

SACLA BEAM PERFORMANCE

Multiple-beamline operations enabling the simultaneous use of three FEL beamlines (BL1, BL2, and BL3) have been standard for user experiments. This operation scheme has provided stable and high-performance soft and hard XFELs for user experiments throughout the year. The net user time in FY2019 across user shifts for these beamlines is expected to exceed 6400 hours, with high levels of laser performance and availability. Self-seeded XFELs have been open for user experiments since the middle of FY2019. On the other hand, aiming at the full system integration of SACLA and SPring-8 towards a sustainable facility upgrade, an innovative system has been developed for enabling timesharing

use of the SACLA linac as an injector for the current SPring-8 storage ring. The upgraded accelerator control system allows arbitrary switching patterns of multiple-beamline, e.g., 1 pps for BL2 and 59 pps for BL3. The beam test has also been intensively carried out to check the operational performance and evaluate the system completeness from the viewpoint of beam injection to the ring and XFEL utilization. The final system check at the user time is scheduled in February 2020. Figure 1 shows variations in the stored current and beam injection efficiency during the beam test. The beam injection rate was 1 Hz during the test, which will be increased to up to 10 Hz in the actual beam injection.

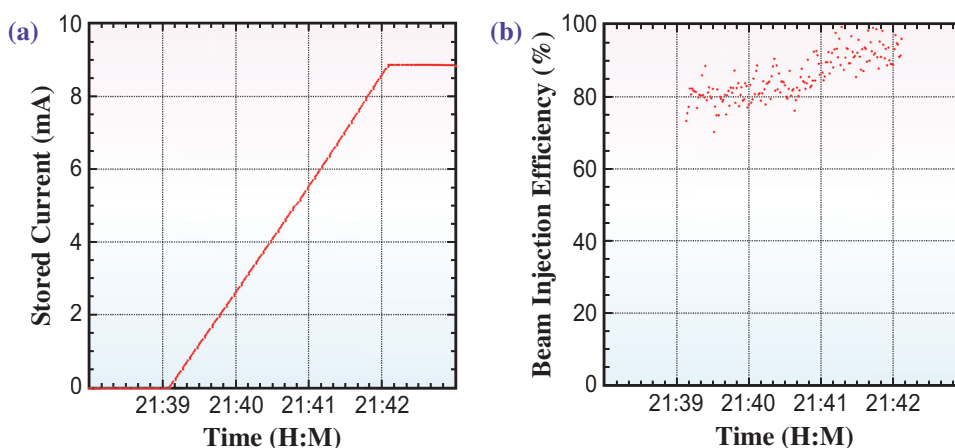


Fig. 1. Variations in stored current (a) and beam injection efficiency (b) during the beam injection test on February 4, 2019. The beam injection rate was 1 Hz.

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