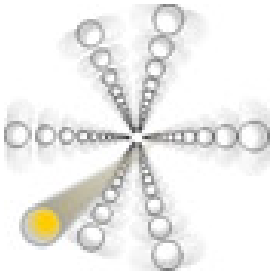

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Measurement of the Dechanneling Length for High-Energy Negative Pions

Monday, 24 September 2012 19:23 (1 minute)

Charged particles impinging on a crystal can be captured into channeling regime provided that their trajectories are aligned with crystalline planes or axes within the critical angle for channeling [1]. Experimental knowledge about channeling of negative particles is less studied due to experimental difficulties arising from peculiarities of particle motion in the crystal. However, recent experiments demonstrated the possibility to steer negatively charged particle beams through bent crystals at the full bending angle [2-4].
Due to incoherent interaction with the crystal atoms, negative channelled particles suffer a strongest dechanneling with respect to the positive counterpart. A physical quantity that quantifies the rate of incoherent interactions is the dechanneling length. This parameters for negative particles lacks of investigation because of the experimental difficulties encountered in studying channeling of negative particles. Negative hadrons represent a useful opportunity to measure the dechanneling length because for such heavier particles the radiation is negligible.
The dechanneling length of 150 GeV π- interacting with a short bent crystal has been measured. Comparison between experiment and simulation show that dechanneling mainly occurs as a result of incoherent interaction with the nuclei.

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