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Electron Cooler for High-Energy Hadrons Based on Energy Recovery Linac

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The Electron Ion Collider (EIC) performance will benefit from cooling of the stored ions at three collision energies. Such cooling must counteract the emittance growth driven by IBS and beam-beam effects. A non-magnetized bunched beam electron cooler is one of the possible approaches to cooling colliding ions. Such an electron cooler must provide electron bunches up to 150 MeV with high average current in the cooling section. Currently there are several options under consideration to satisfy the cooling requirements at the high energy at EIC. In this talk we discuss the electron bunch quality requirements, challenges and design aspects of such electron cooler based on ERL and multiple passes of electron bunches through the cooling section compatible with EIC requirements at all energies.

Footnotes

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Author: KAYRAN, Dmitry (Brookhaven National Laboratory)

Co-authors: FEDOTOV, Alexei (Brookhaven National Laboratory); SELETSKIY, Sergei (Brookhaven National Laboratory)

Presenter: KAYRAN, Dmitry (Brookhaven National Laboratory)

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