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# The Operational Challenges: Achieving 500 mA High Beam Current at Taiwan Photon Source

*Monday 2 June 2025 09:30 (30 minutes)*

The Taiwan Photon Source has been in routine operation at 500 mA since the last season of 2022, utilizing two superconducting cavities and a bunch by bunch feedback system, fast orbit feedback system, along with many technical efforts. The operation of both the Taiwan Photon Source (TPS) maintains its high reliability and availability. The mean time between failures is more than 190 hours with an availability greater than 98.9% for both sources in 2023. With newly developed cryogenic permanent magnet undulators, IVUs, and EPUs, balancing the needs of both soft X-ray and hard X-ray users.

Many challenges have been encountered on the road to achieving a beam current of 500 mA, primarily due to the short bunch length of 16 ps at the TPS storage ring. Impedance issues occur at the strip kicker, undulators with in-vacuum type, and BPMs. The details will be presented.

Ongoing technical development focuses on in-vacuum nonlinear kickers to minimize electron orbit perturbations during top-up injection. Lamda cavity to enlogate the bunch length. Furthermore, more aggressive upgrade or expansion plans for light source development are steadily under discussion to meet the needs of the thriving synchrotron radiation users in Taiwan.

## Footnotes

## Funding Agency

National Science and Technology Council, Taiwan

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