Phenomenology 2022 Symposium: From Virtual to Real



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Constraining anomalous Higgs boson couplings to virtual photons.

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We present a study of Higgs boson production in vector boson fusion and in association with a vector boson and its decay to two vector bosons, with a focus on the treatment of virtual loops and virtual photons. Our analysis is performed with the JHU generator framework, and the results are expressed in terms of an effective field theory. New features of this study include a proposal on how to handle singularities involving Higgs boson decays to light fermions via photons, calculation of the partial Higgs boson width in the presence of anomalous couplings to photons, and phenomenological observations regarding the special role of intermediate photons in analysis of LHC data in the effective field theory framework. Some of these features are illustrated with projections for experimental measurements with the full LHC and HL-LHC datasets.

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