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Current events

1. First steps towards an African Light Source

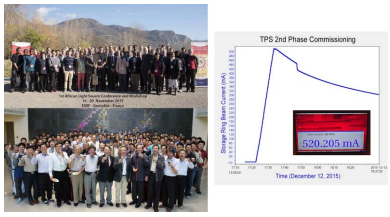
On 16–20 November 2015, the African Light Source Conference and Workshop was held at the ESRF, Grenoble, France. This meeting, the first of a series, set a roadmap with short-, medium- and long-term goals for strengthening the light sources user community from the African continent. The roadmap should lead to the construction of the first light source in Africa.

More than 80 scientists from across the world and government officials attended. During the meeting, African contributions to research based at light sources was highlighted. The scope of the research was very broad, and included research that addressed the social, environmental, economic and scientific challenges confronting Africa. Examples are studying disease and developing new drugs for malaria, HIV, tuberculosis and ebola, also energy technologies, climate and environmental sciences, materials science, physics, diverse fields of engineering, paleontology and heritage studies.

In a concluding address, Simon Connell, Chair of the Organizing Committee, stated: "The work carried out this week will lay strong foundations for a future light source in Africa and also, in the short and middle terms, it will reinforce the light source user community across Africa. Through the 'Grenoble statement', the African scientific community has clearly expressed its desire to work together to promote the use of light sources, towards the goal of establishing an African Light Source."

Sekazi Mtingwa, one of the champions of the African Light Source project, added: 'Africa is the only habitable continent without a light source. If African countries want to take control of their destinies, be competitive socially, politically and economically and become major players in the international scientific community in the years to come, access to a nearby light source will be an absolute necessity. The election of a steering committee and the drawing up of a clear roadmap give us an official mandate to discuss the feasibility of constructing an African Light Source somewhere on the African continent as a collaborative project akin to the Synchrotron-light for Experimental Science and Applications in the Middle East (SESAME) project. The time is therefore right for Africa to begin planning for the development of an African Light Source, which will broaden yet further its full participation in the global science endeavour.'

Francesco Sette, Director General of the ESRF, said: 'In the current international climate, a global discussion towards a collaborative African scientific project has high relevance. Science is an inescapable driver to peaceful relations among cultures and nations, a force for sustainability and a necessity in confronting the major challenges facing society today.'



Participants enjoy the last of the autumn sun on the ESRF site in Grenoble. Credit: C. Argoud, ESRF.

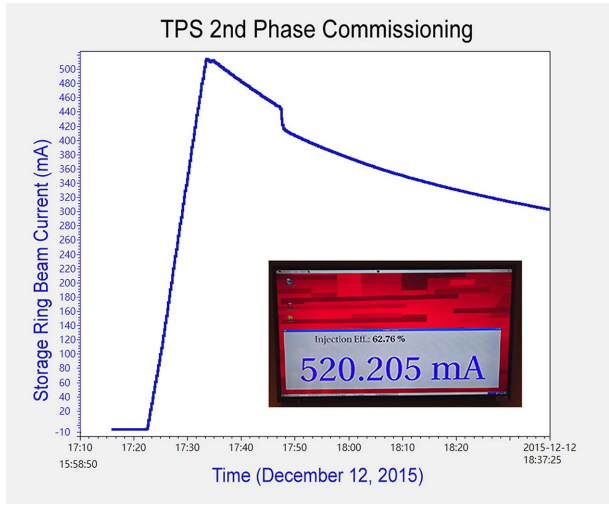
For more information see http://events.saip.org.za/conferenceDisplay.py?confId=61.

2. Taiwan Photon Source exceeds the design goal of 500 mA stored current

On the afternoon of 12 December 2015, the 3 GeV Taiwan Photon Source (TPS) of the National Synchrotron Radiation Research Center (NSRRC) stored 520 mA of electron current and gave the world a bright synchrotron light as the 'International Year of Light 2015' comes to an end. This concludes the second phase of commissioning, conducted after a five-month upgrade for bringing the electron current to its target value of 500 mA. In the first phase of commissioning, 100 mA stored beam was achieved by using two room-temperature five-cell PETRA radio frequency (RF) cavities in March 2015.

Starting in the second quarter of 2015, two superconducting RF (SRF) modules and ten insertion devices (IDs) were installed in the TPS storage ring. Seven out of ten IDs are in-vacuum undulators and the remainder are elliptically polarized undulators. Two 500 MHz KEKB-type SRF cavities were installed in the storage ring in early April to replace the PETRA cavities. For operating the SRF, the cryogenic plant needed to be in place and function. The acceptance test of the cryogenic plant was completed in February and a cryogenic dummy load was used to simulate the requirements of SRF modules in May, leading to a test of the complete SRF system in July. A 610 m-long liquid-nitrogen transfer system to serve 24 ID beamlines was installed and commissioned in October. The magnets of the transfer lines between linac to booster as well as booster to storage were upgraded to improve the injection efficiency and the stability. Ninety-six pieces of fast feedback corrector magnets were placed at both ends of the straight sections as well as upstream of the dipole magnets.

After a minor vacuum problem was solved at the end of November, the commissioning of TPS took a smooth ride, ramping on 12 December from 0 to 520 mA in less than ten minutes. The stored current exceeds the design target value of 500 mA. Taking as the start of the project the ground-breaking ceremony in February 2010, the NSRRC officially concluded the construction of the TPS synchrotron project in less than six years.



Stored beam current at TPS, exceeding the design goal of 500 mA.

While the TPS was ramping up to its target stored current, two beamlines, the protein microcrystallography beamline (TPS-05) and the temporally coherent X-ray diffraction beamline (TPS-09), were being commissioned. Meanwhile, X-rays have been delivered to TPS-05 with a beam size reaching the designed value of few tens of micrometres. At the TPS-09 beamline, with its two collinear in-vacuum undulators in the 12 m straight section with double mini-β_y lattice, beam has been delivered to the eight-circle diffractometer.

The National Synchrotron Radiation Research Center (NSRRC) is a research institution funded by the government of Taiwan. The mission of NSRRC is to serve domestic researchers and academic scholars in conducting scientific experiments and to promote the accelerator-based technologies and experimental techniques to undergraduate and graduate students in Taiwan. NSRRC is the sole synchrotron-based light source provider in Taiwan to facilitate research in physics, chemistry, materials, biology, medicine, advanced technology and scientific applications. NSRRC operates two synchrotron light sources. The 1.5 GeV Taiwan Light Source (TLS) produced its first light in April 1993 and now has 25 beamlines in operation. The 3 GeV Taiwan Photon Source (TPS) delivered its first photon beam in December 2014 and is scheduled to have seven beamlines open to general users in 2016. In 2014, NSRRC supported over 2000 users from Taiwan and 20 other countries.

For more information, see http://www.nsrrc.org.tw/english/index.aspx or contact Diana Lin (email: dianalin@nsrrc.org.tw).

The TPS team, celebrating the milestone of exceeding the design goal.