Contribution ID: **223** Contribution code: **WEP15** Type: **Poster Presentation**

Design and implementation of a parallel linkage mechanism with spring assembly for magnetic force compensation in insertion devices

Wednesday 17 September 2025 17:00 (1 hour)

This study presents the design and fabrication of a mechanical compensation system aimed at neutralizing the magnetic attraction forces inherent in insertion devices (IDs) utilized in synchrotron radiation facilities. The proposed system integrates a parallel linkage mechanism with a spring assembly comprising twelve coil springs. The parallel linkage ensures synchronized and stable movement of the magnetic arrays, while the spring assembly provides a counteracting force to the magnetic attraction between opposing magnet arrays. This configuration effectively reduces the load on the gap adjustment mechanism, enhances structural stability, and maintains precise control over the magnetic gap. The implementation of this system demonstrates improved operational efficiency and safety in the handling of IDs.

Footnotes

Funding Agency

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Session Classification: Wednesday Poster Session

Track Classification: ACCELERATORS: Insertion Devices