Title:	Divector boson production in association with a Higgs boson at hadron colliders
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Abstract:	We consider the production of a Higgs boson in association with two electroweak vector bosons at hadron colliders. In particular, we examine γγH, γZH, ZZH, and WþW−H production at the LHC (14 TeV), HE-LHC (27 TeV), and FCC-hh (100 TeV) colliders. Our main focus is to estimate the gluongluon (gg) channel (gg → VV0 H) contributions to pp → VV0 HðV;V0 ¼ γ; Z;WÞ and compare them with corresponding contributions arising from the quark-quark (qq) channel (qq¯ → VV0 H). Technically, the leading order gg channel contribution to the pp → VV0 H cross section is a next-to-next-to-leading order correction in the strong coupling parameter, αs. In the processes under consideration, we find that in the gg channel, WþW−H has the largest cross section. However, the relative contribution of the gg channel is more important for the pp → ZZH production. At the FCC-hh, the gg → ZZH contribution is comparable with the next-to-leading order QCD correction to qq → ZZH. We also compute the cross sections when W and Z bosons are polarized. In the production of WþW−H and ZZH, we find that the gg channel contributes more significantly when the vector bosons are longitudinally polarized. By examining such events, one can increase the fraction of the gg channel contribution to these processes. Further, we have studied beyond-thestandard-model effects in these processes using the κ-framework parameters κt, κV, and κλ. We find that the gg channel processes ZZH and WWH have a very mild dependence on κλ, but strong dependence on κt and κV. The qq channel processes mainly depend on κV. Dependence of the gg channel contribution on κV is stronger than that of the qq channel contribution. Therefore, focusing on events with longitudinally polarized W and Z bosons, one can find stronger dependence on κV that can help us measure this parameter.
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