding energy of about 0.34 eV below the Fermi level. The surface-state peak shows parabolic dispersion from the band bottom upwards to the Fermi level almost identically in both directions parallel and perpendicular to the steps. The peak shape is also identical in both the directions. Based on the isotropy of photoelectron spectra in both the directions we suppose that the surface state propagates on the (111) planes rather than on the average surface of (755).

*Department of Physical Sciences, Faculty of Science and Engineering, Ritsumeikan University,
Kusatsu, Shiga 525-8577, Japan.*