

Simplified Models for Higgs Physics Studies

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Just as renormalizable Simplified Models can be used alongside of effective field theories for the study of dark matter interactions, Simplified Models can be used to describe new physics associated with the Higgs boson. The objective is for the Simplified Model to capture some of the new Higgs physics associated with a wide range of UV-complete theories. Such models allow for variations in the tree-level and loop-induced Higgs couplings in a somewhat uncorrelated manner, and necessarily predict the existence of new ‘mediator’ particles that can searched for at the LHC and elsewhere. Here we present a simple example of one such model that employs both a vector-like, isosinglet top quark and a new isosinglet scalar, that generates the new quark mass as well as coupling to the 125 GeV Higgs. In this work the detailed phenomenology of this Simplified Model is examined in detail.

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