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New results on Higgs properties

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ABSTRACT

We present the latest ATLAS and CMS measurements of several Higgs properties, such as signal-strength modifiers for the main production modes, fiducial and differential cross sections, and the Higgs mass. We have analyzed the 13 TeV proton-proton LHC collision data recorded in 2016, corresponding to integrated luminosities up to 36.1 fb^{-1}. Results for the $\text{H} \to \text{ZZ} \to 4\ell$ ($\ell = \text{e}\mu$), $\text{H} \to \gamma\gamma$, and $\text{H} \to \tau\tau$ decay channels are presented. In addition, searches for new phenomena in the $\text{H} \to \gamma\gamma + E_{\text{T}}^{\text{miss}}$ and $\text{H} \to \text{b}\overline{\text{b}} + E_{\text{T}}^{\text{miss}}$ decay channels are presented.

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1 Introduction

Observation of the Higgs Boson [1, 2].

2 H → ZZ

See Figure 1 and Table 1.

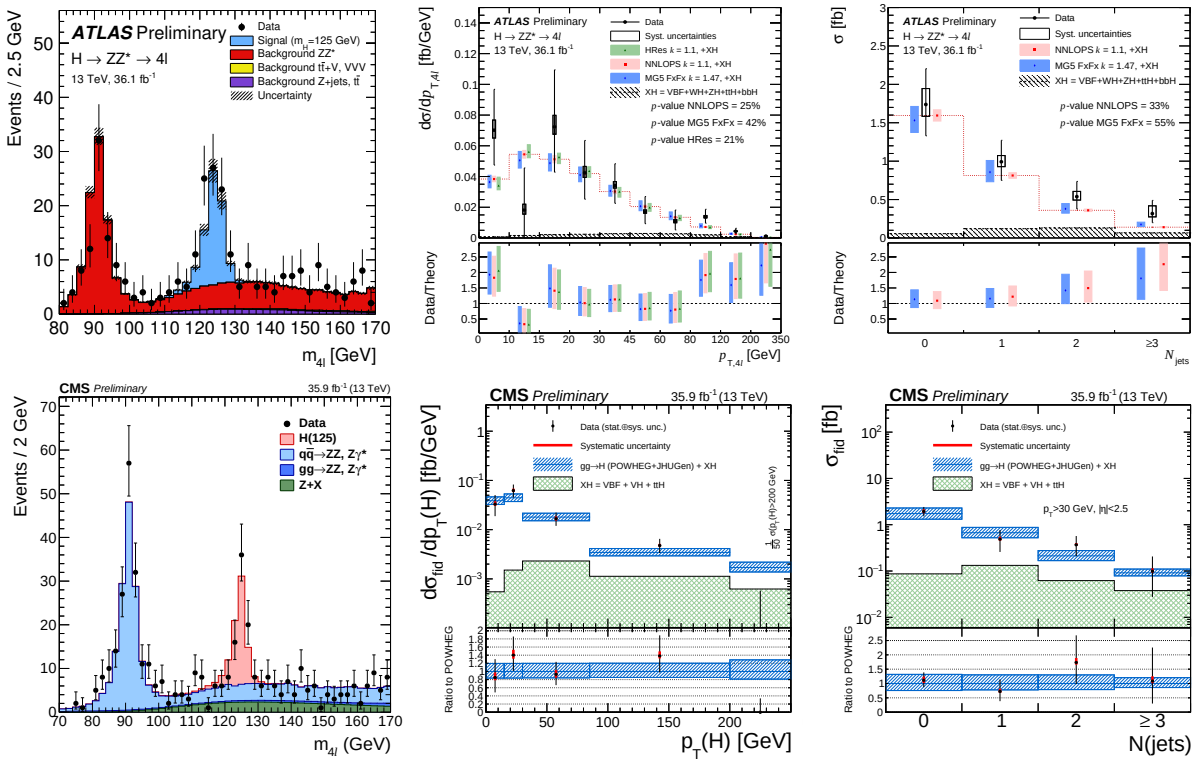

Figure 1: (Top left) ATLAS four-lepton invariant mass distribution of the selected events. The systematic uncertainty on the prediction is shown by the dashed band. (Top center and right) ATLAS differential fiducial cross sections, for the transverse momentum of the Higgs boson (center) and the number of jets (right). The measured cross sections are compared to different ggH predictions, and predictions for all other Higgs production modes XH are added. (Bottom left) CMS four-lepton invariant mass distribution of the selected events. (Bottom center and right) CMS differential fiducial cross sections, for the transverse momentum of the Higgs boson (center) and the number of jets (right). The sub-dominant component of the signal (VBF + VH + ttH) is denoted as XH.

3 H → γγ

See Figure 2.

Patient	Initial level(μg/cc)	w. Magnet	w. Magnet and Sound
Guglielmo B.	0.12	0.10	0.001
Ferrando di N.	0.15	0.11	< 0.0005

Table 1: Place the caption here.

4 $\mathbf{H \rightarrow \tau\tau}$

5 Searches for new phenomena

6 Conclusions

References

[1] G. Aad *et al.* [ATLAS Collaboration], Phys. Lett. B **716**, 1 (2012) [arXiv:1207.7214 [hep-ex]].

[2] S. Chatrchyan *et al.* [CMS Collaboration], Phys. Lett. B **716**, 30 (2012) [arXiv:1207.7235 [hep-ex]].

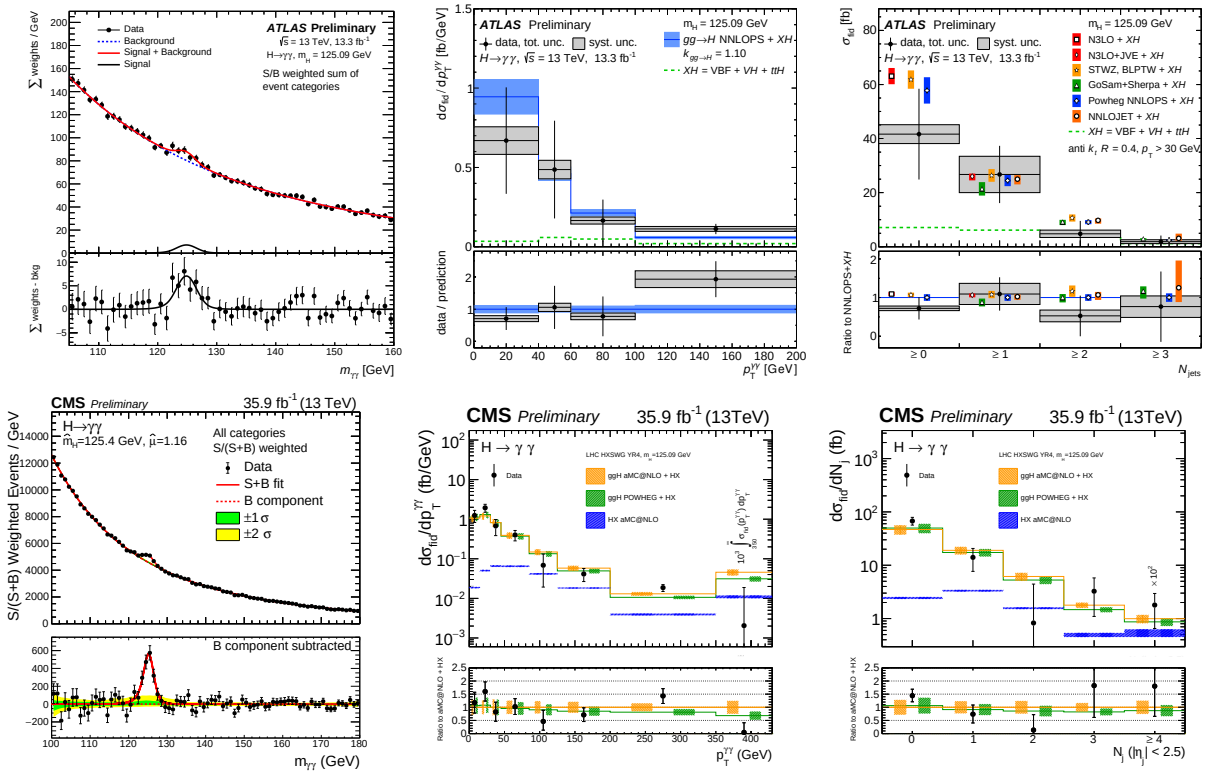

Figure 2: (Top left) ATLAS diphoton invariant mass spectrum. (Top center and right) ATLAS differential fiducial cross sections, for the transverse momentum of the Higgs boson (center) and the number of jets (right). (Bottom left) CMS diphoton invariant mass spectrum. (Bottom center and right) CMS differential fiducial cross sections, for the transverse momentum of the Higgs boson (center) and the number of jets (right).