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Gun and Collector Development on the Electron Cooler Test Stand (ECTS)

Wednesday 29 October 2025 09:30 (30 minutes)

The electron cooler of the Antiproton Decelerator (AD) at CERN, that can operate with an electron beam of up to 2.4 A at 27 keV, is scheduled for replacement during the upcoming Long Shutdown 3 (LS3). A newly designed electron gun and collector—optimized for enhanced reliability, efficiency, and operational performance—are undergoing rigorous testing and validation at the dedicated Electron Cooler Test Stand (ECTS).
The new electron collector features a re-engineered cooling system, where the water circuit is fully decoupled from the vacuum environment, significantly reducing the risk of vacuum leaks. The new electron gun operates at high perveance in the range of 2.2 to 2.5 µP and employs a magnetic beam expansion by a factor of two. This expansion lowers the transverse temperature of the electron beam, thereby enhancing the cooling efficiency. This talk will present the ongoing research, key design considerations, and the latest experimental results from the ECTS, contributing to the successful implementation of the new AD electron cooler.

Footnotes

Funding Agency

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Yes

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