



Contribution ID: 27

Type: Poster

Precision QCD with the LHeC and the FCC-eh

Tuesday, June 25, 2019 4:11 PM (1 minute)

The Large Hadron-electron Collider (LHeC) is a proposed upgrade of the LHC at CERN. An ERL will provide electrons to collide with the HL-LHC, HE-LHC and the FCC-hh proton beams to achieve centre-of-mass energies 1.3-3.5 TeV and luminosities $10^{34} \text{ cm}^{-2} \text{ s}^{-1}$. They will enlarge the kinematic plane by more than one order of magnitude towards smaller x and larger Q^2 than HERA. DIS measurements in such configurations offer unprecedented possibilities to enlarge our knowledge on parton densities through a complete unfolding of all flavours, both in a single experimental setup and combined with data from hadron colliders where precise factorisation tests can be performed. In this talk we review the most recent developments on the determination of proton PDFs and the measurement of α_s at both the LHeC and the FCC-eh.

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Session Classification: Posters

Track Classification: Future facilities