

Triple Higgs production in the SM and in models with singlet NP scalars at proton-proton colliders (10'+8')

Monday 28 November 2022 09:36 (10 minutes)

In this talk we will discuss the production of three Higgs bosons in the LHC and at a proton-proton collider running at a centre-of-mass energy of 100 TeV. We will argue that the seemingly challenging 6-bottom jets final state is a very good candidate to investigate triple Higgs production within and beyond the SM in proton-proton colliders. In particular we will consider three different scenarios: one in which the triple and quartic Higgs boson self-couplings are not affected by new physics phenomena besides the Standard Model (SM) and in addition, we will explore two possible SM extensions by one and two new scalars. We will show that a 100 TeV machine can impose competitive constraints on the quartic coupling in the SM-like scenario. In the case of the scalar extensions of the SM, we will show that large significances can be obtained in the LHC and the 100 TeV collider while obeying current theoretical and experimental constraints including a first order electroweak phase transition.

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