



Contribution ID: 563 Contribution code: TUPC22

Type: **Poster Presentation**

Optimization of a permanent magnet multi-energy FFA arc for the CEBAF energy upgrade

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

It is currently planned to increase the energy of the CEBAF recirculating linear accelerator to 20 GeV or more by adding two new recirculating arcs that contain multiple new energy passes. The beam is continuous (CW), so no field ramping is desired, making this a fixed-field accelerator (FFA). The wide energy range requires a low dispersion lattice that can be created with high-gradient permanent magnets. One constraint is the existing tunnel radius in relation to the fields achievable by practically-sized permanent magnets. Thus, searching for the most efficient implementation in terms of magnet material volume is important. In this paper, a lattice cell search and optimization is conducted that evaluates cells by the magnet volume per unit length, with the permanent magnet designs also produced via an automated code. The new lattice cells are compared to the previous manually designed cell.

Footnotes

Funding Agency

Brookhaven National Laboratory / Department of Energy

Paper preparation format

LaTeX

Region represented

North America

Primary author: BROOKS, Stephen (Brookhaven National Laboratory)

Co-author: TRBOJEVIC, Dejan (Brookhaven National Laboratory)

Presenter: BROOKS, Stephen (Brookhaven National Laboratory)

Session Classification: Tuesday Poster Session

Track Classification: MC1: Colliders and other Particle and Nuclear and Physics Accelerators: MC1.A12 FFA