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Top quark physics at FCC-ee and FCC-hh

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The Future Circular Collider (FCC) programme provides unique opportunities for comprehensive and precise studies of top quark physics. At the FCC-ee, operating at and slightly above the top pair threshold, a precise measurement of the top quark mass with a statistical and systematic accuracy down to the MeV level can be achieved through a threshold scan. Furthermore, the FCC-ee run at 365 GeV allows precise determinations of top quark electroweak couplings, particularly the $t\bar{t}Z$ vertex with sub-percent precision, and enables stringent constraints on flavor-changing neutral currents (FCNC), such as the V_{ts} coupling. At the FCC-hh, the unprecedented center-of-mass energy of 84 TeV enables precise differential measurements of top quark production processes at very high momentum transfer, such as top quark pairs and rare four-top final states. These high Q^2 measurements provide critical sensitivity to new physics effects at multi-TeV scales and will complement precision measurements from FCC-ee, thus offering a comprehensive exploration of the top quark sector.

Secondary track

Authors: MEHTA, Ankita (CERN); KLUTE, Markus (KIT)

Presenter: MEHTA, Ankita (CERN)

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