Contribution ID: **1013** Contribution code: **MOPM014** Type: **Poster Presentation**

Reducing floor vibration of TPS experimental hall caused by air handling units

Monday, 8 May 2023 16:30 (2 hours)

The Taiwan Photon Source (TPS) experimental facility has experienced vibration interference at approximately 16.8 Hz during experiments at the end station of the TPS 23A beamline, which was traced back to the air handling units (AHUs) located on the second floor of the outer ring area of TPS. The vibration of the AHUs not only affects the TPS beamline 23A end station but also all experimental areas. In this paper, we present two methods to reduce the floor vibration of the experimental hall caused by the AHUs. Firstly, we adjusted the operating frequency of each AHU fan to avoid resonance and reduce the vibration of the nearby experimental area floor, which can be reduced by up to 40%. Secondly, we installed additional air isolation mounts outside the AHU to further reduce the impact of the fans on floor vibrations, which resulted in a reduction of vibration transmission by about 30%. Our findings provide useful information for those dealing with vibration interference caused by AHUs and can help improve the experimental accuracy and efficiency in similar facilities.

Funding Agency

Footnotes

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Session Classification: Monday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.A05: Synchrotron Radiation Facilities