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Low emittance tuning of FCC-ee

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The FCC-ee project studies the design of a future 100 km e+/e circular collider for precision studies and rare decay observations in the range of 90 to 350 GeV centre of mass energy with luminosities in the order of 10^{35} cm^{-2} s^{-1}. In order to reach these luminosity requirements, strong focusing is needed in the interaction regions. Large maximum beta values (of 7736 m for the Z energy) and the small beta star values, make the FCC-ee lattices particularly susceptible to misalignments and field errors. FCC-ee therefore presents an appreciable challenge for emittance tuning. In this talk, we describe a comprehensive correction strategy used for the low emittance tuning. The strategy includes programs that have been developed to optimise the lattice based on Dispersion Free Steering (DFS), linear coupling compensation based on Resonant Driving Terms (RDT) and beta beat correction utilising response matrices. One hundred misalignment and field error random seeds were introduced in MAD-X simulations and the final corrected lattices are presented.

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