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Electroweak physics at the EIC

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We discuss measurements of parity violating asymmetries in the DIS region at an EIC. With γZ interference in the electroweak processes, the parity violating asymmetries are associated with a new series of structure functions, $F_{\gamma Z1}$, $F_{\gamma Z3}$, $g_{\gamma Z1}$, $g_{\gamma Z5}$, which provide unique combinations of unpolarized/polarized parton distribution functions. We will present the projections of these structure functions from electron-proton collisions at future EIC with different beam energy configurations considering QED, QCD radiative corrections as well as corrections of detector smearing. We will also present the weak mixing angle $\sin^2(\theta_W)$ study at much higher Q^2 range than fixed target measurements using electron-deuteron collisions at an EIC.

Presenter: ZHAO, Yuxiang (Stony Brook University)

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