

Advanced Micro-crystallography Single Crystal X-ray Diffraction Beamline at TPS

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A dedicated X-ray diffraction beamline “Micro-crystal X-ray diffraction beamline (mXRD)” for advanced and non-ambient crystallography of chemical crystal research are scheduled at **TPS 15A**, a Phase-II beamline at TPS (Taiwan Photon Source). The beamline consists of a tapered cryogenic undulator source (CUT18), a coupled Double Crystal Monochromator (DCM) / Double Multilayer Monochromator (DMM) system, three focusing mirrors (FM, VFM, and HFM) and two end-stations (ES1 and ES2). CUT18 will generate high brilliance X-ray for the designed available energy range 9 – 35 keV. The X-ray beam is focused by FM and delivered to ES1 with adjustable beam size $100 \times 100 - 200 \times 200 \mu\text{m}^2$; then X-ray is focused again by a pair of Kirkpatrick-Baez (KB) mirror (VFM and HFM) down to $\sim 10 \times 10 \mu\text{m}^2$ at the sample position of ES2. Experiments can be conducted in either monochromatic (by DCM) or pink beam (by DMM width bandwidth 3 or 5 %) mode at both end-stations. A set of instrument, including the high-heat-load chopper, millisecond shutter, and a ultra-fast chopper, are synchronized to the storage ring clock, which will be used to isolate a single X-ray pulse (FWHM < 100 ps) and deliver it to the sample at ES2. ES1 will equip with a vertical fixed- κ goniometer and a photon III detector; ES2 will equip with a MD3UP high precision kappa geometry goniometer and an EIGER 2X CdTe 9M detector.