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Monitoring and control systems for a new branched proton beam line in Hadron Experimental Facility at J-PARC.

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The Hadron Experimental Facility at the Japan Proton Accelerator Research Complex (J-PARC) is designed to provide high-intensity beams. A new branched proton beam line called as the “B-line” at J-PARC has been constructed and is going to start its operation from Feb. 2020. A small fraction ($<0.1\%$) of the primary beam is branched by a Lambertson magnet and goes into the B-line. While the beam intensity of the B-line greatly depends on the beam profile at the Lambertson magnet, the beam intensity of the B-line must be controlled to be under 3×10^{10} protons per spill. With these regards, the beam monitors and the control system play a crucial role for the B-line.

Beam monitors are newly installed, and a control system is developed for the operation of the B-line. In particular, the beam profile and beam loss around the Lambertson are monitored to ensure the beam intensity going into the B-line. The beam profile and the beam intensity are also monitored at a beam dump to ensure the proper beam destination. When the control system detects the unexpected large beam intensity, the primary beam extraction will be aborted within a few msec even during the beam extraction.

In this presentation, we will show the details of the control and monitoring system of the new proton beam line and report the first operation results.

Minioral

Yes

IEEE Member

No

Are you a student?

No

Author: Dr MORINO, Yuhei (KEK, High Energy Accelerator Research Organization)

Co-authors: Mr AGARI, Keizo (KEK, High Energy Accelerator Research Organization); Mr AKIYAMA, Hiromobu (KEK, High Energy Accelerator Research Organization,); Dr SATO, Yoshinori (KEK, High Energy Accelerator Research Organization,); Dr TOYODA, Akihisa (KEK, High Energy Accelerator Research Organization,); Dr KOMATSU, Yusuke (KEK, High Energy Accelerator Research Organization)

Presenter: Dr MORINO, Yuhei (KEK, High Energy Accelerator Research Organization)

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