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A sequential global analysis of Proton and nuclear PDFs at the Electron Ion Collider

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We present an impact study of the upcoming Electron-Ion collider pseudo-data on unpolarized proton and nuclear Parton Distribution Functions (PDFs). The pseudo-data consists of inclusive cross sections for lepton-proton and lepton-nucleus Deep-Inelastic Scattering (DIS). We perform a sequential global analysis, whereby we start by fitting the proton PDFs which then we use as a baseline to fit the nuclear PDFs. The lepton-proton pseudo-data marked a mild impact except at large-x on the proton PDF while the lepton-nucleus ranging from helium to gold had a more significant constraint on nuclear PDFs across nuclei. We also quantify the implication of the reduced nuclear PDF uncertainties on the UHE neutrino cross-sections.

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