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FCC: QCD physics

he Future Circular Collider (FCC) will deliver unprecedented precision in the measurement of the properties and parameters of the Standard Model (SM), directly and indirectly probing new physics up to the 100-TeV scale. Its broad and diverse programme, including very high-luminosity e^+e^- collisions (FCC-ee) and hadronic collisions at the energy frontier (FCC-hh), will offer exceptional opportunities to advance knowledge of the strong interaction through high-precision measurements across a wide range of energy scales and scattering processes. Key measurements at the FCC-ee and FCC-hh are reviewed that will provide a deeper understanding of quantum chromodynamics (QCD) in the perturbative, nonperturbative and high-density regimes, and advance its theoretical description to a level of precision far beyond that of current collider experiments. The critical role played by QCD in determining key Standard Model quantities at FCC-ee is also discussed, highlighting how improved theoretical calculations and simulations are needed to match the foreseen FCC-ee experimental uncertainties.

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