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Status of the Synchrotron Radiation Telescope at the Large Hadron Collider

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Accurate and continuous measurement of the transverse beam profile is essential for optimizing the performance of particle accelerators. At the Large Hadron Collider (LHC), this task is performed non-invasively by the Synchrotron Radiation Telescope (BSRT). Operational since Run 2, the BSRT has undergone upgrades enhancing its reliability and performance. It operates under conditions that pose specific challenges not commonly encountered in synchrotron radiation diagnostics at electron facilities. These include the complexity of the radiation source, consisting of multiple magnetic elements evolving during the machine cycle, operation near the diffraction limit in the shortwave ultraviolet, and the requirement for full remote control, as the setup is inaccessible during regular machine operation.

This contribution presents the current status of the BSRT system, reviewing its key capabilities, operational limitations, and role in both routine machine operations and dedicated beam physics studies. Finally, an outlook is provided on future upgrades under study, aimed at extending the instrument's performance and ensuring readiness for the upcoming High-Luminosity LHC era.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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