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Enhancing Planar Channeling Efficiency: Final Results from the GALORE Project

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The efficiency of planar channeling for positive particles is limited by nuclear scattering when particles approach too close to the nuclei within the atomic planes. To mitigate this effect, a solution was proposed in 2007 [1], involving the creation of an optimized interruption in the crystal lattice at a strategic position before nuclear dechanneling can occur. Implementing this solution presents a significant technological challenge, which had remained for years unresolved.
In this talk, we present the final results achieved by the recently concluded GALORE project. Utilizing techniques developed for silicon microelectronics, we fabricated a silicon bent crystal with a micro-trench designed to enhance channeling efficiency. This new prototype was tested at CERN's SPS H8 beamline using a 180 GeV/c hadronic beam, marking the first measurement of increased channeling efficiency.

References
1. Tikhomirov, V. V. (2007). A technique to improve crystal channeling efficiency of charged particles. Journal of Instrumentation, 2(08), P08006

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