

Mixed QCD-electroweak corrections to Higgs gluon fusion

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The study of the Higgs boson properties is one of the main tasks of contemporary high-energy physics. Among Higgs properties, its interaction with gluons is interesting since it can be facilitated by yet unknown elementary particles. One of the major sources of uncertainty in the theoretical description of ggH coupling originates from mixed QCD-electroweak contributions. The NLO QCD corrections to these contributions were evaluated in the approximation where electroweak boson masses were considered to be significantly larger than the mass of the Higgs boson and it is desirable to compute these corrections for physical masses of the gauge bosons and the Higgs boson. I will present a major step towards this goal and describe first the analytic evaluation of NLO mixed QCD-EW three-loop virtual corrections to $gg \rightarrow H$, and then their implementation in the evaluation of the total cross section for $gg \rightarrow H$ in the soft-gluon approximation for real corrections.

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