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Four-lepton production in gluon fusion at NLO matched to parton showers

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We present a calculation of the NLO corrections to the gluon-induced electroweak gauge boson pair production, $gg \rightarrow ZZ$ and $gg \rightarrow W+W-$, matched to the PYTHIA 8 parton shower in the POWHEG approach. The calculation consistently incorporates the continuum background, the Higgs-mediated process, and their interference. We consider leptonic decay modes of the vector bosons and retain offshell and non-resonant contributions. Parton-shower effects are found to be marginal in inclusive observables and quite sizeable in observables that are exclusive in additional jet radiation. The Monte Carlo generator presented here allows for realistic experimental effects to be incorporated in state-of-the-art precision analyses of diboson production and of the Higgs boson in the offshell regime.

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