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Precision electroweak measurements and SMEFT studies at the EIC

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The EIC's high luminosity, wide kinematic coverage, availability of proton and isoscalar deuteron targets, and ability to polarize both the lepton and hadron beams, allows for unique opportunities for precision tests of the electroweak sector of the Standard Model and constraining beyond the Standard Model physics in a manner that complements efforts at the LHC and low energy experiments. In particular, neutral current parity violating DIS allows for a precision extraction of the weak mixing angle over the previously unexplored range of $10 \text{ GeV} < Q < 70 \text{ GeV}$. Furthermore, the various PVDIS asymmetries at the EIC can constrain new physics using the model-independent techniques such as Standard Model Effective Field Theory (SMEFT) analysis. In this talk, we will present an overview of these different topics and provide projection results based on recently carried out realistic EIC simulation studies.

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