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Firmware and Software Implementation Status of the nBlm and icBlm Systems for ESS Facility

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Ionization chamber Beam Loss Monitor (icBLM) and neutron Beam Loss Monitor (nBLM) systems are fundamental components of European Spallation Source (ESS) accelerator safety infrastructure. Main responsibility of these devices is an instantaneous and reliable detection of accelerated proton beam loss that exceeds predefined safety threshold. The detection statuses from several detectors are combined using operator-defined logical function to emit Beam Inhibit signal to Machine Protection System, which brings the accelerator to safe state.

The paper presents implementation details of beam loss detection algorithms used for both types of systems together with overview of remaining firmware and software layers. Each component of the system is discussed in the context of requirements defined by ESS and possible improvements. In addition, the contribution covers overall system evaluation details in simulation, laboratory and real facility tests.

Minioral

Yes

IEEE Member

No

Are you a student?

No

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