Contribution ID: **45** Type: **not specified**

Composite effective field theory signal in case of searching for neutral triple gauge couplings with $ZZ \to \ell^+\ell^-\nu\bar{\nu}$ production

Thursday 7 September 2023 17:30 (30 minutes)

The Standard Model (SM) is a theory of elementary particles and their interactions that has a good agreement with experimental high-energy-physics data. However, this model should be extended to a more general theory due to the some theoretical problems of the SM and experimental facts beyond the SM. Effective field theory (EFT) is a way that allows one to search for any deviations from the SM by studying of anomalous couplings. It is based on the parameterization of the Lagrangian with the operators of higher dimensions accompanying by the Wilson coefficients. These operators represent contributions from physics of currently inaccessible energies and were constructed from the SM fields so that the gauge invariance is respected.

In order to set more stringent limits on Wilson coefficients one should use methods of sensitivity increasing in addition to the luminosity growth. In this work the method of composite anomalous signal is studied. It is based on accounting for background processes anomalous contributions in addition to the signal process one. This technique is considered for $ZZ \to \nu\bar{\nu}\ell^+\ell^-$ production at the LHC. This process is sensitive to the neutral triple gauge couplings (nTGCs), that are described by six dimension-eight operators. Anomalous contribution from the main background, WZ production, is significant for some operators. This contribution was accounted in the limit-setting procedure in addition to the contribution from the signal process, and the derived limits on the Wilson coefficients are more stringent.

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Session Classification: Plenary