



Contribution ID: 176

Type: LHC experiments

Higgs to 4 leptons with 2017 dataset

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The $H \rightarrow ZZ \rightarrow 4\ell$ decay channel ($\ell = e, \mu$) is one of the most important channels for studies of properties of the Higgs boson since it has a large signal-to-background ratio due to the complete reconstruction of the final state decay objects and excellent lepton momentum resolution. Measurements performed using this decay channel and Run 1 data include, among others, the determination of the mass, spin-parity, and width of the new boson as well as tests for anomalous HVV couplings. This analysis presents measurements of properties of the Higgs boson in the $H \rightarrow ZZ \rightarrow 4\ell$ decay channel at the $\sqrt{s} = 13$ TeV using 41.8 fb^{-1} of pp collision data collected with the CMS experiment at the LHC in 2017.

In the previous iteration, categories have been introduced targeting sub-leading production modes of the Higgs boson such as vector boson fusion (VBF) and associated production with a vector boson (WH, ZH) or top quark pair (ttH). Apart from a larger dataset used, the main improvements in this analysis are newly optimised lepton selection, featuring in particular the usage of a new multivariate discriminant for electrons, and improved categorisation, especially optimised towards the associated production with a top quark.

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