

1 Beamlines at the Photon Factory, KEK

1.1. Beamline 18A

The beamline 18A has been dedicated to photoemission experiments to investigate electronic structures of surfaces and interfaces of metals, semiconductors and those of adsorbed by various atoms and molecules. The beamline is equipped with a constant deviation angle grazing incidence monochromator. The monochromator covers the photon energy range from 15 to 170 eV. At the end-station, two commercial angle-resolved photoemission spectrometers are installed. The one is VG ADES500. The other is VG Scienta SES-100 with the rotational flange and the linear transfer mechanism.

Recent works performed at this beamline were Fermi surface and band mappings by angle-resolved photoemission (ARPES) measurements of (1) surfaces and thin films with strong spin-orbit interaction inducing the Rashba effect, (2) one-dimensional system or nano-scale materials fabricated on Si surfaces by metal or gas adsorption, (3) magnetic materials such as magnetic semiconductor or transition metal silicides, and so on.

Joint research at the beamline 18A was finished in March, 2014.

1.2. Beamline 19A

The beamline 19A is an undulator beamline equipped with a constant deviation angle grazing incidence monochromator and covers the output photon energy from 20-250 eV. The beamline 19A has been dedicated to the spin- and angle-resolved photoemission (SARPES) experiments. At the end-station of this beamline, a high-energy resolution photoelectron analyzer (PHOIBOS 150, SPECS GmbH) is equipped together with high efficient spin detector associating very low energy electron diffraction. The system is designed to provide high stability, high-energy resolution and high efficiency of spin detection for spin-resolved photoemission experiments. The new spin polarimeter achieved approximately 100 times higher efficiency than a conventional Mott detector.

Recently, the VLEED spin system was utilized to obtain precise information on spin-dependent electronic structures of surfaces and thin films with strong spin-orbit interaction inducing the Rashba effect and topological insulators.

Joint research at the beamline 19A was finished in March, 2014.

1.3. Beamline 19B

The beamline 19B is an undulator based soft X-ray beamline. In this beamline, measurements of X-ray emission spectroscopy (XES), X-ray absorption spectroscopy (XAS) and X-ray photoemission spectroscopy (XPS) with the photon energies of 70 to 400 eV were available.

Joint research at the beamline 19B was finished in March, 2013.