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Combination of Higgs to Invisible Direct Measurements

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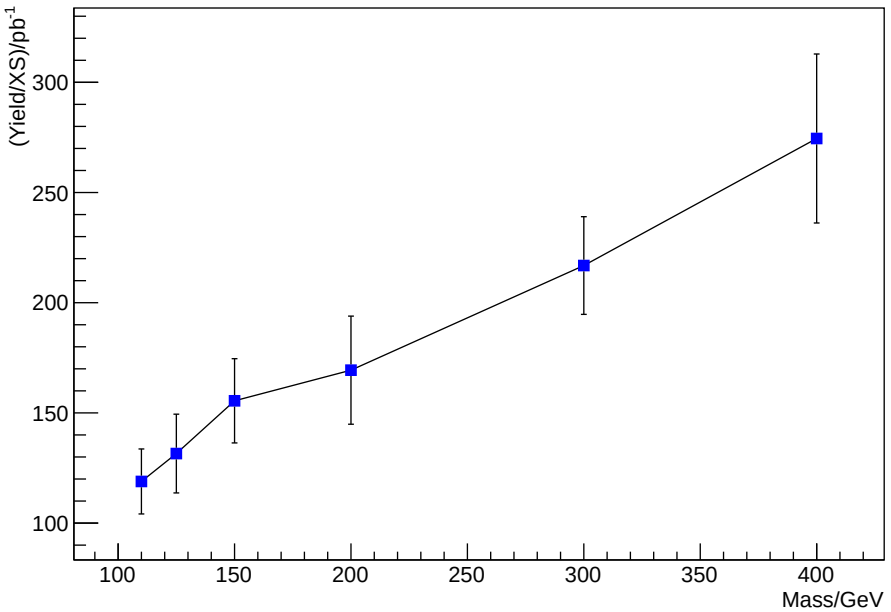
Datacards

- ZH analysis (cards from M. Zanetti) has datacards for 105,115,125,135 and 145 GeV
- VBF analysis has datacards for 110,125,150,200,300 and 400 GeV
- The signal yield is the only Higgs mass dependent part of the datacard
- New VBF datacards were produced for 115,135 and 145 GeV, with signal yields caluclated using method on the next slide

Signal Yield interpolation

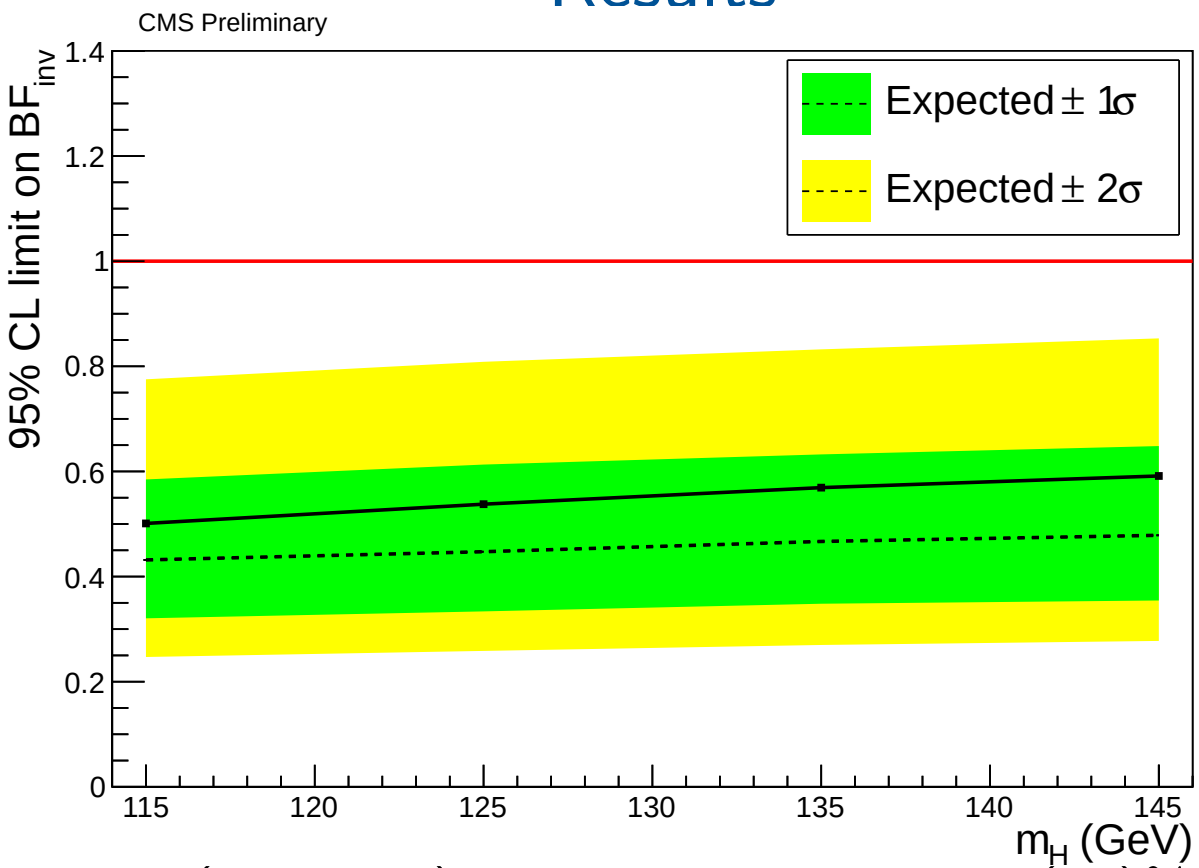
- $N_{Signal} = eff. \times acc. \times \mathcal{L}\sigma$
- Luminosity is constant
- Yield over cross-section is thus proportional to efficiency times acceptance
- Signal yields were produced at 115, 125(to cross-check), 135 and 145 GeV for the VBF channel
  - Cross-sections from LHC-HXSWG were used



Combination Method

- The cards for the two approved analyses were combined using the standard Higgs combination tool
- The luminosity uncertainties were considered correlated between the analyses
- All other uncertainties were considered not to be correlated between analyses
- The VBF analysis datacard does not separate out individual sources of error so JES/R correlations cannot be taken into account without more information

Results



- Observed (expected) limit at 125 GeV is 54(45)%
- Consistent with number from M. Zanetti's talk 56(47)%