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Title:	Probing non-standard HVV ($V = W, Z$) couplings in single Higgs production at future electron-proton collider
Authors:	Sharma, Pramod (/jspui/browse?type=author&value=Sharma%2C+Pramod) Shivaji, Ambresh (/jspui/browse?type=author&value=Shivaji%2C+Ambresh)
Keywords:	non-standard HVV ($V = W, Z$) couplings Higgs production
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Abstract:	The couplings of the Higgs boson (H) with massive gauge bosons of weak interaction ($V = W, Z$), can be probed in single Higgs boson production at the proposed future Large Hadron-Electron Collider (LHeC). In the collision of an electron with a proton, single Higgs production takes place via so-called charged-current ($e-p \rightarrow \nu e H$) and neutral-current ($e-p \rightarrow e H$) processes. We explore the potential of the azimuthal angle correlation between the forward jet and scattered neutrino or electron in probing the non-standard HVV couplings at the collider center-of-mass energy of $\sqrt{s} \approx 1.3$ TeV. We choose the most general modifications (of CP-even and CP-odd nature) to these couplings due to new physics effects beyond the standard model. We derive exclusion limits on new physics parameters of HVV couplings as a function of integrated luminosity at 95% C.L. using the azimuthal angular correlations in charged- and neutral-current processes. We find that using 1000 fb^{-1} data, the standard model-like new physics parameters in HWW and HZZ couplings can be constrained with accuracies of 4% and 15%, respectively. The least constrained CP-even parameters of HWW coupling can be as large as 0.04, while those of HZZ coupling can have values around 0.31. Allowed values of CP-odd parameters in HWW and HZZ couplings are found to be around 0.14 and 0.34, respectively. We also study changes in the allowed values of non-trivial new physics parameters in the presence of other parameters.
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