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Vector boson scattering in the ATLAS detector

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Vector boson scattering (VBS) processes probe the fundamental structure of electroweak interactions and provide a high sensitivity to new physics (NP) phenomena affecting gauge and Higgs couplings. These processes are among the rarest ones in the Standard Model (SM) and were observed during last years in the Large Hadron Collider (LHC). The semileptonic final state, where one of the scattered gauge boson decays hadronically into a quark/antiquark pair and the other boson decays leptonically into electrons, muons or neutrinos, has good statistics and allows to study a lot of different couplings. VBS is sensitive to trilinear gauge couplings and quartic gauge couplings, which can be studied in the framework of the Effective Fields Theories (EFT) to set model-independent constraints on NP. The various and complementary VBS analyses performed in the ATLAS experiment allow to start a combination of the different results in order to set limits on dimension-8 EFT operators.

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