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Status and plan of the emittance tuning of the FCC-ee High Energy Booster ring

The Future Circular Collider (FCC), in its electron/positron configuration, is one of the CERN's leading proposals for its next high-energy collider. This collider aims to achieve luminosities one to two orders of magnitude higher than ever before, enabling unprecedented precision studies of Z, WW, and H bosons, as well as the largest and purest production of top/anti-top quark pairs.

Previous studies for the FCC have highlighted the need to define tolerances on magnet imperfections and develop correction strategies. This is crucial for ensuring the performance of one of the main elements in the acceleration chain: the High Energy Booster (HEB) ring.

The efficiency and overall performance of these correction strategies, as well as the magnet field quality and misalignment tolerances, directly influence the specifications of correction magnets. This, in turn, affects key parameters such as beta functions, dispersion, transverse coupling, and emittance.

We show the status of the emittance tuning for the HEB ring of the FCCee, following a method ramping the sextupole's strength.

Secondary track

Author: BRUANT, Quentin (CEA/IRFU/DACM)

Co-authors: Dr GHRIBI, Adnan ({CNRS}UPR3266); CHANCE, Antoine (CEA Irfu); DALENA, Barbara (IRFU)

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