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Status and Opportunities of Taiwan Photon Source

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Recently the National Synchrotron Radiation Research Center (NSRRC) in Taiwan has successfully constructed a low-emittance 3 GeV synchrotron light source, the Taiwan Photon Source (TPS). The TPS with a circumference of 518 m is composed of 24 double-bend achromatic (DBA) cells connected by six 12-m straight sections and eighteen 7-m straight sections. The natural emittance of the TPS is 1.6 nm.rad with a small dispersion in the straight sections. In phase-I operation, the TPS uses two sets of KEK-B type superconducting RF cavities to achieve a design goal of 500-mA electron current in a top-up injection mode. Seven phase-I beamlines aim for the forefront of research to cover the diverse photon sciences in an energy range from soft to hard X-rays. These beamlines are optimized for protein micro-crystallography, low-energy excitations of novel materials with atomic specificity, spectroscopy and diffraction on the submicron and nanometer scales, scattering of coherent X-rays, and scanning nanoprobe studies that will resolve structures in a spatial resolution of tens nm. All phase-I beamlines will be available to users in 2017. In this talk, we will present the scientific activities from the TPS phase-I operation, Particularly, we will discuss results of high-resolution X-ray powder diffraction, X-ray nanodiffraction and coherent diffraction including ptychography, followed by an overview of future beamline plan.