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Semi-inclusive Deep-Inelastic Scattering, Parton Distributions and \\ Fragmentation Functions at a Future Electron-Ion Collider

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We present a quantitative assessment of the impact a future Electron-Ion Collider would have in the determination of parton distribution functions in the proton and parton-to-hadron fragmentation functions through semi-inclusive deep-inelastic electron-proton scattering data. Specifically, we estimate the kinematic regions for which the forthcoming data are expected to have the most significant impact in the precision of these distributions, computing the respective correlation and sensitivity coefficients. Using a reweighting technique for the sets of simulated data with their realistic uncertainties for two different center-of-mass energies, we analyse the resulting new sets of parton distribution functions and fragmentation functions, which have significantly reduced uncertainties.

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