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## Top and EW physics at the LHeC

The Large Hadron electron Collider (LHeC) is the proposal to deliver electron-proton/nucleus collisions at CERN using the LHC hadron or nuclear beams and a 50 GeV electron beam from an Energy Recovery Linac (ERL) in racetrack configuration. While the 2021 update of its CDR [1] contemplated concurrent operation of electron-hadron and hadron-hadron collisions at the HL-LHC followed by standalone electron-hadron collisions, we propose, in view of the current HL-LHC schedule, an LHeC program extending the regular HL-LHC program with only a standalone electron-hadron operation phase [2]. In this way, the LHeC becomes a bridge from the HL-LHC to the next flagship project at CERN.

In this talk we review the EW and top physics studies at the LHeC. We present new results on the extraction of the Weinberg angle and top, Z and W masses, together with the impact of the improved determination of PDFs+ $\alpha_s$  at the LHeC on their extraction at the HL-LHC. We also present the possibilities for the determination of neutral current vector and axial couplings to light quarks, and for constraining parameters in SMEFT analyses. Concerning top physics, we present the determination of  $|V_{td}|$  and  $|V_{ts}|$  and of anomalous couplings, including FCNC  $\gamma tq$  and Ztq, and of magnetic and electric dipole moments.

P. Agostini et al. (LHeC/FCC-he Study Group), J. Phys. G 48, 110501 (2021), arXiv:2007.14491 [hep-ex].
F. Ahmadova et al., e-Print: 2503.17727 [hep-ex].

## Secondary track

Author: ARMESTO, Nestor (Universidade de Santiago de Compostela) Session Classification: T06

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