



Contribution ID: 922 Contribution code: MOPC73

Type: **Poster Presentation**

Design Updates to the EIC Electron Storage Ring Lattice

Monday, 20 May 2024 16:00 (2 hours)

The Electron-Ion Collider (EIC) at Brookhaven National Laboratory will feature a 3.8-kilometer electron storage ring (ESR) that will circulate polarized beams with energies ranging from 5 to 18 GeV for collision with hadrons from a separate ring at luminosities up to $10^{34} \text{ cm}^{-2} \text{ s}^{-1}$. This contribution focuses on several recent changes to the lattice design of the ESR. Super-bend dipole triplets are used in the arc cells to increase the damping decrement and horizontal emittance at 5 GeV. Their lengths have recently been optimized to balance these two requirements. The interaction region has been modified to accommodate the requirements of a Compton polarimeter. Major changes have been made to IR8, which is the location of a possible second interaction region and detector that may be installed in a future upgrade. A design for a non-colliding IR8 has been developed that simplifies the setup to reduce initial costs and complexity. The latest lattice design of the ESR is presented here, and the major design choices are discussed.

Footnotes

Funding Agency

Work supported by Brookhaven Science Associates, LLC, under Contract No. DE-SC0012704 and by Jefferson Science Associates, LLC, under Contract No. DE-AC05-06OR23177 with the U.S. Department of Energy.

Paper preparation format

LaTeX

Region represented

North America

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Session Classification: Monday Poster Session

Track Classification: MC1: Colliders and other Particle and Nuclear and Physics Accelerators:
MC1.A19 Electron-Hadron Colliders