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Combination of anomalous quartic gauge coupling searches with full ATLAS Run II dataset

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Data provided by the LHC enable searches for a variety of new particles, but no deviations from the SM have been found. Therefore, these studies are supplemented by indirect searches for new physics in the same data, assuming that new particles are inaccessible. Anomalous quartic gauge couplings can arise in diverse physics models; limits on the coupling parameters are related to constraints on new physics model. Searches for these coupling manifestations have been carried out in different final states using data collected by the ATLAS detector in 2015-2018. This report presents the results of the combination of various analyses of vector-boson scattering and a triboson study. This work is not only the first combination, but also the most comprehensive study of anomalous quartic gauge couplings. It provides confidence intervals for scenarios with one or two non-zero parameters at a time as well as a treatment of theory unitarity and positivity bounds. Confidence limits with all coupling parameters being non-zero simultaneously are also set.

Primary author(s) : SEMUSHIN, Artur (A. Alikhanyan National Science Laboratory (Yerevan Physics Institute)); SOLDATOV, Evgeny (MEPhI)

Presenter(s) : SEMUSHIN, Artur (A. Alikhanyan National Science Laboratory (Yerevan Physics Institute))

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