

# eeFACT 2025 - 70th ICFA Advanced Beam Dynamics Workshop on High Luminosity Circular e<sup>+</sup>e<sup>-</sup> Colliders



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Type: **Invited Oral Presentation**

## SuperKEKB IR upgrade idea

*Tuesday 4 March 2025 15:20 (30 minutes)*

SuperKEKB is an energy-asymmetric double-ring collider with a 7 GeV electron beam and a 4 GeV positron beam. An extremely small beta function at the interaction point (IP) and low emittance are necessary to achieve a peak luminosity that is an order of magnitude higher than that achieved by the KEKB. A final focusing superconducting magnet system provides the focusing magnetic field required to squeeze down the beta functions at the IP. The Belle-II detector solenoid field is compensated by the superconducting solenoids on each side of the IP. Modifications of the superconducting quadrupole magnet and interaction region (IR) are potential upgrade items required to further improve the SuperKEKB performance. An optics study has shown that moving the superconducting quadrupole magnet closer to the IP increases the dynamic aperture and extends the beam lifetime. Based on the results of optics analysis, a new design concept of superconducting quadrupole magnet using Nb<sub>3</sub>Sn cables is reported in this study.

### Footnotes

### Funding Agency

### I have read and accept the Privacy Policy Statement

Yes

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