Contribution ID: **451** Contribution code: **TUP104** Type: **Poster Presentation**

Vertical Emittance Growth from IBS Diffusion via Beam-Beam Coupling in the EIC

Tuesday 12 August 2025 16:00 (2 hours)

We investigate vertical emittance growth in the Electron-Ion Collider (EIC) arising from intrabeam scattering (IBS) diffusion through beam-beam interactions. Using weak-strong simulations, we demonstrate that when horizontal noise is introduced, vertical emittance increases even in the absence of direct vertical diffusion. This behavior is attributed to resonance streaming around the synchro-betatron resonance $2\nu_x - 2\nu_y + p\nu_z = 0$ which enables unidirectional emittance transfer from the horizontal to the vertical plane. We further show that horizontal cooling alone cannot suppress the vertical growth, confirming that dedicated vertical cooling is essential for preserving the flat beam profile in high-luminosity EIC operation.

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

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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