



Contribution ID: 1143 Contribution code: TUPB059

Type: **Poster Presentation**

Analysis of low-frequency disturbances (~ 0.3 Hz) in TPS and TLS beam orbit feedback systems

Tuesday 3 June 2025 16:00 (2 hours)

The stability of electron beams in storage rings is vital for precise synchrotron radiation experiments. However, external vibrations, such as earthquakes, ocean waves, and human activities, often disrupt beam stability. This study analyzed low-frequency (~ 0.3 Hz) disturbances in the beam orbit systems of the Taiwan Photon Source (TPS) and Taiwan Light Source (TLS). Using Fast Fourier Transform (FFT) and Dynamic Time Warping (DTW), we identified a strong correlation between these disturbances and ocean wave frequencies, with a similarity score of 0.12. Our findings confirm ocean waves as a major disturbance source and emphasize the need for advanced orbit control and vibration compensation to enhance beam stability.

Footnotes

Paper preparation format

LaTeX

Region represented

Asia

Funding Agency

Author: HSIEH, Yi-Tang (National Synchrotron Radiation Research Center)

Co-authors: TSAI, Hung-Jen (National Synchrotron Radiation Research Center); LIN, Wei-Yu (National Synchrotron Radiation Research Center); HUANG, Szu-Jung (National Synchrotron Radiation Research Center); LEE, Tsung-Yu (National Synchrotron Radiation Research Center); CHEN, Hung-Chiao (National Synchrotron Radiation Research Center); Mr CHEN, Hsin-Hui (National Synchrotron Radiation Research Center); HUANG, Bin Yuan (National Synchrotron Radiation Research Center); HUNG, Chih Yu (National Synchrotron Radiation Research Center); LI, Jar-An (National Synchrotron Radiation Research Center); WANG, Huai-San (National Synchrotron Radiation Research Center); HSU, Ting-Wei (National Synchrotron Radiation Research Center)

Presenter: HSIEH, Yi-Tang (National Synchrotron Radiation Research Center)

Session Classification: Tuesday Poster Session

Track Classification: MC8: Applications of Accelerators, and Engagement for Industry and Society:

MC8.U09 Other Applications