

Progress and Plans of Synchrotron Radiation Facilities in China

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There are three synchrotron radiation facilities in China: Beijing Synchrotron Radiation Facility (BSRF), Hefei Light Source (HLS) and Shanghai Synchrotron Radiation Facility (SSRF). Recent progress and plans of the three SRs are illustrated here.

BSRF is the first synchrotron radiation facility in china. Currently, there are 3 experimental halls, 5 insertion devices, 14 beamlines and 15 endstations at BSRF. Institute of High Energy Physics (IHEP) are planning to build a 5GeV synchrotron radiation facility, Beijing Advanced Photon Source (BAPS) in the future. BAPS is a high-energy and low-emittance synchrotron radiation facility, to provide high brilliance hard X-ray, for requirement of industrial application, and also better support to fundamental research. Recently, R&D project of BAPS is proposed, to overcome difficulties in the technique for this machine, including the accelerator, beamlines and experimental stations.

HLS is the first dedicated synchrotron radiation facility in China. HLS is on upgrade from 2012 to 2013. There are 14 beamlines and endstations in HLS before upgrade. The performance of HLS will be notably improved after upgrade. Storage ring structure of HLS will be changed from 4×TBA to 4×DBA. Straight section will be changed from 3.36m×4 to 4.0m×4+2.3m×4. Injection energy will increase from 200MeV to 800MeV. Seven Bending Magnets and Six Straight sections are available for beamline construction. Five ID Beamlines will be operated in the end of 2013. The project for upgrading the storage ring will push HLS into an excellent vacuum ultraviolet light source.

SSRF, a third-generation light source, was constructed from 2004 to 2009 with a 3.5 GeV storage ring and 7 beamlines (8 endstations) in project Phase-I. Over 1000 beamtime proposals were approved in 2012. After project Phase-I accomplished, additional 6 beamlines sponsored by users are under construction from 2010 to 2013, include 5 beamlines (6 endstations) on protein science and one photoemission spectroscopy beamline. Project Phase-II on SSRF, a new project with 16 advanced beamlines and auxiliary system, is proposed recently, with a 6 years period and 1.68 billion RMB budget. Project Phase-II will aim at research field as energy science (4 beamlines), material science (4 beamlines), environment science (3 beamlines), life science (2 beamlines), and industrial applications (3 beamlines). These beamlines would have their unique characteristic respectively, such as beamlines-combinative, extremely high-performance, multi-functional, in-situ and dynamic instrumentations, etc. Auxiliary system constructing plan include machine upgrading, user experiments supporting facility, beamline techniques supporting facility and utilities. With achieving project phase-II, SSRF would possess capacity for providing more than 10000 shifts to more than 5000 users annually.