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Prospects for Higgs physics in high-energy ep scattering

The LHeC is a proposed facility at CERN that will provide ep collisions with centre-of-mass energies above 1 TeV and a high luminosity of $O(ab?1)$. This facility will provide a unique opportunity to study the $WW \rightarrow H$ and $ZZ \rightarrow H$ production modes. Several decay channels - such as $H \rightarrow b\bar{b}$, $H \rightarrow c\bar{c}$ and $H \rightarrow \tau^+\tau^-$ - that are difficult to study precisely at the LHC because of the more involved experimental and theoretical conditions, will be accessible. Besides, the higher centre-of-mass energies of the FCC-he will allow the study of the $H \rightarrow t\bar{t}$ and $H \rightarrow HH$ channels that have too small cross sections at the LHeC. Here we present an overview on the progress in studies of the opportunities for Higgs physics in ep, including couplings, CP properties and different distributions.

Summary

Primary author(s) : Dr. ARMESTO, Néstor (Universidade de Santiago de Compostela)

Presenter(s) : KLEIN, Uta (University of Liverpool)

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