Contribution ID: **9** Contribution code: **TUP080** Type: **Poster Presentation**

Preliminary study of space charge and beam-beam interplay in a collider ring

Tuesday 12 August 2025 16:00 (2 hours)

Hadron Collider Rings offer unprecedented opportunities to address fundamental scientific questions in particle and nuclear physics. To achieve these ambitious goals, the colliders must deliver exceptionally high levels of luminosity, hence require high intensity hadron beam in the ring, which leads to high beam-beam parameter, as well as comparable space charge effects.
This study focuses on nonlinear effects that impact the beam dynamics within the hadron accelerator ring, including weak-strong beam-beam interactions and their interplay with space charge effects. Accurately predicting these non-linearities, particularly resonances arising during multi-turn acceleration, is critical for long beam lifetime and optimal
accelerator performance. This work presents an initial attempt to develop an optimized approach that integrates space charge effects across the entire ring length while incorporating localized beam-beam interactions at specific interaction points.

Please consider my poster for contributed oral presentation

Yes

Would you like to submit this poster in student poster session on Sunday (August 10th)

Yes

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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Track Classification: MC1 - Colliders and other Particle and Nuclear Physics Accelerators