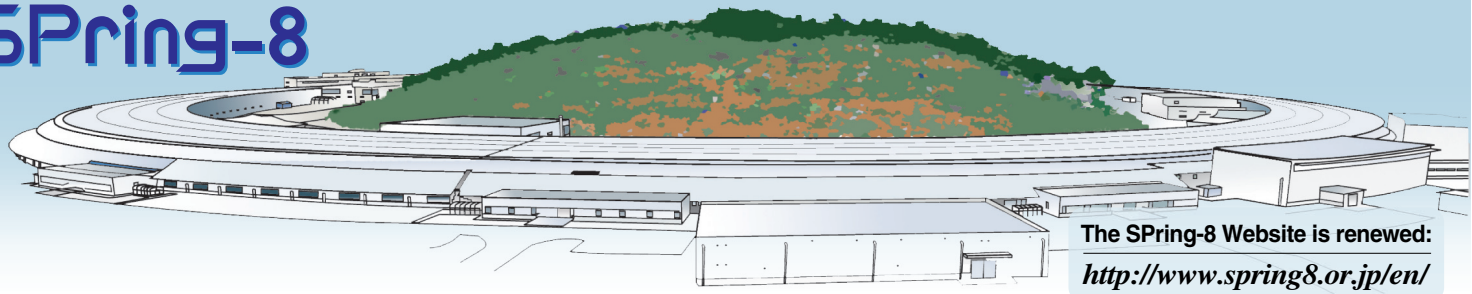
SPring-8



The SPring-8 Website is renewed:

http://www.spring8.or.jp/en/

Stable Low-Emittance Operation

"Top-up operation with low emittance electron beam" is our recent successful improvement in brilliance of X-ray beam in SPring-8. SPring-8 has been providing users with stable and three times more brilliant X-rays by steady top-up operation of the storage ring with the optics of 3 nmrad since the middle of September 2005. A utilization of three times more intense monochromatized X-rays onto a microscale sample allows us to reduce measurement time and/or improves data accuracy significantly. In fact, breakthroughs in precise data measurement were reported for Hard X-ray Photoelectron Spectroscopy (HX-PES) [1], microbeam imaging, time-resolved experiments etc. Here is an example presented for HX-PES experiment. As generally known, large probing depth, i.e., surface insensitivity, is the most attractive feature of this method but the problem is that the photoelectron intensity is rather weak. The low emittance reduces the focused beam size to about 50x50 μm^2 at a sample position, and can consequently retain the spot size on the sample surface smaller than the detectable area of an electron analyzer even at the grazing incidence angle of 1 degree. This drastically increases photoelectron intensity as demonstrated in Fig. 1 because attenuation length of X-rays (typically > 1μm @ several keV) is much longer than probing depth (typically > 5 nm) of HX-PES. Now the throughput becomes surprisingly high.

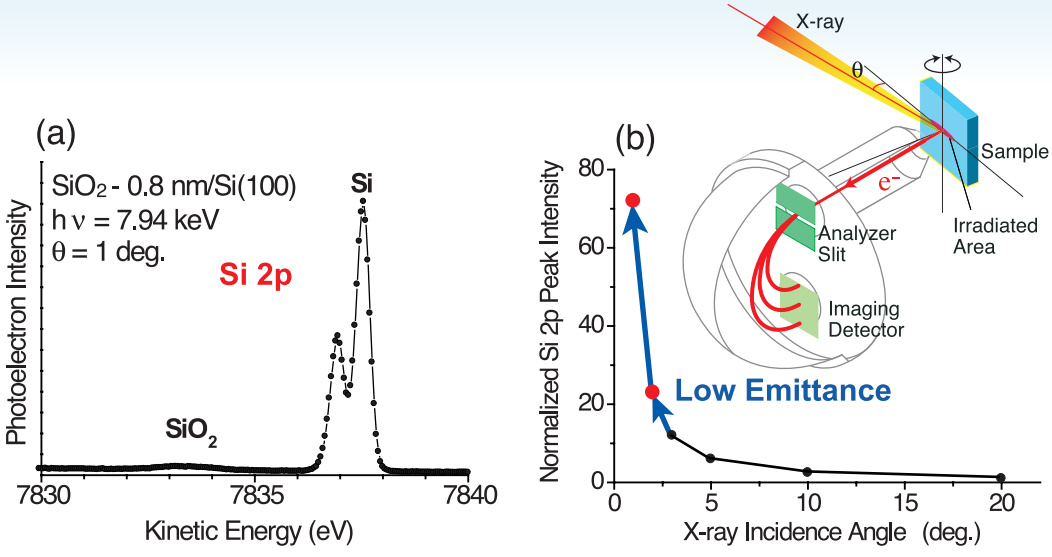


Fig.1
(a)Si 2p core level PES spectrum of Si (100) measured at hν=7.94 keV under the incidence angle θ of 1 degree. (see inset). The quality is very high even with a short acquisition time of 30 sec. It should be noted that the contribution of surface oxidized layer (0.8 nm) is almost negligible.
(b)Incidence angle dependence of the Si 2p peak intensity normalized to that of θ =20 degrees. The intensity drastically increases with the low emittance operation.

[1]Y. Takata, M. Yabashi, K. Tamasaku, Y. Nishino, D. Miwa, T. Ishikawa, E. Ikenaga, K. Horiba, S. Shin, M. Arita, K. Shimada, H. Namatame, M. Taniguchi, H. Nohira, T. Hattori, S. Södergren, B. Wannberg and K. Kobayashi: Nucl. Instrum. Methods. **A 547**, 50 (2005)

MEDSI 2006

The International Workshop on Mechanical Engineering Design of Synchrotron Radiation Equipment and Instrumentation (MEDSI 2006) will be held at the Egret Himeji, Hyogo, Japan, from May 24 to 26, 2006,

http://medsi2006.spring8.or.jp/

SRI 2006

The 9th International Conference on Synchrotron Radiation Instrumentation (SRI 2006), co-hosted by Pohang Accelerator Laboratory (PAL) and JASRI/SPring-8, will be held at the EXCO center, Daegu, Korea, from May 28 to June 3, 2006.

http://sri2006.postech.ac.kr/