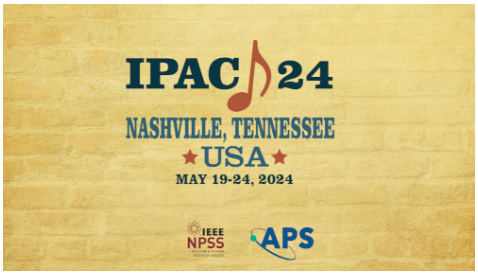

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Anodically bonded bent crystals: an advanced tool for channeling applications in particle beams steering

Tuesday, 21 May 2024 16:00 (2 hours)

In accelerator physics, channeling is a well-established phenomenon. By carefully selecting crystal orientation, particle's trajectories can be controlled and guided along desired paths. Bent crystals have been used at worldwide particle accelerators as optical elements to steer charged particle beams, with an elective application related to the collimation of the lead ion beam circulating in the large hadron collider (LHC) at CERN. This result opens new possibilities for innovative experimental setups, allowing for example to realize fixed target experiments at the TeV scale energy. Such experiments require compact, and light bent crystals with a length along the beam in the range of few cm and extremely uniform radius of curvature. An innovative method of crafting bent crystal for this class of experiments relies on anodic bonding of silicon to pre-figured glass. The presented methodology has potential to open new possibilities for optimizing beam quality and beam extraction in particle accelerators, leading to innovative physics experiments.

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