

Probing Anomalous $WW\gamma$ and WWZ Couplings with Polarized Electron Beam at the LHeC and FCC-Ep Collider

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Abstract : We study the anomalous $WW\gamma$ and WWZ couplings by calculating total cross sections of the $ep\rightarrow\nu q\gamma X$ and $ep\rightarrow\nu qZX$ processes at the LHeC with electron beam energy $E_e=140$ GeV and the proton beam energy $E_p=7$ TeV, and at the FCC-ep collider with the polarized electron beam energy $E_e=80$ GeV and the proton beam energy $E_p=50$ TeV. At the LHeC with electron beam polarization, we obtain the results for the difference of upper and lower bounds as (0.975, 0.118) and (0.285, 0.009) for the anomalous $(\Delta\kappa_\gamma, \lambda_\gamma)$ and $(\Delta\kappa_z, \lambda_z)$ couplings, respectively. As for FCC-ep collider, these bounds are obtained as (1.101, 0.065) and (0.320, 0.002) at an integrated luminosity of $L_{int}=100$ fb⁻¹.

Keywords : anomalous couplings, future circular collider, large hadron electron collider, W-boson and Z-boson

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