

Replacement of electrostatic septa with crystal technology

Slow extraction is needed for continuous particle spills from synchrotrons but is inherently lossy due to the non-zero particle density between circulating and extracted beam lines. At CERN's SPS, this results in significant activation of electrostatic septa, making it a highly radioactive area. The current SPS operational parameters and annual slow-extracted protons are already constrained by this activation. With increasing demands for higher intensities and integrated flux, enhancing extraction efficiency and reducing activation are critical, not only for SPS but for all facilities using slow extraction.

This contribution explores the current status and future prospects of supplanting the conventional thin electrostatic septa with innovative crystal technology at the SPS. Initially, we delve into the current performance and potential future capabilities of crystal systems, followed by an examination of some concepts for their practical application. Subsequently, a proposed timeline and a feasible R&D pathway for integrating this technology into the SPS infrastructure are presented.

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