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Tolerances of RF phase and voltage noises with beam-beam interaction in 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. We have studied the impacts of various machine noises on beam emittance growth in the presence of beam-beam interactions. These noises include power supply current ripples, crab cavity phase and voltage noise, and intrabeam scattering. In this article, we present our recent simulation studies on the effects of phase and voltage noise from the storage RF cavities in both storage rings of the EIC: the electron storage ring (ESR) and the hadron storage ring (HSR). The goal of this study is to determine the tolerances for RF phase and voltage noises in the EIC storage rings and to provide important input for the EIC RF engineering design.

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

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I have read and accept the Privacy Policy Statement

Yes

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