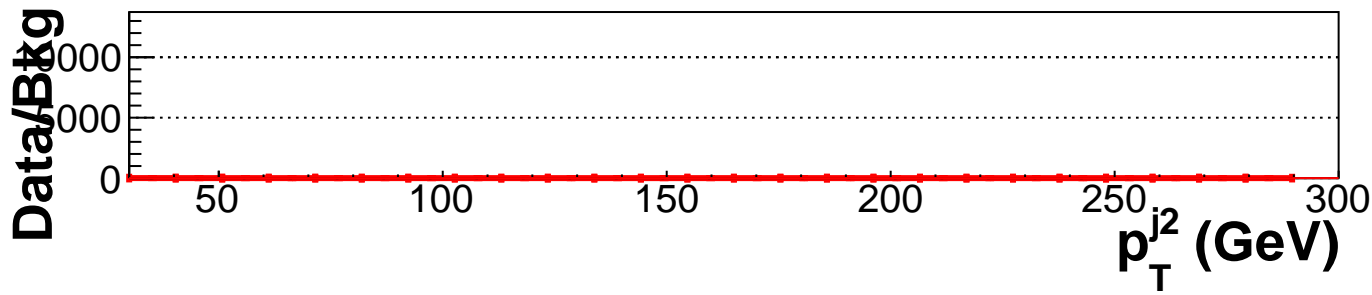
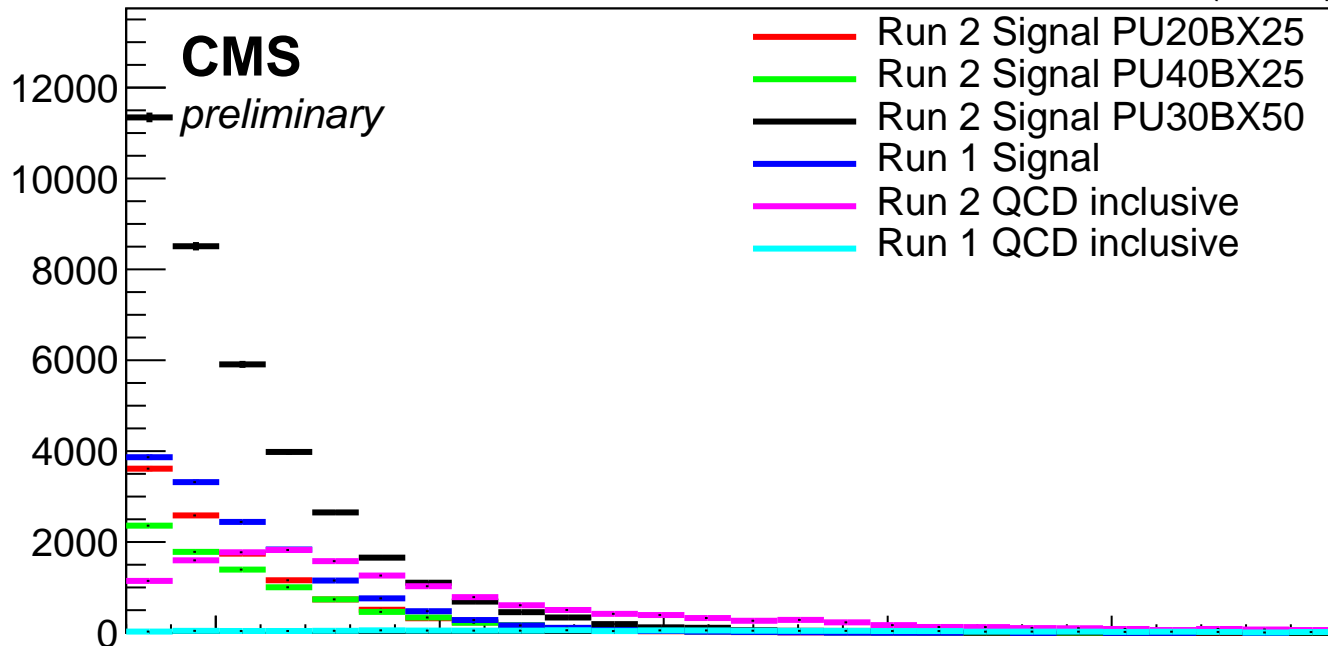


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

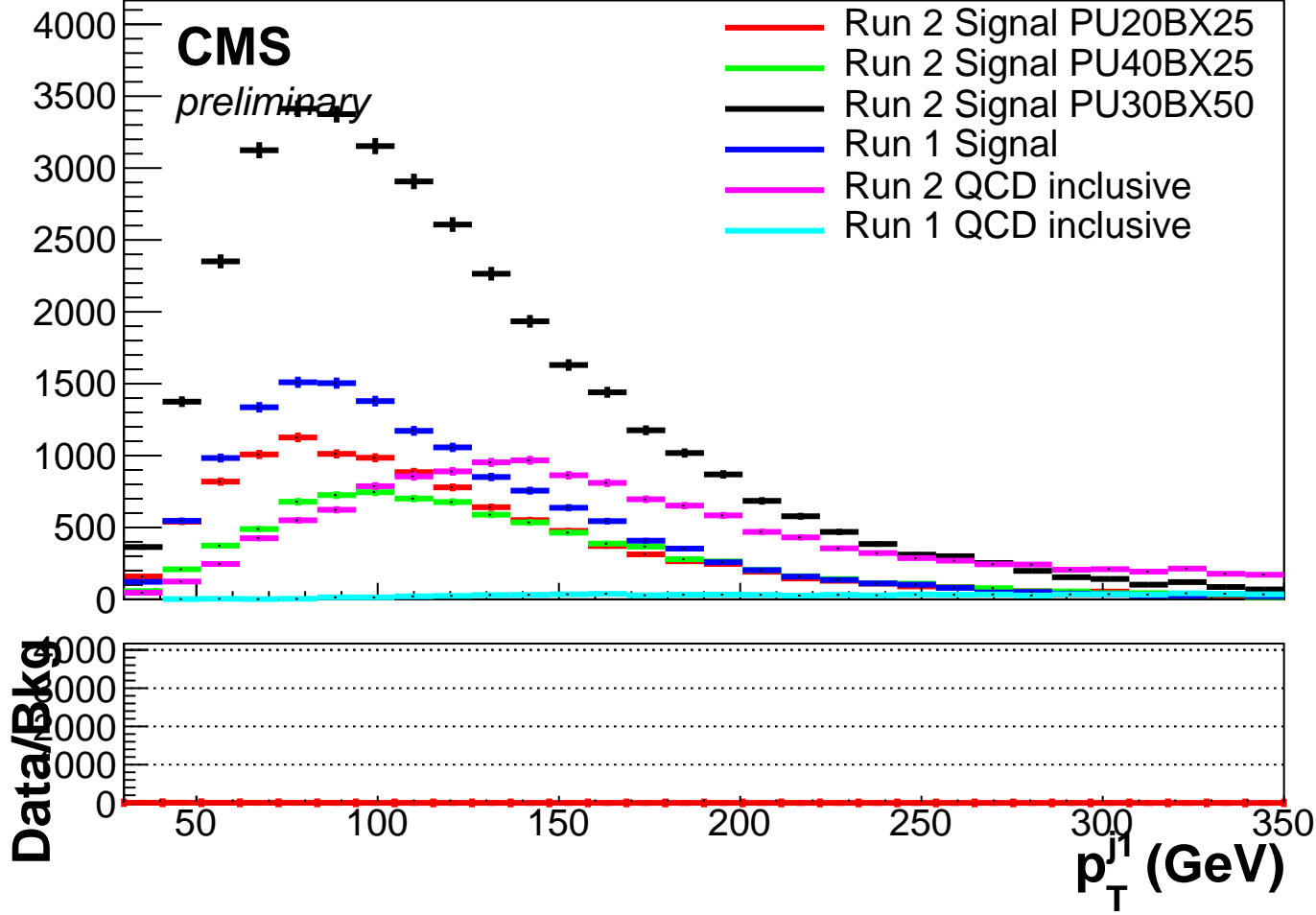


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

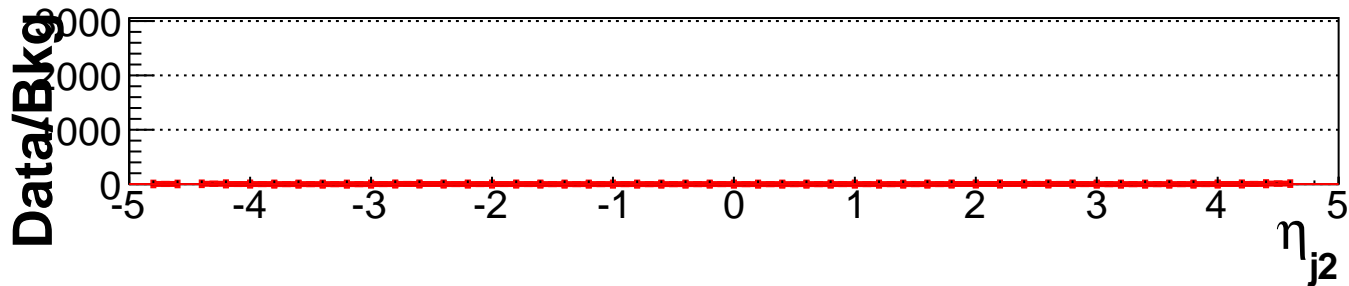


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary* +

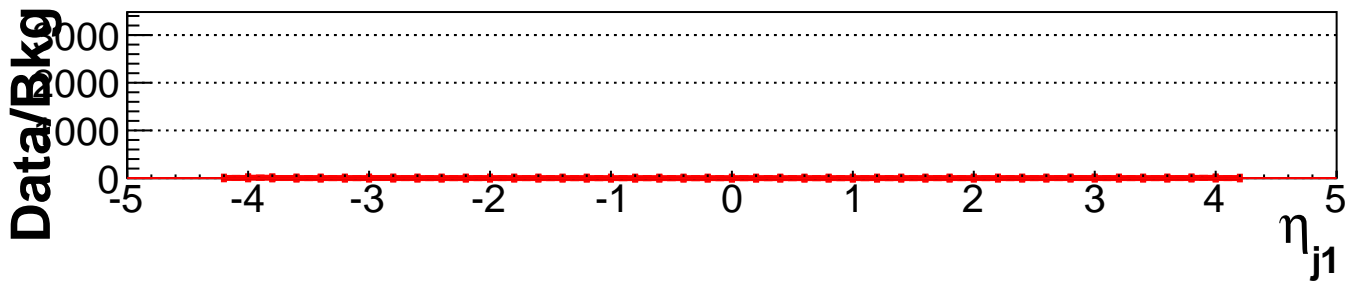
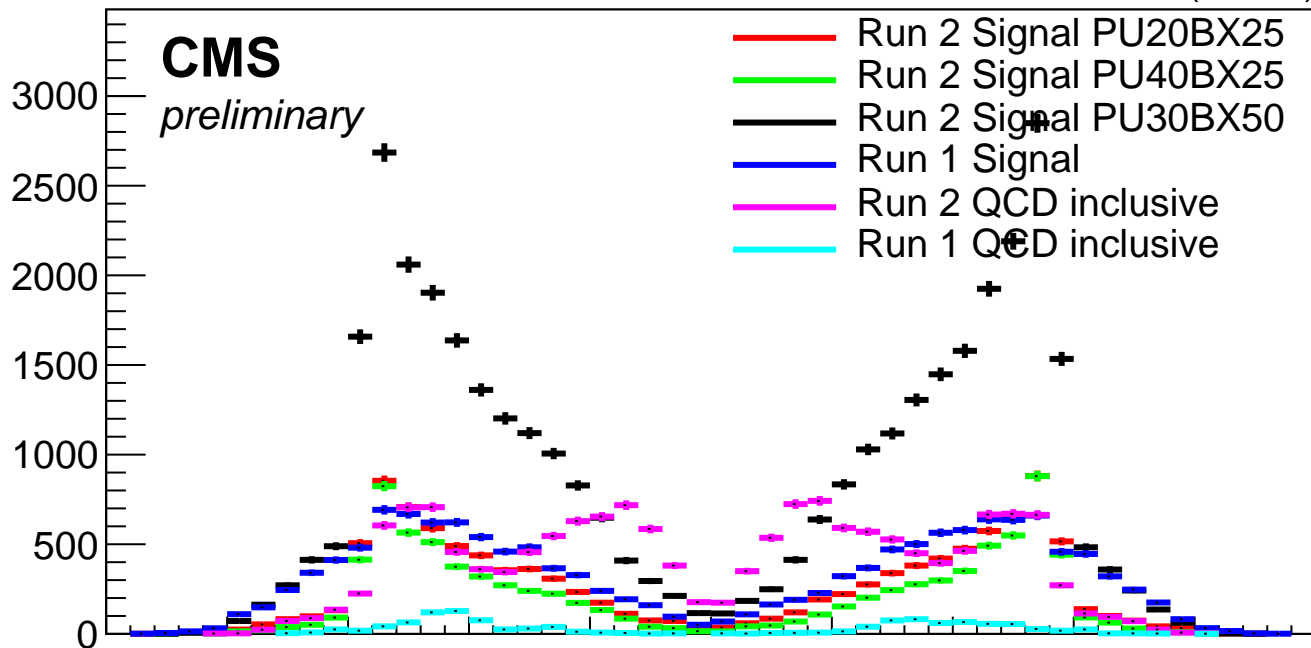
- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive



19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

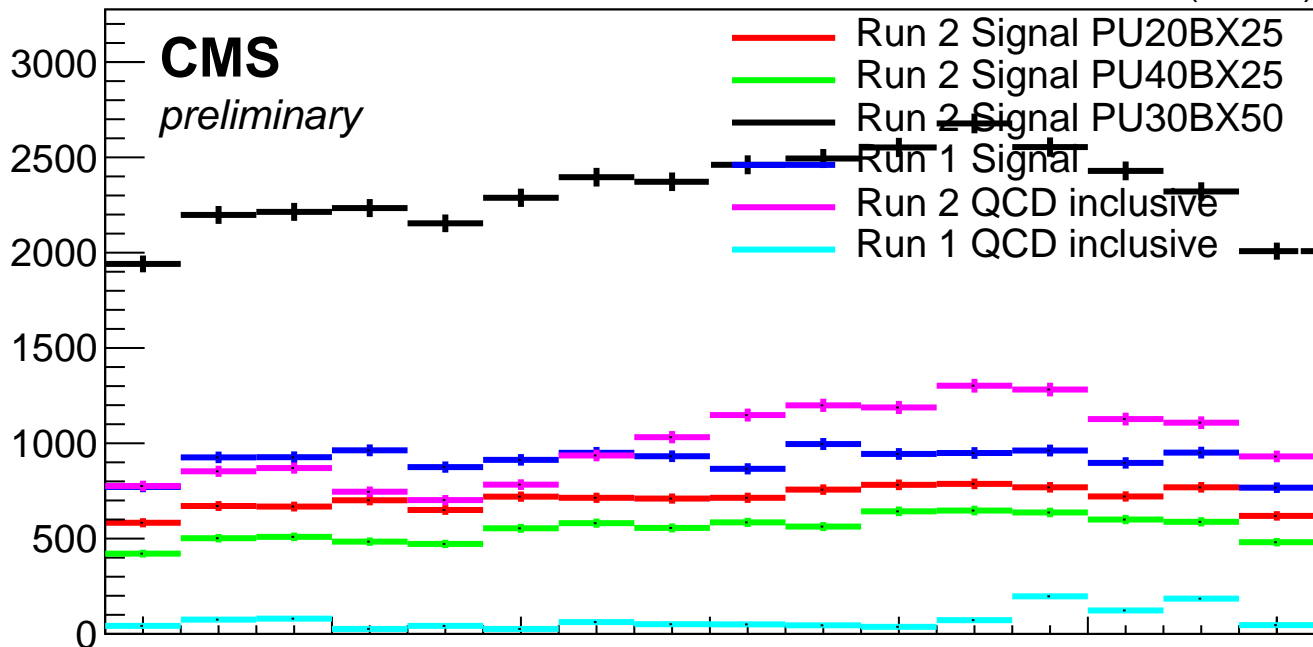
*preliminary*



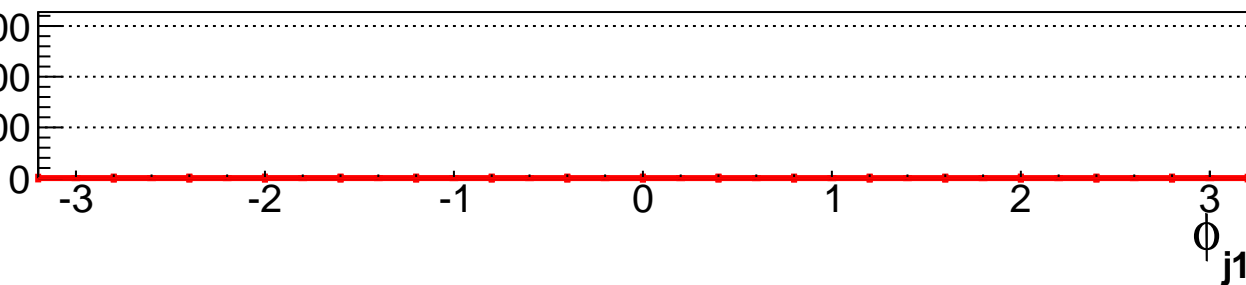
19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*



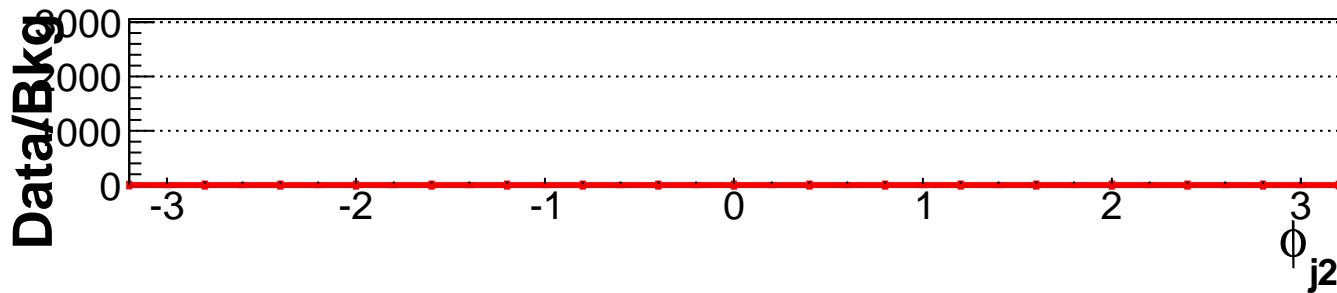
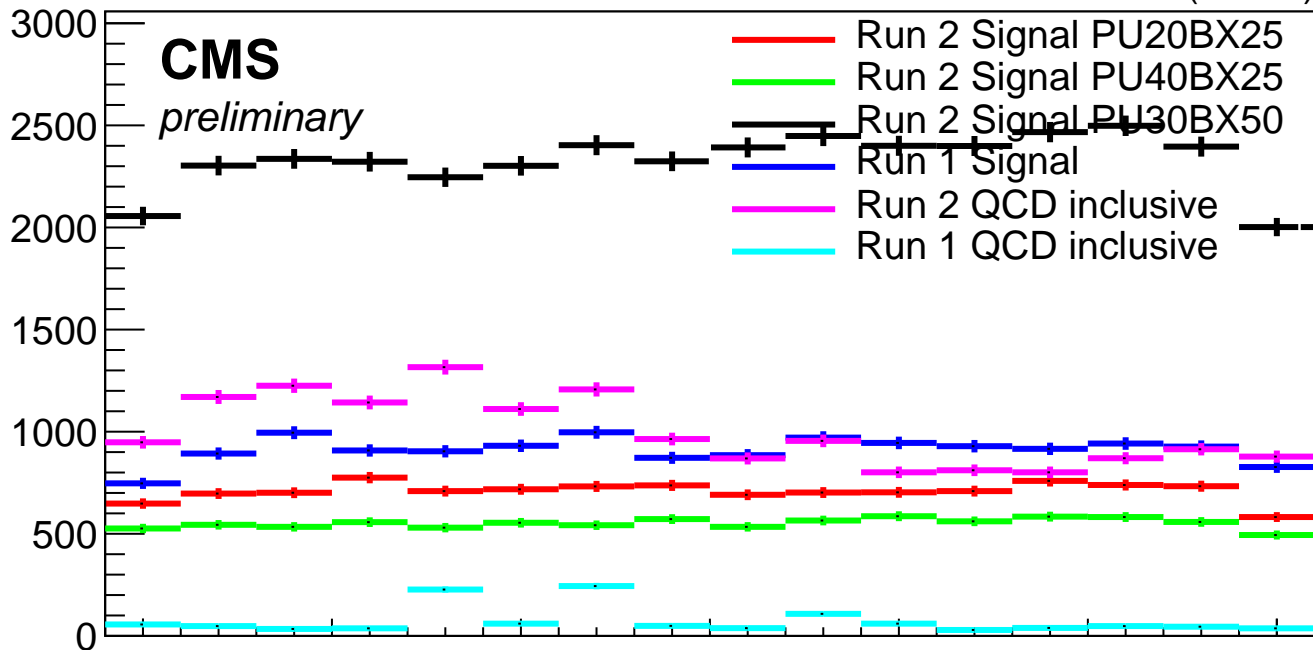
**Data/Bkg**



19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

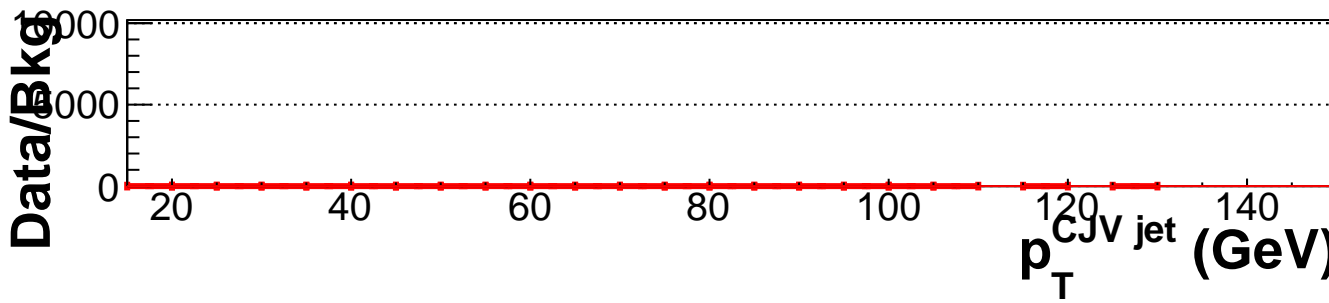
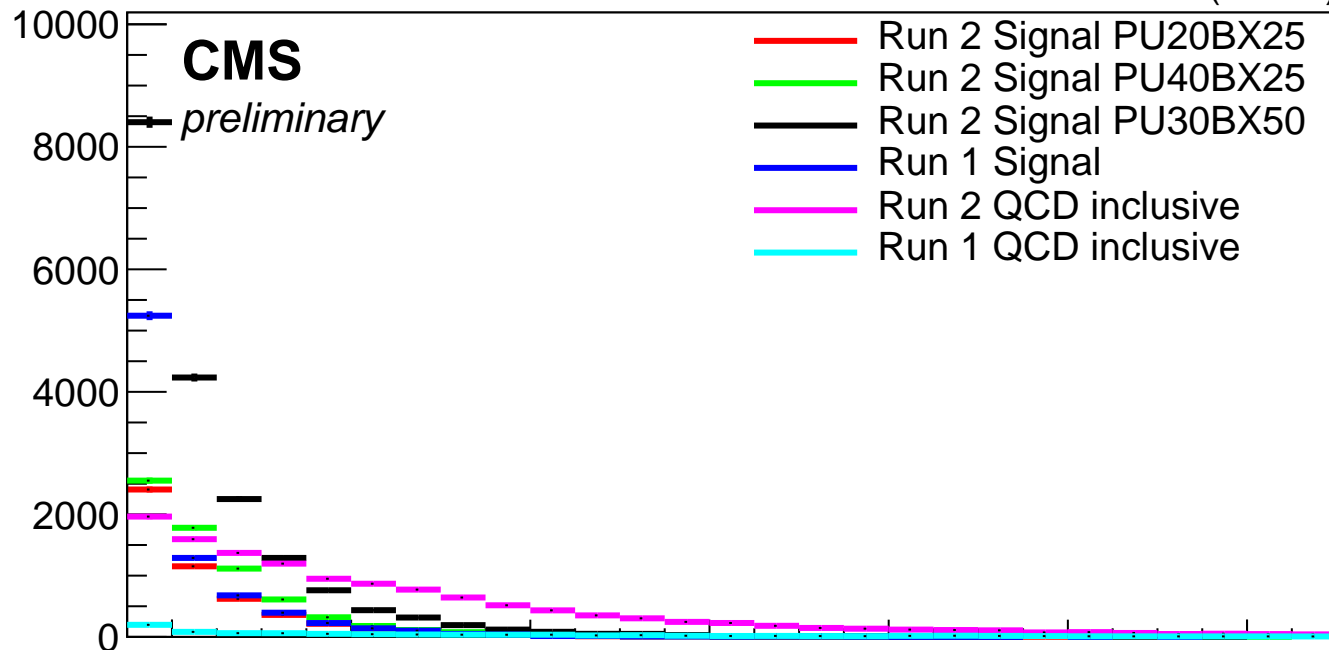


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

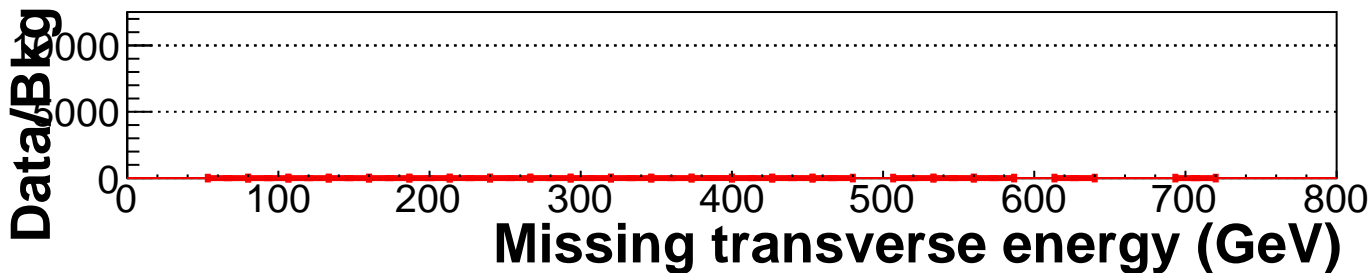
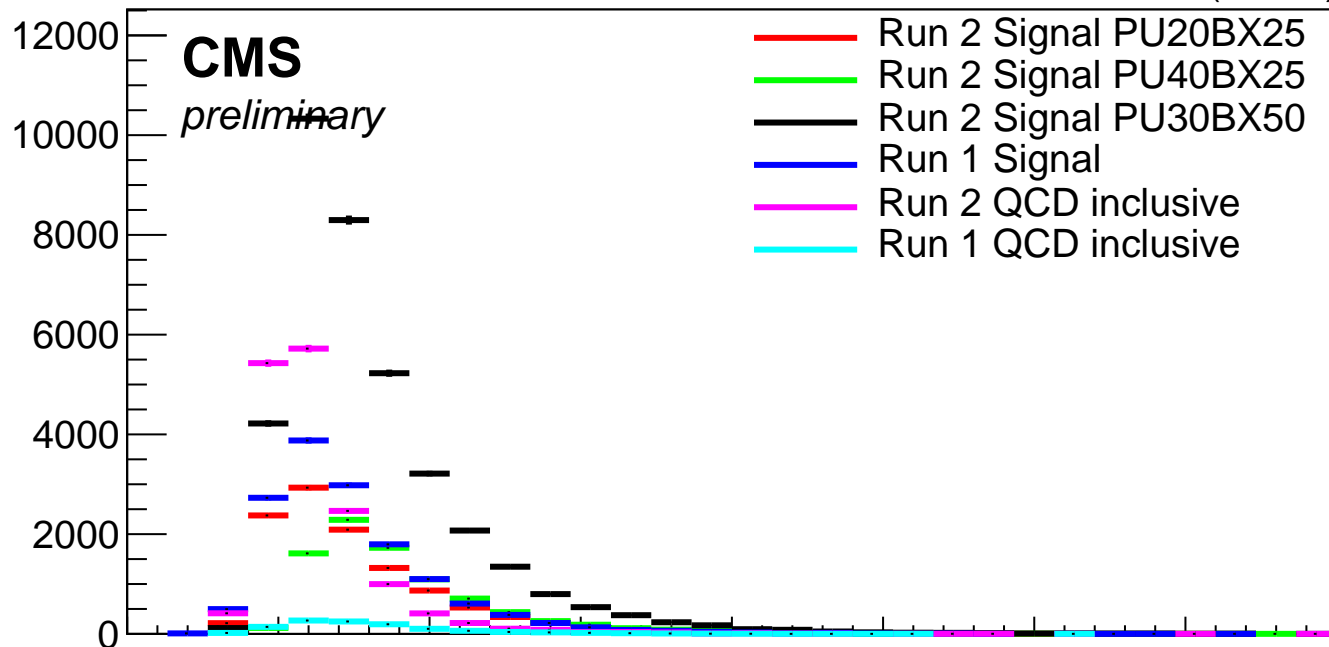


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive



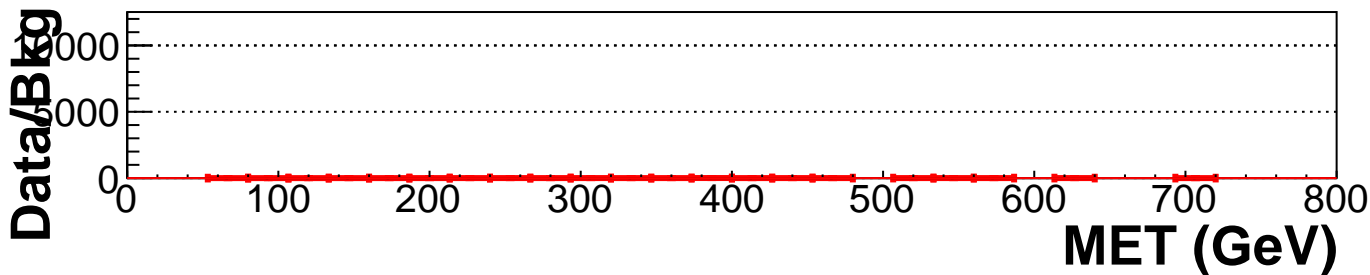
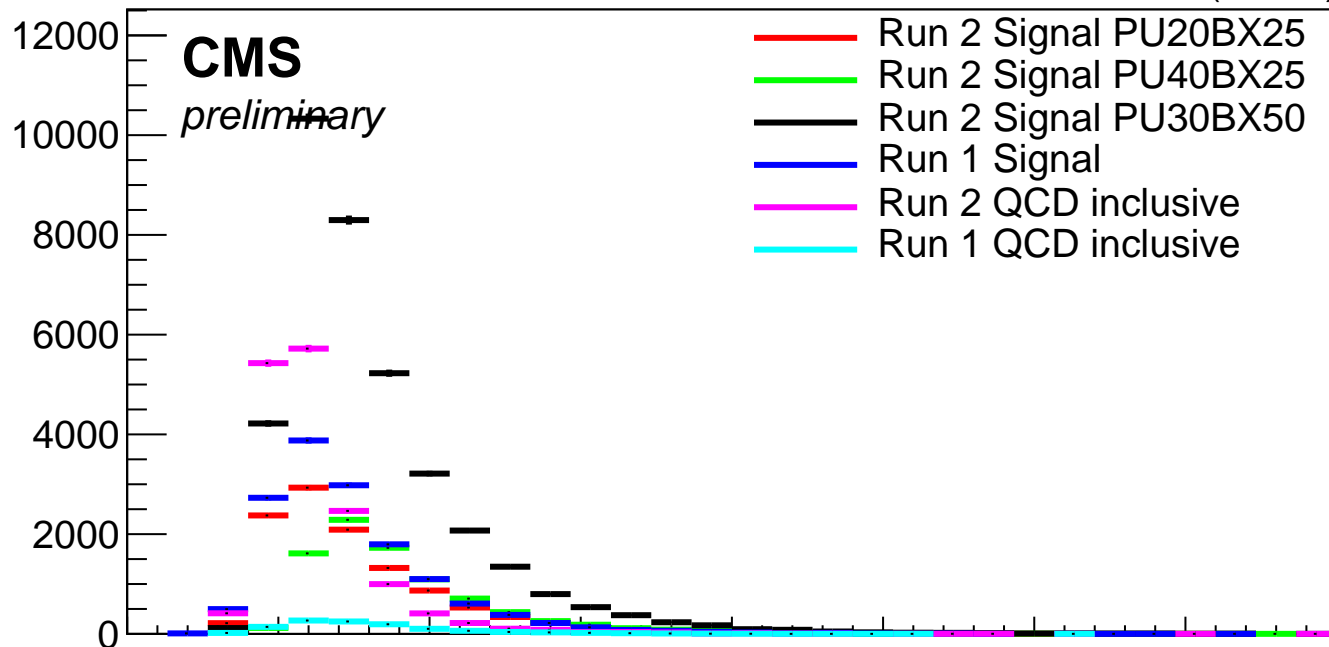


19.2 fb<sup>-1</sup> (8 TeV)

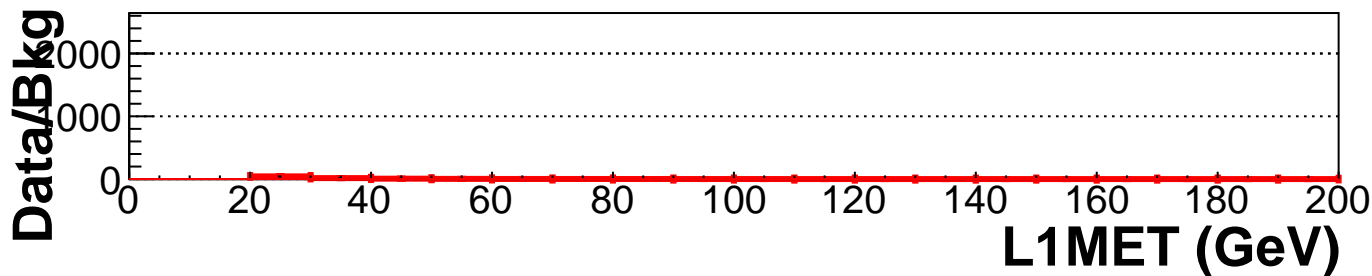
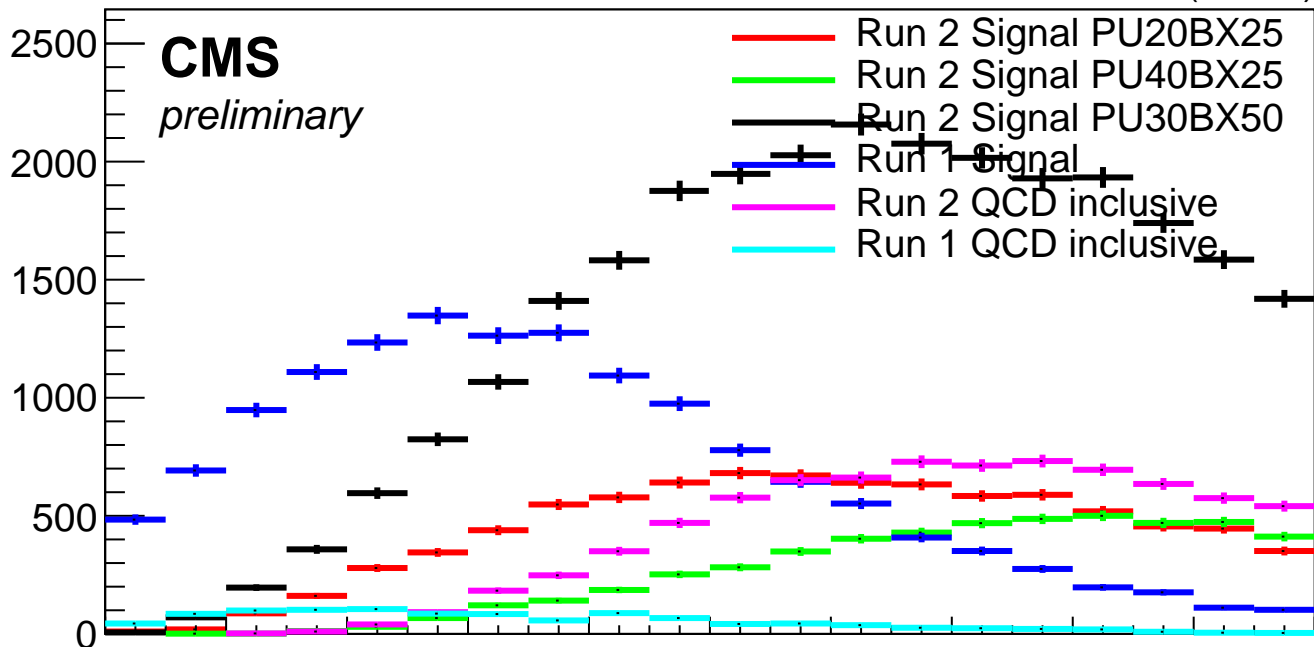
**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive



19.2 fb<sup>-1</sup> (8 TeV)

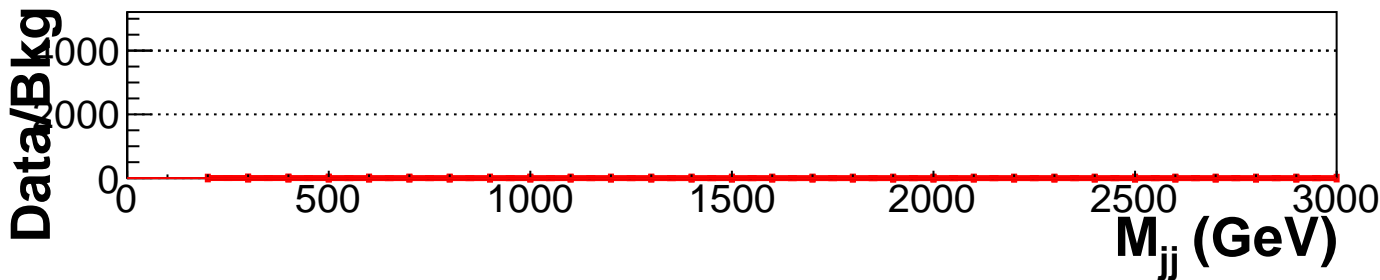


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

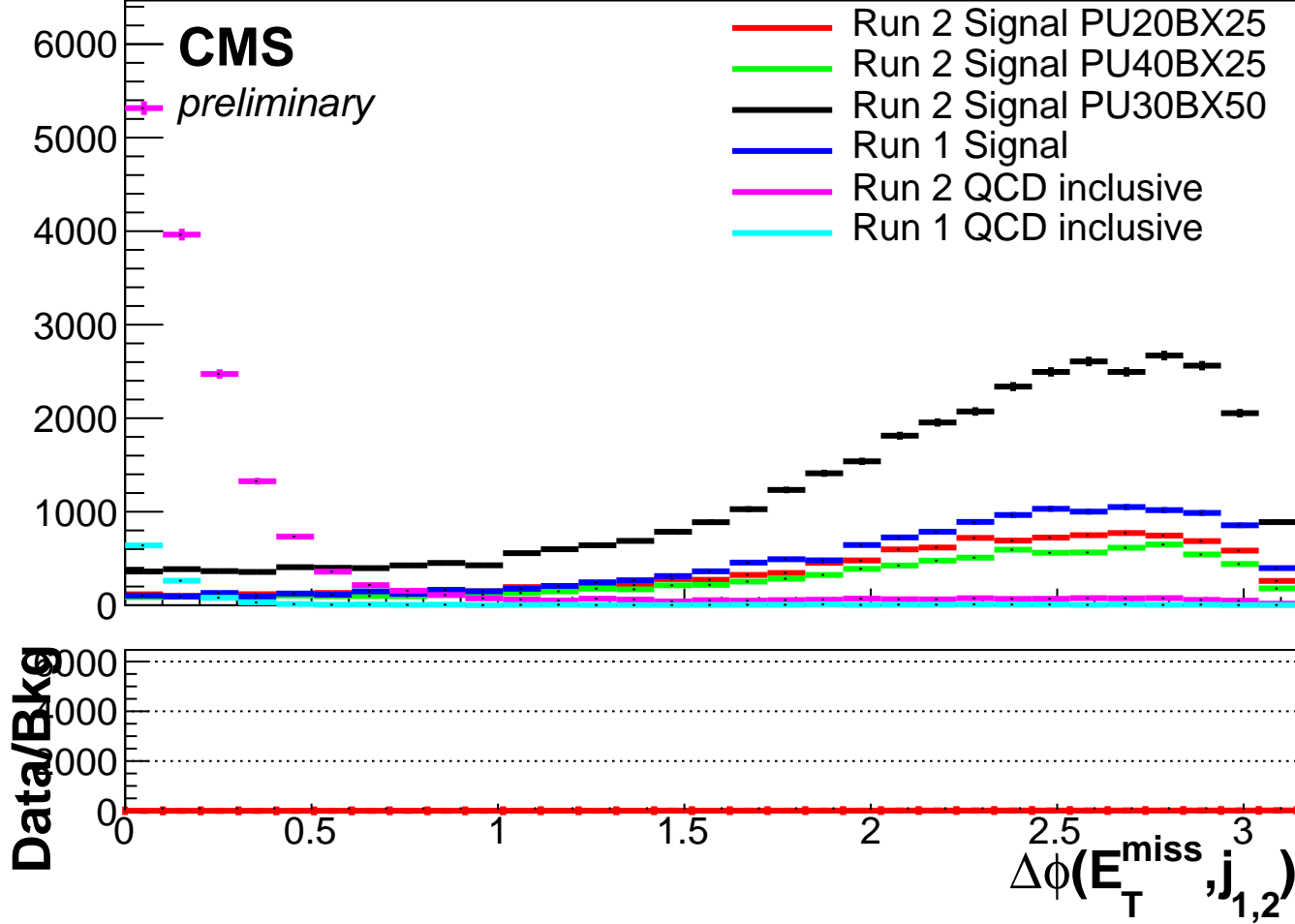


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

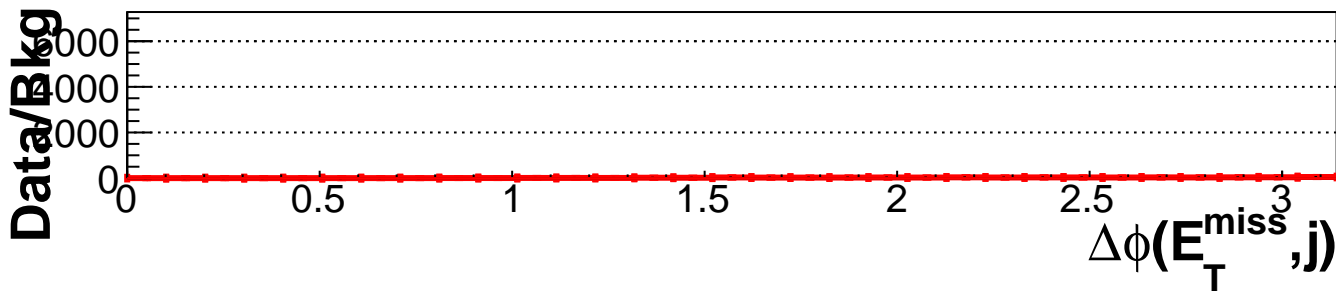


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

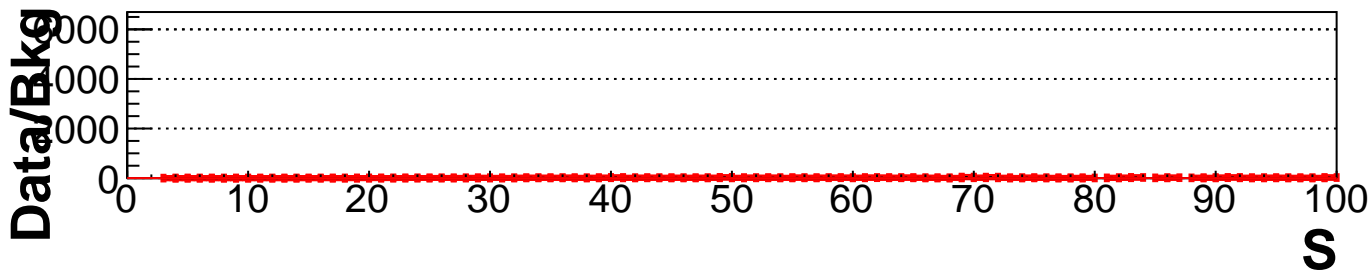
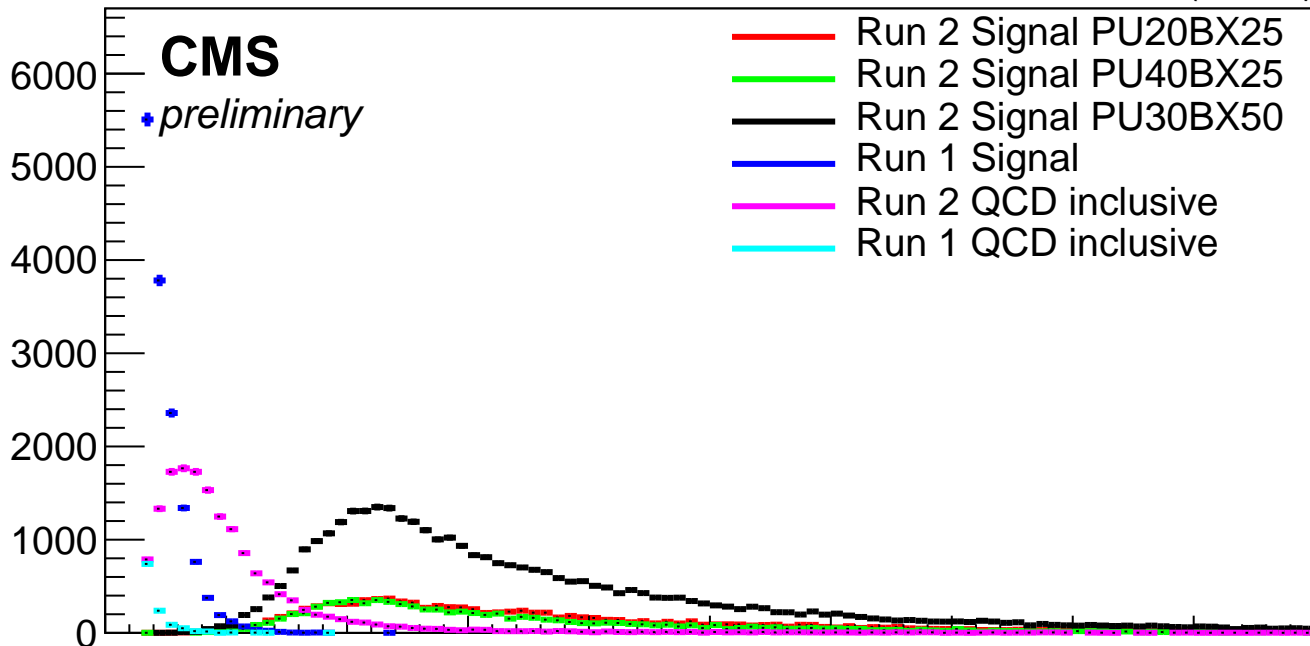
- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive



19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

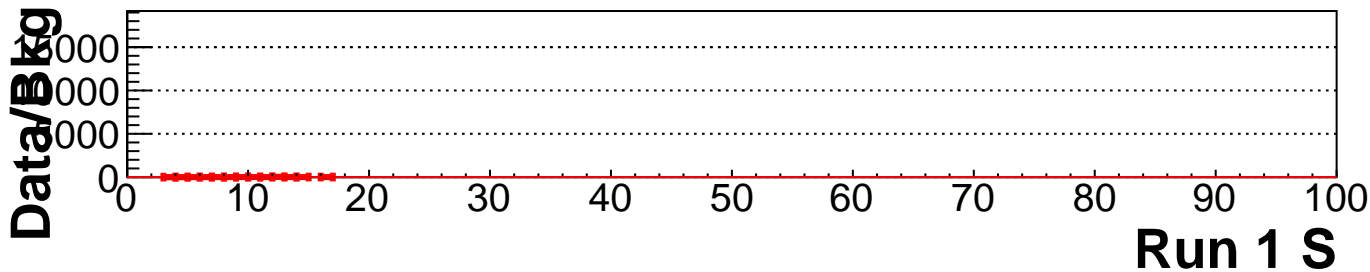
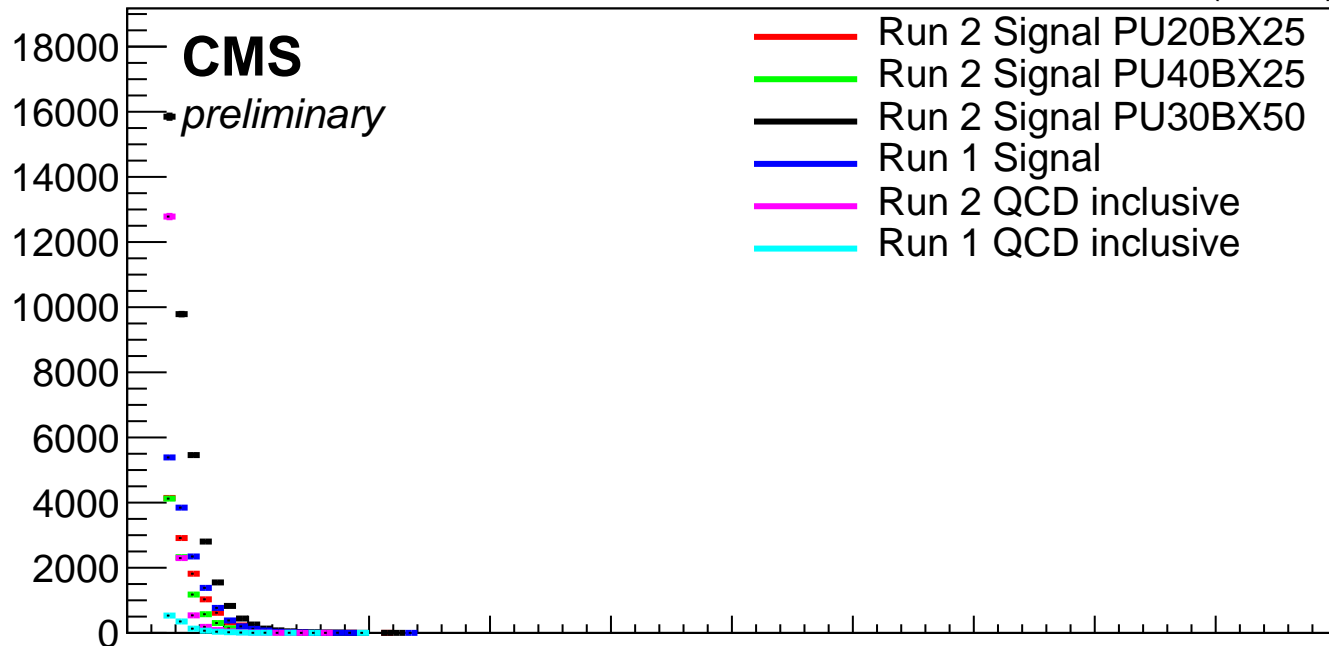


19.2 fb<sup>-1</sup> (8 TeV)

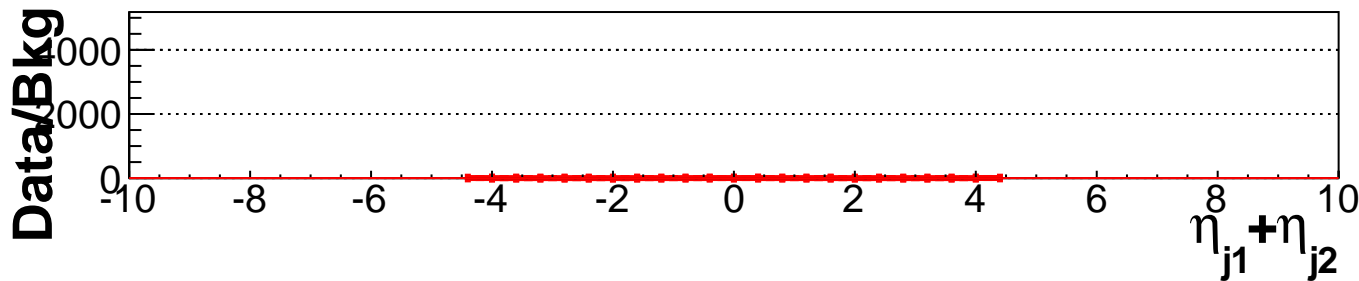
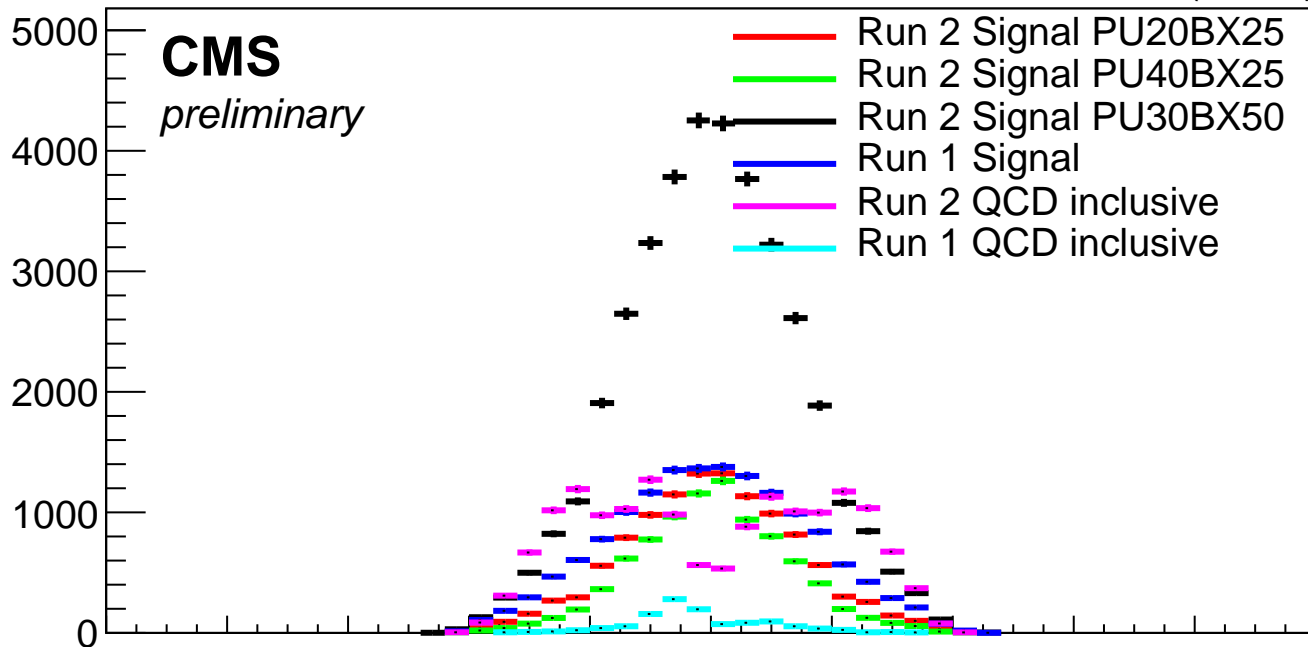
**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive



19.2 fb<sup>-1</sup> (8 TeV)

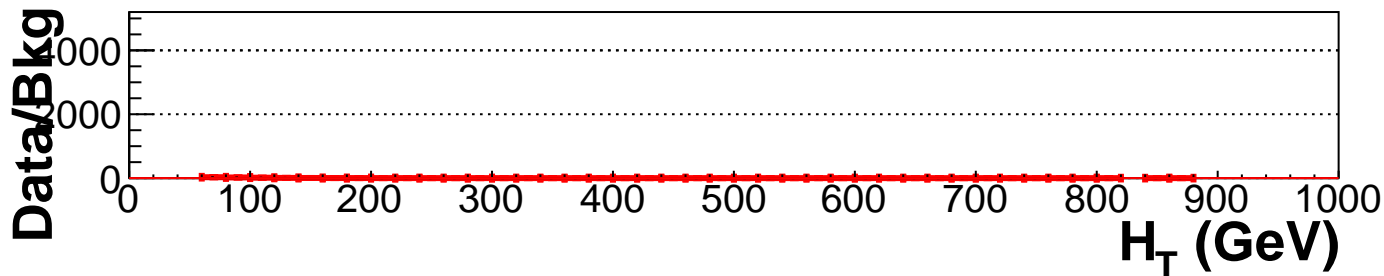
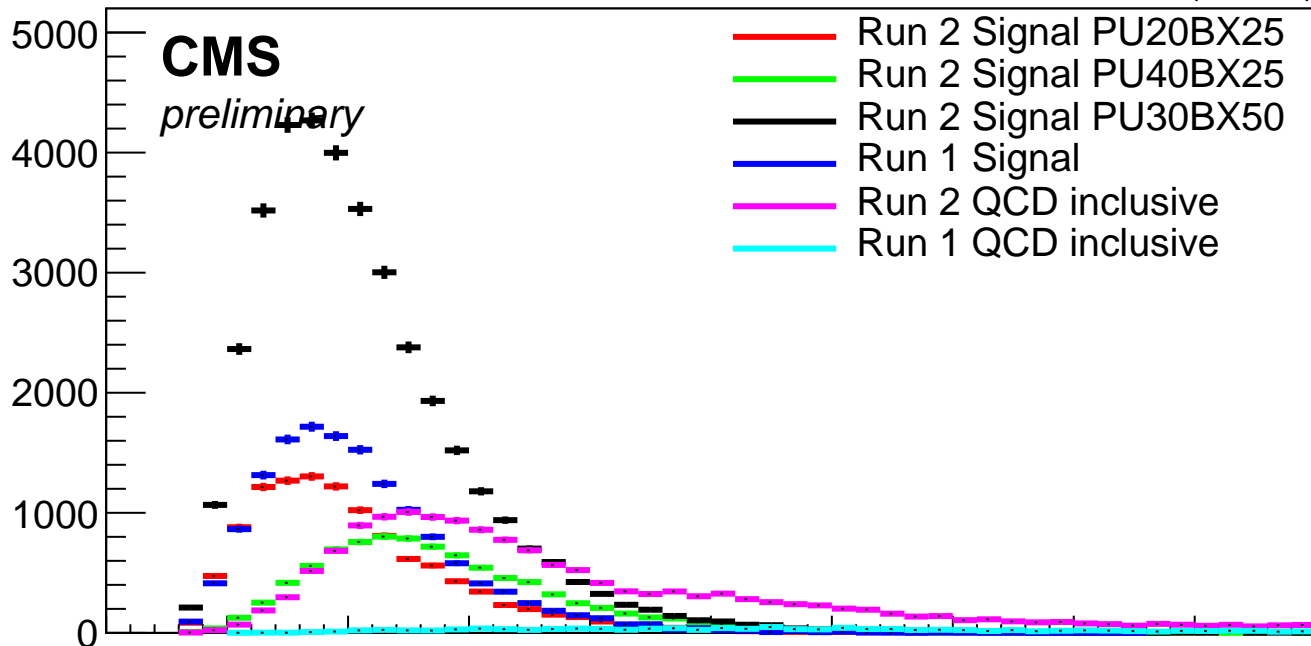




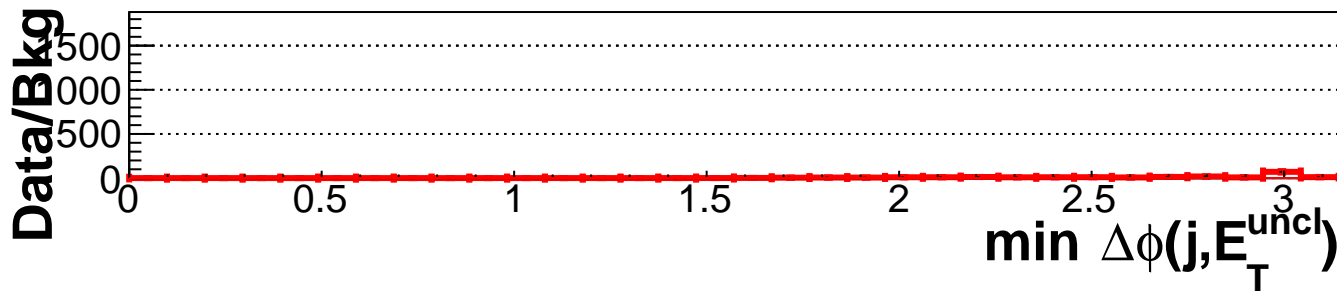
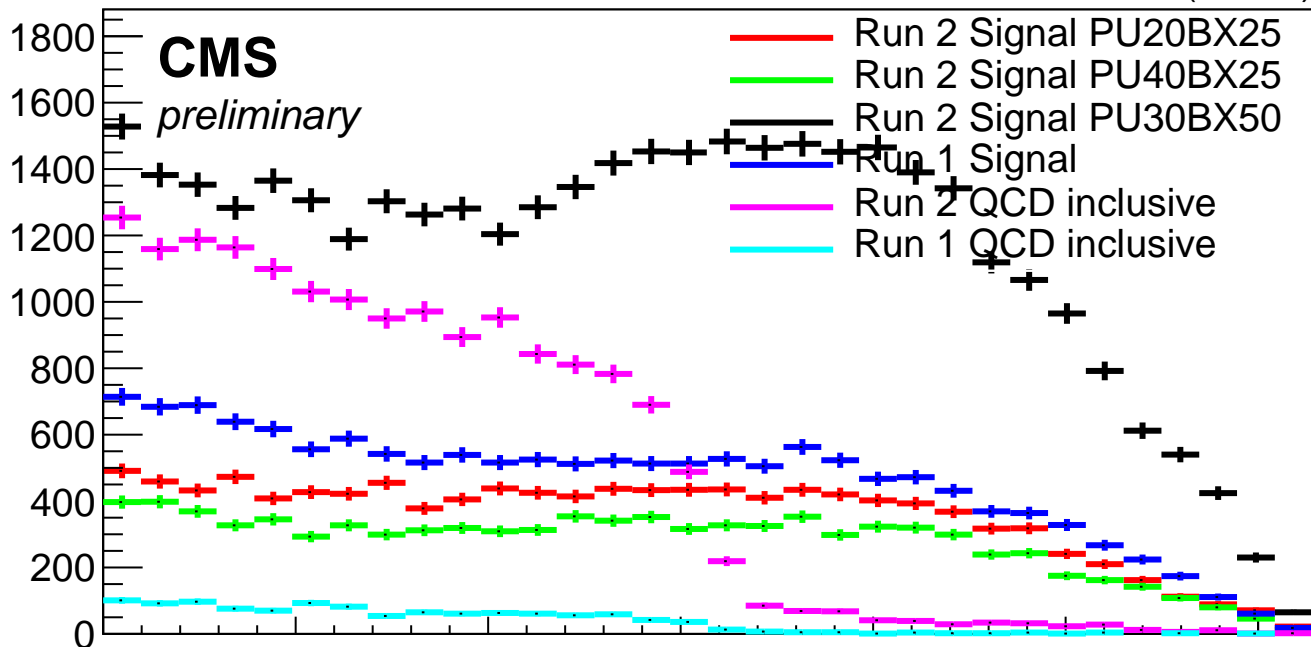
19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*



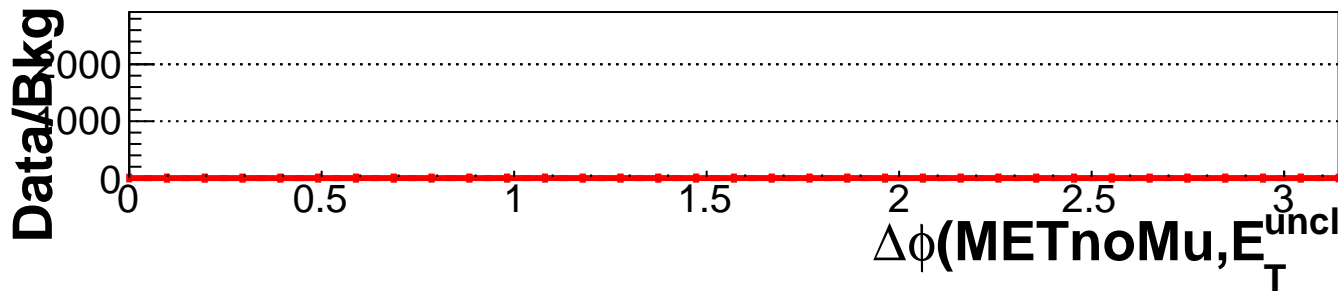
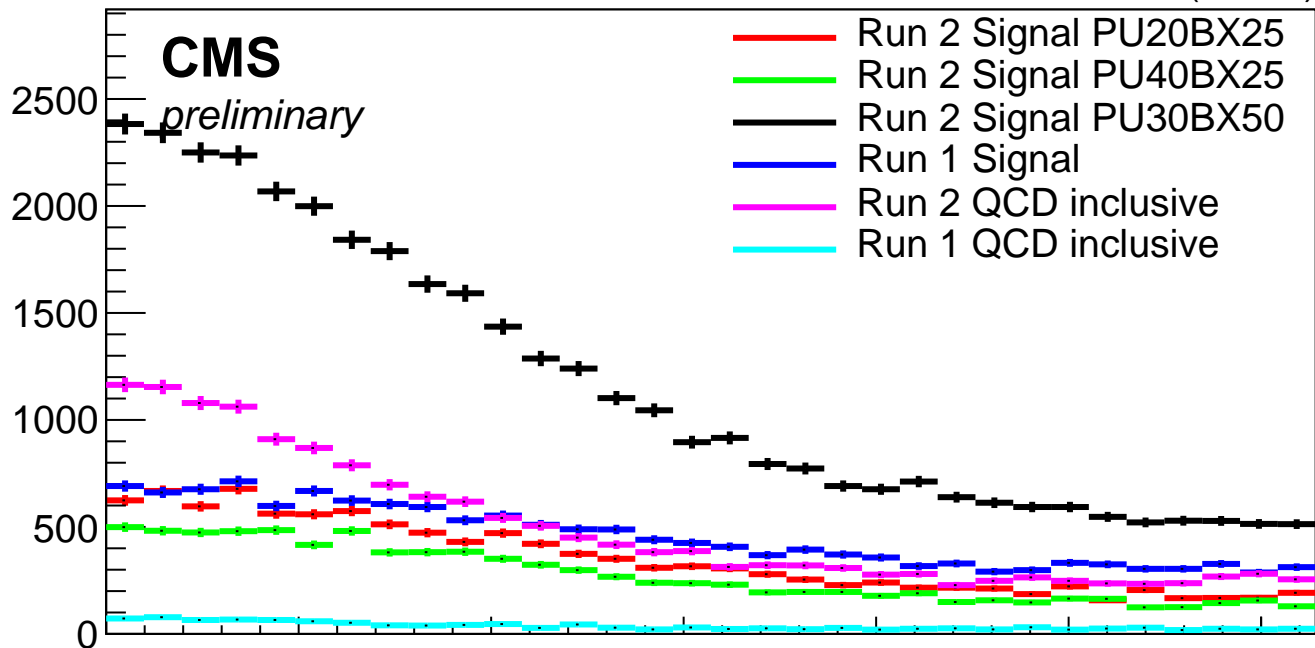
19.2 fb<sup>-1</sup> (8 TeV)



19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

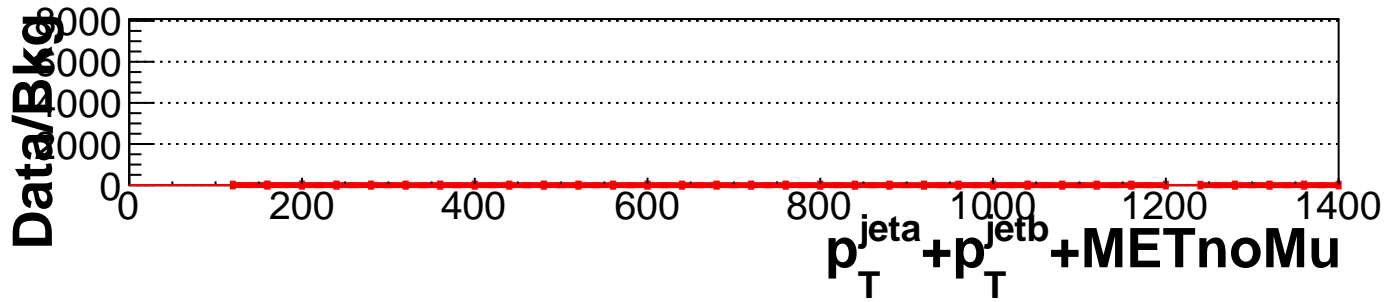


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

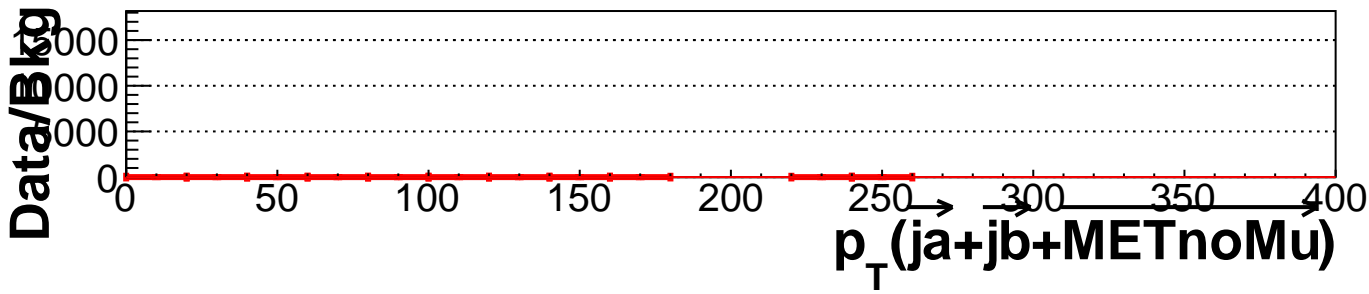
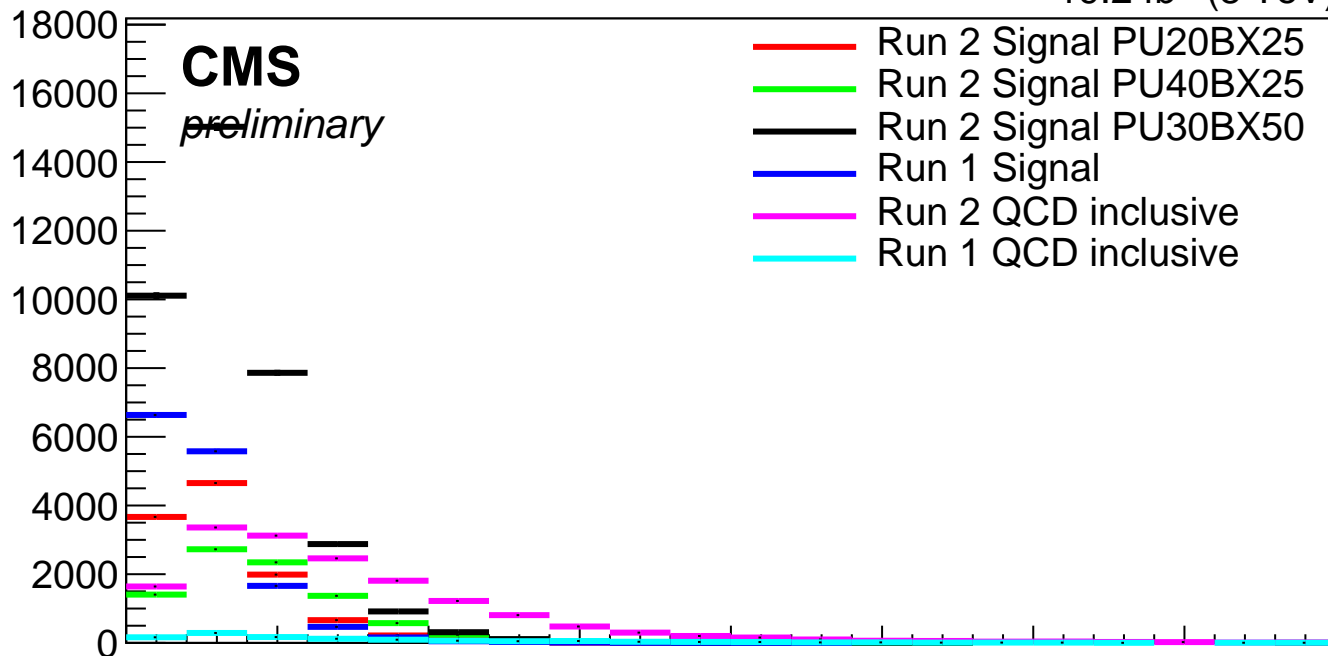


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

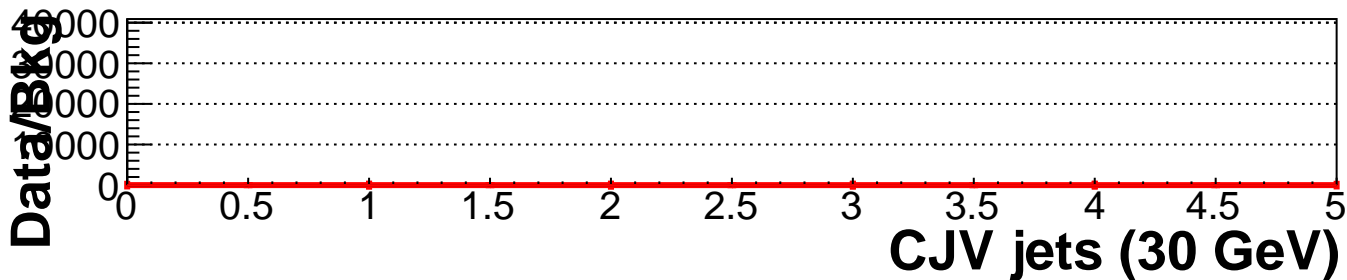
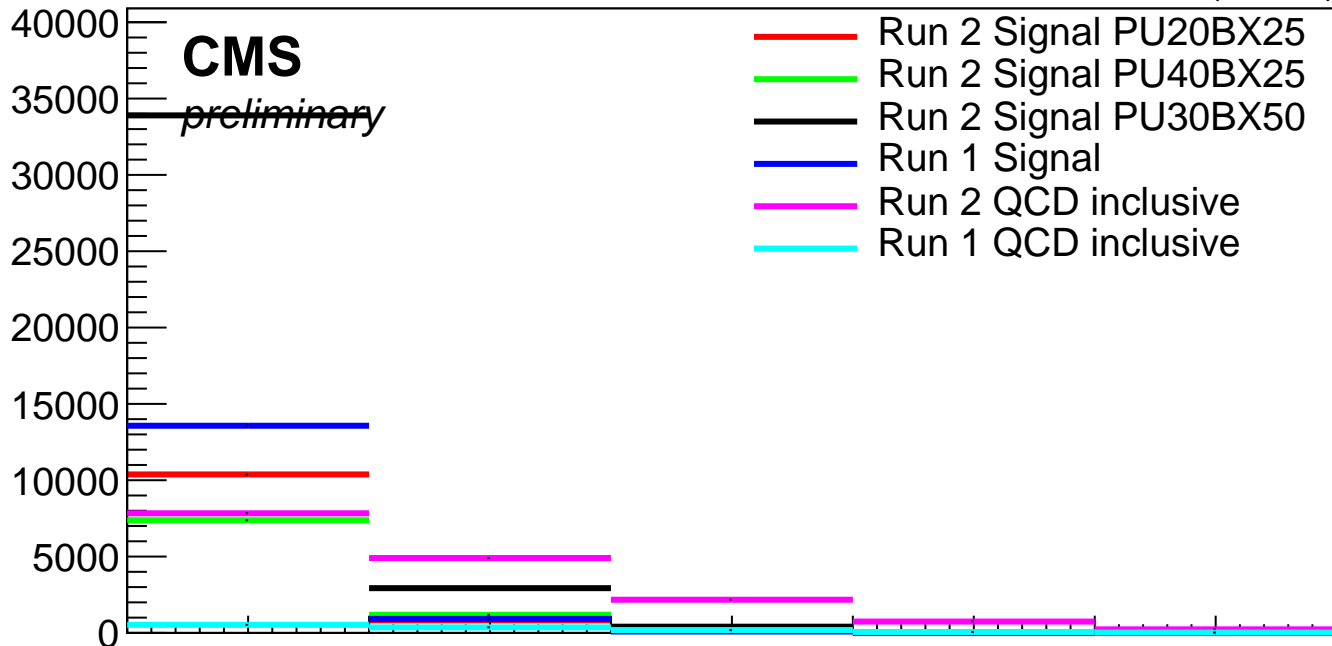


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

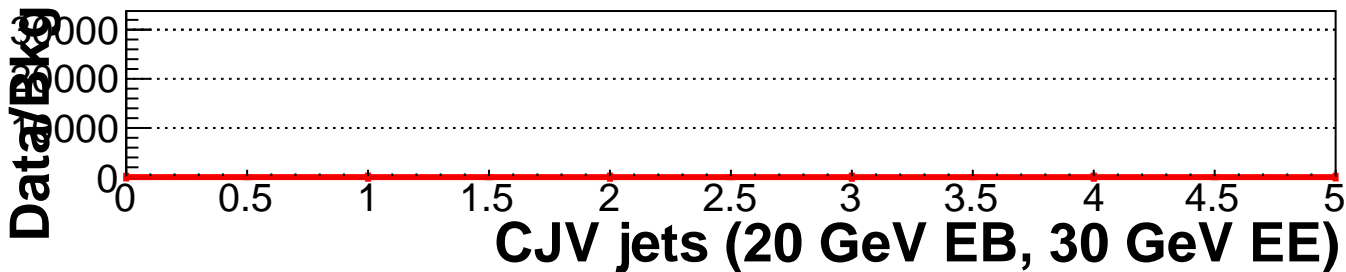
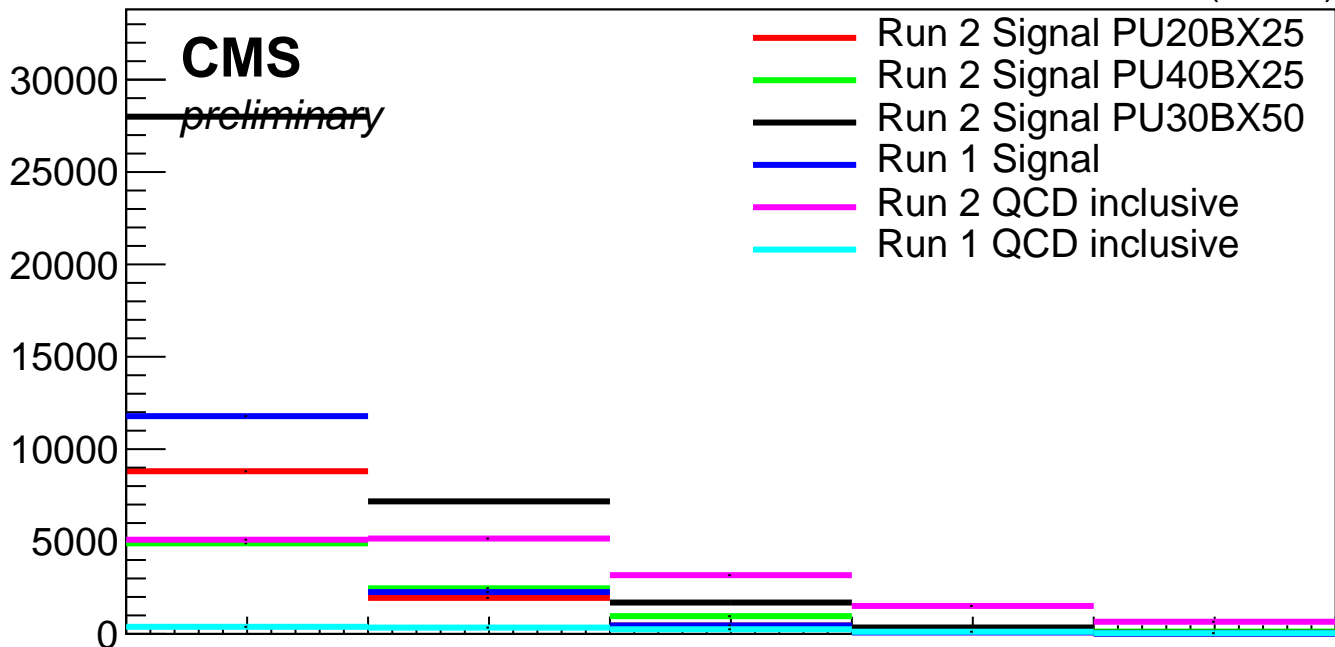


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

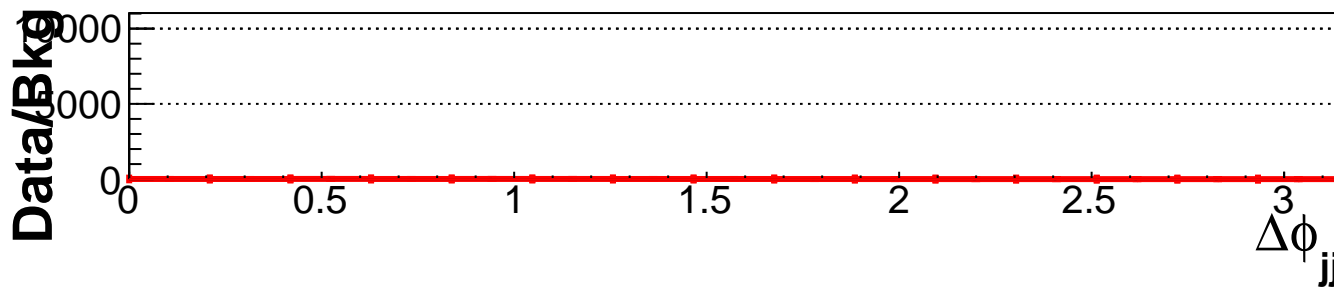
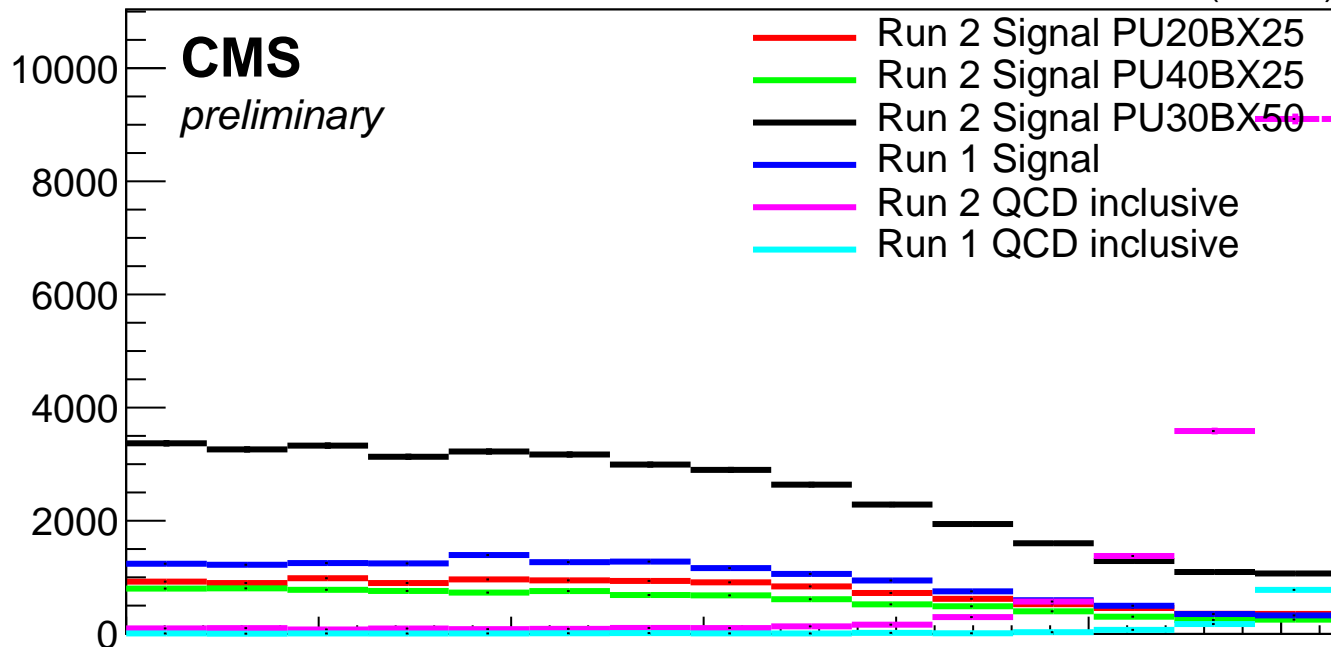


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

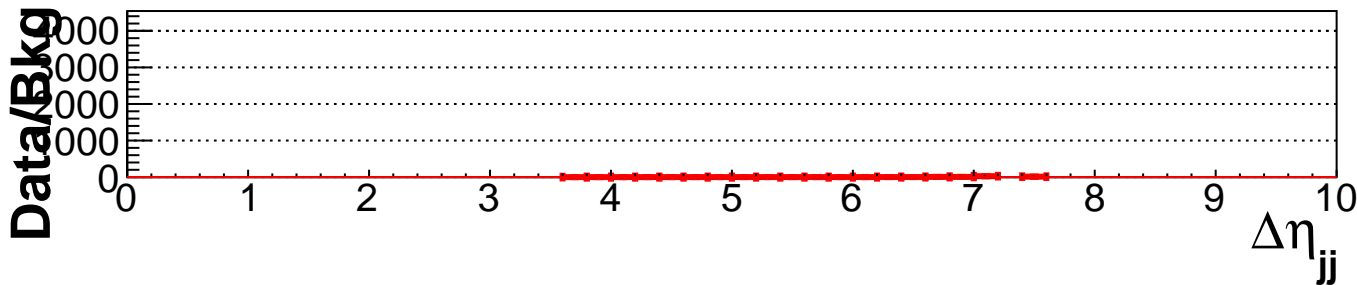
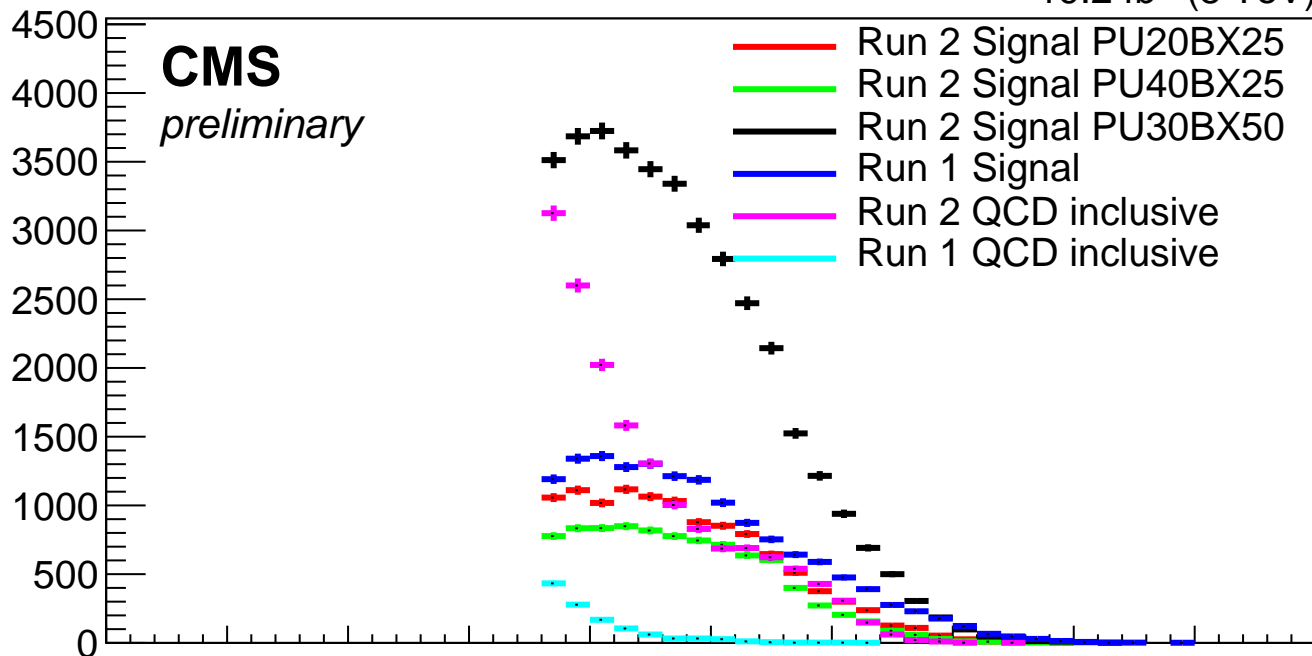
- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive





19.2 fb<sup>-1</sup> (8 TeV)

**CMS**  
*preliminary*



19.2 fb<sup>-1</sup> (8 TeV)

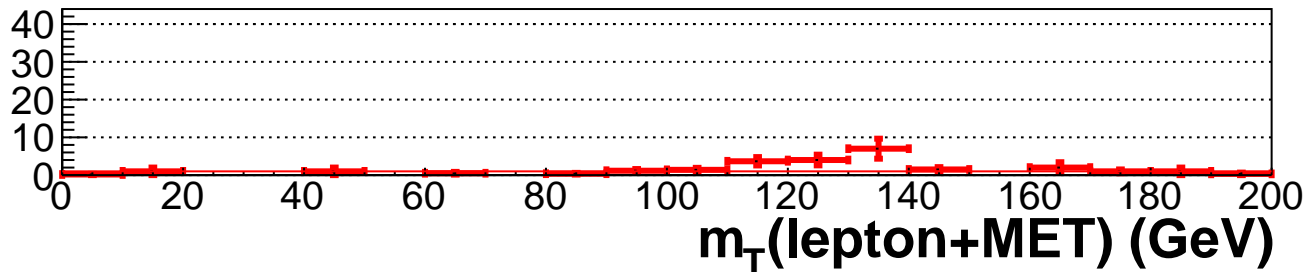
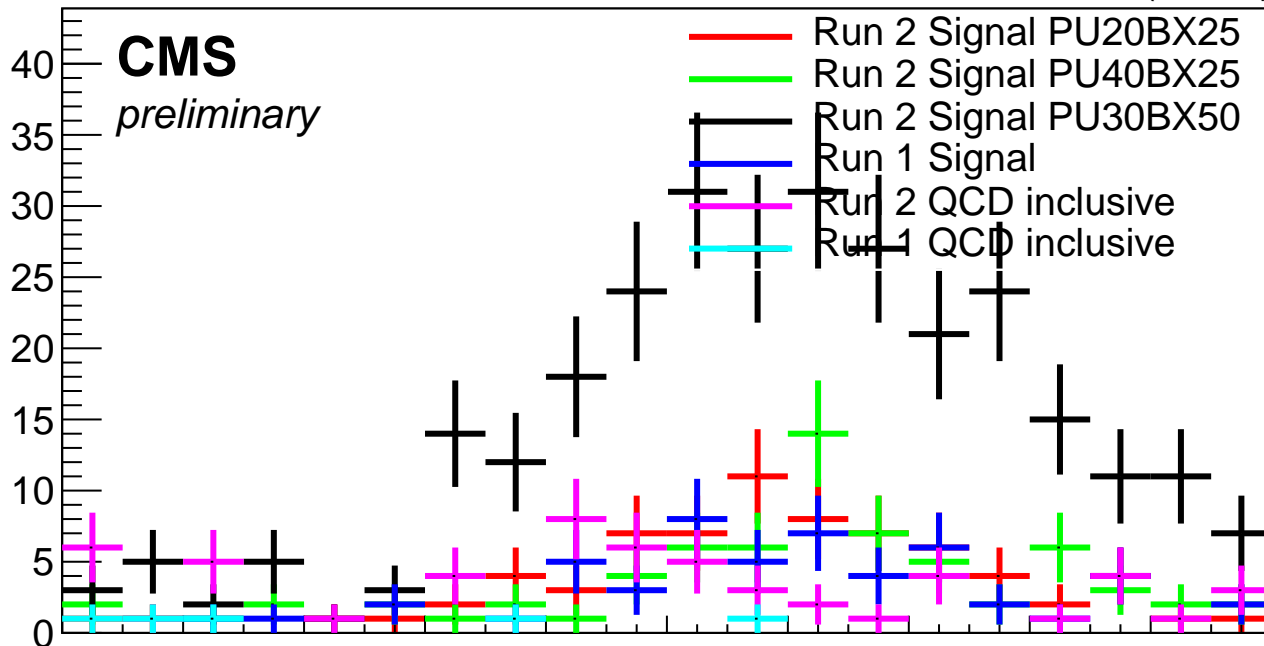
**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

**Data/Bkg**

**$m_T(\text{lepton}+\text{MET})$  (GeV)**

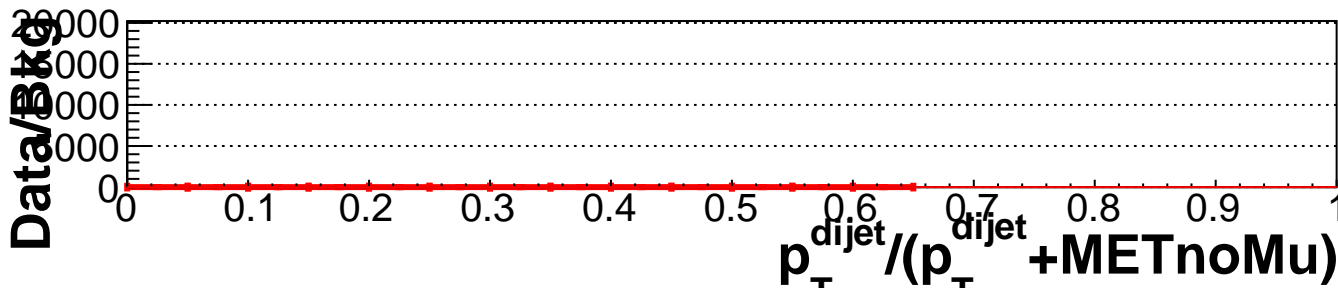
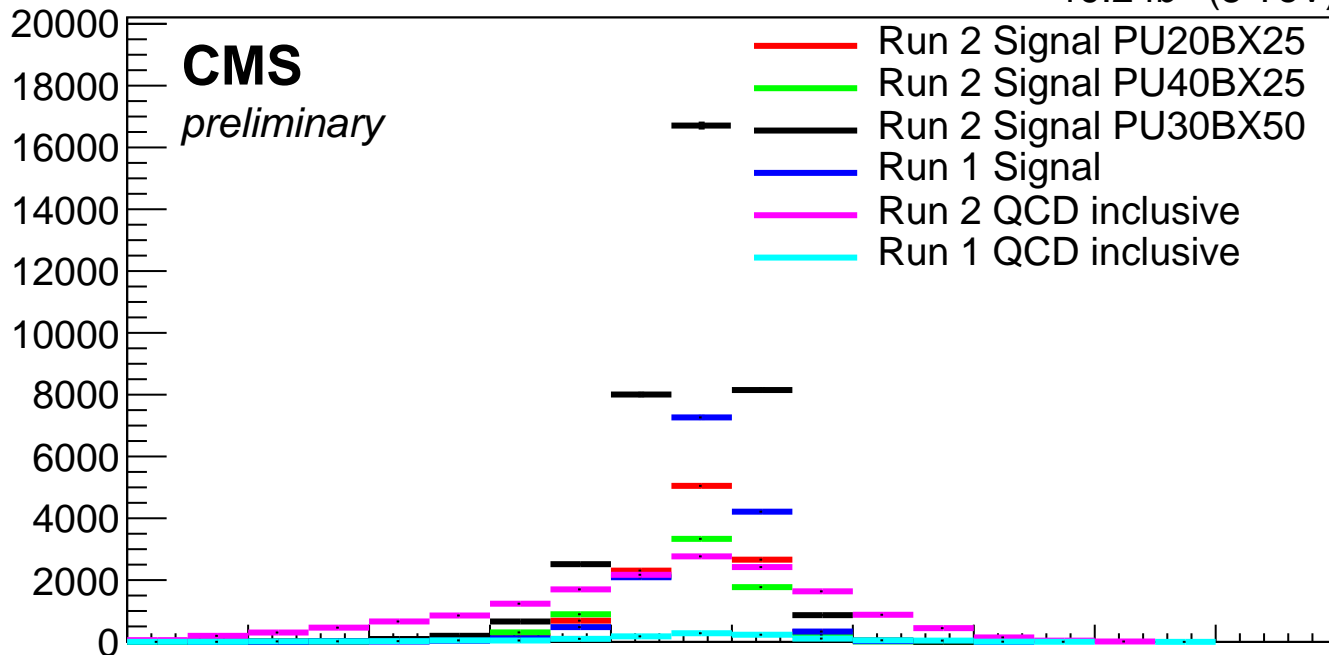


19.2 fb<sup>-1</sup> (8 TeV)

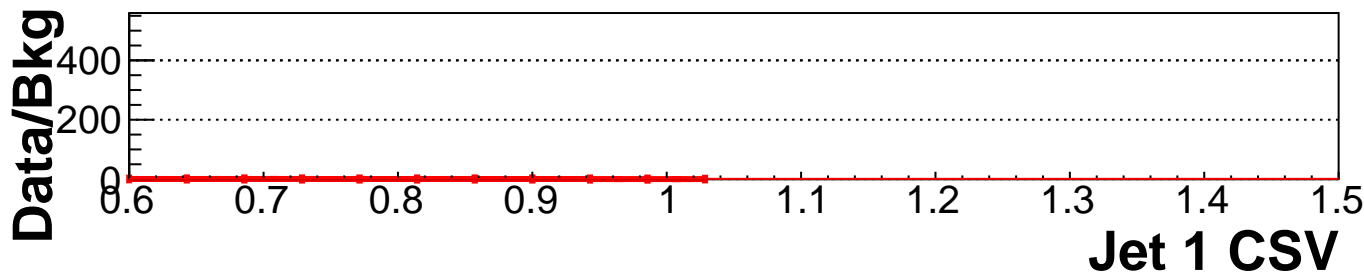
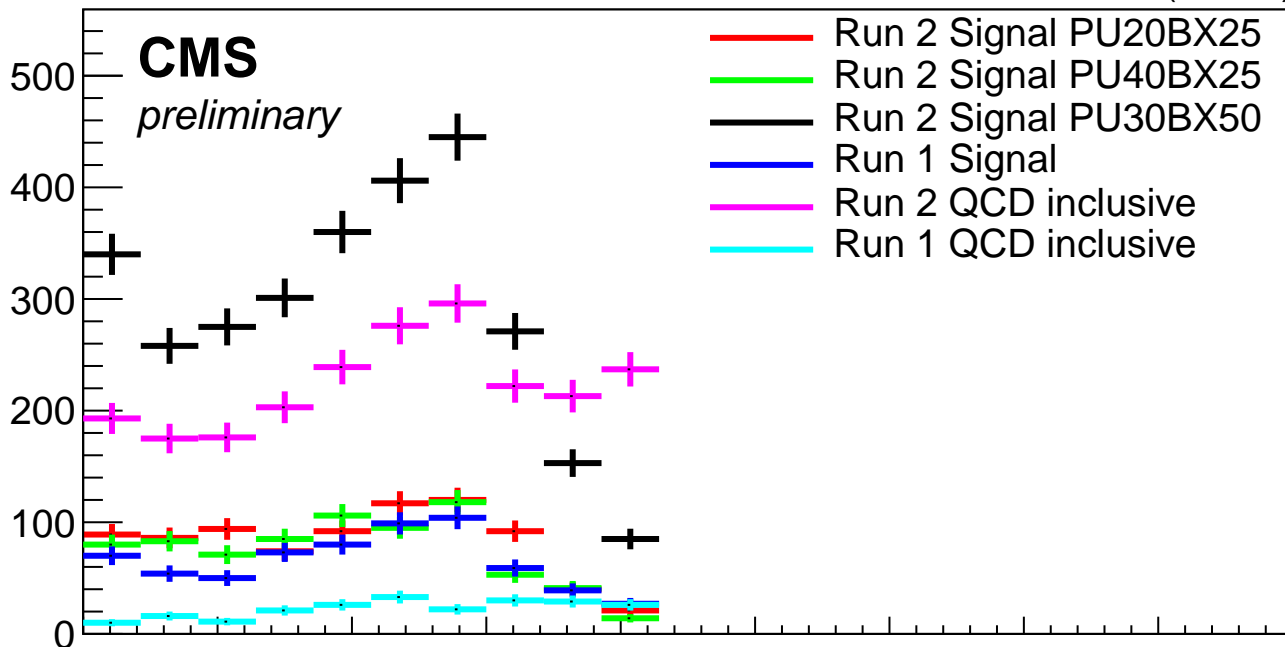
**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive



19.2 fb<sup>-1</sup> (8 TeV)



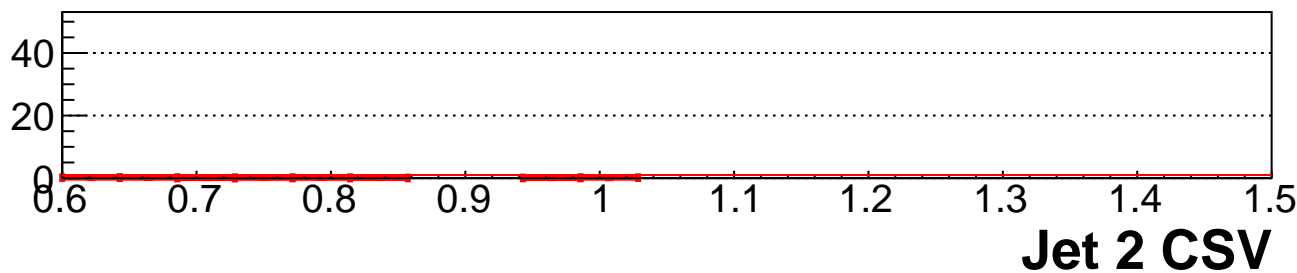
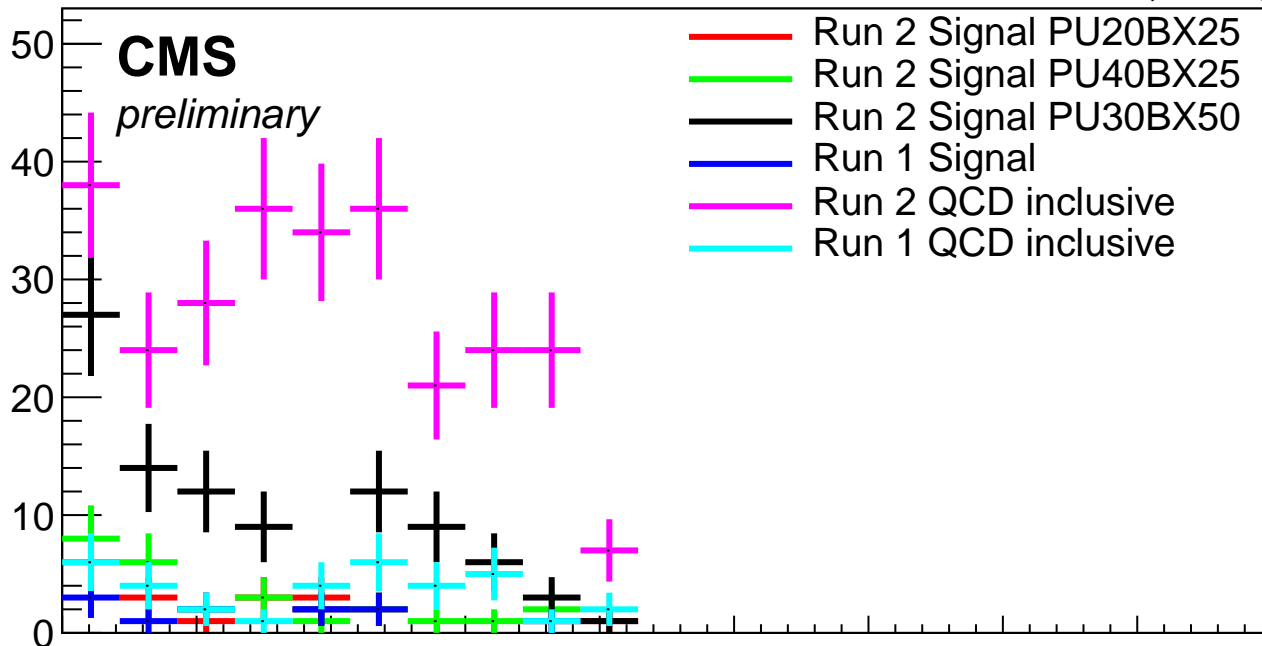
19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

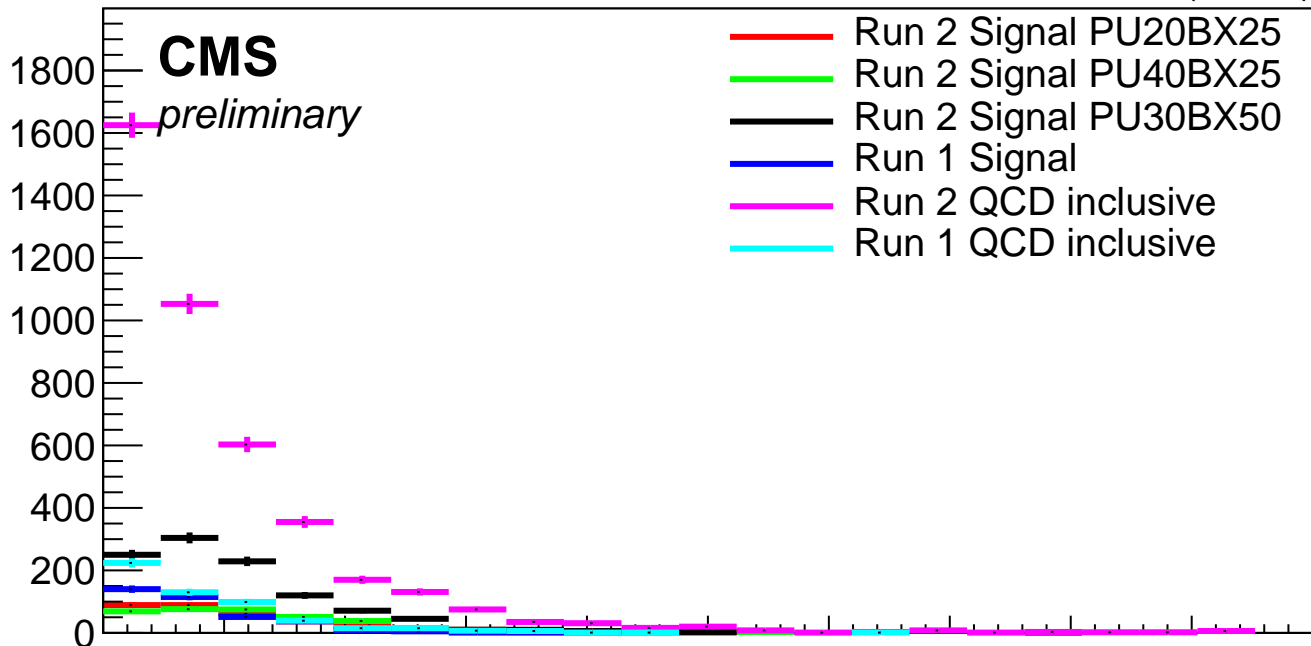
**Data/Bkg**



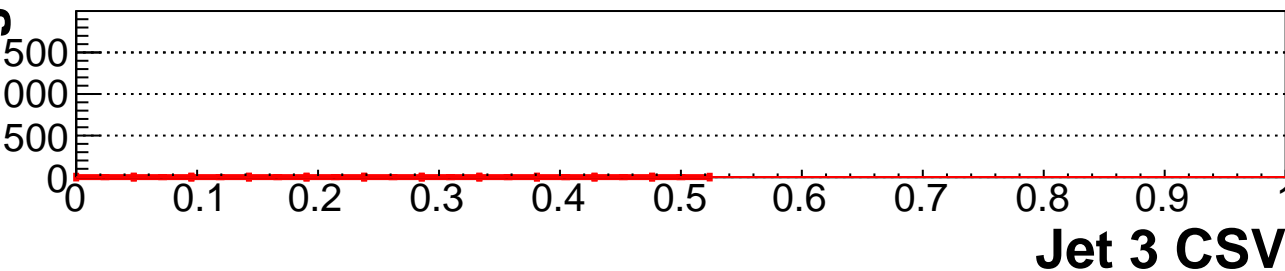
19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*



**Data/Bkg**

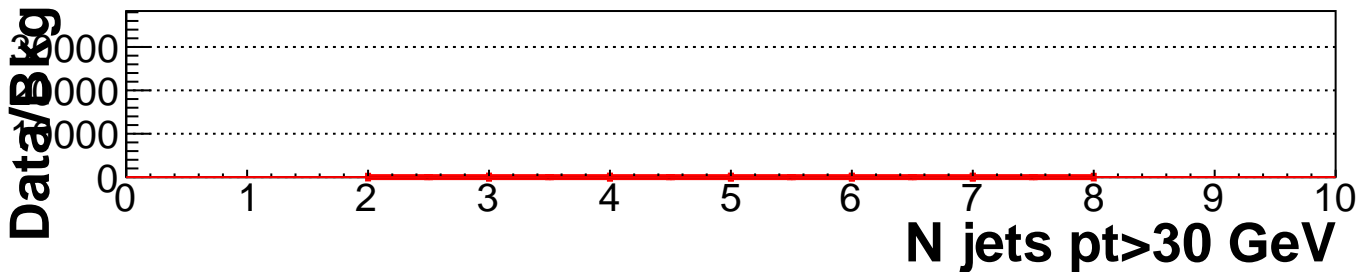
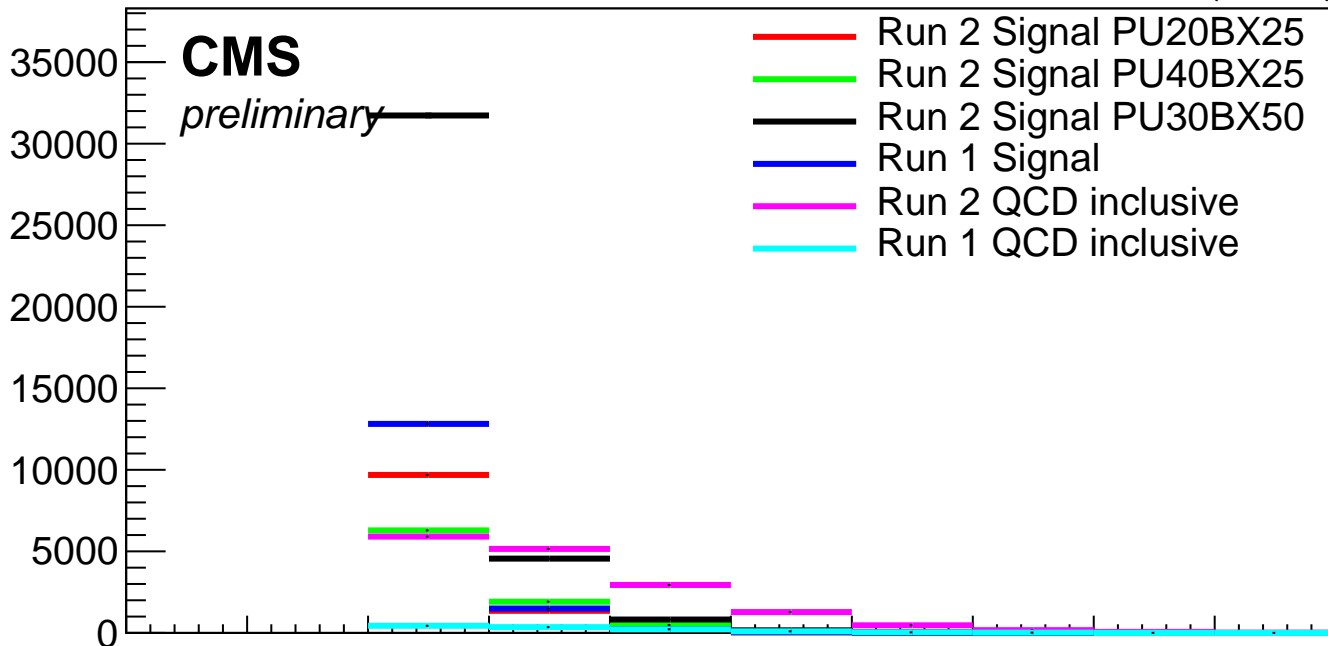


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

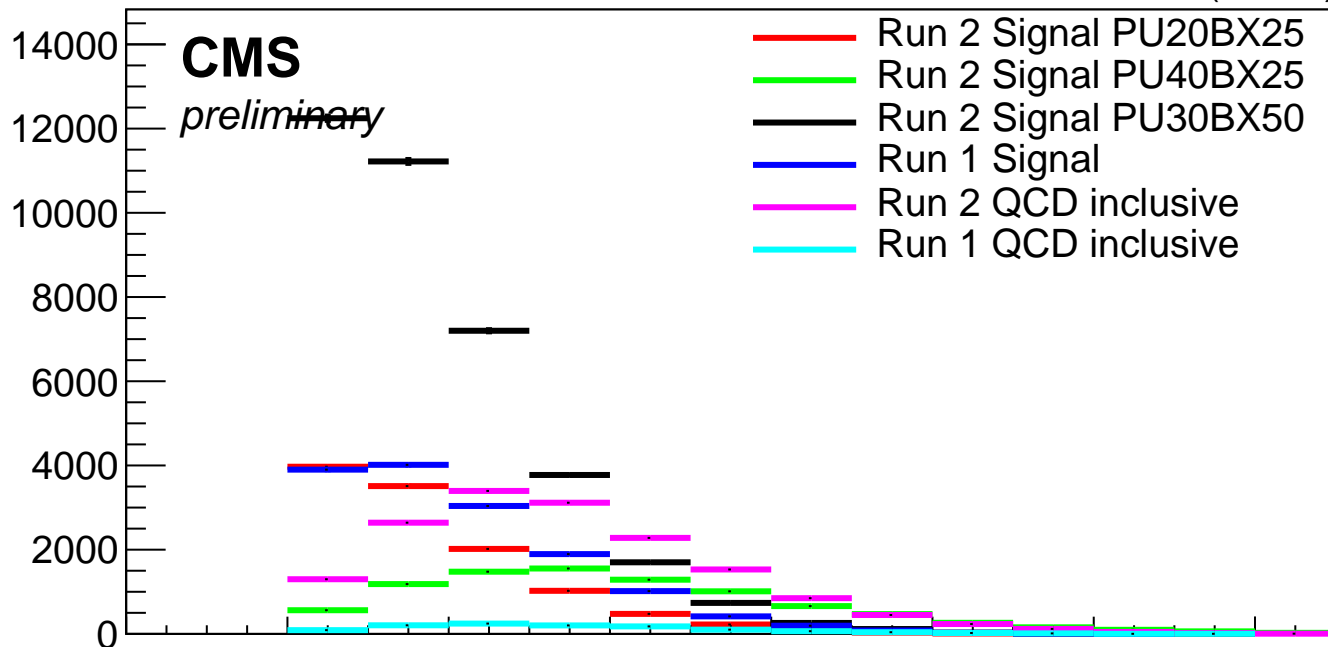


19.2 fb<sup>-1</sup> (8 TeV)

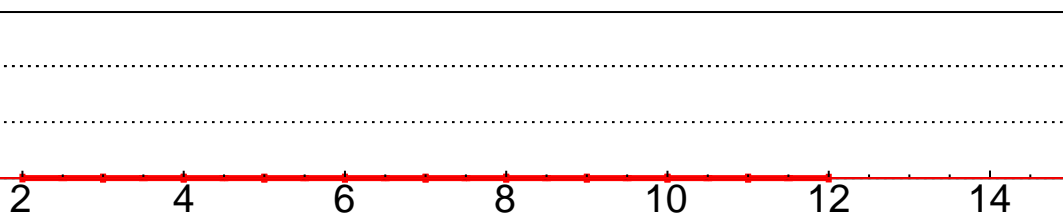
**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive



**Data/Bkg**



**N jets pt > 15 GeV**

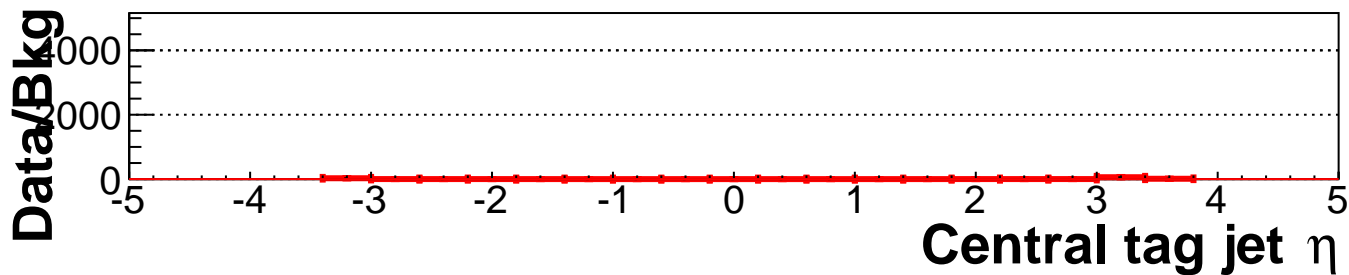


19.2 fb<sup>-1</sup> (8 TeV)

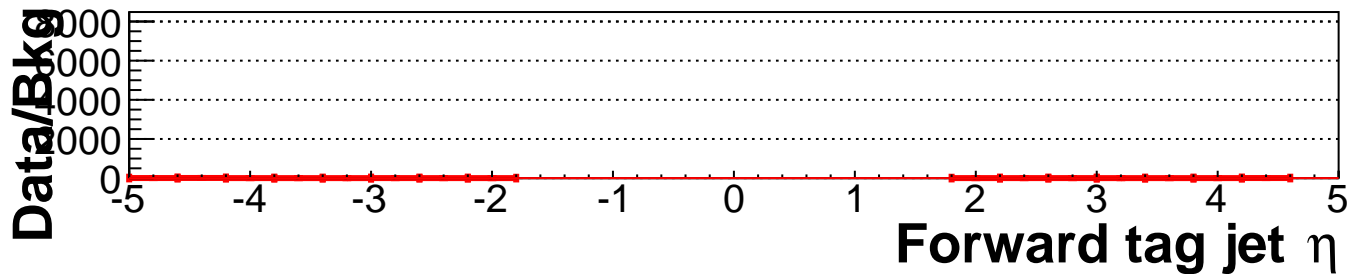
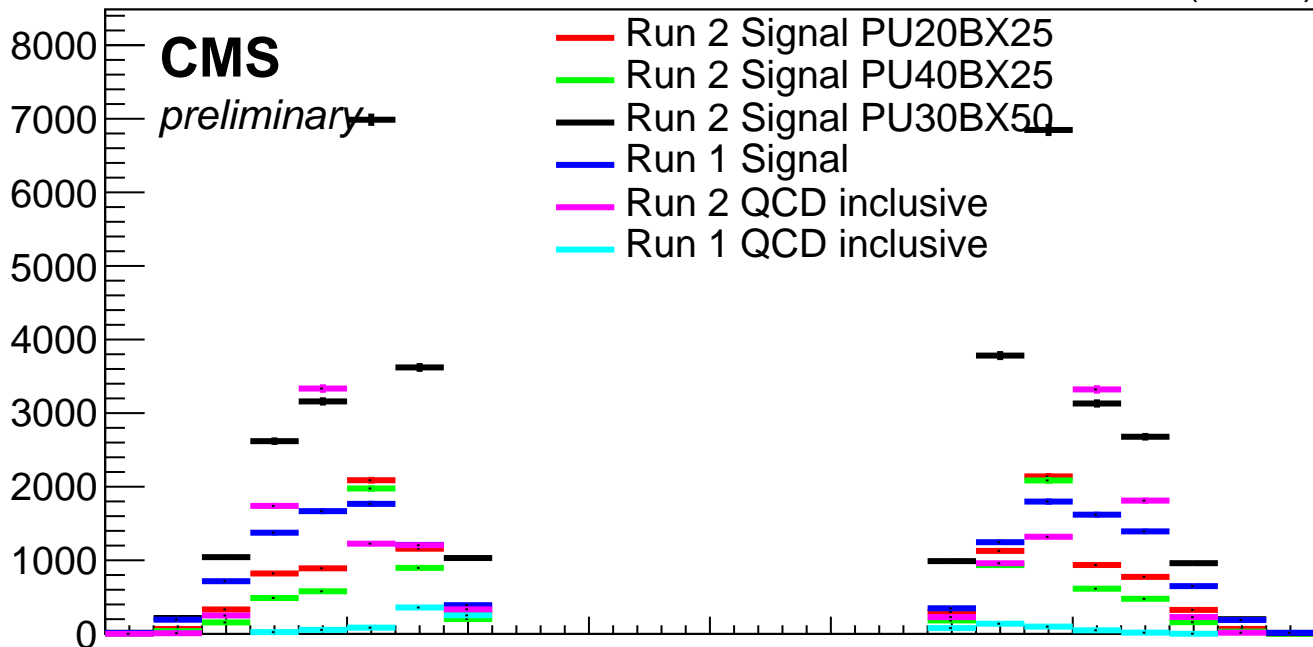
**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive



19.2 fb<sup>-1</sup> (8 TeV)

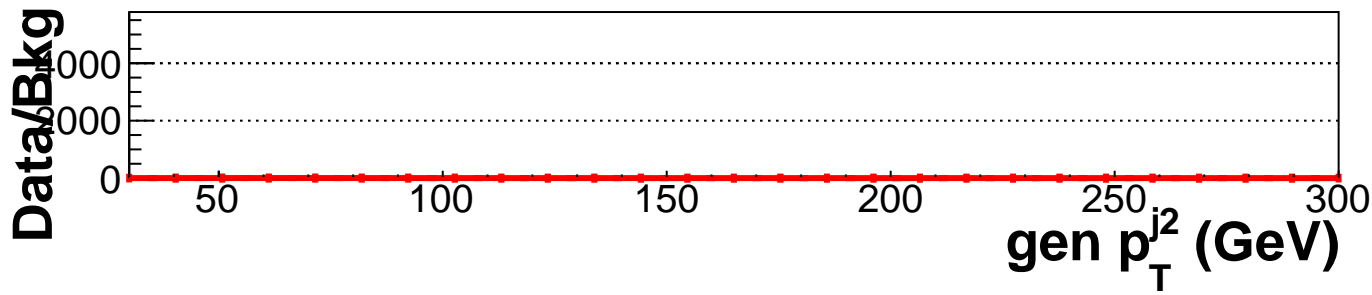


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

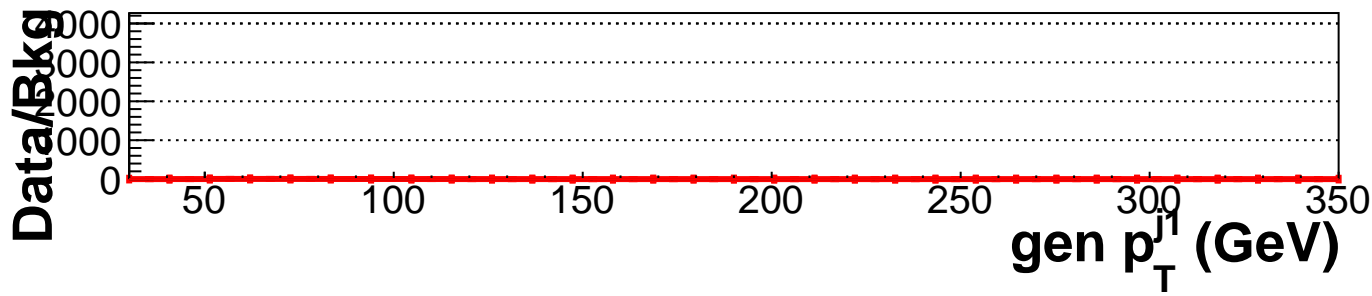
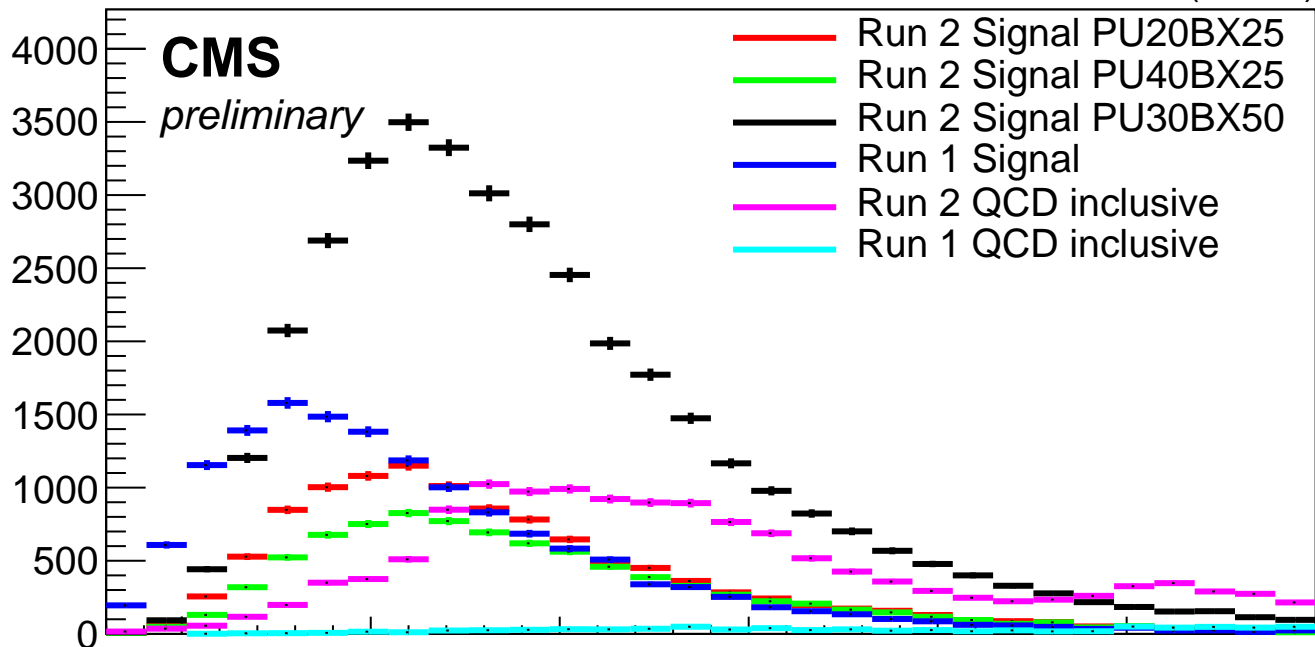
- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive



19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

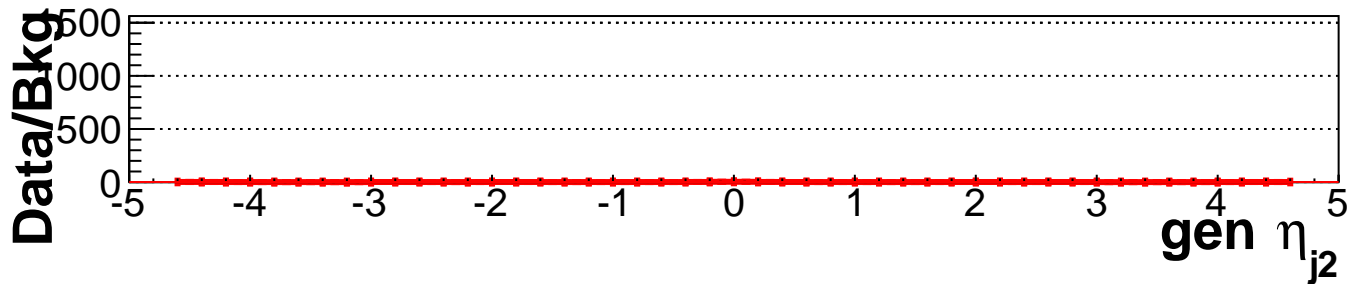
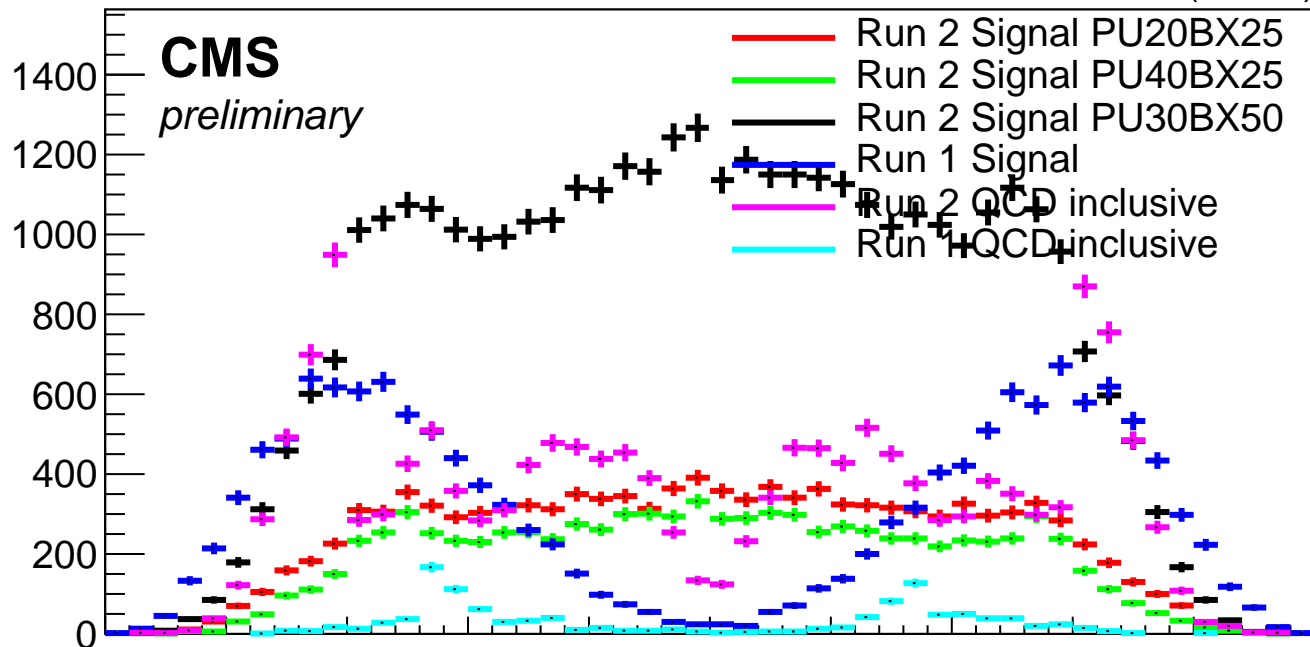
*preliminary*



19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

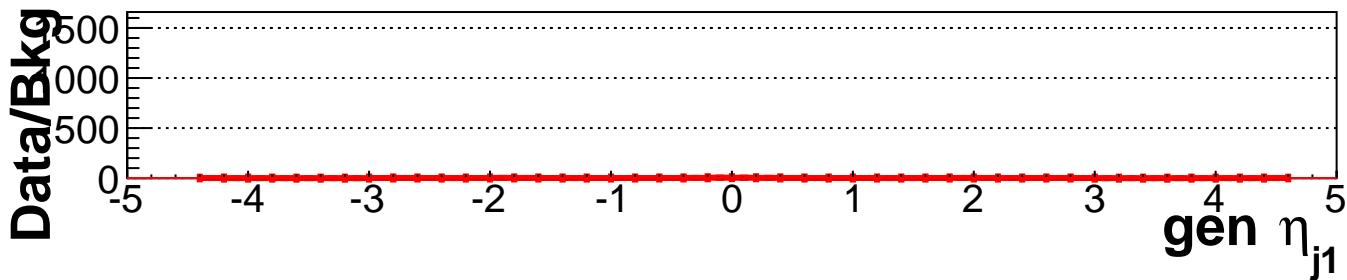
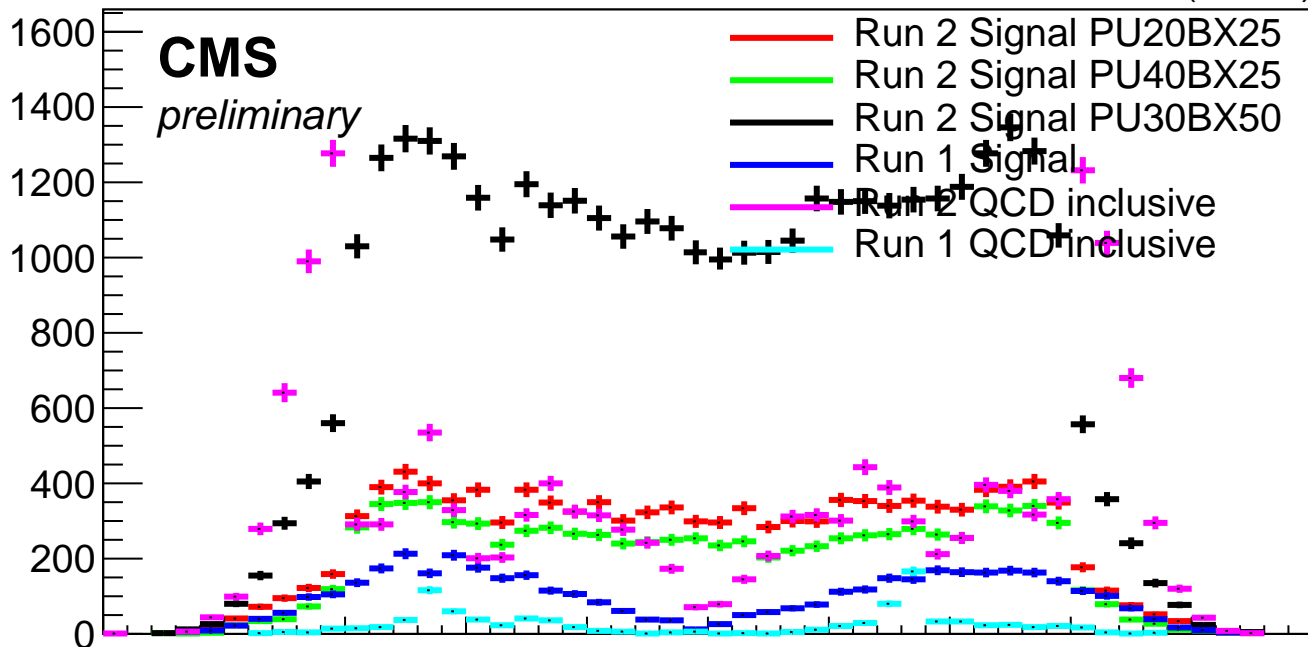
*preliminary*



19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*



19.2 fb<sup>-1</sup> (8 TeV)

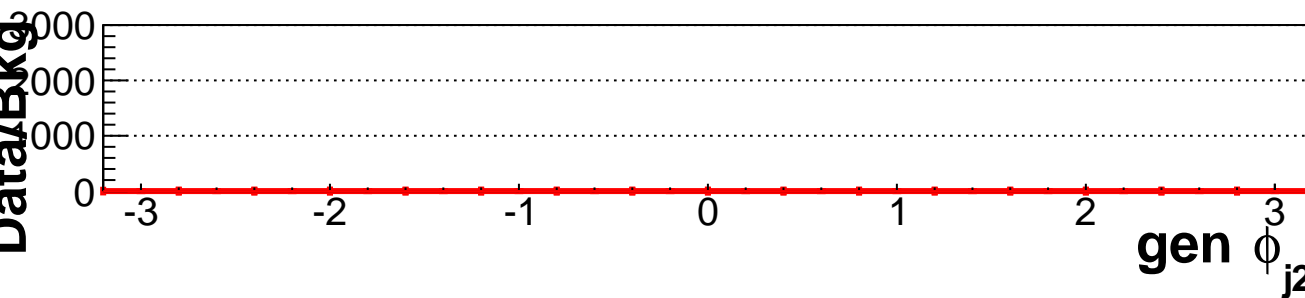
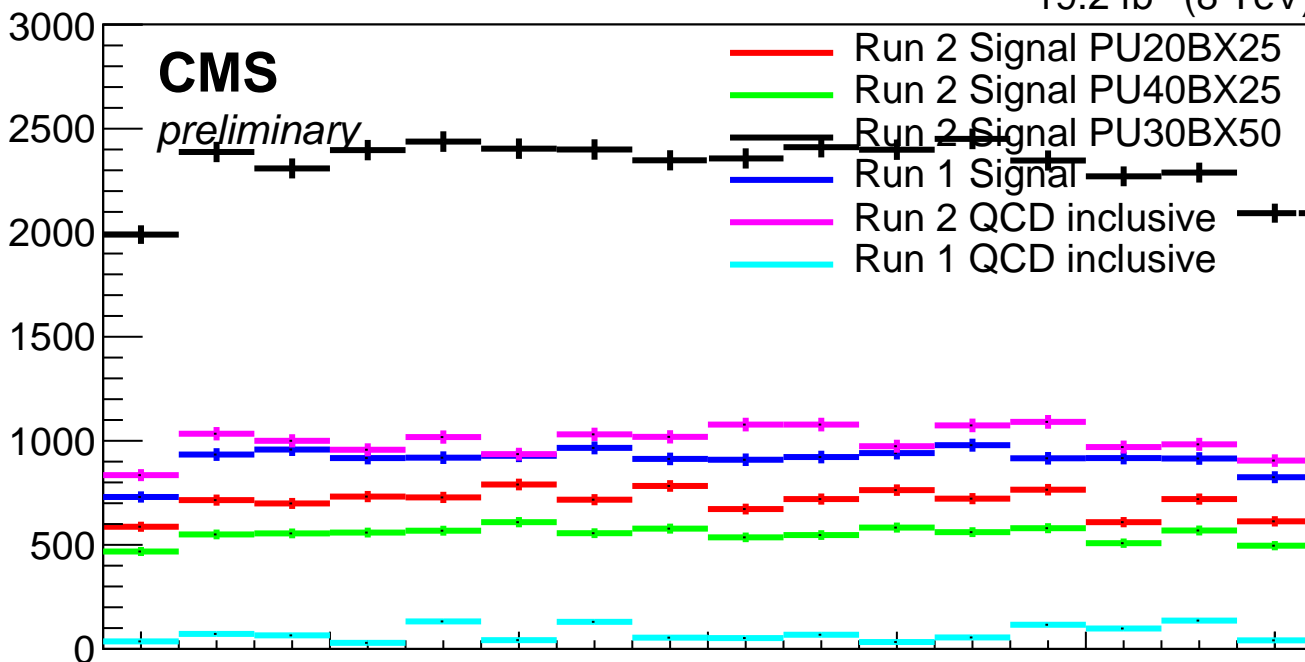
**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive

**Data/Bkg**

**gen  $\phi_{j2}$**

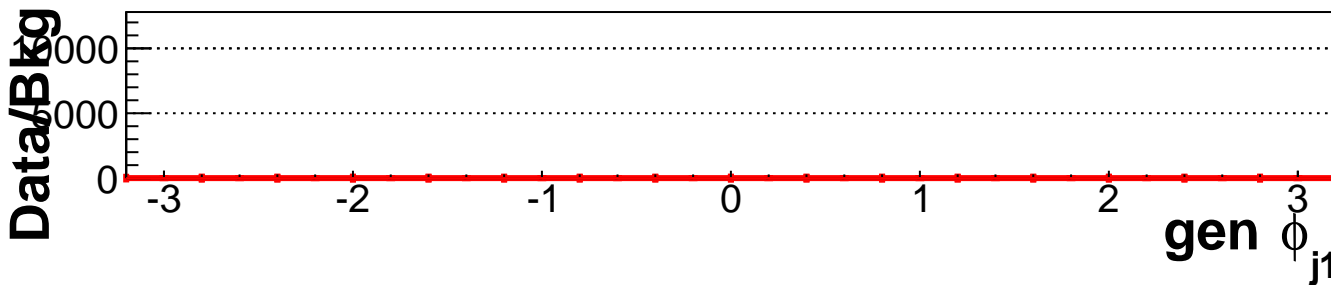
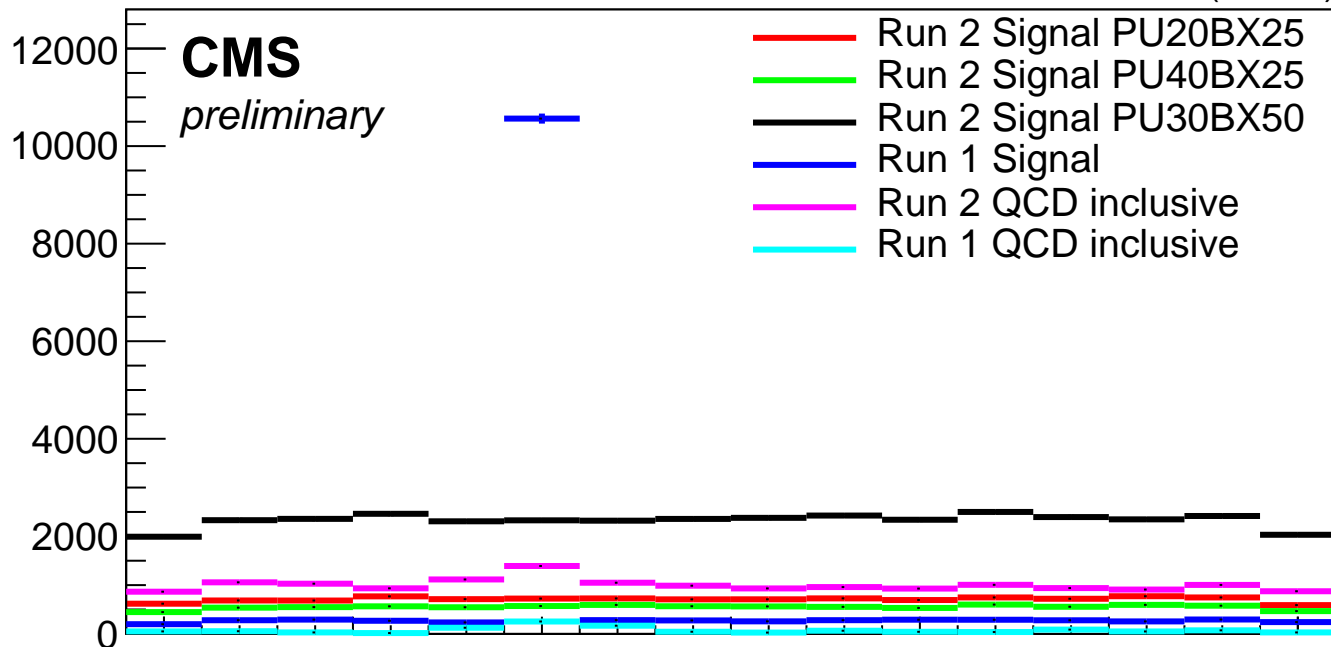


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive



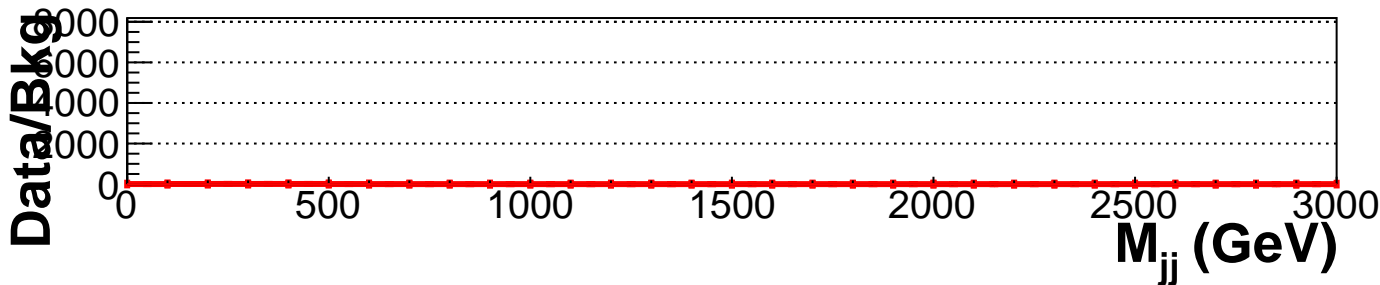


19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

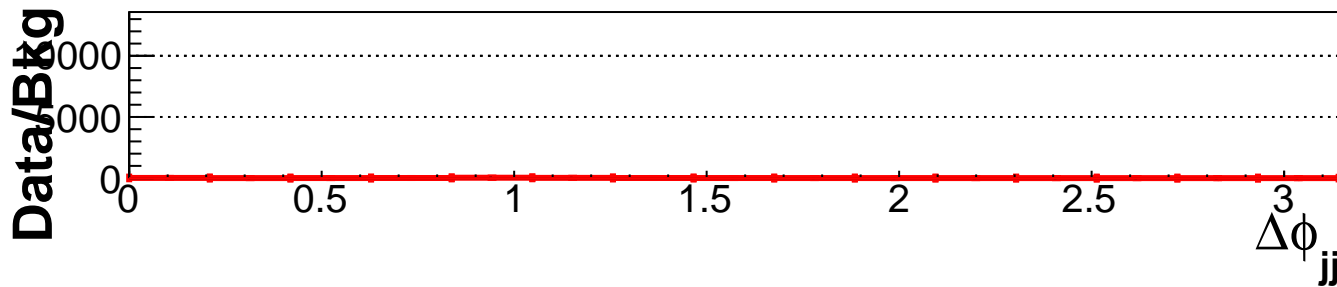
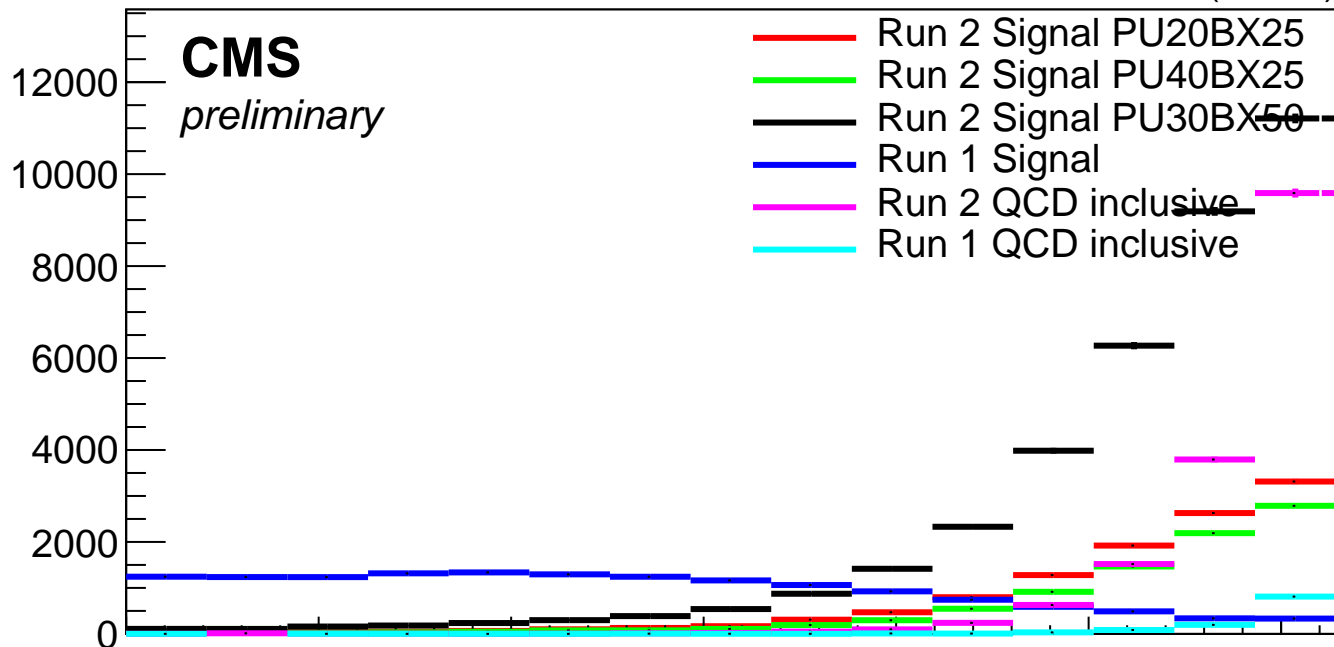
- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive



19.2 fb<sup>-1</sup> (8 TeV)

**CMS**  
*preliminary*

- Run 2 Signal PU20BX25
- Run 2 Signal PU40BX25
- Run 2 Signal PU30BX50
- Run 1 Signal
- Run 2 QCD inclusive
- Run 1 QCD inclusive



19.2 fb<sup>-1</sup> (8 TeV)

**CMS**

*preliminary*

