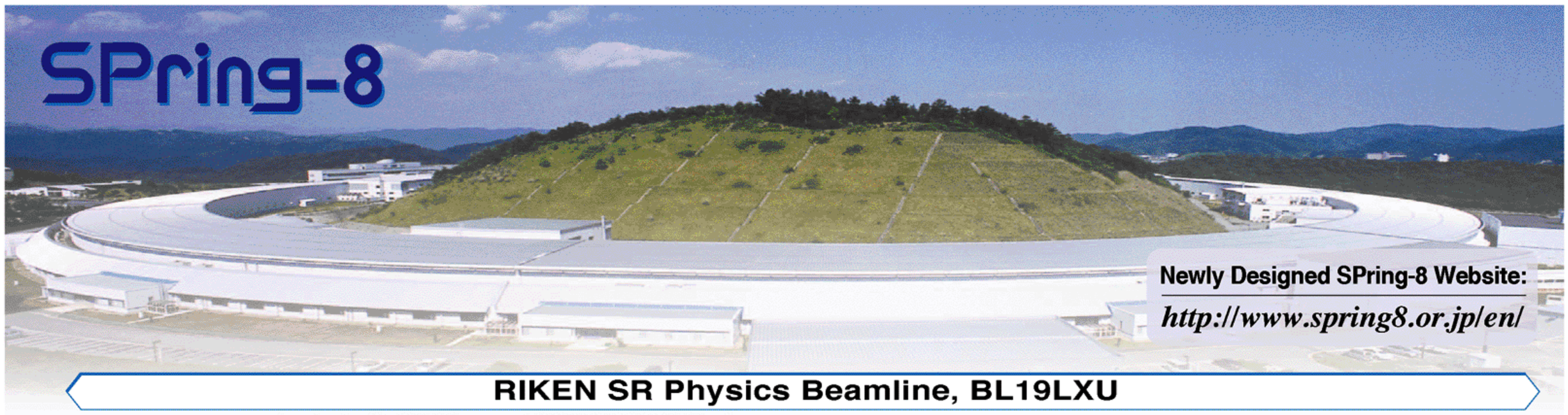
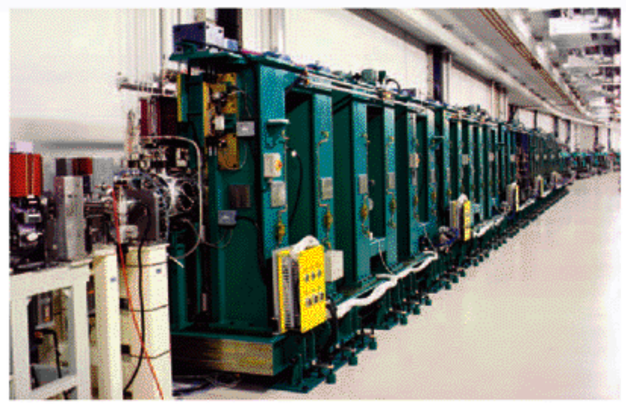


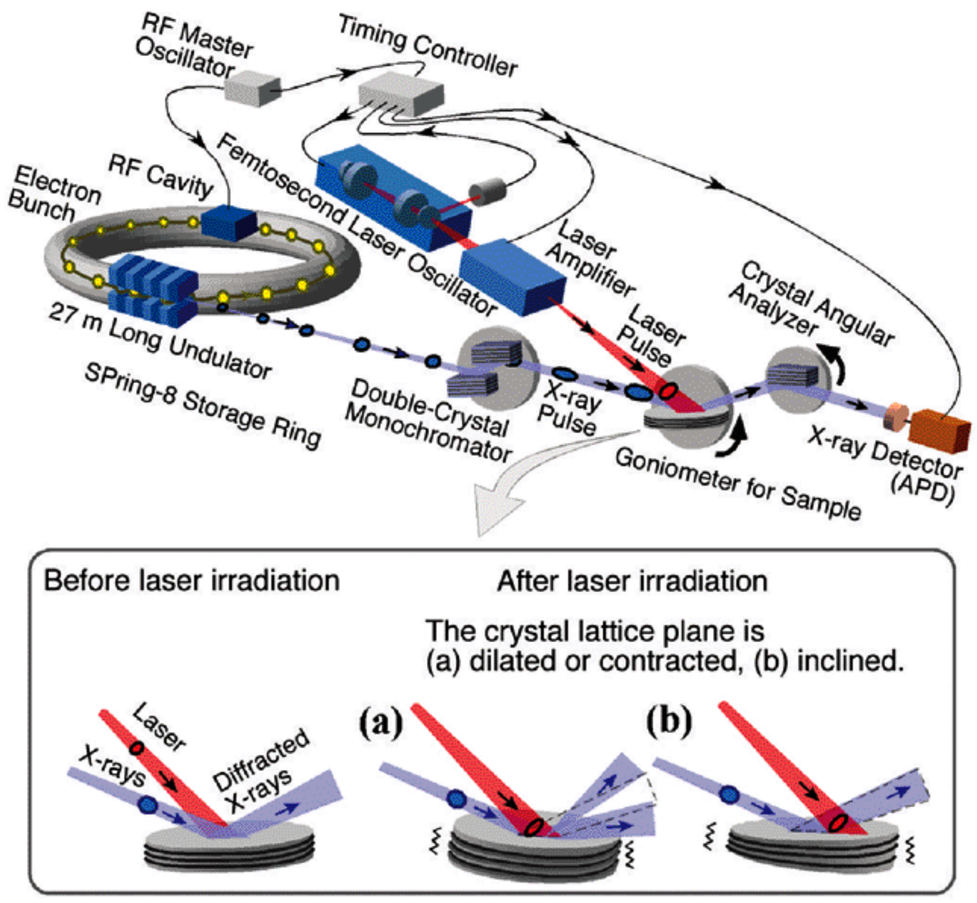
RIKEN SR Physics Beamline, BL19LXU

BL19LXU provides experimental stations for the studies using highly brilliant X-rays produced from a 27 m long undulator. The beamline is equipped with a cryogenically cooled Si 111 double-crystal monochromator and a double-mirror in the optics hutch. Investigations on X-ray optics, fast lattice dynamics, magnetic scattering etc. are carried out in the experimental hutches. The technical developments for intense X-ray SR experiments are also conducted in preparation for the future X-ray Free Electron Laser (XFEL) experiments.


The 27 m long undulator at BL19LXU

Detection of strain pulse in a crystal with "ultrafast X-ray stroboscopy"

Dr. Yujiro Hayashi (RIKEN Junior Research Associate from Kyushu Univ.; Hokkaido Univ. at present), Dr. Yoshihito Tanaka (RIKEN/SPring-8), Dr. Tetsuya Ishikawa (RIKEN/SPring-8) and coworkers have established time-resolved X-ray triple-crystal diffractometry (TRTCD) using high brilliance pulsed X-rays from the 27 m long undulator at RIKEN SR Physics Beamline (BL19LXU) of SPring-8 [1]. This beamline is equipped with a femtosecond pulsed laser synchronized with the pulsed X-ray SR [2], which allows "ultrafast X-ray stroboscopy." Since TRTCD requires brilliant X-rays, they used the beamline that provides the world's brightest X-rays at the moment [1]. They applied TRTCD to the detection of acoustic pulse echoes that are generated in silicon and gallium arsenide semiconductor plates by femtosecond laser irradiation. The obtained time-dependent longitudinal strain component for the pulse echoes showed that the polarity of the strain pulse was dependent on the optically induced initial stress, and that the bipolar pulse waveform was gradually deformed and broadened in the course of propagation. The pulse duration broadening was consistent with a boundary roughness for an unpolished plate. This implies that the method may be applicable to the monitoring of the roughness of optically inaccessible boundaries in materials. TRTCD has helped us understand lattice motion for propagation of wide-band acoustic wave packets in crystals. In the near future, X-ray Free Electron Laser (XFEL) at SPring-8 may promise to show pictures of faster atomic motion induced by ultrashort pulse laser in materials. This work has been published in Physical Review Letters [3].



A schematic illustration of the TRTCD setup

[1] T. Hara *et al.*, Rev. Sci. Instrum. 73, 1125 (2002).
[2] Y. Tanaka *et al.*, Rev. Sci. Instrum. 71, 1268 (2000).
[3] Y. Hayashi *et al.*, Phys. Rev. Lett. 96, 115505 (2006).

HAXPES2006

The 2nd International Workshop on Hard X-ray Photoelectron Spectroscopy (HAXPES2006) will be held at SPring-8, from September 19 to 20, 2006,

http://haxpes2006.spring8.or.jp/

LEEM /PEEM-V

The 5th International Conference on LEEM/PEEM (LEEM/PEEM-V) will be held at the Egret Himeji, Hyogo, Japan, from October 15 to 19, 2006,

http://leem-peem-v.spring8.or.jp/