



Contribution ID: 504 Contribution code: THPS26

Type: **Poster Presentation**

## Cryogenic permanent magnet undulator at high beam currents

*Thursday, 23 May 2024 16:00 (2 hours)*

A PrFeB-based cryogenic permanent-magnet undulator (CPMU) of period length 15 mm has been constructed to provide hard X-rays of energy 10-40 keV at the Taiwan photon source (TPS). Two cryo-coolers with total cooling capacity nearly 300 watts and special designed components are dedicated for TPS-CU15 to ensure its stable magnetic and cryogenic performance. The CU15 can generate an effective magnetic field of 1.32 T at gap 4 mm when the temperature of magnet is 80 K. At beam current of 500 mA with bunch length of 16 ps, the measured beam-induced heat load is 112 W at a vacuum gap 4.8 mm. The broadband impedance, include geometrical impedance and resistive wall heating, was found to contribute the most in the beam heating mechanism.

### Footnotes

### Funding Agency

### Paper preparation format

### Region represented

Asia

**Primary author:** HUANG, Jui-Che (National Synchrotron Radiation Research Center)

**Co-authors:** YANG, Chih-Sheng (National Synchrotron Radiation Research Center); CHEN, Ching-Lung (National Synchrotron Radiation Research Center); KITAMURA, Hideo (The Institute of Physical and Chemical Research)

**Presenters:** YANG, Chih-Sheng (National Synchrotron Radiation Research Center); HUANG, Jui-Che (National Synchrotron Radiation Research Center)

**Session Classification:** Thursday Poster Session

**Track Classification:** MC7: Accelerator Technology and Sustainability: MC7.T15 Undulators and Wigglers