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Probing the Higgs trilinear self-coupling via single Higgs production and precision physics.

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In the Standard Model of the Electroweak Interactions the value of the Higgs trilinear self-coupling is predicted from its relation to the Higgs mass and the Fermi constant. However, the experimental verification of this prediction through the measurement of the double Higgs production is extremely challenging.

I present the possibility of probing an anomalous trilinear coupling indirectly, through its effects in the single Higgs production and decay processes at the LHC and in the precision observables. Indeed, although these processes do not depend on this coupling at the tree level, they are sensitive to the Higgs self-coupling via loop effect. The constraints on the trilinear Higgs self-coupling that can be obtained from various observables, like the signal strength of the different channels, the cross-section of the associate Higgs production with top quarks and the measurement of the W mass, are presented.

Experimental Collaboration

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