Imperial College London

VBF Higgs to Invisible - Update

HIG-14-038, AN-14-243

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Overview

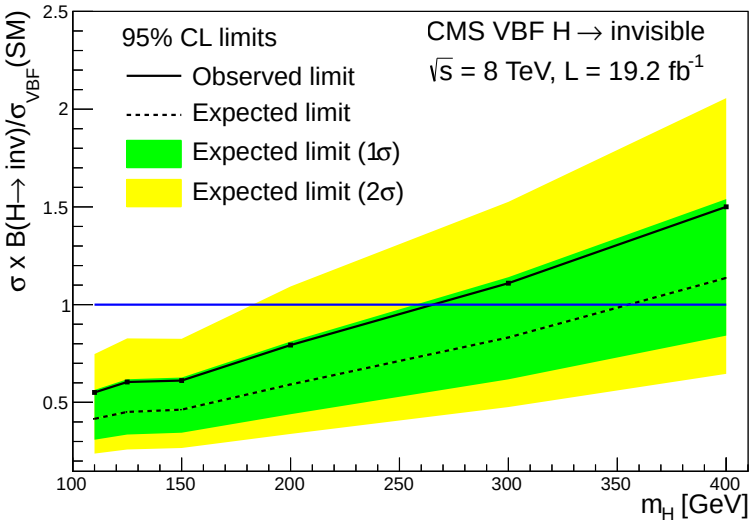
- Preapproval conditions answered before Christmas
- Further study of single mu data suggested
  - Completed last week
- Unblinded results have been obtained and will be shown below

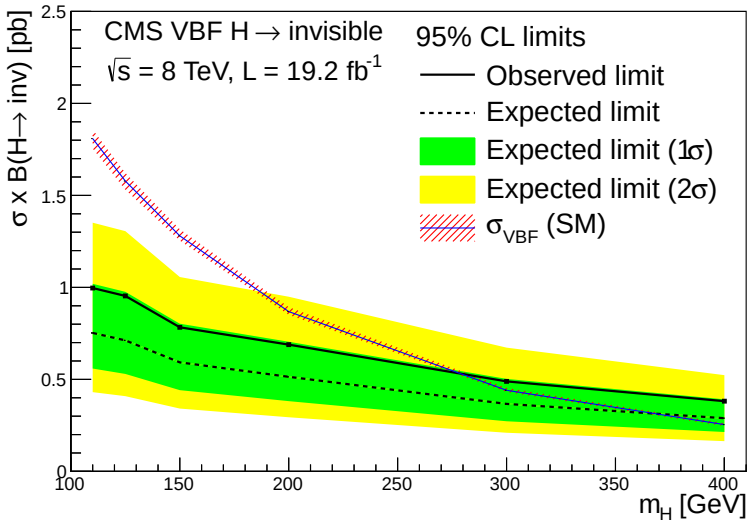
Yields

Background	$N_{est} \pm (stat) \pm (syst)$
$Z \to \nu\nu$	$157.3 \pm 37.1 \pm 38.3$
$W \to \mu\nu$	$101.8 \pm 6.1 \pm 11.9$
$W \to e\nu$	$57.4 \pm 7.3 \pm 7.0$
$W \to \tau\nu$	$98.0 \pm 13.2 \pm 25.4$
top	$4.4 \pm 1.0 \pm 1.4$
VV	$3.8 \pm 0.0 \pm 0.7$
QCD multijet	$17 \pm 0 \pm 14$
Total Background	$439.7 \pm 40.5 \pm 55.8$
Signal(VBF 125)	$273.4 \pm 0.0 \pm 31.2$
Signal(ggH 125)	$22.6 \pm 0.0 \pm 15.6$
Observed	508

Limits

- Prefit expected limit on B(H→inv) 42% for m_H=125 GeV
- Postfit observed (expected) limit on B(H→inv) 60 (45)% for m_H=125 GeV
  - This corresponds to a 1σ upwards fluctuation





- Single bin counting experiment so limit 100% correlated across all mass points

Conclusion

- Unblinded results shown
- We observe a 1σ upwards fluctuation
- This gives us a postfit observed (expected) limit on B(H→inv.) of 60 (45)% for m_H=125 GeV
  - This limit includes a 20% uncertainty on the $Z/\gamma^* \to \mu\mu$ to $Z \to \nu\nu$ extrapolation factor which is under investigation
- Control plots and updated documentation will follow shortly

Backup