Contribution ID: **101** Type: **Invited talk**

Development of high-efficiency spin-resolved ARPES towards micrometer spatial resolution at HiSOR

Thursday 29 August 2024 16:15 (20 minutes)

Since the discovery of strong spin-orbit coupled materials such as Rashba systems, topological insulators, and Weyl semimetals, spin- and angle-resolved photoemission spectroscopy (SARPES) has become a very important technique to investigate spin-dependent electronic structures. A combination of the electron analyzer with the state-of-the-art spin polarimeter based on a very low energy electron diffraction (VLEED) scheme utilizing the ferromagnetic target allows us to reveal a detailed spin texture in solids. However, in the case of materials possessing magnetic domains or several surface terminations, the presence of multi-domain structures prevents us from obtaining true signals from a single domain. To overcome this problem, the spatial resolution should be improved below the domain size.
At Hiroshima Synchrotron Radiation Center (HiSOR), we constructed two VLEED-based SARPES instruments combined with vacuum ultraviolet (VUV) synchrotron radiation ($h\nu$ = 16 - 80 eV) and 6 eV laser light sources [1-3]. They run stably and are open for users. Recently, we have installed focusing mirrors to improve the spatial resolution. Consequently, the beam spot sizes are remarkably reduced to 500×100 μm at the VUV beamline and 5×9 μm at the laser system. These values are one or two orders of magnitude smaller than before the introduction of the focusing mirrors. In this talk, we will present several SARPES results utilizing our aforementioned high-efficiency SARPES systems.

References
[1] T. Okuda *et al.*, Rev. Sci. Instrum. **82**, 103302 (2011).
[2] T. Okuda *et al.*, J. Electron Spectrosc. Relat. Phenom. **201**, 23 (2015).
[3] T. Iwata *et al.*, Sci. Rep. **14**, 127 (2024).

I plan to submit also conference proceedings

No

Primary author: SUMIDA, Kazuki (Hiroshima University)

Presenter: SUMIDA, Kazuki (Hiroshima University)

Session Classification: Mikrosymposium 4/2: New Detector Developments

Track Classification: 4. New detector developments