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Study of neutral triple gauge couplings sensitivity to new physics manifestations using augmented vertex function approach with $Z(\nu\bar{\nu})\gamma$ production

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The most successful theory describing elementary particles, Standard Model (SM), can not explain some already observed phenomena, so it needs an extension. Any new observed manifestation of the new physics phenomenon brings the construction of a more general theory closer, since it provides new necessary information. The study reported in this talk contains an indirect model-independent way, vertex function approach, which is used for searching more physics phenomena beyond the SM. This approach allows one to parameterize neutral triple gauge couplings (nTGC) which are prohibited in the SM. The $Z(\nu\bar{\nu})\gamma$ production in pp collisions is used to study nTGC. Expected one-dimension limits on 12 vertex parameters are set under the conditions of Run II and Run III of the ATLAS experiment (LHC). Four aforementioned parameters have not been studied at the LHC experiments before. Two-dimensional correlation contours are also studied in this work. This analysis shows that in future the most strict limits may be set by using the $Z(\nu\bar{\nu})\gamma$ production. Moreover, the problem of unitarity violation is also considered in the work. Unitarity bounds have been calculated for several coefficients, and all the limits are found to be unitarized.

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