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Exotic decay of the Higgs boson to a pair of light pseudoscalars in the CMS experiment

The Standard Model is one of the most successful theories at describing the strong, weak, and electromagnetic forces and the interactions between the elementary particles.

The scalar boson discovered in 2012 at the Large Hadron Collider (LHC) might be consistent with the Higgs boson predicted by the Standard Model, thus validating the Higgs mechanism and therefore representing a further confirmation of this theoretical framework. However, the experimental data still leave plenty of room to determine whether or not an extension of the scalar sector is allowed.

The LHC combination of the SM Higgs boson measurements at 7 and 8 TeV allows Higgs boson decays to BSM states with a rate of up to 34% at 95% confidence level.

Presence of new physics within the context of the Two-Higgs-Double-Model and NMSSM theories allows the exotic decay of the Higgs boson into a pair of light pseudoscalars. CMS collaboration has searched for this exotic decay of the Higgs boson in the dataset collected at 13 TeV in different final states. In this contribution, the search in the $m\mu b\bar{b}$ final state is reviewed and the results are summarized.

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