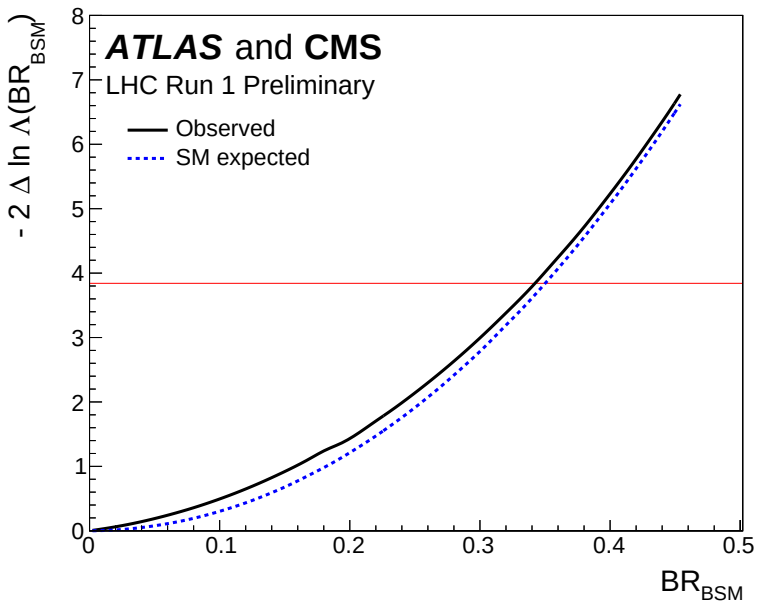
Imperial College London

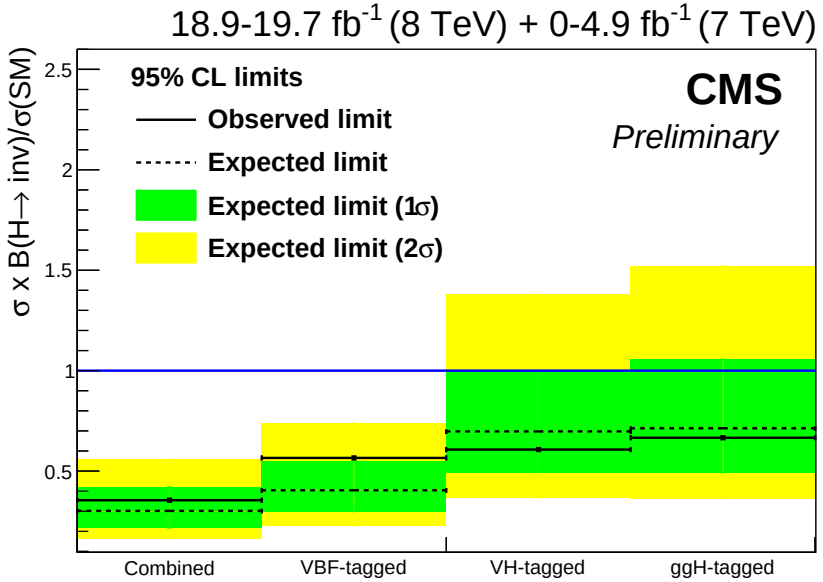
VBF Higgs to Invisible Trigger Efficiencies

P. Dunne on behalf of the H→invisible analysis group

VBF - Higgs to Invisible in Run II

- At the end of run 1 significant BSM Higgs properties are not excluded:
  - Direct CMS observed (expected) limit 36 (30)%
  - Indirect limit from ATLAS+CMS on $BR_{BSM} \sim 35\%$
- Most sensitive VBF channel is still statistically limited
  - Need as much data in run 2 as possible





Triggers and Dataset

Triggers

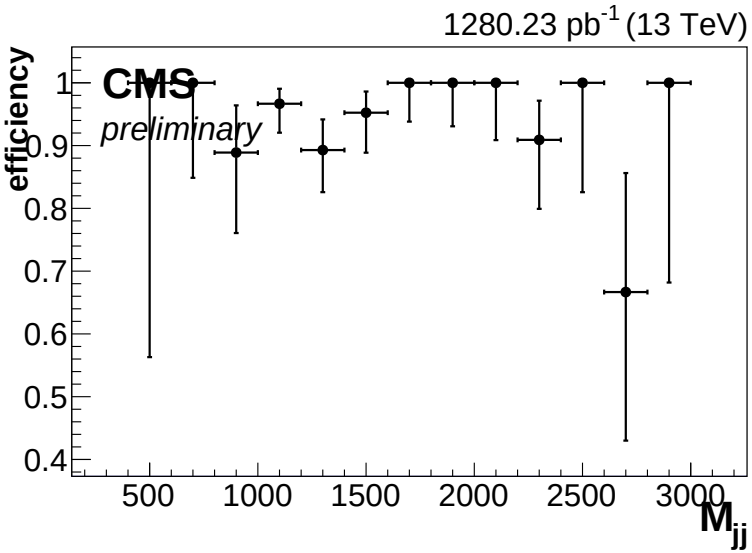
- We have two triggers runnning for VBF Higgs to invisible:
  - Signal trigger: unprescaled HLT_DiPFJet40_DEta3p5_MJJ600_PFMETNoMu140
  - Prescaled HLT_DiPFJet40_DEta3p5_MJJ600_PFMETNoMu80
- Will show efficiencies for signal trigger today

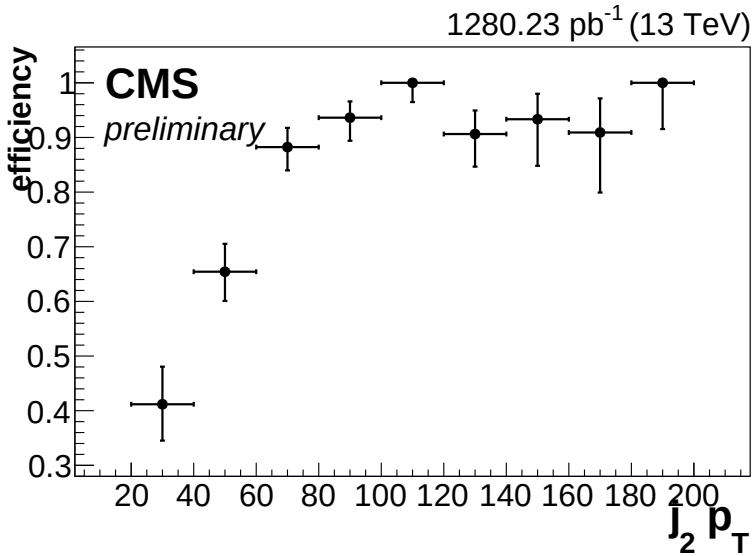
Dataset used for efficiency measurement

- Use SingleMuon dataset to measure efficiency
  - We have 1280 pb^{-1} processed
- We are using the latest 74X_dataRun2_Prompt_v4 jet energy corections
- We are using the latest MET filter recipes
  - CSC filter is due to be replaced with an event list to veto although this is not yet available
- Cuts for efficiency denominator chosen where trigger is 90% efficient

Trigger Efficiencies

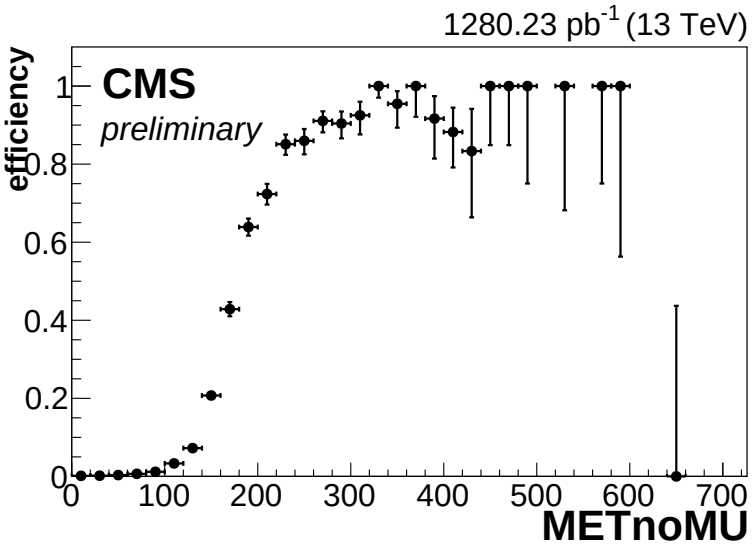
- Denominator is all events in SingleMuon passing:
  - METnoMu> 300 GeV, DiPFJet> 80 GeV, $\Delta\eta_{jj} > 3.6$, M_{jj} >600
- Cut on variable shown is not applied

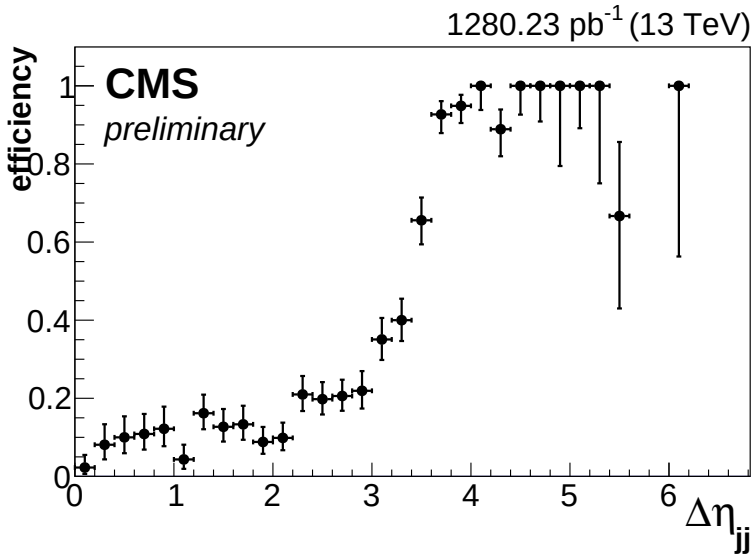




Trigger Efficiencies

- Denominator is all events in SingleMuon passing:
  - METnoMu> 300 GeV, DiPFJet> 80 GeV, $\Delta\eta_{jj} > 3.6$, M_{jj} >600
- Cut on variable shown is not applied





Summary

- Trigger efficiencies from 25ns data shown
- Possible dips in efficiency above turn on in MET and jet 2 pt
  - Need investigating and monitoring as statistics increase
- MET and jet p_T turn ons are very high
- We will continue to update these plots as new luminosity and recipes become available

Backup

CMS