Contribution ID: **102**   Type: **Parallel Sessions**

Searches for resonant and non-resonant Higgs boson pair production in the four bottom quark final state at 13 TeV

Tuesday, 19 October 2021 15:30 (10 minutes)

This presentation will provide an overview of the latest results from the CMS collaboration on searches for resonant and non-resonant Higgs boson pair production decaying into four bottom quarks. The chosen final state guarantees the largest branching ratio. Presented results are extracted from the dataset of proton-proton collisions at 13 TeV of center-of-mass energy collected during the 2016-2018 Run-2 LHC data-taking period, which corresponds to 138 fb^{-1} of integrated luminosity. Particular focus will be dedicated to the background model techniques crucial to properly model the large QCD background affecting the considered final state. These, together with the use of machine learning techniques allowed to boost the sensitivities yielding the current tightest constraint on the Higgs boson pair production cross section and to strongly constrain the presence of physics Beyond the Standard Model.

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