

Overview of SM Higgs measurements at CMS and constraints on DM from Higgs searches

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An overview of Higgs boson results from CMS is presented using pp collision data collected at centre-of-mass energies of 7 and 8 TeV corresponding to integrated luminosities of 5/fb and 20/fb respectively. The combination of the coupling results of all Higgs boson decay channels measured at CMS is presented with

various fits looking for deviations of the couplings from the Standard Model predictions. Measurement of Higgs boson mass from combination of 4-lepton and $\gamma\gamma$ channel is presented.

Studies of the Higgs boson spin and parity are presented using data samples corresponding to the $\gamma\gamma$, ZZ , and WW decay channels. The data are compared to the expectations for a Standard Model Higgs boson, and for several alternative models.

Constraints on the total Higgs boson width, Γ_H , are presented using off-shell production and decay in the ZZ channel. The analyses are carried out in the ZZ to 4-lepton and to 2-lepton-2-neutrino channels, and constraints on the Higgs boson width are obtained.

A search for Higgs boson invisible decay modes has been carried out in events where the Higgs boson is produced in association with a Z boson as well as through Vector Boson Fusion.

In the associated production search, electron, muon and b -quark pair decay modes of the Z -boson are considered. No evidence of a signal has been found and upper limits on the invisible branching ratio are obtained and interpreted in a Higgs portal model of dark matter interactions.

Summary

CMS results from Higgs boson analysis. Study of deviations of Higgs couplings from standard model. Study of Higgs boson spin and parity. Measurement of Higgs boson mass and width. Constraints on DM through Higgs portal model from invisible decays of Higgs boson.

Primary author: PLESTINA, Roko (Chinese Academy of Sciences (CN))

Presenter: PLESTINA, Roko (Chinese Academy of Sciences (CN))

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