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Design and experiment of BPM electronics for the CSNS RTBT line

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The primary objective of the first phase of the China Spallation Neutron Source (CSNS) project is to accelerate negative hydrogen ions to 80 MeV using a linear accelerator. Subsequently, these negative hydrogen ions are stripped to become protons, which are then injected into a rapid cycling proton synchrotron. The proton beam is accelerated to an energy of 1.6 GeV and directed through a beam transport line to a tungsten target, where spallation reactions occur to produce neutrons. The Ring to Target Beam Transport (RTBT) line handles two 90 ns beam pulses extracted from the ring. This article mainly focuses on the validation design of the beam position measurement electronics in the RTBT section. It considers the impact of increased power on the signal after the second phase upgrade of the spallation source, involving front-end analog design, FPGA-based position algorithms, and related testing.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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