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Development of an automatic calibration system for BPM

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Beam position monitor(BPM) is used to measure the horizontal and vertical positions of the beam in the vacuum pipe. Before online installation, it usually needs to be calibration. High Intensity Heavy-ion Accelerator Facility(HIAF) and China initiative Accelerator Driven System(CiADS) will need a large number of BPM, so it is a great challenge for BPM calibration work. In order to complete this work efficiently and accurately, this research designs and develops an automatic BPM calibration system.

The hardware of this BPM calibration system consists of 4 major sections, they are calibration platform equipment, precise motion control device, signal processing electronics and industrial computer. The control software was programmed by C to realize automatic calibration functions based on EPICS. A high-order fitting algorithm programmed by python used to solve the problem of smaller linear range of the capacitive BPM. It significantly improves the accuracy of position measurement after calibration.

Footnotes

Funding Agency

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Yes

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