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Diboson production in the SMEFT from gluon fusion

Tuesday 22 August 2023 09:30 (20 minutes)

Precision measurements of diboson production at the LHC is an important probe of the limits of the Standard Model. The gluon-fusion channel of this process offers a connection between the Higgs and top sectors. We study in a systematic way gluon-induced diboson production in the Standard Model Effective Field Theory. We compute the helicity amplitudes of double Higgs, double Z/W and associated ZH production at one loop and with up to one insertion of a dimension-6 operator. We study their high-energy limit and identify which operators in each channel lead to growths with energy for different helicity configurations. We perform a phenomenological study of associated ZH production, including both quark and gluon initial states. Our analysis uses the channels in which the Higgs decays to b quarks and the Z decays leptonically. To maximise our sensitivity to New Physics, we consider both the resolved and boosted Higgs regimes and employ a binning in p_T. We show that for some top operators the gluon-induced channel can offer competitive sensitivity to constraints obtained from top quark production processes.

Collaboration / Activity

Theory

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