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Belle II Loss Monitor Activities for Understanding the SBL Mechanism

The SuperKEKB accelerator at the Belle II experiment has achieved record luminosities, but increasing luminosity is hindered by Sudden Beam Loss (SBL) events, which can damage both the accelerator and detector components. To address this issue, we have developed and implemented advanced beam diagnostic and beam abort systems.

High-speed loss monitors, including PMTs and Electron Multiplier Tubes (EMTs), have been installed at key locations around the accelerator ring to accurately detect the onset of beam losses with sub-μs resolution. These detectors are synchronized using the White Rabbit (WR) time synchronization system, allowing precise correlation of beam loss events.

To mitigate the impact of beam losses, enhancements have been made to the beam abort system. New loss monitors and CLAWS detectors have been strategically placed to issue faster abort requests, reducing beam loss durations and minimizing damage. Further improvements, such as a direct optical path for abort signals and the development of a laser-based abort request system, are also under study.

This presentation will provide an overview of the latest developments in SuperKEKB's beam loss monitoring and mitigation strategies, highlighting their impact on machine protection and performance optimization.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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