



Contribution ID: 351

Type: Oral Presentation

Measuring the anomalous ttZ and $tt\gamma$ couplings at Future $e-p$ colliders.

Wednesday 9 July 2025 10:00 (20 minutes)

We investigate the anomalous ttX couplings for neutral charged gauge boson $X=Z/\gamma$ in the Standard Model (SM) and measure their precision beyond the SM in future electron-proton collider environments. The tt quark pairs are produced in the neutral currents channel through the process $e^+p \rightarrow t\bar{t}$, for electron and proton beams of energy $E_e = 60$ GeV and $E_p = 7$ TeV respectively, at the center of mass energy of 1.3 TeV as proposed for the LHeC. The ttX interaction is further probed through the photo-production process $\gamma p \rightarrow t\bar{t}\gamma$ with γ scattered from the electron. We focus on the semileptonic channel where $t \rightarrow bW^+$, $W^+ \rightarrow l^+\nu_l$ and $\bar{t} \rightarrow \bar{b}W^-$, $W^- \rightarrow l^-\bar{\nu}_l$ and investigate sensitive kinematic observables to these couplings. We observe that the azimuthal angular difference, $\Delta\Phi$, between the scattered electron and the $l^+\nu_l$ is the most sensitive observable to ttZ couplings. We further investigate sensitive kinematic observables to $tt\gamma$ couplings in the photo-production process. We perform a χ^2 analysis at the inclusive and differential levels in the cross section to constrain the couplings.

Apply for student award at which level:

None

Consent on use of personal information: Abstract Submission

Yes, I ACCEPT

Primary author: INNOCENT, Katlego (University of the Witwatersrand)

Co-author: Dr KUMAR, Mukesh (University of the Witwatersrand)

Presenter: Dr KUMAR, Mukesh (University of the Witwatersrand)

Session Classification: Nuclear, Particle and Radiation Physics-2

Track Classification: Track B - Nuclear, Particle and Radiation Physics