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Mechanical structure upgrade of the Pivot KB mirror system for improved vibration and stability

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At this conference, we introduce an upgraded Kirkpatrick–Baez (KB) mirror system developed by the Pohang Accelerator Laboratory (PAL) for the PLS-II beamline. PAL is also actively involved in designing KB mirrors for the upcoming Korea 4GSR project, aiming to enhance the overall stability and precision of synchrotron beamline optics. To address vibration and axis instability, the KB mirror structure originally designed for PLS-II has undergone major mechanical improvements. Key upgrades include ultra-high vacuum (UHV) actuators, Inconel 718-based cartwheel mechanisms for pitch and yaw axes, and cross-roller guide systems. These enhancements improve structural rigidity, enable precise angular adjustments, and suppress vibration transmission, achieving sub-micron positioning accuracy. The system is now being installed on the PLS-II beamline, with commissioning planned to demonstrate compound-axis control and beam reproducibility. In parallel, research is underway to explore alternative cartwheel materials for further performance optimization. We look forward to presenting the enhanced Pivot KB Mirror and related technologies from PLS-II and Korea 4GSR at this conference.

Footnotes

Funding Agency

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