



Contribution ID: 22

Type: **not specified**

Precise predictions for Higgs production via gluon fusion in BSM scenarios

Wednesday 1 June 2011 17:45 (15 minutes)

The search for the Higgs boson is a primary objective at the Tevatron and the LHC. The dominant production mechanism is gluon fusion, for which new physics effects can lead to significant deviations from the Standard Model predictions.

We consider extensions of the Standard Model with heavy particles in various representations of the Lorentz group and with arbitrary couplings to the Higgs boson. We present the construction of an effective Lagrangian where the heavy particles are integrated out and the computation of the corresponding Wilson coefficient through three loops. We analyse the deviations of the Higgs production cross-section from the Standard Model predictions in scenarios as a four-generation Standard Model and composite Higgs models with an extended quark sector.

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Session Classification: P12 –COLLIDER PHENOMENOLOGY