Project XFEL

The year 2009 should be a memorable one for photon-related scientists and engineers since the first X-ray Free Electron Laser in the hard X-ray region using Self-Amplified Spontaneous Emission (SASE) scheme was observed at the Linac Coherent Light Source (LCLS) at the SLAC National Accelerator Laboratory in the U.S. The initial user operation in the softer X-ray region has demonstrated extraordinary potentials of SASE-FEL, and at the same time, has shown very small opportunity with only one XFEL line in the world. The world community is eagerly waiting for us to appear on the stage. The operational stability achieved at the LCLS supports our conclusion from the operational experience of SPring-8 Compact SASE Source (SCSS) that SASE sources are, in principle, stable, contrary to the various experiences at the FLASH-FEL at Hamburg.

Our five-year project of XFEL construction that started in 2006 has reached the middle of the second half. Buildings for accelerator and undulators were completed at the end of the previous fiscal year. Accelerator assembly and undulator alignment are moving ahead at a fast pace, together with the construction of the experimental building as well as the electron beam transport to the SPring-8 booster synchrotron. Everything is on, or a little ahead of, schedule as of February 2010 so that we are able to complete all the hardware assembly before autumn, make RF aging within the calendar year, and start electron beam tuning in January 2011. Meanwhile, many users have been enjoying the stable operation of SCSS of around 60 nm wavelength, which has enormously contributed to the development of many components of the 8 GeV XFEL.

In addition, the XFEL and SPring-8 photon beam colliding facility was approved, enabling a novel scheme of pump-probe experiments that use the XFEL light as a pump and SPring-8 synchrotron X-rays as a probe. This new possibility will enhance the synergy between SPring-8 and XFEL, in addition to the electron beam injection capability from XFEL linac to the SPring-8 storage ring.

We would like to encourage and invite completely new ideas to use the unique capability of our XFEL, which is located closely to the world's brightest synchrotron radiation source, SPring-8.

Tetsuya Ishikawa

