Contribution ID: **347** Contribution code: **TUP091** Type: **Poster Presentation**

Space Charge Studies on Strong Hadron Cooler Energy Recovery Linac

Tuesday 12 August 2025 16:00 (2 hours)

An Energy Recovery Linac (ERL) based cooler, using Coherent electron Cooling (CeC) is being designed for cooling hadron beams of the Electron-Ion Collider (EIC). The ERL design utilizes highcurrent, high-brightness electron beams with low emittance and a uniform longitudinal distribution for efficient hadron cooling. This is designed to operate in two modes to accommodate cooling requirements for hadron bunches at 100 GeV and 275 GeV, each with an average current of 100 mA and 1 nC bunch charge. With these parameters, the space charge effects become significant in this ERL design due to the low beam energy and high beam current. In this paper, we discuss strategies for including space charge effects in the optics design and implementation of an interface for space charge dominated and non-dominated regions of this ERL lattice.

Please consider my poster for contributed oral presentation

No

Would you like to submit this poster in student poster session on Sunday (August 10th)

No

Footnotes

Funding Agency

This work is supported by Jefferson Science Associates, LLC under U.S. DOE Contract DE-AC05-06OR23177 and Brookhaven Science Associates, LLC, Contract DESC0012704

I have read and accept the Privacy Policy Statement

Yes

Author: NETHTHIKUMARA, Isurumali (Thomas Jefferson National Accelerator Facility)

Co-authors: GAMAGE, Bamunuvita (Thomas Jefferson National Accelerator Facility); WANG, Erdong (Brookhaven National Laboratory); DEITRICK, Kirsten (Thomas Jefferson National Accelerator Facility); SERENO, Nick (Thomas

Jefferson National Accelerator Facility); WANG, Ningdong (Cornell University); SETINIYAZ, Sadiq (Thomas Jefferson National Accelerator Facility); Dr SATOGATA, Todd (Thomas Jefferson National Accelerator Facility); BERGAN, William (Brookhaven National Laboratory)

Presenter: NETHTHIKUMARA, Isurumali (Thomas Jefferson National Accelerator Facility)

Session Classification: TUP: Tuesday Poster Session

Track Classification: MC5 –Beam Dynamics and EM Fields