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## Optimizing the design tunes of the electron storage ring of the Electron-Ion Collider

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The Electron-Ion Collider (EIC) presently under construction at Brookhaven National Laboratory will collide polarized high energy electron beams with hadron beams with luminosities up to  $10^{34} \text{cm}^{-2} \text{s}^{-1}$  in the center mass energy range of 20-140 GeV. Preliminary beam-beam simulations resulted in an optimum working point of (.08, .06) in the Electron Storage Ring (ESR). However, during the ESR polarization simulation study this working point was found to be less than optimal for electron polarization. In this article, we present beam-beam simulation results in a wide range tune scan to search for optimal ESR design tunes that are acceptable for both beam-beam and polarization performances.

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### Footnotes

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Yes

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