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Design considerations of the bunch-by-bunch transverse feedback system for the CSNS RCS

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The CSNS RCS (Rapid Cycling Synchrotron) is a proton accelerator designed to achieve a target beam energy of 1.6 GeV, with a typical operating intensity of 140 kW, which is expected to increase to 500 kW after the CSNS II upgrade. However, a significant current instability has been observed during the 100 kW beam operation. To mitigate this instability, techniques such as operational tuning and chrominance modulation were previously used to make the 100-kilowatt beam operate stably. In order to face the subsequent stronger instability, a bunch-by-bunch transverse feedback system is developed to mitigate the coherent lateral oscillations caused by instability and injection errors. The system consists of a beam position monitor, strip-line kicker, power amplifier, and signal processing electronics.

Footnotes

Paper preparation format

LaTeX

Region represented

Asia

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Author: CHEN, Weiwen (Institute of High Energy Physics)

Co-authors: YANG, Renjun (Institute of High Energy Physics); QIU, Ruiyang (Institute of High Energy Physics)

Presenter: CHEN, Weiwen (Institute of High Energy Physics)

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