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Determination of proton parton densities and α_s at the LHeC and the FCC-eh

The Large Hadron-electron Collider LHeC and the Future Circular Collider in electron-hadron mode FCC-eh will provide electron-proton collisions with center-of-mass energies in the range 1.3-3.5 TeV and instantaneous luminosities larger than $10^{34} \text{ cm}^{-2} \text{ s}^{-1}$. In this talk, we present new results on the precise determination of proton parton densities at both small and large x in these machines. We will also discuss the possibilities that the study of both NC and CC processes offer for a complete flavour decomposition of parton densities in the proton for the first time. Finally, we will analyse the new results of the per mille determination of the strong coupling constant that could be achievable from the measurement of scaling violations, together with those offered by jet studies.

Experimental Collaboration

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