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Emittance mismatching of electron swap-out injection for the Electron Storage Ring of the Electron-Ion Collider

Tuesday 12 August 2025 16:00 (2 hours)

The Electron-Ion Collider (EIC), to be constructed at Brookhaven National Laboratory, will collide polarized high-energy electron beams with polarized proton and ion beams, achieving luminosities of up to 1 × 10ˆ34 cmˆ−2 sˆ−1 in the center-of-mass energy range of 20-140 GeV. The EIC consists of two storage rings: the Hadron Storage Ring (HSR) and the Electron Storage Ring (ESR). Given the short polarization lifetime of the electrons, a swap-out injection scheme is adopted for the ESR injection. In this article, we estimate the injection mismatch tolerances for the electron swap-out injection from the Rapid Cycling Synchrotron to the ESR. In these studies, strong-strong beam-beam simulations are performed. The tolerances for injection emittance mismatch in the ESR are presented in this article.

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No

Footnotes

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