

Flavour Physics at FCC-ee

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A possible long-term strategy for high-energy physics at colliders, after the exploitation of the LHC and its High Luminosity upgrade, considers a tunnel of about 100 km circumference, which takes advantage of the present CERN accelerator complex. The Future Circular Collider (FCC) concept follows on the successful experience and outcomes of the LEP-LHC tunnel. A possible first step of the project is to fit in the tunnel a high-luminosity e^+e^- collider aimed at studying comprehensively the electroweak scale with centre-of-mass energies ranging from the Z pole up to beyond the $t\bar{t}$ production threshold. A 100 TeV proton proton collider is considered as the ultimate goal of the project.

Future Circular Collider study groups have been formed in a design study hosted by CERN, aiming at a Conceptual Design Report and a review cost in time for next European Strategy milestone foreseen in 2019.

The unprecedented statistics at the Z pole ($\mathcal{O}(10^{12-13})$ Z decays potentially delivered by the high-luminosity e^+e^- collider can be studied in particular to explore further the Flavour Physics case at large. We will discuss the Physics potential of the measurements of rare decays of b -hadrons, which can complement the knowledge and anticipated results from the current and foreseen b -Physics programs (LHCb upgrade and SuperKEKB B -factory). The large statistics at the Z pole can be used as well to scrutinize Lepton Flavour Violating Z decays, which would serve as an indisputable evidence for Beyond Standard Model Physics if seen. The precision expected for specific rare decays as well as for CP violation phenomena observables, in the current stage of the Design Study, will be reviewed.

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