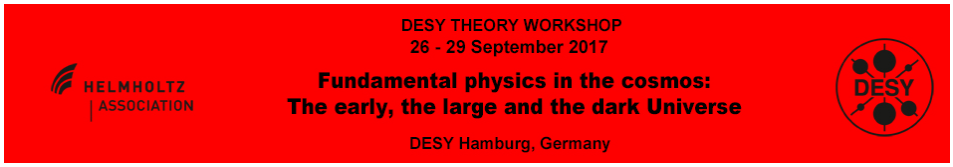


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# A global view on the Higgs self-coupling

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The Higgs self-coupling is notoriously intangible at the LHC. It was recently proposed to probe the trilinear Higgs interaction through its radiative corrections to single-Higgs processes. This approach however requires to disentangle these effects from those associated to deviations of other Higgs-couplings to fermions and gauge bosons. We show that a global fit exploiting only single-Higgs inclusive data suffers from degeneracies that prevent one from extracting robust bounds on each individual coupling. We show how the inclusion of double-Higgs production via gluon fusion, and the use of differential measurements in the associated single-Higgs production channels WH, ZH and ttH, can help to overcome the deficiencies of a global Higgs-couplings fit. In particular, we bound the variations of the Higgs trilinear self-coupling relative to its SM value to the interval [0.1, 2.3] at 68% confidence level at the high-luminosity LHC, and we discuss the robustness of our results against various assumptions on the experimental uncertainties and the underlying new physics dynamics. We also study how to obtain a parametrically enhanced deviation of the Higgs self-couplings and we estimate how large this deviation can be in a self-consistent effective field theory framework.

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