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Application Note

Spin-Resolved ARPES of Au(111) with DA30-L, 2D Ferrum VLEED and VUV5k

Prof. Lin of the Natioal Tsing Hua University has a Spin-ARPES system based on the Scienta Omicron DA30-L analyser with a 2D Ferrum VLEED spin detector and the VUV5k UV source. Test measurements were made using a cooled Au(111) sample.

The measurements were performed using the DA30-L ARPES mapping and Spin mapping modes to take advantage of the analyser's deflection capability. All data was therefore acquired with fixed manipulator/sample position. The complete ARPES data set cube seen in Figure 1 was acquired in 10 min. The ARPES data in Figure 2 show the ThetaX/E and ThetaX/ThetaY Fermi surface map cuts from this 10 min data set. The data clearly shows the separation of the spin bands in the Au(111) surface state.

The high resolution Spin resolved data from the indicated position in the ThetaX/ThetaY map in Figure 2 was measured with maximum resolution settings in 2h. The two spin directions indicated with red and blue are clearly separated with excellent resolution and statistics.

Data courtesy:
Prof. Dengsung Lin, Dept. of Physics, NTHU, Taiwan

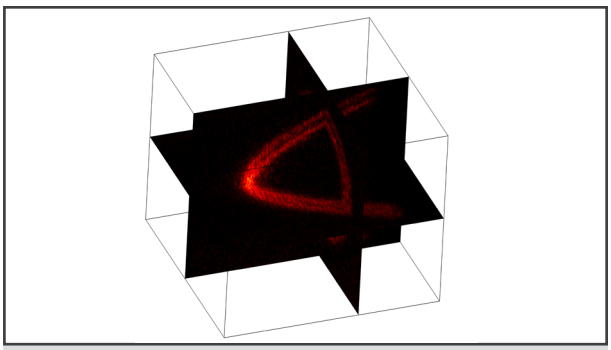


Figure 1: 3D representation of the ARPES data set measured with the DA30-L ARPES mapping mode and the VUV5k UV source. The complete data cube was measured in 10 min.

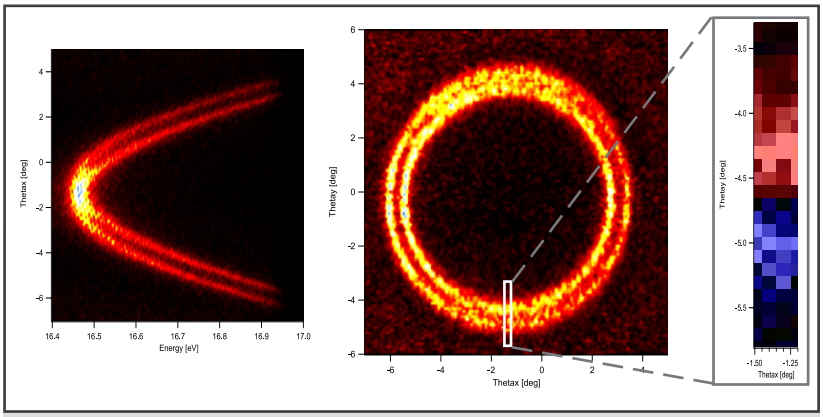


Figure 2: The Spin-ARPES system allows state of the art ARPES data and high efficiency, high resolution spin resolved measurements. This flexibible system allows settings to make high resolution or fast overview ARPES and Spin-ARPES measurements as required.

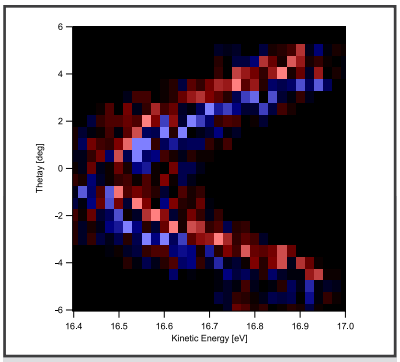
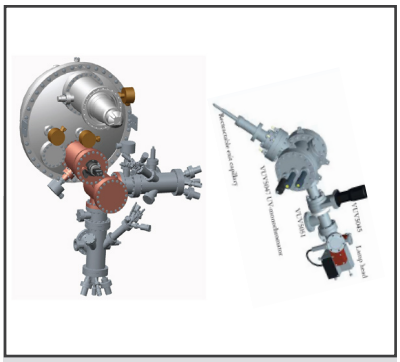


Figure 3: The high efficiency of the system makes it possible to make a spin resolved overview measurement of in this case the complete ThetaY cut in only 1 hour.



Key equipment: DA30-L equipped with a 2D/3D Ferrum VLEED detector system and the VUV5k UV source.

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