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## **Mechanical design of the in-vacuum tapered undulator at Taiwan Photon Source**

*Wednesday 17 September 2025 17:00 (1 hour)*

Synchrotron light sources commonly provide users with two types of insertion devices for experiments in biology, medicine, and other fields: in-vacuum undulators (IU) with short period lengths for medium-energy photon sources and cryogenic permanent magnet undulators (CPMU) for higher photon energy. The strong magnetic field generates significant forces on the insertion device magnets, leading to structural deformation and ultimately degrading the magnetic field quality. This paper presents the design and measurement methods of an in-vacuum tapered undulator, analyzes the simulation and measurement results of its structural deformation, and introduces how a flexible structure can be used to establish nonlinear magnetic force compensation to improve system performance

### **Footnotes**

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