

MAX IV Laboratory Facility Update

Linac installations completed

Final installations in the MAX IV linac was completed during the fall of 2014, while conditioning of the RF structures were ongoing. During this time beam commissioning of the injector, including both the thermionic and photo cathode guns was started. By the end of 2014 beam commissioning through the whole 3 GeV linac and beam transport began, and full energy was reached on the 9th of February.

Despite problems with the klystron for the thermionic RF gun, the gun aimed for injection into the MAX IV storage rings, beam was finally delivered to the transferlines in April. The electron bunches had then reached some important specifications needed for storage ring commissioning, such as 1.5/3 GeV energy, bunch charge of 1 nC and a 500 MHz time structure. Linac operation was then paused for final installation of the storagering transferlines. Using the high brightness photo cathode gun, electrons were delivered through the Short Pulse Facility (SPF), and reached the main beam dump at charges just below the specified 100 pC. To achieve the full set of specification from the SPF further modifications and tuning of the photogun and linac transport are needed.

Storage rings well on the way

On May 27th, the vacuum chambers of the last one of the twenty multibend achromats that make up the 528-meter-long MAX IV 3 GeV ring were lowered into the magnets after their non-evaporable getter coating had been activated. This brings the most critical part of the assembly and installation procedures in the 3 GeV ring to a successful completion within only about six months after its start in mid November 2014. In the next few days, the last one of the 140 magnet blocks in the ring had their top halves installed and, as in the previous achromats, magnets and chambers fit nicely confirming that the tight assembly tolerances of this small-aperture compact system had been fulfilled. In parallel, work with other subsystems in the 3 GeV ring is also close to completion – five of the six 100 MHz RF cavities have been conditioned and installed and the three 300 MHz Landau cavities are also in place. Six RF power plants based on solid-state

amplifiers have been delivered and tested at full power. In particular all high power circulators were tested at their maximum rating of 120 kW.

At this moment, subsystems tests are ongoing with the aim of verifying readiness for commissioning with beam, which is planned to start in early August.

Infrastructures installation work on the MAX IV 1.5 GeV ring was initiated with positioning of the concrete stands that will support the 12 double-bend achromat magnet blocks. Full installation is planned for autumn 2015.

The first front end installed

During the last week of May the first front end on the MAX IV 3 GeV ring was installed. The front end tailored after the 4 m long Elliptically Polarizing Undulator (EPU) of the Veritas beamline (a soft X-ray RIXS beamline) was installed on achromat 16. Four additional front ends will be installed on the ring before its commissioning starts in August. Most components along the 14 m long section from the valve separating the front end with the machine vacuum to until the trigger inside the optical hutch are identical for all these front ends while the heat absorbing components had to be tailored after the different type of insertion devices. The detailed design of these components was with help of external experts made in close collaboration with the manufacturer FMB-Berlin who also supported the installation together with various departments at MAX IV.

See pictures at www.maxiv.se

