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Validation and countermeasures of vertical emittance growth due to crab cavity noise in a horizontal crab-crossing scheme

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The future Electron-Ion Collider (EIC) adopts a horizontal crab crossing scheme to compensate for the geometric luminosity loss from a 25 mrad crossing angle. The crab cavity noise-induced emittance growth in the deflecting plane (horizontal for EIC) has been well studied and a feedback system is effective to suppress the growth. However, simulations also showed emittance growth in the vertical plane when the beam profile is flat at IP. In this article, we will validate this observation and propose countermeasures to this emittance growth.

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Footnotes

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Yes

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