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## Impact of collimators' geometric impedance on beam stability in FCC-ee

*Sunday 1 June 2025 14:00 (2 hours)*

Beam stability in the FCC-ee collider is strongly influenced by transverse and longitudinal beam coupling impedance. Developing a flexible and comprehensive impedance model is crucial for accurately evaluating and mitigating instabilities as machine parameters evolve. This study investigates the effect of the FCC-ee collimation system, identifying it as a dominant source of total machine impedance. Both resistive and geometric contributions are analyzed, with geometric effects found to play a critical role in shaping the overall impedance landscape. Accurately modeling collimators' geometric impedance is essential for beam stability assessment. Such modeling enables global impedance considerations, accounting for the interplay between different accelerator elements and guiding the definition of critical design parameters.

### Footnotes

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Europe

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