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Performance of the spin- and angle- resolved photoemission spectrometer with highly efficient VLEED spin detector K. MIYAMOTO, T. OKUDA, A. KIMURA, H. MIYAHARA, K. KURODA, H. NAMATAME, M. TANIGUCHI, Hiroshima univ. — Because of the growing scientific interests in the spin-related exotic materials such as topological insulators, spin- and angle-resolved photoemission with much improved efficiency is strongly desired. In this report, we present the current status of a new SARPES with significantly improved energy- (ΔE) and angular resolutions ($\Delta\theta$), which is under construction at beam line BL-9B in Hiroshima Synchrotron Radiation Center. The system consists of high performance hemispherical analyzer (VG-Scienta R-4000) and highly efficient spin detector based on very low energy electron diffraction of Fe(001)p(1x1)-O, which has 100 times higher efficiency than conventional Mott spin detector. Owing to the high efficiency of the detector, the highest ΔE and $\Delta\theta$ have been improved to be 7.5 meV and 0.37^o. Moreover, high-resolution ARPES measurement ($\Delta E \sim$ 2meV, $\Delta\theta \sim 0.2^o$) and Fermi surface mapping in the sample temperature range from 8K to room temperature can be efficiently performed by hemispherical analyzer equipped with multi-channel detector and motorized 5 axis goniometer. These features of the SARPES enable us to observe detailed spin-dependent band structures of topological insulators very precisely and efficiently.

Koji Miyamoto
Hiroshima univ.

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