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Title of the talk: **"Progress and Challenge on the Proton Structure: From HERA to the Future Colliders EIC/LHeC"**

Abstract: The advent of new-generation particle accelerators, such as the Electron-Ion Collider (EIC) and the Large Hadron Electron Collider (LHeC), will not only initiate a new era in the search for new physics beyond the Standard Model (SM) of particle physics but will also provide significant opportunities for the precise study of hadron structure. In this talk, we will review the progress and challenges concerning proton structure functions, focusing on the physics potential of new high-luminosity colliding machines. This talk also includes a brief review of electroweak physics at the LHeC and addresses how EIC measurements contribute to our current understanding of the 3D tomography of the nucleon. Finally, we outline the expected impact of future EIC and LHeC measurements on the precise extraction of Parton Distribution Functions (PDFs) and their uncertainties.