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Optics design of the solenoid compensation scheme at FCC-ee

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We present the optics design of the solenoid compensation scheme at the FCC-ee. The 2T solenoids from the experiments induce coupling on the beams, generating an increase on vertical emittance. This compensation scheme minimizes emittance growth, with a final value of approximately 5% of the nominal. A screening solenoid is placed around the Final Focus Quadrupoles to protect them from the experiment's field. A skew quadrupole component is added to the Final Doublet, aligning the magnet axis to the rotated reference frame of the beam. Two anti-solenoids placed approximately ± 20 m from the IP are used to cancel the field integral. The vertical orbit generated by the horizontal crossing angle in the detector field is compensated by vertical correctors placed right after the beam pipe separation and next to the final focus quadrupoles. We describe the IR optics in this scheme, including the detector solenoid and the magnetic elements used for compensation.

Footnotes

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