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Anomalous triple gauge couplings in electroweak dilepton tails at the LHC and interference resurrection

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We study the electroweak dilepton production with two forward jets at the LHC, aiming to measure the anomalous triple gauge couplings in the Effective Field Theory (EFT) approach. This process exhibits a distinctive feature, namely, the interference between Standard Model (SM) and beyond the SM is resurrected in the inclusive cross section of the full amplitude, including two forward jets. As a concrete illustration, we perform the detailed analytic and numerical study of the interference using a simpler toy process, and discuss the subtlety of the effective W approximation. We propose a new kinematic variable, VBFhardness, that controls the amount of energy flowing into the dilepton subprocess. We show that an appropriate cut on VBFhardness makes the interference resurrection manifest.

Finally, we use the invariant mass of the dilepton system as well as the transverse momentum, as done in the literature, to derive the sensitivity to anomalous triple gauge couplings at the LHC and the high luminosity LHC. Our result is compared with the existing limits from the experiments.

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