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Enhancing the performance of old X-ray mirrors through surface figure correction

Wednesday 17 September 2025 17:00 (1 hour)

The X-ray Optics Laboratory at the Pohang Accelerator Laboratory is advancing synchrotron radiation research by enhancing X-ray mirror performance through in-house precision metrology and coating technologies. A thin-film deposition system was developed for coating X-ray mirrors up to 1 meter in length. By precisely controlling the substrate stage speed, the system can correct and modify the surface figure of the mirror. Differential deposition is achieved by continuously adjusting the substrate's movement during coating. The stage control system calculates the dwell time using deconvolution algorithms, based on accurate measurements of the unit coating distribution and the target surface figure. Recently, the lab successfully reduced the figure error of the 5A beamline mirror by a factor of 15, and plans are underway to extend these improvements to other beamlines, including those at PLS-II and XFEL.

Footnotes

Funding Agency

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