Imperial College London

VBF Higgs to Invisible Trigger Efficiencies

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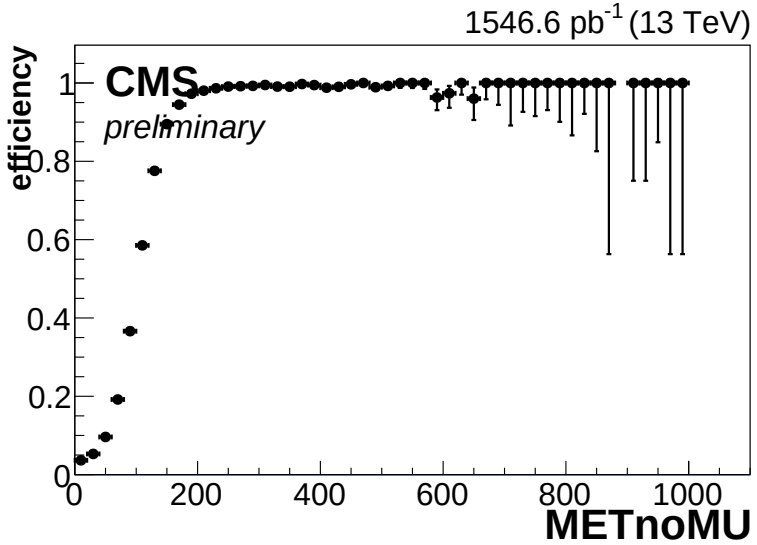
Reminder

- Slow trigger turn on seen in met (300 GeV 95% efficiency) and jet 2 pt (80 GeV 95% efficiency
- Possible culprits:
  - Calo prefilter + wrong JEC at HLT
  - L1 MET turn on
- Will investigate L1 MET turn on further in today's slides
- Also add HLT_IsoMu20 to preselection to rule out bias from triggers in SingleMuon

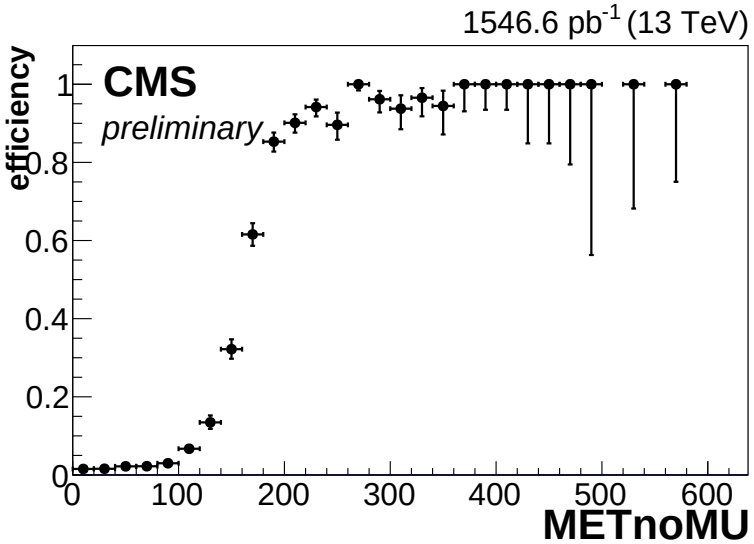
L1ETM60 Efficiency

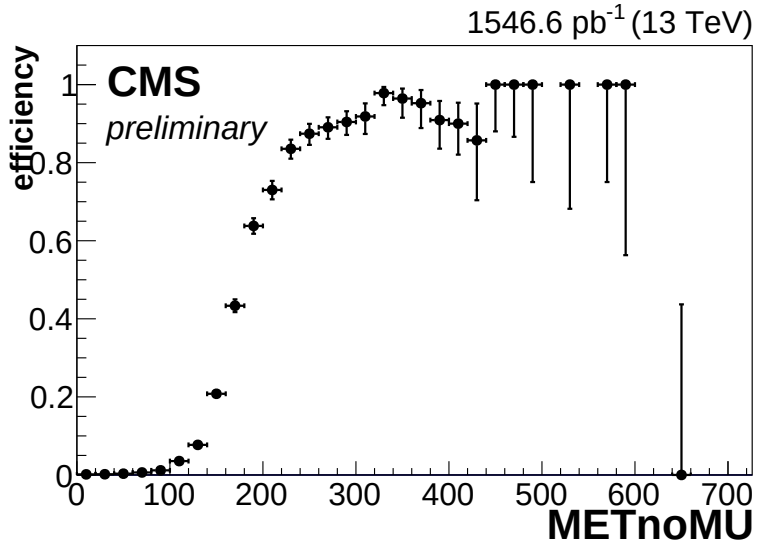
- Measure L1 ETM turn on
- Trigger: L1ETM60
- Denominator: SingleMuon events passing HLT_IsoMu20
- 95% efficient by 200 GeV



Signal trigger efficiency: MET

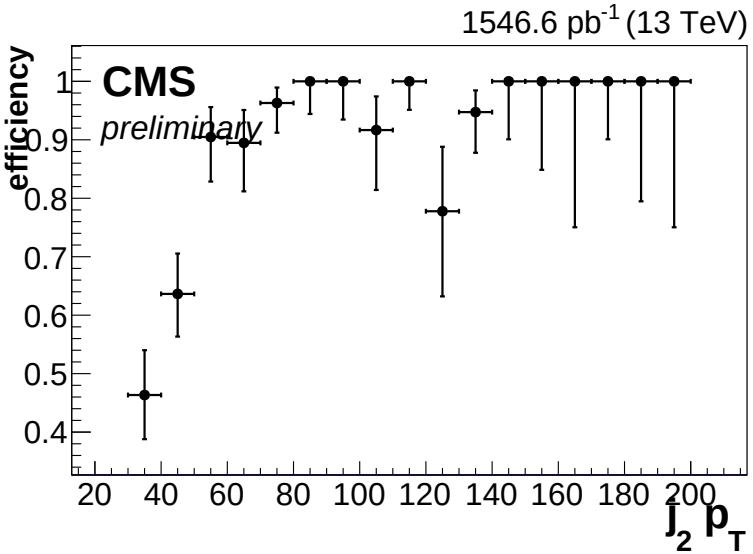
- Measure signal trigger efficiency after requiring L1ETM60
- Trigger: HLT_DiPFJet40_DEta3p5_MJJ600_PFMETNoMu140
- Denominator: SingleMuon events with dijet $p_T > 80$, $M_{jj} > 600$, $\Delta\eta_{jj} > 3.6$ plus for left plot only HLT_IsoMu20 and L1ETM60
- Clearly better after L1ETM60 cut: 95% efficient by 250 GeV

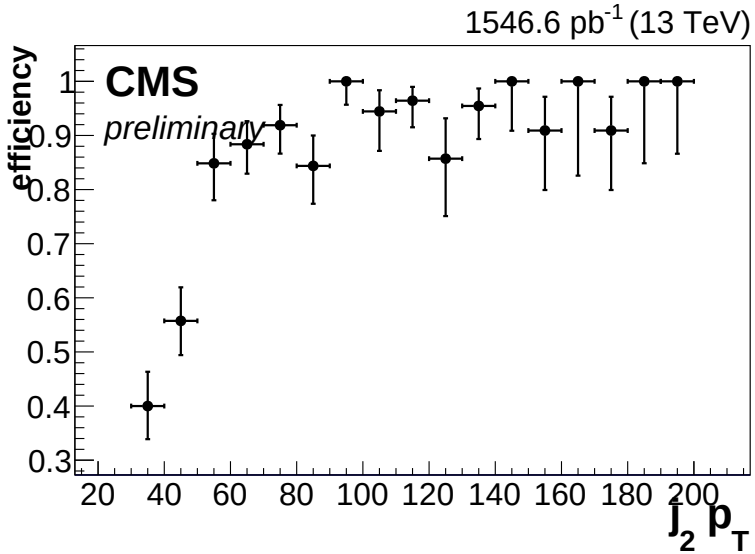




Signal trigger efficiency: jet pt

- Measure signal trigger efficiency after requiring L1ETM60
- Trigger: HLT_DiPFJet40_DEta3p5_MJJ600_PFMETNoMu140
- Denominator: SingleMuon events with dijet $METnoMU > 300$, $M_{jj} > 600$, $\Delta\eta_{jj} > 3.6$ plus for left plot only HLT_IsoMu20 and L1ETM60
- Slightly better after L1ETM60 cut: 95% efficient by 70 GeV





Summary

- L1ETM60 fully efficient at ∼200 GeV
- Requiring L1ETM60 improves trigger turn ons
- Jet p_T still less efficient than in run 1
  - 95% efficient at 70 GeV compared to 50 GeV in run 1
  - Calo prefilter + wrong JEC possible candidate for remaining slow turn on but needs more investigation
  - Jim reemulating trigger on raw data so we can study events failing trigger

Backup


CMS