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Electron-Ion Collisions at the LHeC and FCC-eh

Thursday, 29 September 2022 17:45 (20 minutes)

The LHeC and the FCC-eh will open a new realm in our understanding of nuclear structure and the dynamics in processes involving nuclei, in an unexplored kinematic domain. In this talk we will review the most recent studies as shown in the update of the 2012 CDR [1]. We will discuss the determination of nuclear parton densities in the framework of global fits and for a single nucleus. Then we will discuss diffraction, both inclusive and exclusive. Finally we will demonstrate the unique capability of these high-energy colliders for proving the long sought non-linear regime of QCD, saturation, to exist (or to disprove). This is enabled through the simultaneous measurements, of similar high precision and range, of ep and eA collisions which will eventually disentangle non-linear parton-parton interactions from nuclear environment effects.

[1] LHeC Collaboration and FCC-he Study Group, P. Agostini et al., e-Print: 2007.14491 [hep-ex].

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