

Design and Beam Off-Line Performance Evaluation of the Machine Protection System for the RAON

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The RAON is a sophisticated system designed for advanced scientific experiments using high-energy particle beams. These high-power beams pose significant risks, potentially causing equipment damage and safety hazards. To mitigate these risks, a reliable Machine Protection System (MPS) is essential for ensuring the safe operation of the accelerator. The RAON MPS was developed with three primary objectives: preventing equipment damage due to beam loss, ensuring the safety of superconducting cavities, and providing a rapid beam shutdown mechanism. The system is designed to respond within 50 μ s to prevent damage from high-power beams. This paper presents the design of the RAON MPS and evaluates its performance through beam off-line tests. The results show that the MPS can shut down the beam within 3 μ s of a fault signal, well within the design target of 10 μ s. These findings confirm the system's reliability in safeguarding the accelerator and highlight potential areas for further system improvements to enhance operational efficiency.

Paper submission Plan

Best Presentation

Contribution track

ICABU WG1. Accelerator Systems

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