Contribution ID: **48** Type: **not specified**

Probing Neutral Triple Gauge Couplings at the LHC, CEPC and SPPC

Friday, 17 November 2023 14:20 (20 minutes)

We study probes of neutral triple gauge couplings (nTGCs) at the LHC, CEPC and SPPC. The nTGCs provide a unique window to the new physics beyond the Standard Model (SM) because they can arise from SM effective field theory (SMEFT) operators that respect the full electroweak gauge group $\mathrm{SU}(2)_{\mathrm{L}} \otimes \mathrm{U}(1)_{\mathrm{Y}}$ of the SM only at the level of dimension-8 or higher. We derive the neutral triple gauge vertices (nTGVs) generated by these dimension-8 operators in the broken phase and map them onto a newly generalized form factor formulation, which takes into account only the residual $\mathrm{U}(1)_{\mathrm{em}}$ gauge symmetry. Using this mapping, we derive new relations between the form factors that guarantee a truly consistent form factor formulation of the nTGVs and remove large unphysical energy-dependent terms. We then analyze the sensitivity reaches of the LHC, CEPC and SPPC for probing the nTGCs via both the dimension-8 nTGC operators and the corresponding nTGC form factors. We compare their sensitivities with the existing LHC measurements of nTGCs and with those of future colliders.

Primary author: XIAO, Ruiqing

Presenter: XIAO, Ruiqing

Session Classification: Theory