First X-ray lasing of SACLA

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RIKEN and the Japan Synchrotron Radiation Research Institute (JASRI) have successfully produced a first beam of X-ray laser light with a wavelength of 1.2 Angstroms. This light was created using SACLA, a cutting-edge X-ray Free Electron Laser (XFEL) facility unveiled by RIKEN in February 2011 in Harima, Japan. SACLA (SPring-8 Angstrom Compact free electron LAser) opens a window into the structure of atoms and molecules at a level of detail never seen before.

The use of ultra high-intensity X-ray free electron laser light to explore the miniature structure of matter, until recently inconceivable, is today transforming how we visualize the atomic world. By providing much shorter wavelengths and higher intensities than other lasers, XFEL enables researchers to directly observe and manipulate objects on an unrivalled scale, opening new research opportunities in fields ranging from medicine and drug discovery to nanotechnology.

One of only two facilities in the world to offer this novel light source, SACLA has the capacity to deliver radiation one billion times brighter and with pulses one thousand times shorter than other existing X-ray sources. In late March, the facility marked its first milestone with beam acceleration to 8GeV and spontaneous X-rays of 0.8 Angstroms.

Only three months later, SACLA has marked a second milestone. On June 7, SACLA successfully increased the density of the electron beam by several hundred times and guided it with a precision of several micrometers to produce a bright X-ray laser with a wavelength of only 1.2 Angstroms (a photo energy of 10 keV). This matches the record of

1.2 Angstroms set at the only other operational XFEL facility in the world, the Linac Coherent Light Source (LCLS) in the United States.

With experiments soon to commence and user operations at the facility to begin by the end of fiscal 2011, this new record offers a taste of things to come with SACLA's powerful beam, the world's most advanced X-ray free electron laser.

More information: The latest information will be updated on the website of SACLA: xfel.riken.jp/

Provided by RIKEN