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Investigation of Diagonal Cut-Plane BPM Performance in the CSNS RCS

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Diagonal-cut plane Beam Position Monitors (BPMs) are utilized to measure the transverse position of the proton beam at the Rapid Cycling Synchrotron (RCS) of the CSNS. Custom developed electronics are employed to process signals from the BPMs. Significant transverse beam position offsets were observed at several locations along the RCS. These offsets were attributed to abrupt changes in the cross-section of the upstream vacuum duct and BPM, calibration constants determined at a single frequency on the test bench, and limitations in the position calculation algorithm. Analytical estimates and numerical simulations were conducted to assess the impact of the sudden change in the beam duct aperture. Additionally, BPMs were recalibrated at the test bench to evaluate the influence of different frequencies on the observed offsets.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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