Contribution ID: **1580** Contribution code: **TUPB023** Type: **Poster Presentation**

Simulation studies on bent silicon crystals for loss reduction in slow extraction operation at J-PARC Main Ring

Tuesday 3 June 2025 16:00 (2 hours)

Reducing beam loss during slow extraction remains a critical challenge for the J-PARC Main Ring, which aims to enhance beam power for its 30 GeV proton beam. Since beam loss during slow extraction mainly occurs at the electrostatic septum, it is important to reduce beam loss at this location. Researchers at CERN SPS have recently reported that beam loss can be reduced by installing bent silicon crystals in the accelerator ring and utilizing their charged particle deflection effect. In this paper, we report the results of a simulation study on the expected beam loss reduction effect when the bent silicon crystal is installed upstream of the electrostatic septum of the J-PARC Main Ring and the beam deflection effects of the bent silicon crystal, called channeling or volume reflection, are utilized. The required size and installation position of the silicon crystal, and the required accuracy for adjusting the position and angle will also be reported.

Footnotes

Paper preparation format

LaTeX

Region represented

Asia

Funding Agency

Author: MUTO, Ryotaro (High Energy Accelerator Research Organization)

Co-authors: MATSUMURA, Akihiko (Nihon Advanced Technology Co., Ltd); YANAOKA, Eiichi (High Energy Accelerator Research Organization); OKAMURA, Katsuya (High Energy Accelerator Research Organization); NUMAI, Kazunori (High Energy Accelerator Research Organization); TOMIZAWA, Masahito (High Energy Accelerator Research Organization); MURASUGI, Shigeru (High Energy Accelerator Research Organization); ASAMI, Takashi (Japan Proton Accelerator Research Complex); KIMURA, Takuro (Japan Proton Accelerator Research Complex); SHIRAKABE, Yoshihisa (High Energy Accelerator Research Organization)

Presenter: MUTO, Ryotaro (High Energy Accelerator Research Organization)

Session Classification: Tuesday Poster Session

Track Classification: MC4: Hadron Accelerators: MC4.T12 Beam Injection/Extraction and Transport