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Beam losses due to beam-residual gas interactions in the FCC-ee

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The Future Circular electron-positron Collider, FCC-ee, is a design study for a luminosity-frontier and highest-energy e^+e^- collider with a 91 km circumference. In a circular machine, the interactions between the beam particles and the residual gas in the vacuum chamber may degrade the beam quality, potentially affecting the beam lifetime and the collider luminosity, and cause local beam losses. In addition, experimental backgrounds may be increased. Ideally, the vacuum system must be able to keep vacuum conditions sufficiently good so that beam-residual gas interaction effects are tolerable for collider operation. This paper presents a study of the beam loss distribution arising from beam-residual gas interactions in the FCC-ee, together with beam-gas lifetime estimates.

Footnotes

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