Compare Data and Pythia MC Basic Tracking

Tracking POG

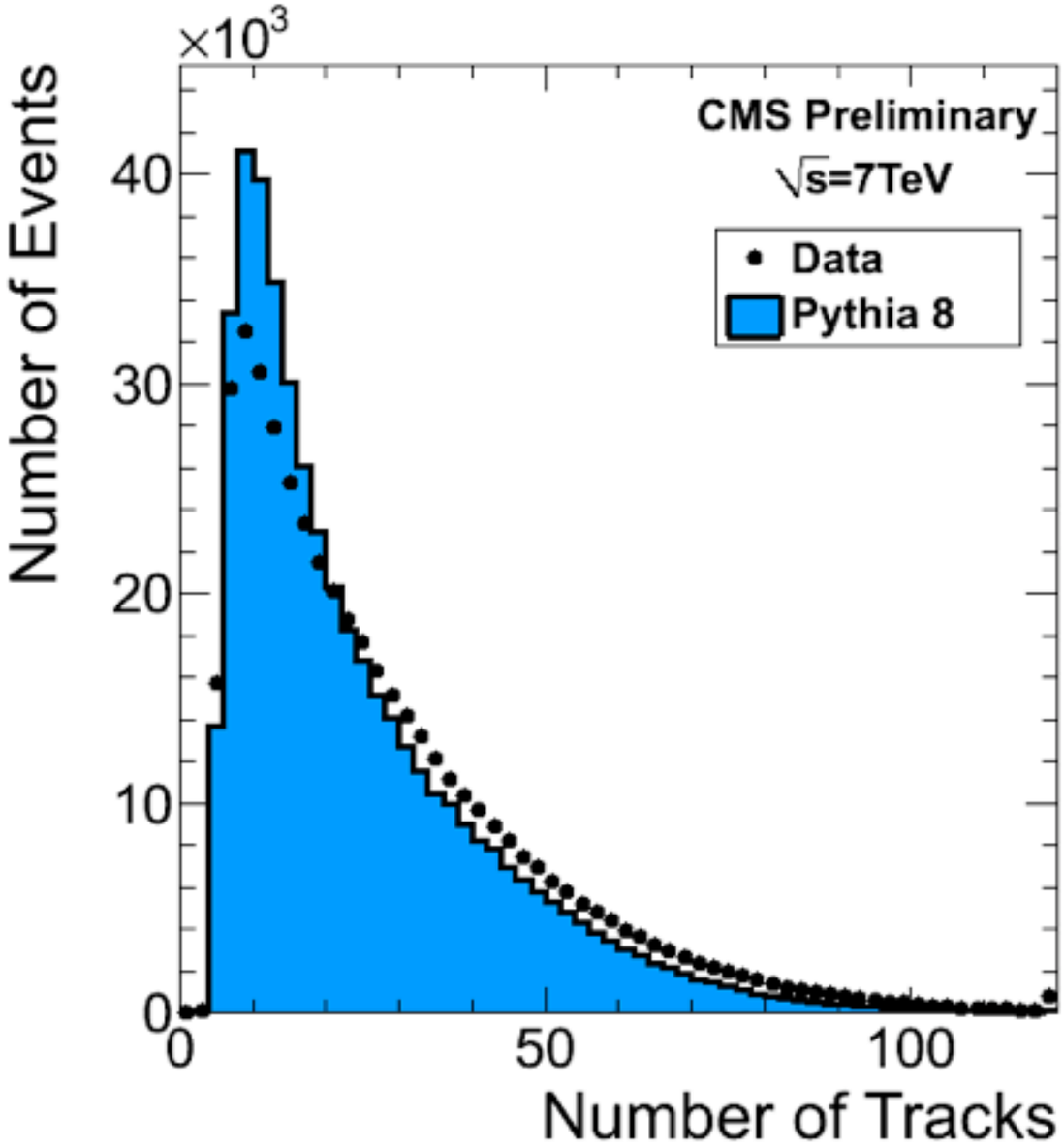
Plots in this talk are available at http://home.fnal.gov/~ygao/CMS/Tracking/TrackPAS7TeV/

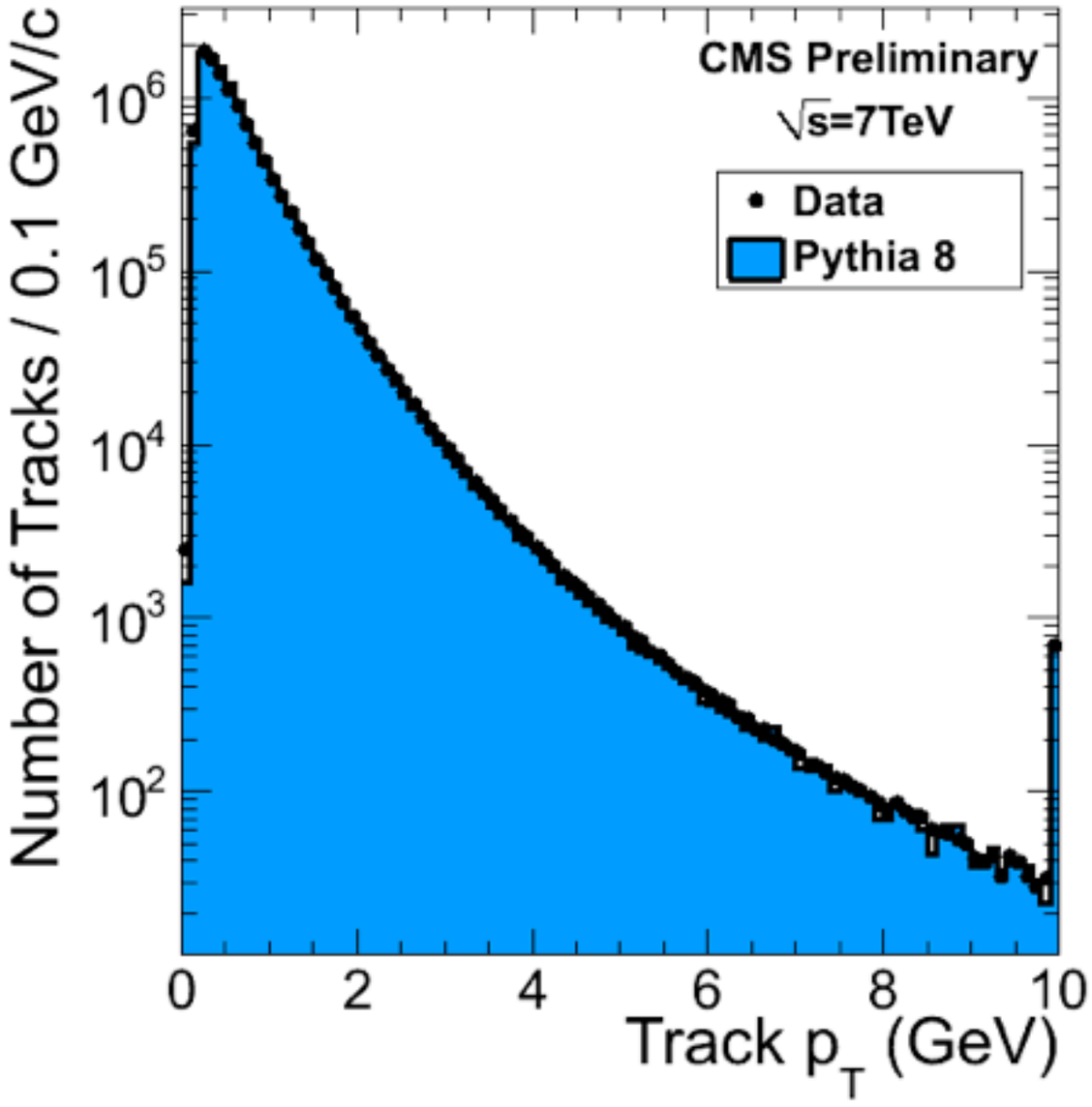
Details on the MC tuning: https://twiki.cern.ch/twiki/bin/view/CMS/TrackingPOGMCTuning

Compare the Data to Pythia MC

- Dataset reconstructed in 358p3
  - Run132601: /MinimumBias/Commissioning10-May6thPDSkim_GOODCOLL-v1
  - Pythia 8 MC: /MinBias_7TeV-pythia8/Spring10-START3X_V26B-v1/
  - Pythia D6T MC: /MinBias_TuneD6T_7TeV-pythia6/Spring10-START3X_V26B-v1/
- Event selections on top of GOODCOLL
  - vertex ndof>=4 && scraping veto (fraction of HP tracks > 25% if nTracks>10)
- Track selections
  - HighPurity && ptErr/pt<5%
  - |dz significance|<10 {dz(pvtx)/sqrt(dzErr^2+pvtx_zErr^2)}
- Notes on the plots in the next slides
  - All track distributions except the track multiplicity are normalized by nTracks
  - The first(last) bin of the histograms include the underflow(overflow) bins

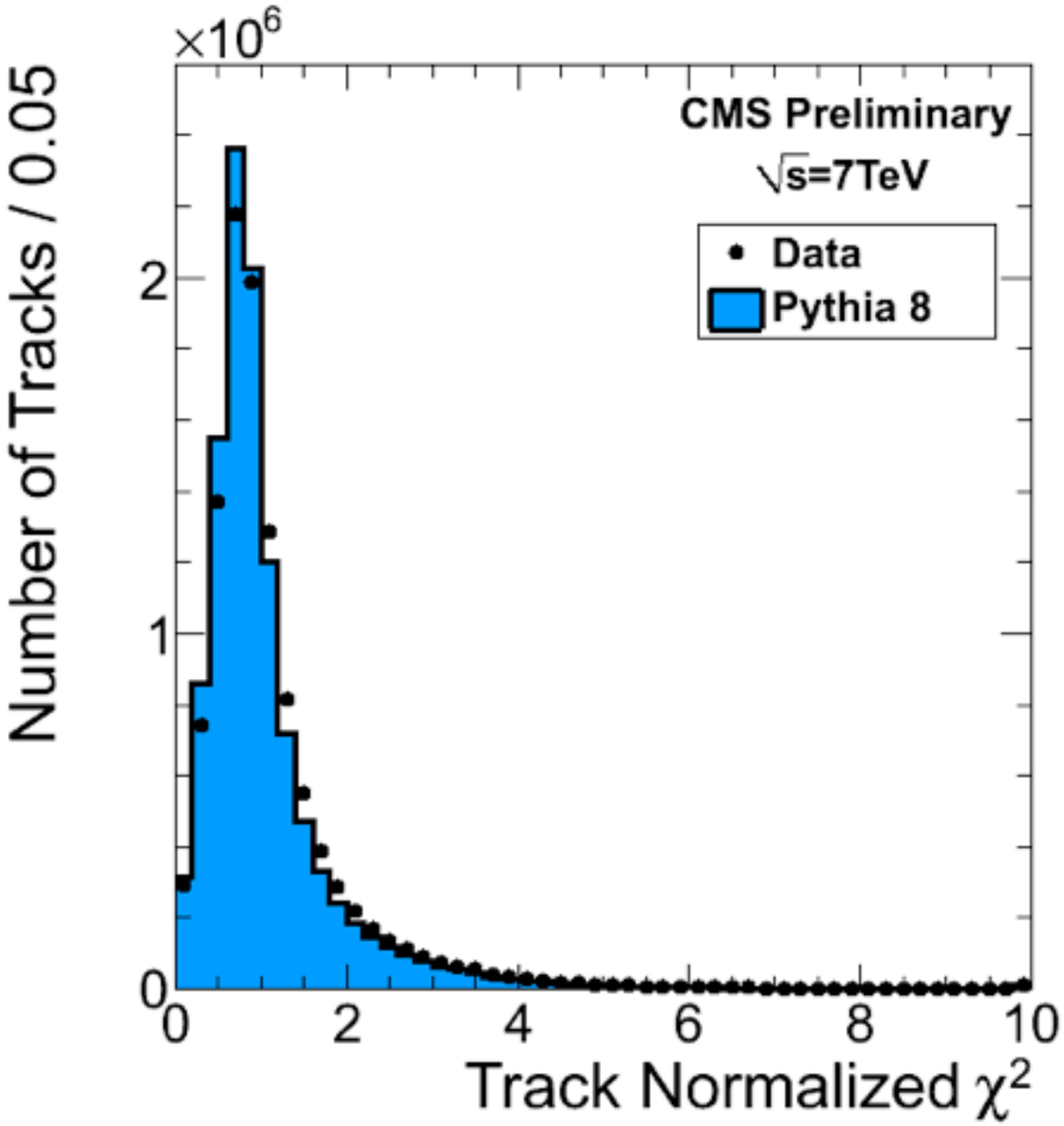
Track Distributions with no pT cut (1/4)

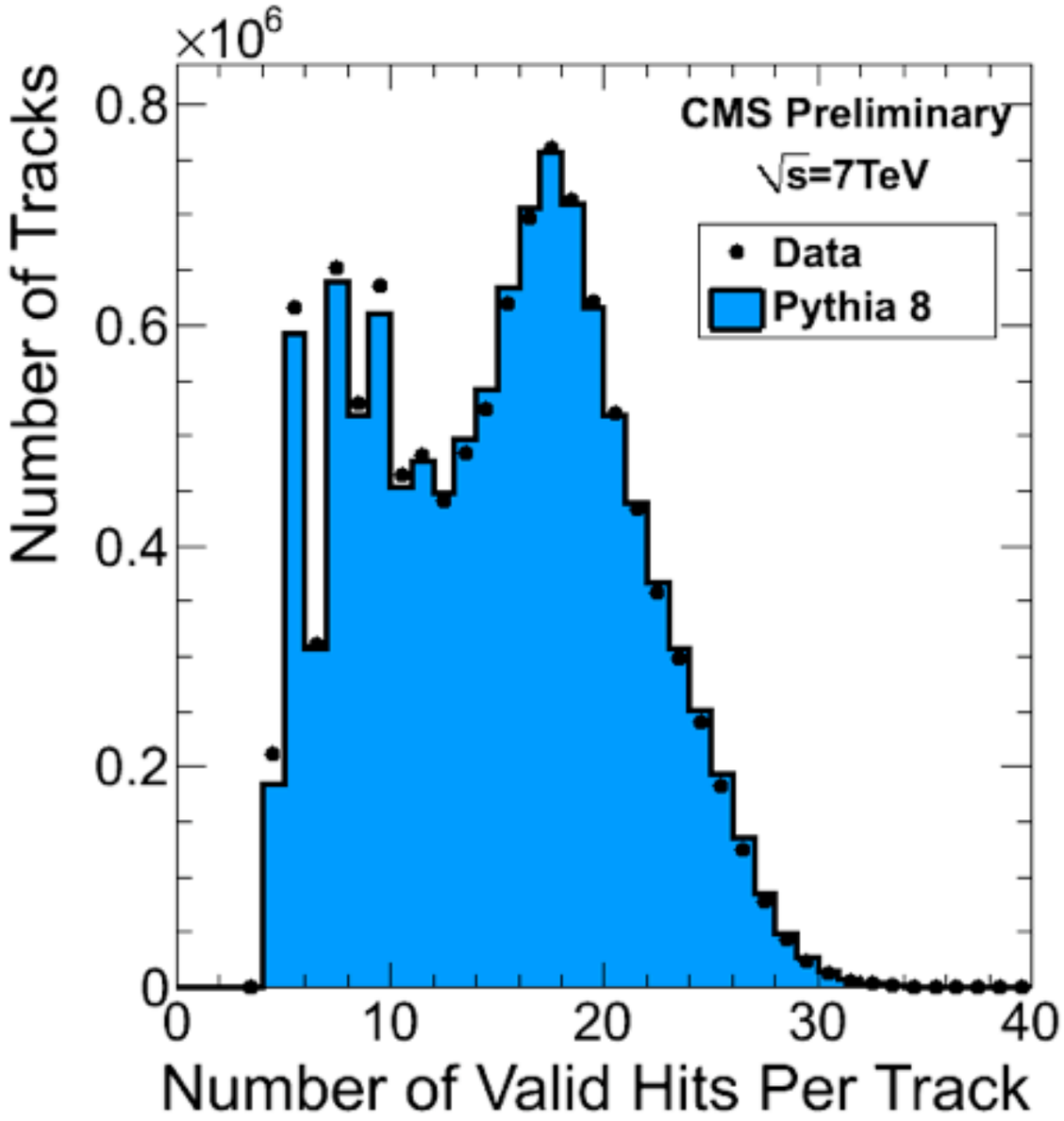




- The nTracks log scale and pT linear plots are in the backup slide 8
- The excess in the data are mainly in the low pT region. The track multiplicity agrees better between data/MC with pT>0.5GeV (slide 9)

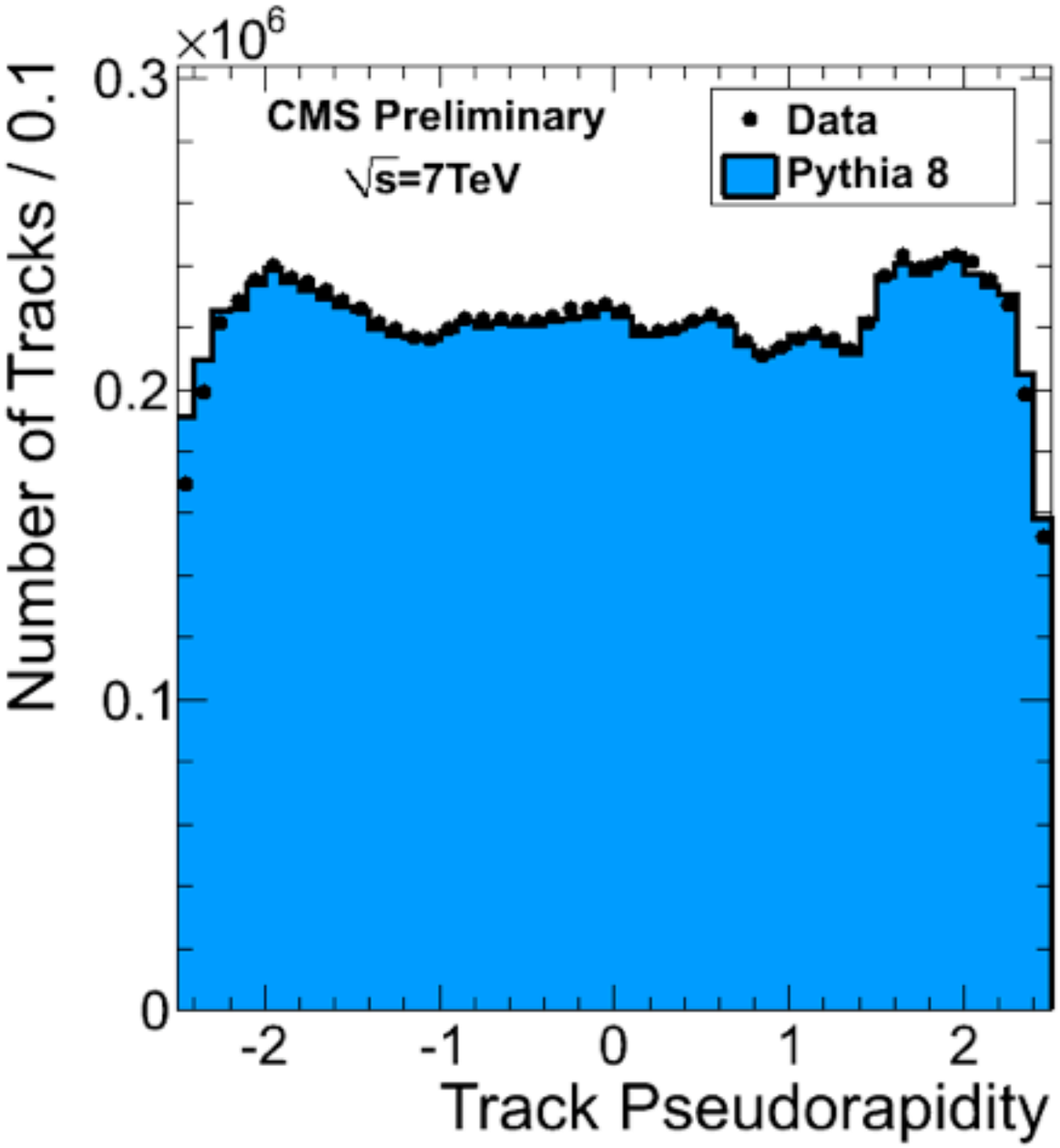
Track Distributions with no pT cut (2/4)

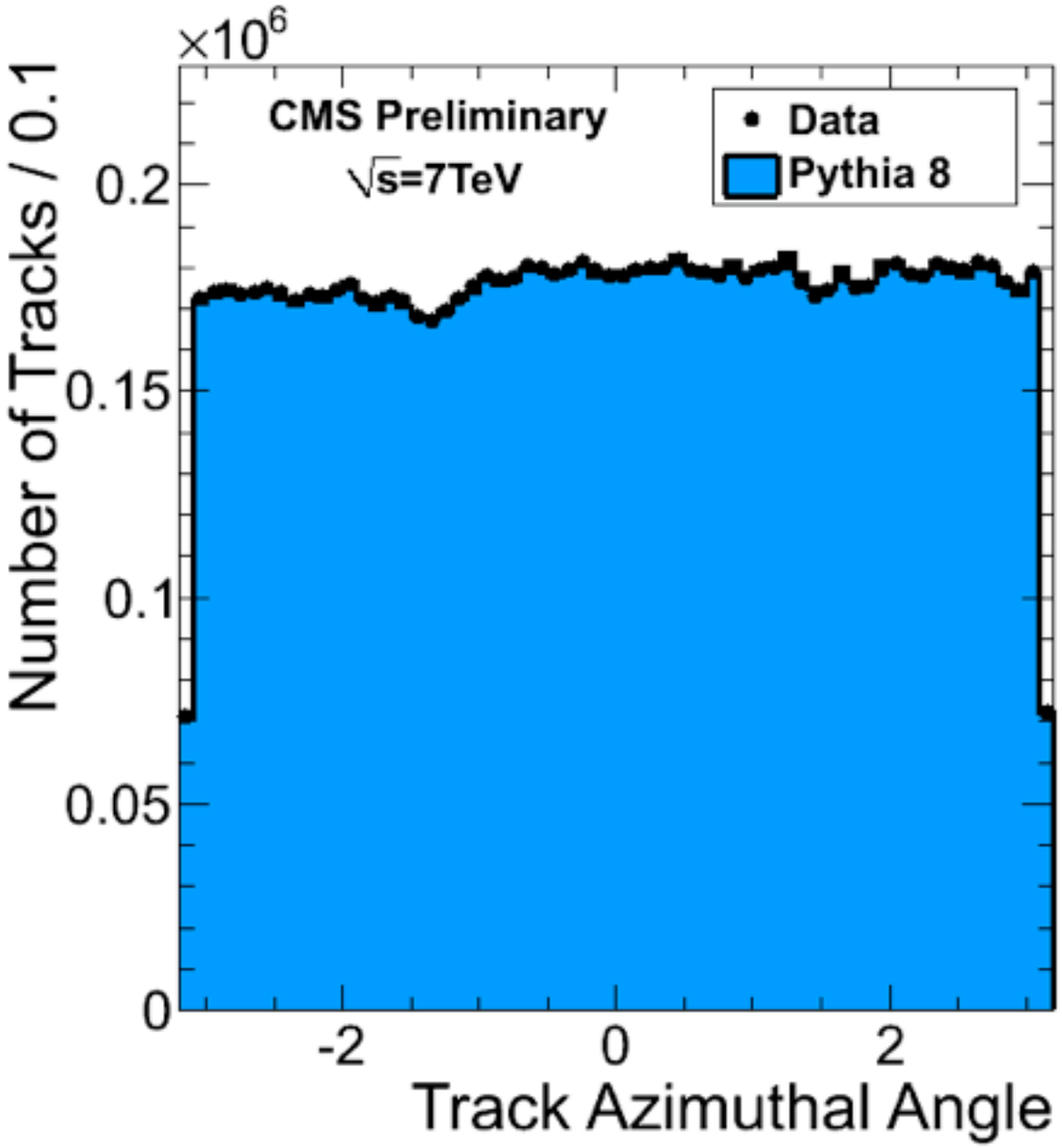




- The disagreement in the low nHit bins are mainly due to low pT tracks. The data/MC matches better with pT> 0.5 GeV (see backup slide 10)

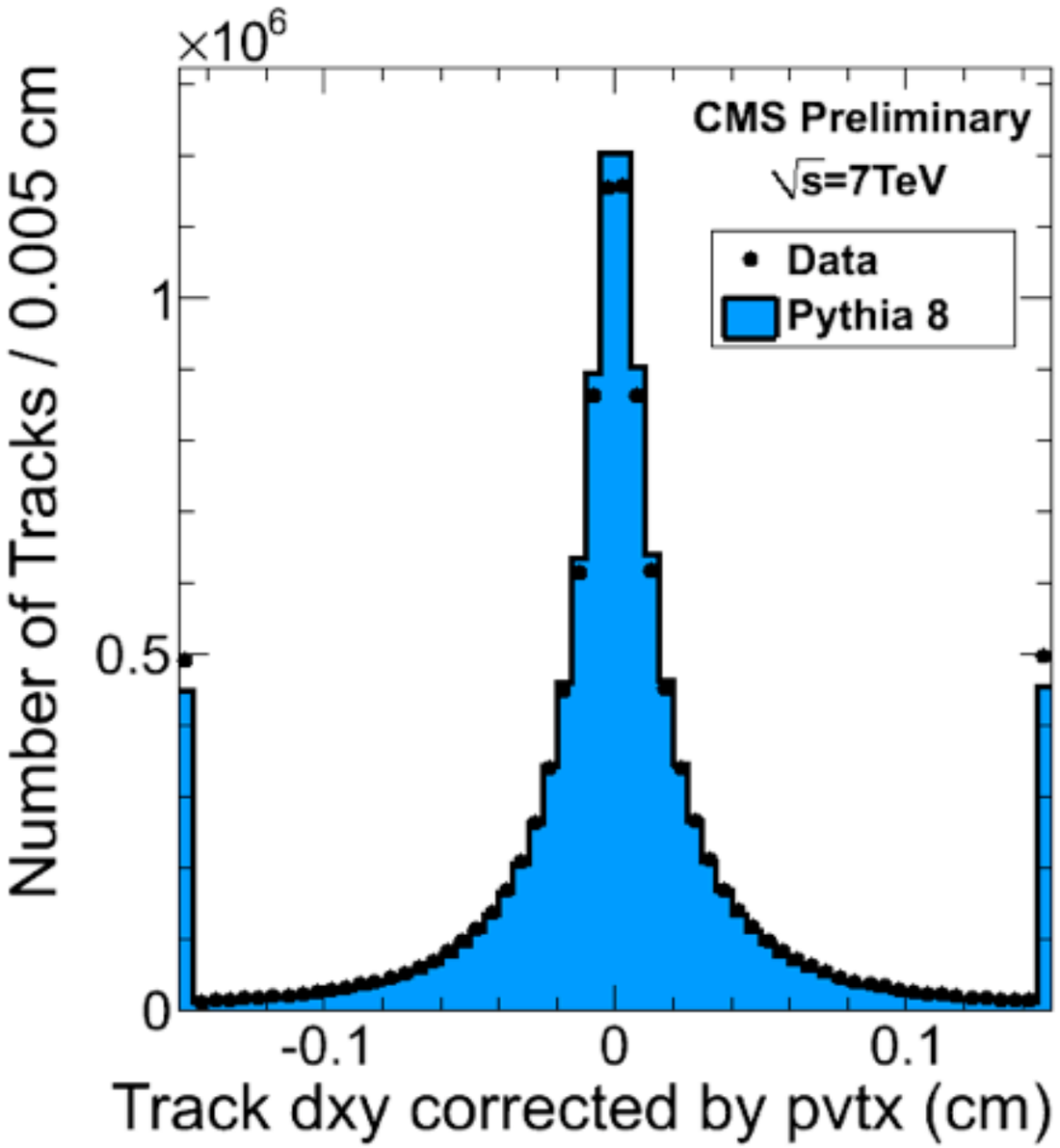
Track Distributions with no pT cut (3/4)

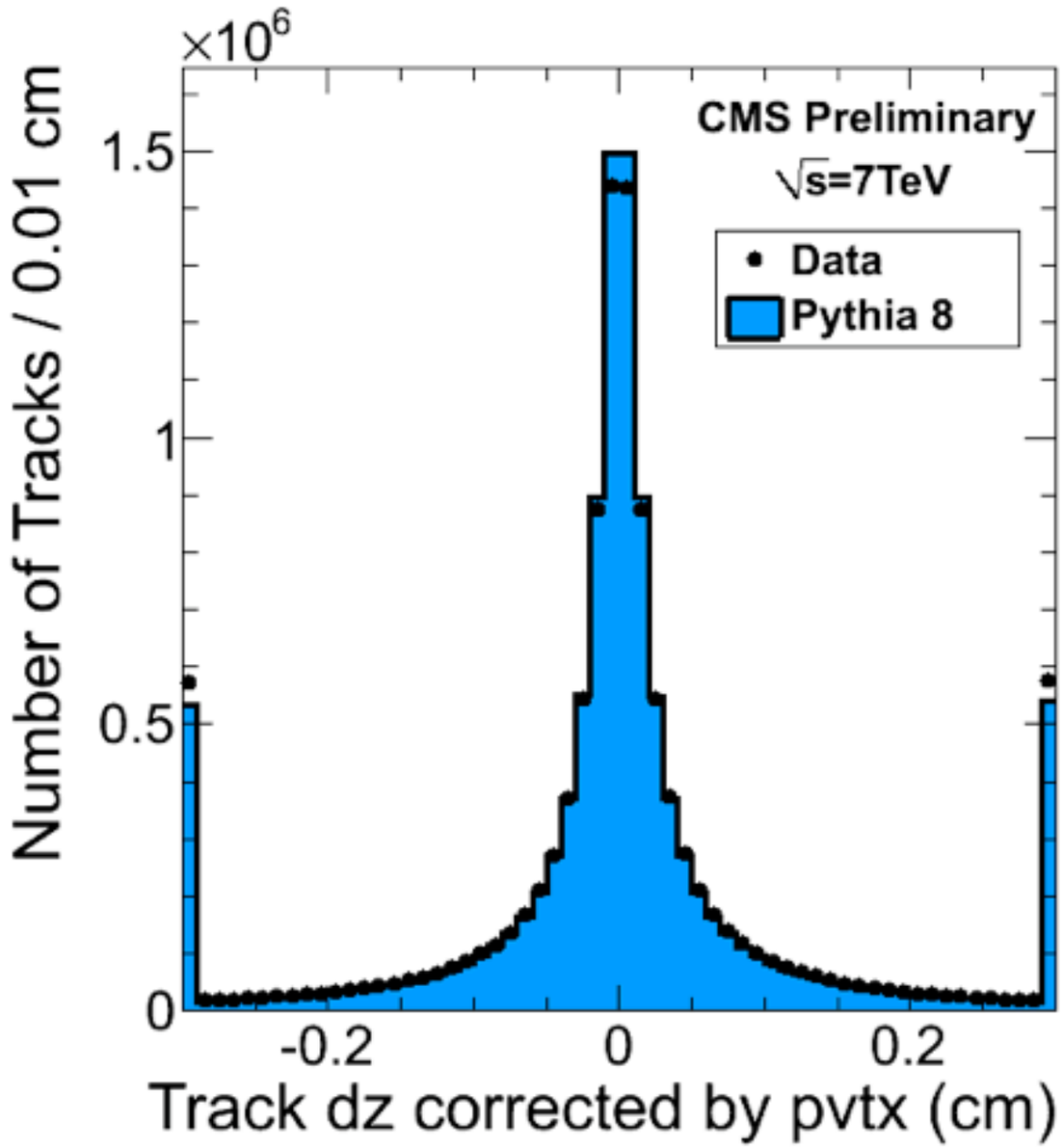




- The dip at phi ~ -1.5 is due to the inactive material in the tracker. It affects mainly for the low pT tracks. The size of the dip gets smaller with pT > 0.5 GeV (see backup slide 10)

Track Distributions with no pT cut (4/4)

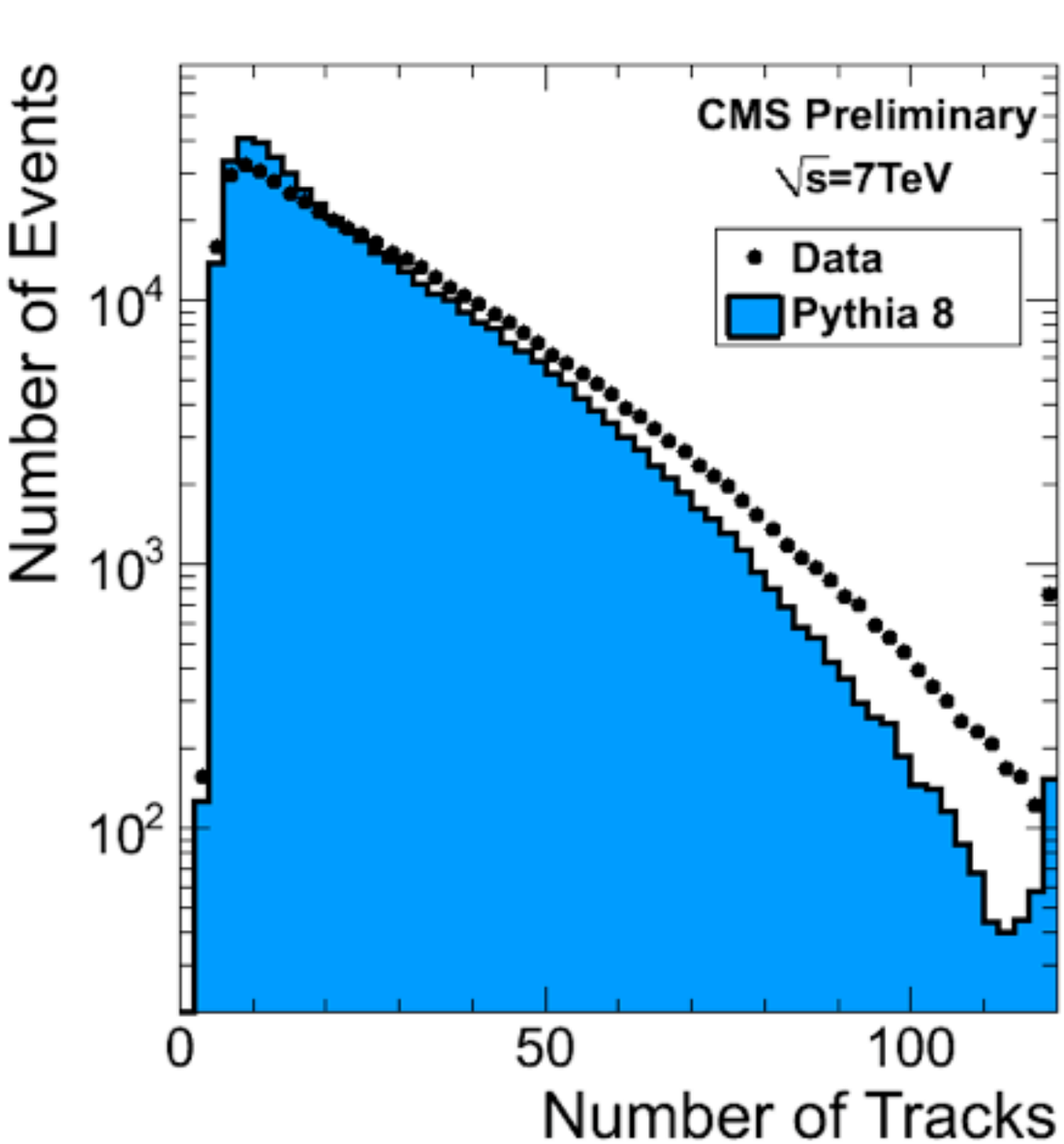


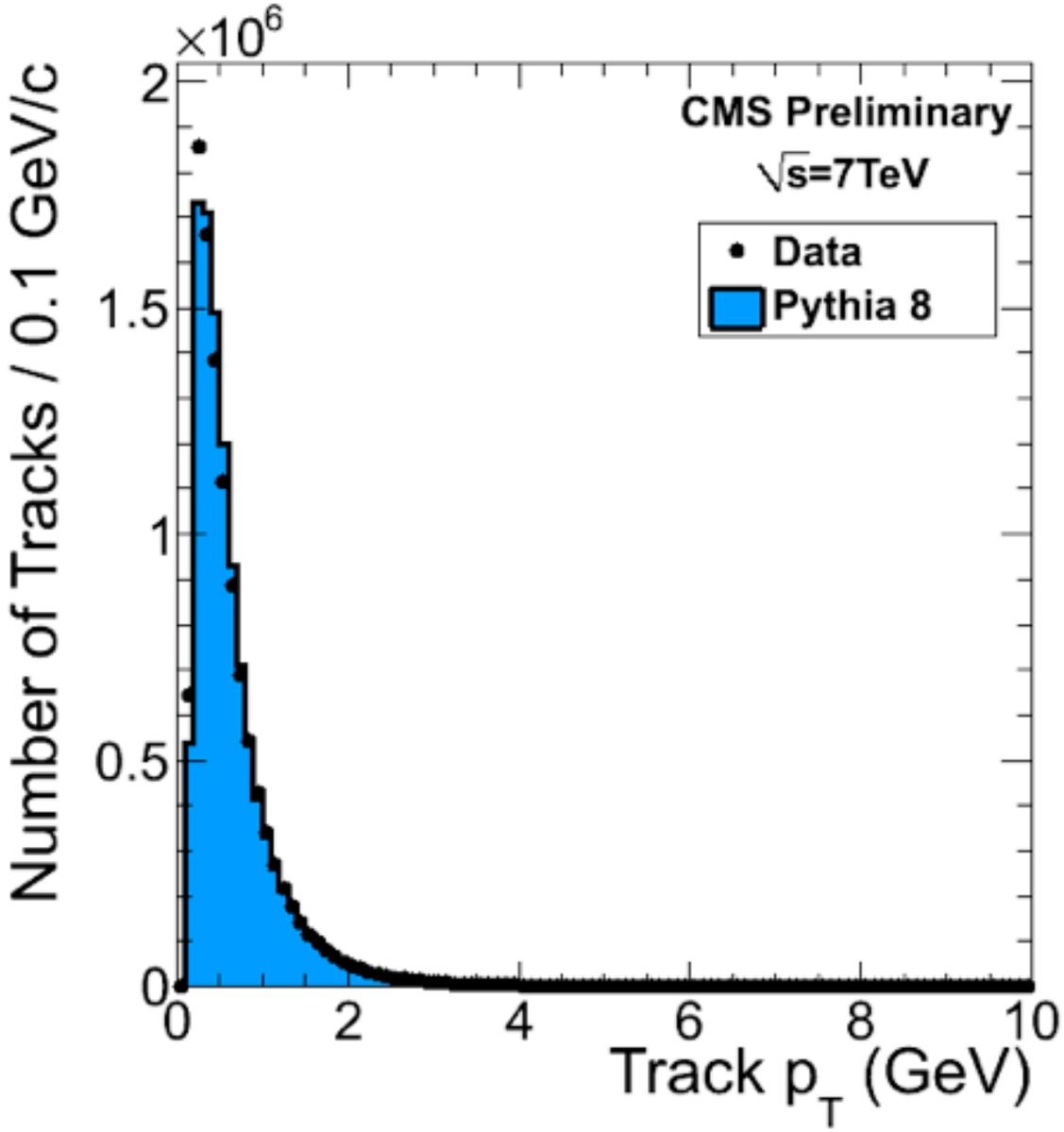


- The data/Pythia D6T comparison results are in backup slides 11-14

Backup Slides

Tracking Distributions (pT>0)





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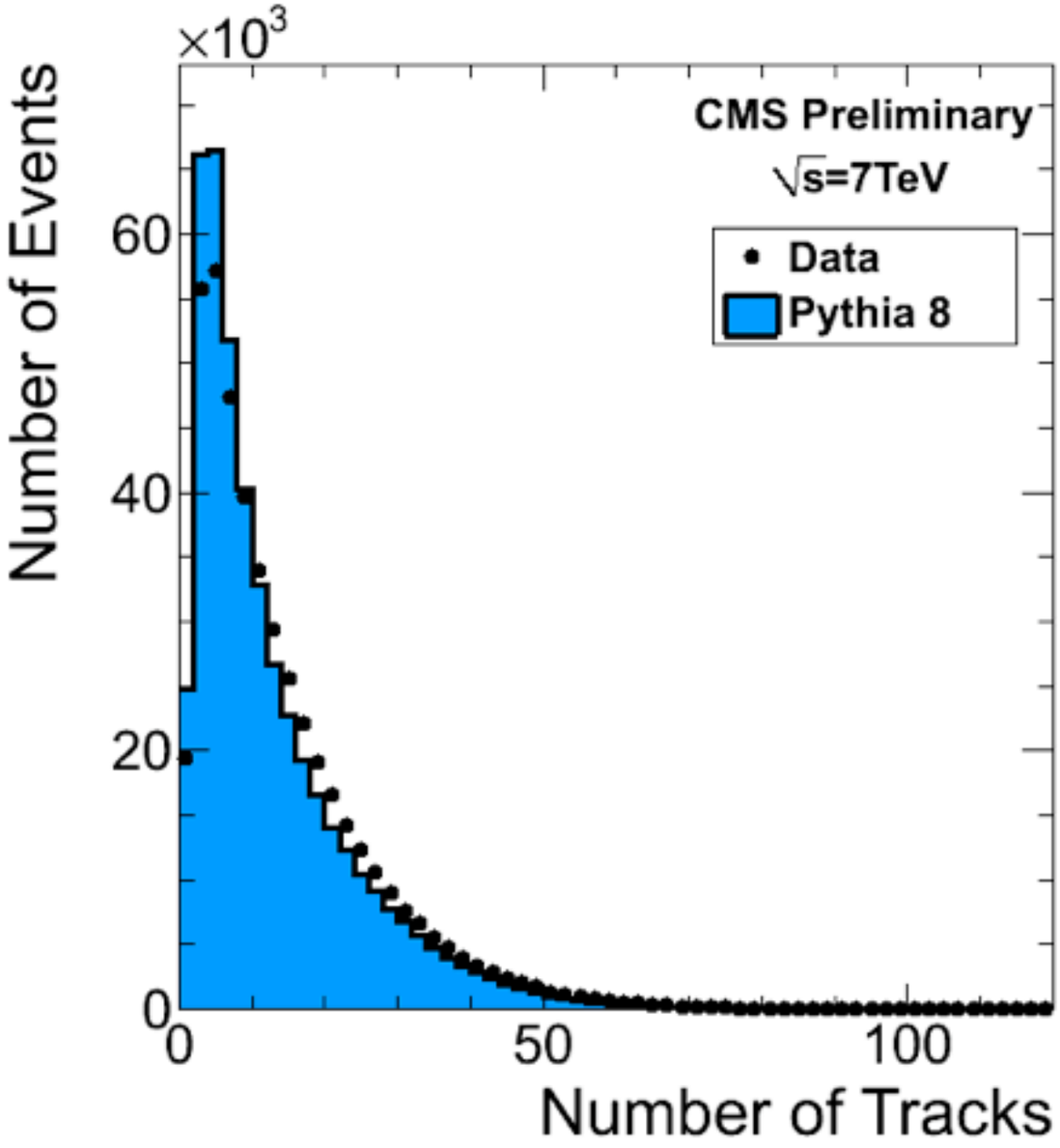
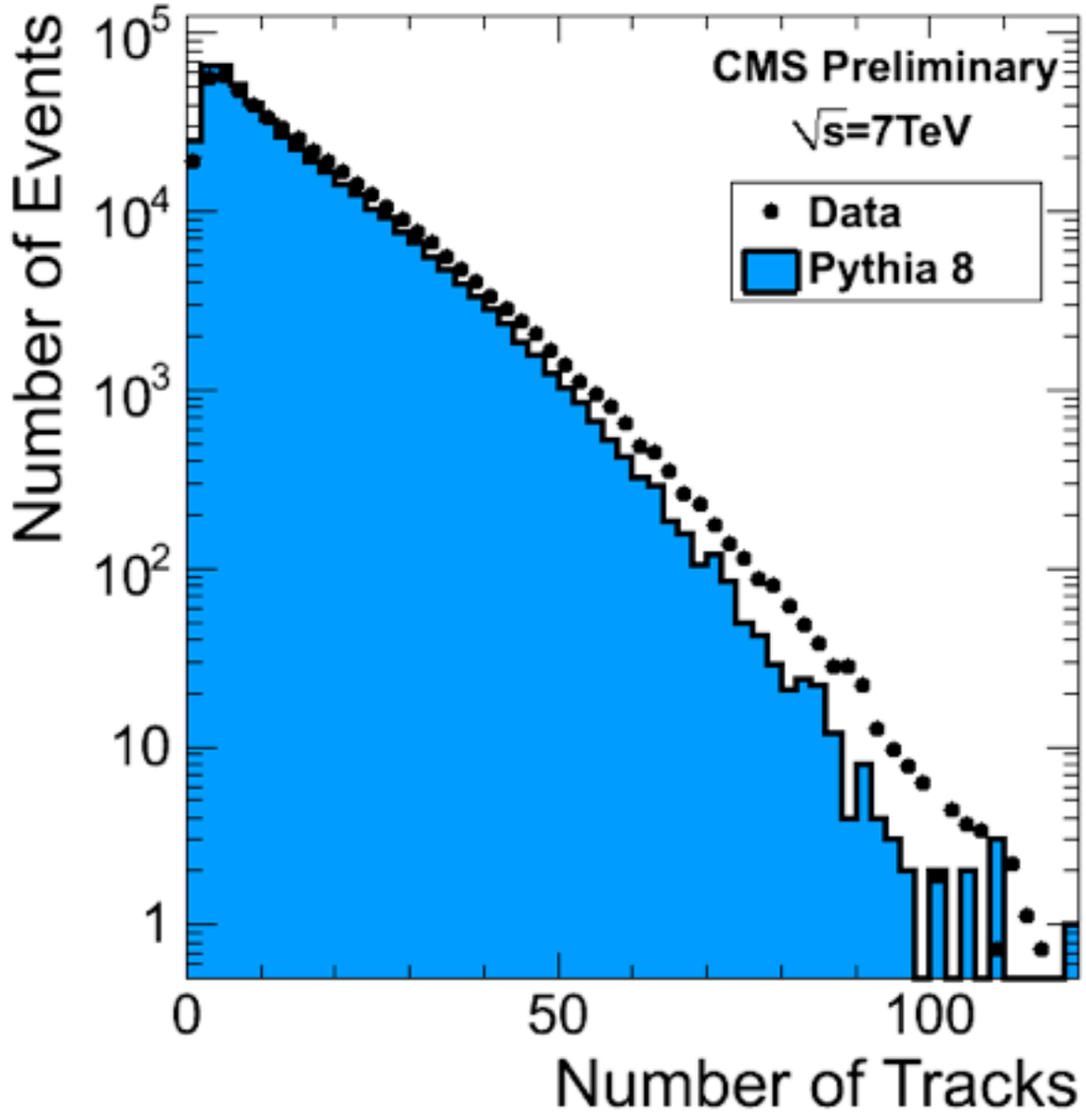
Tracking Distributions (pT>0.5GeV)





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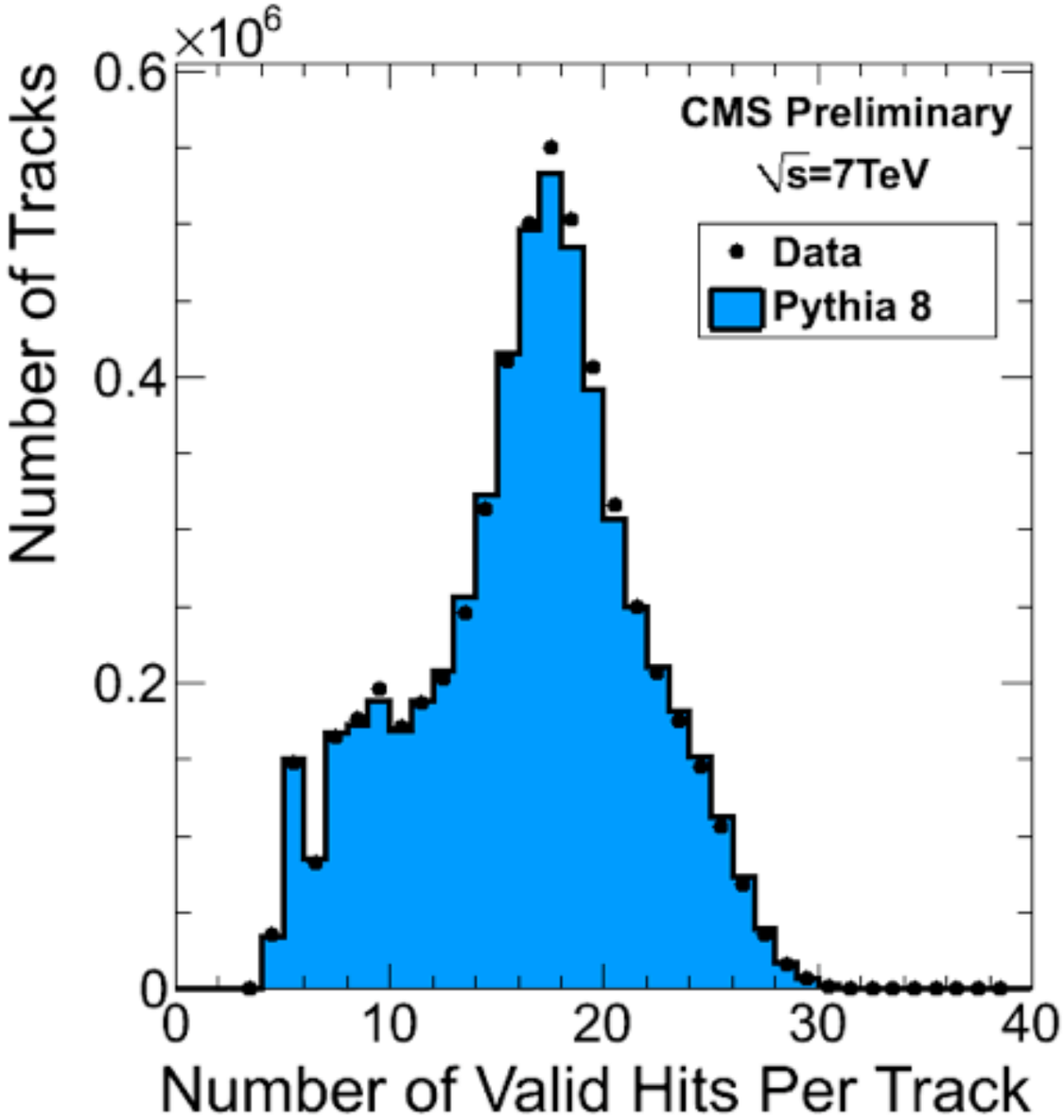
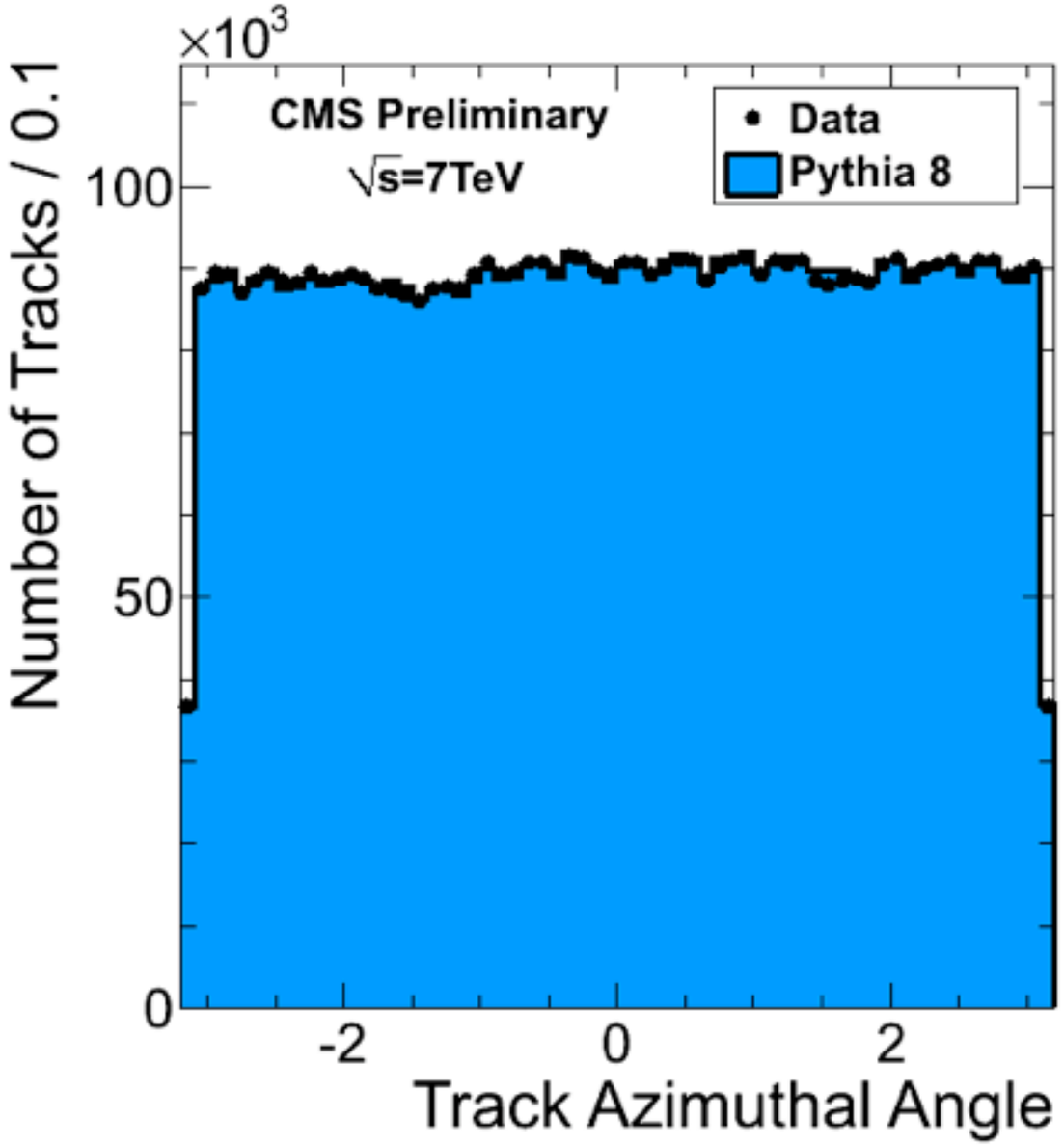
Tracking Distributions (pT>0.5GeV)





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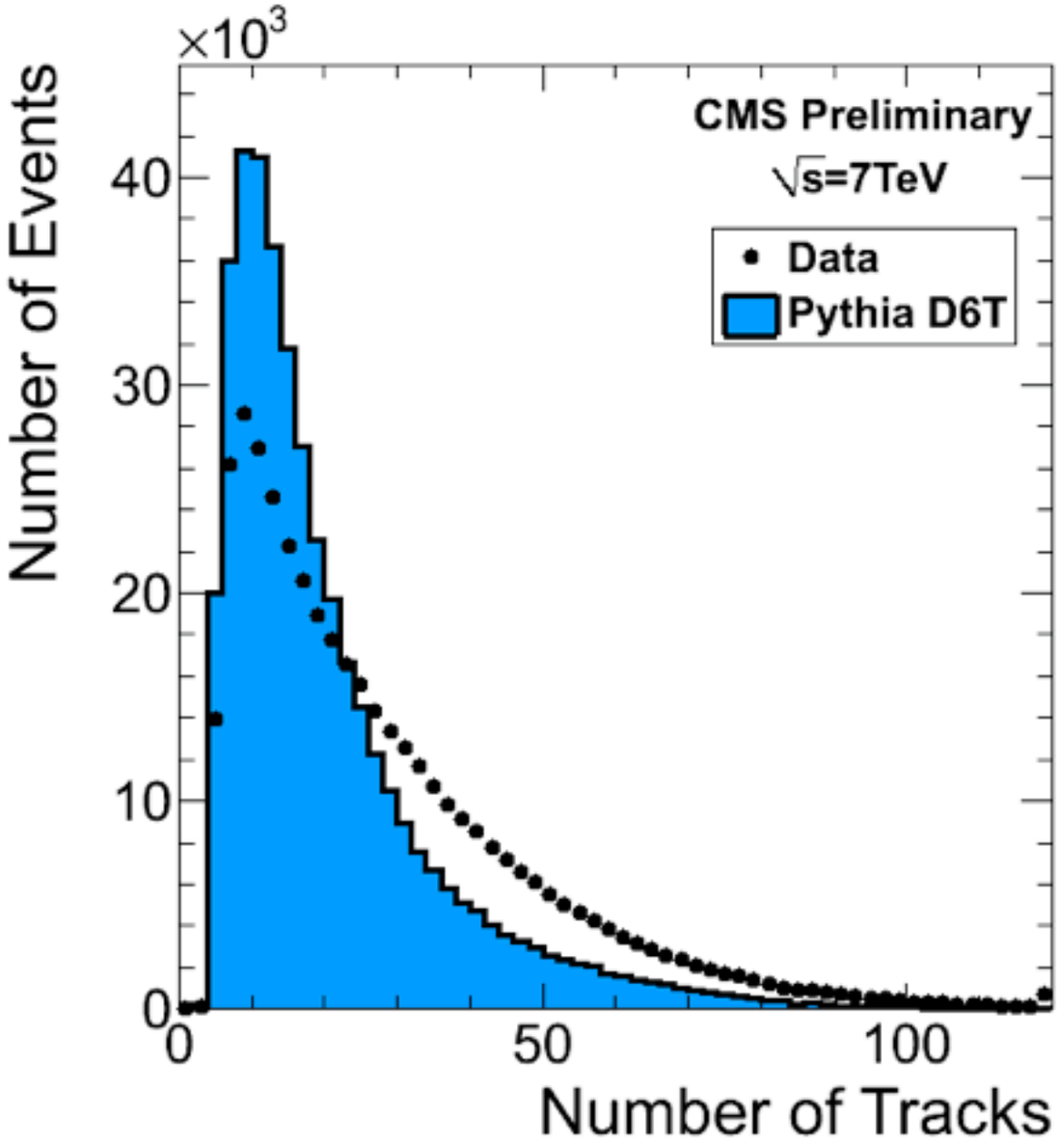
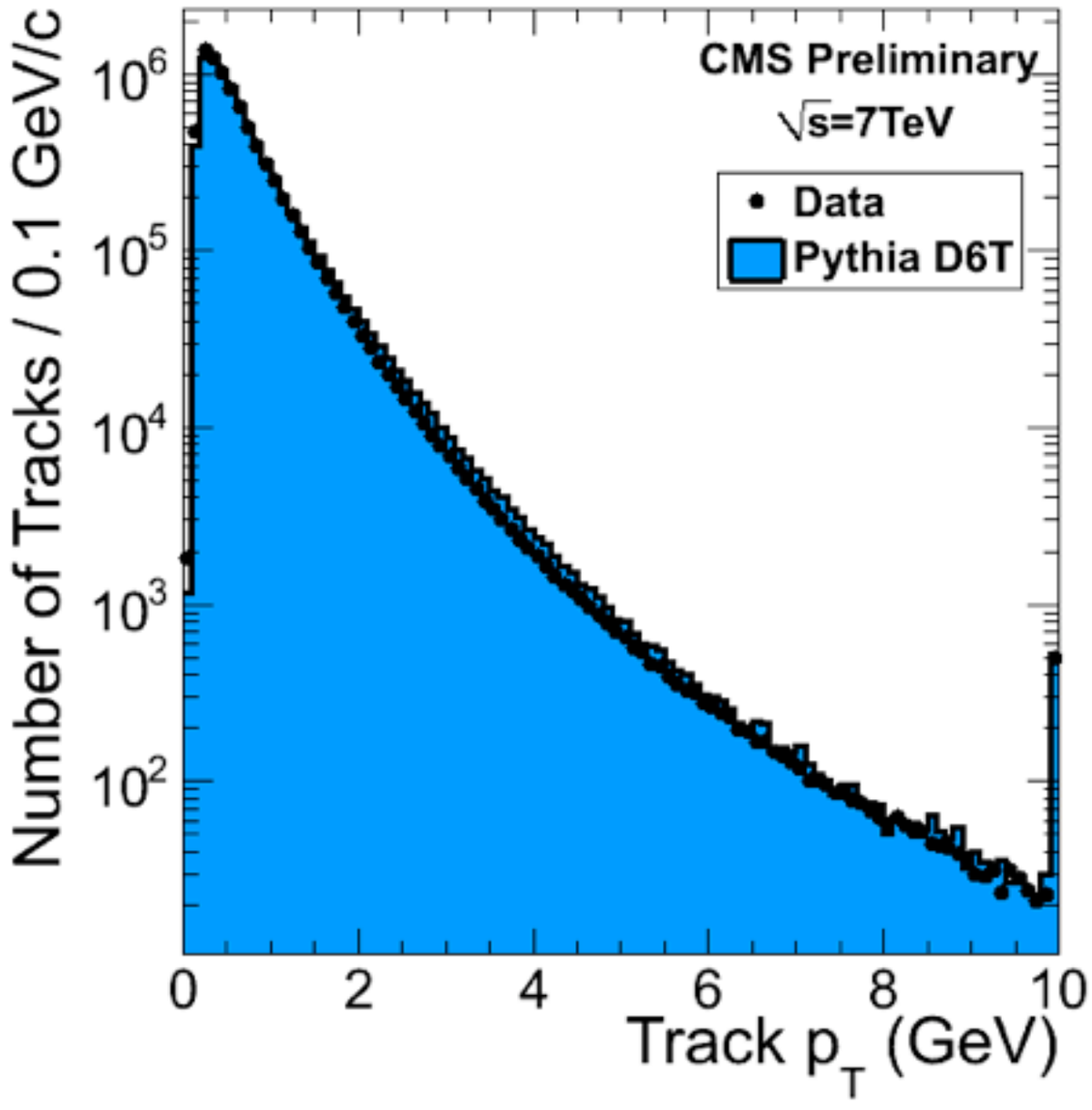
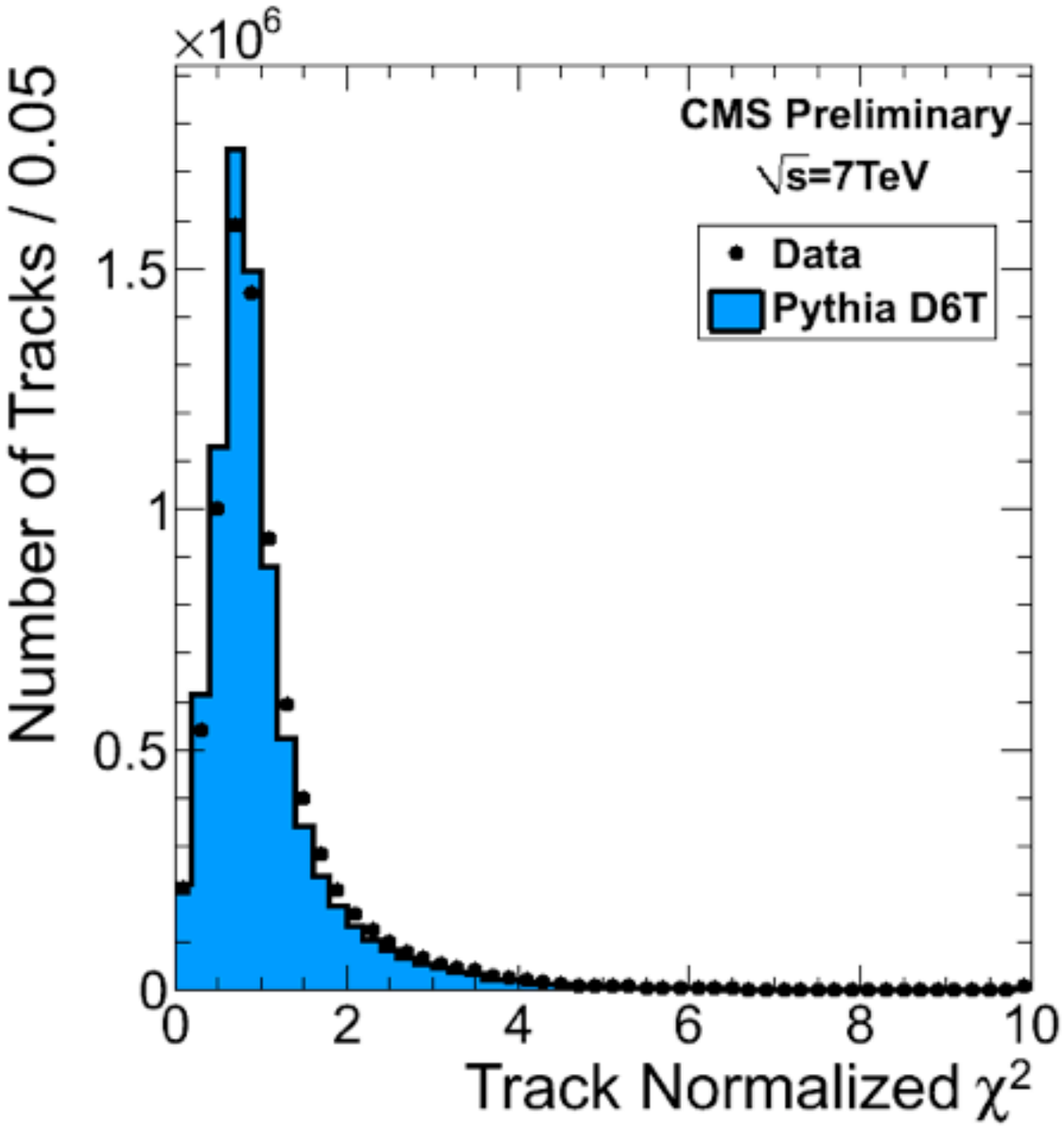
Track Distributions with no pT cut (1/4)

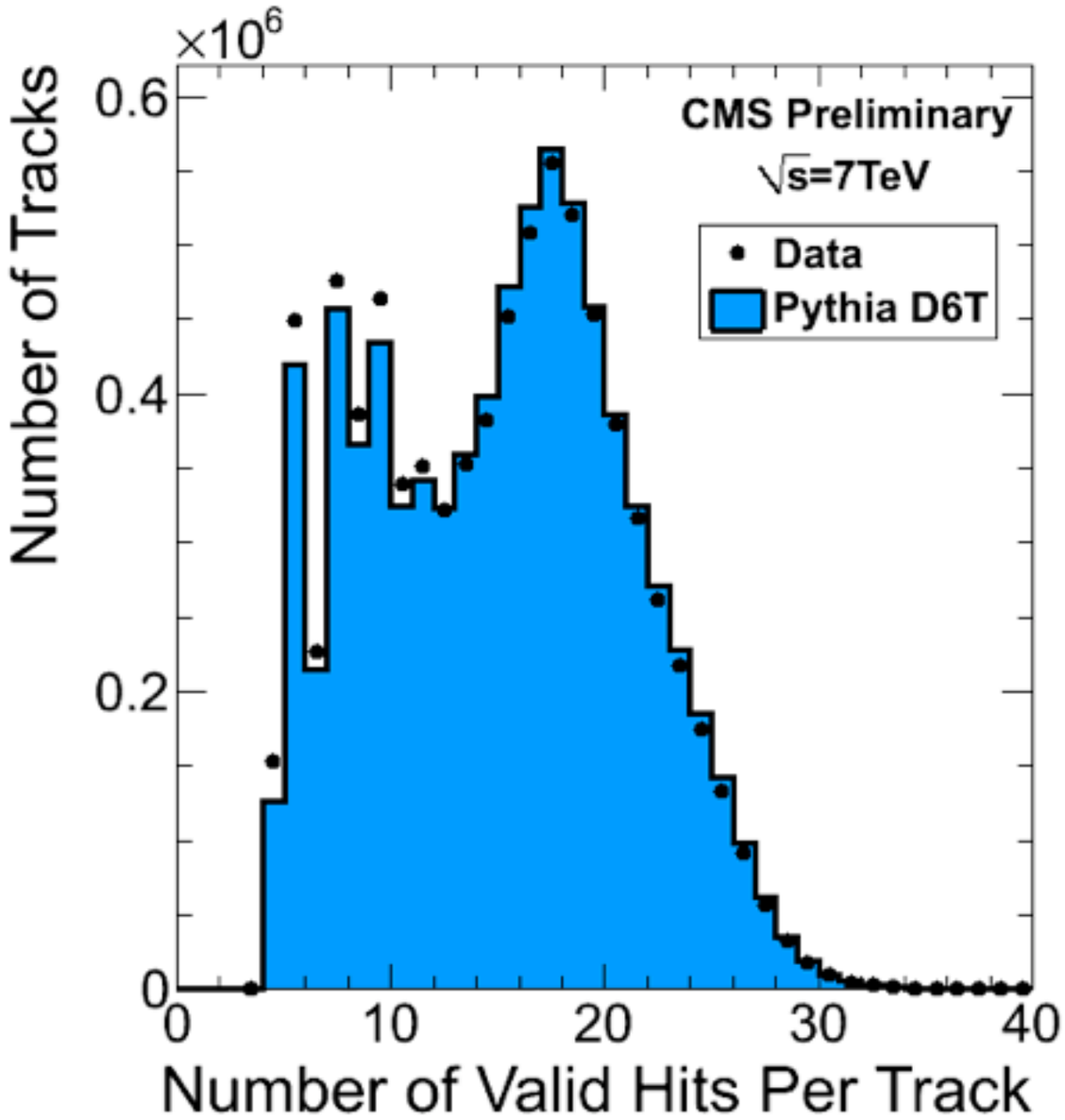




- The excess in the data are mainly in the low pT region. The track multiplicity agrees better between data/MC with pT>0.5GeV

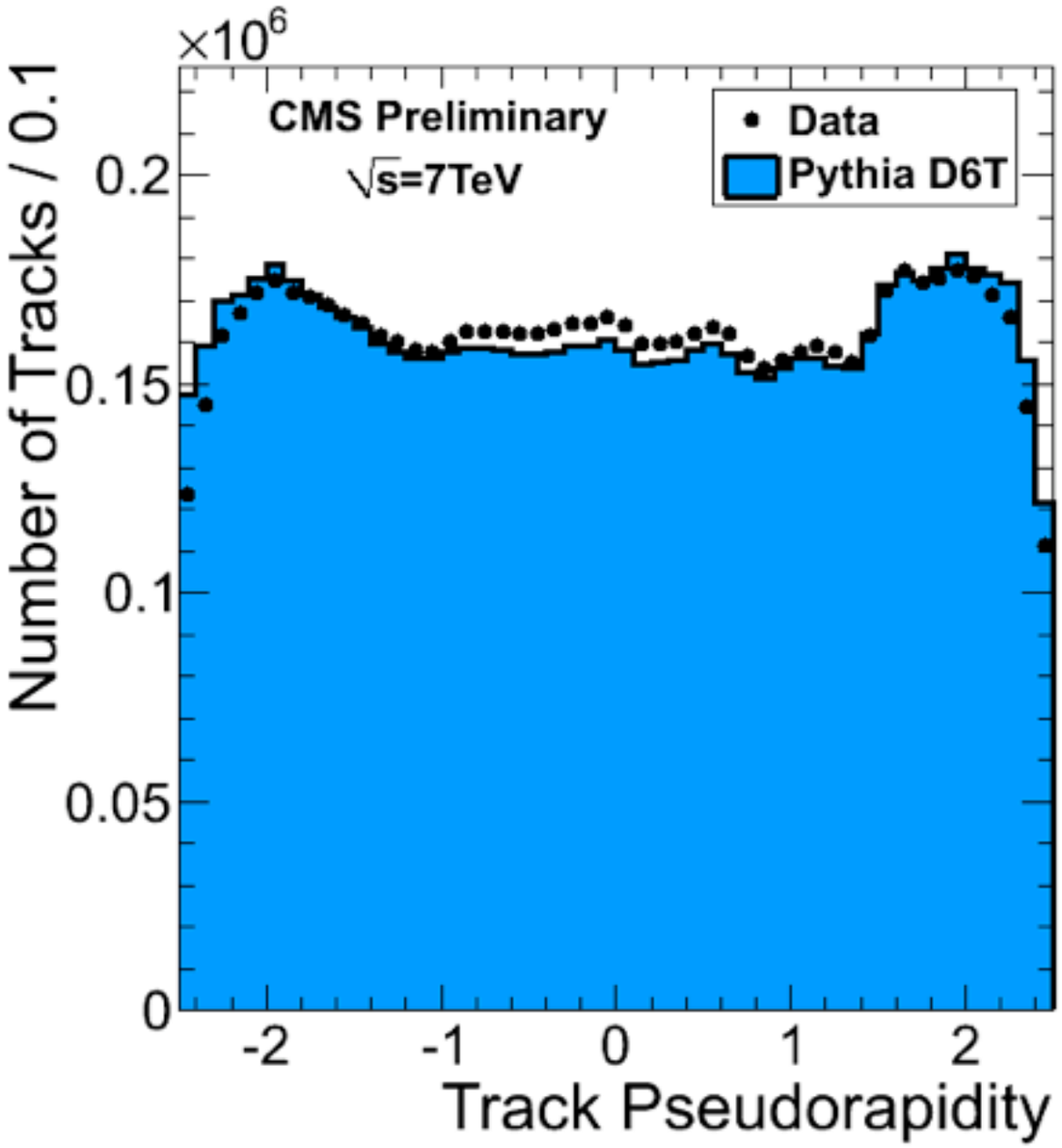
Track Distributions with no pT cut (2/4)

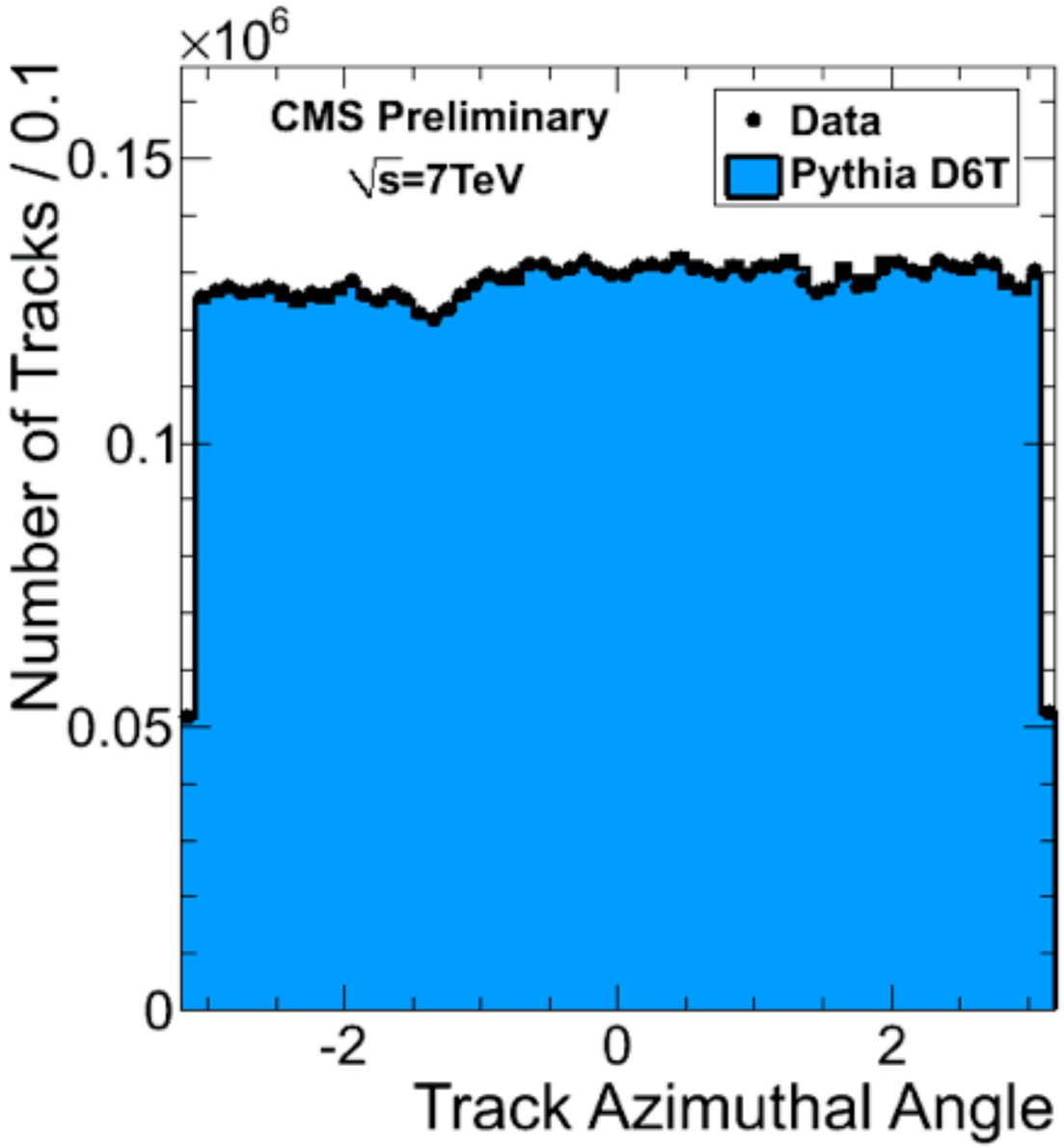




- The disagreement in the low nHit bins are mainly due to low pT tracks. The data/MC matches better with pT> 0.5 GeV

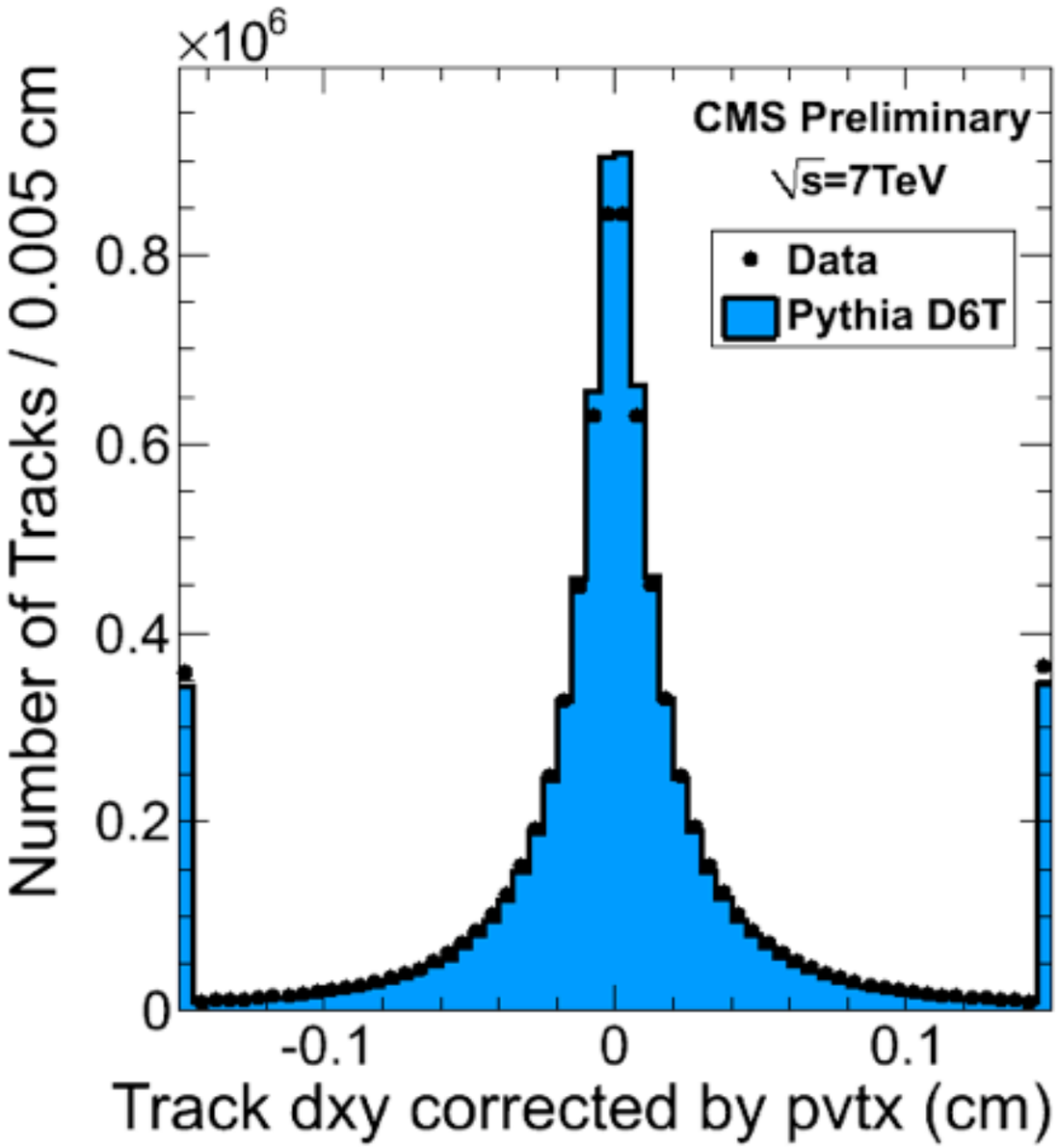
Track Distributions with no pT cut (3/4)

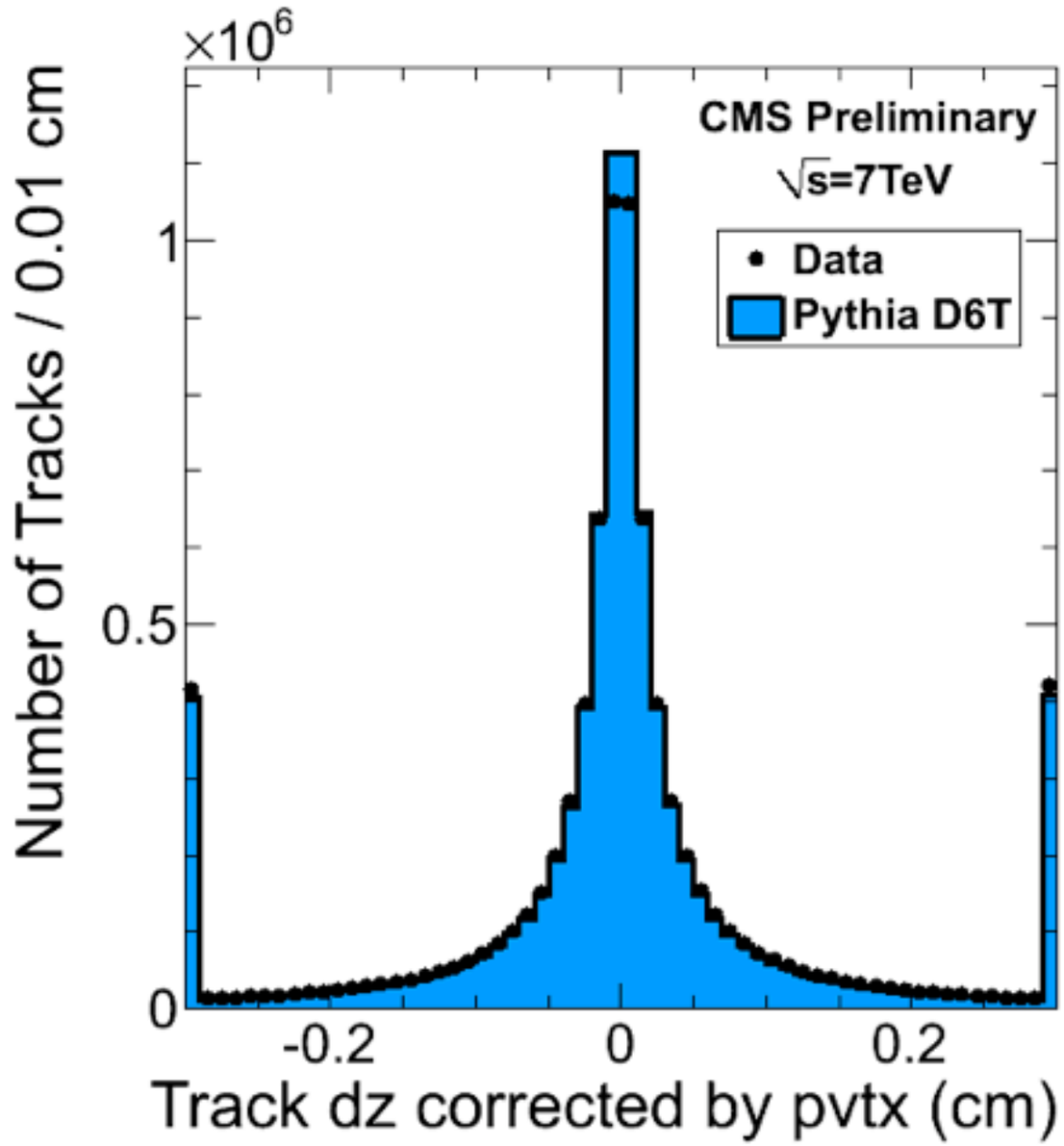




- The dip at phi ~ -1.5 is due to the inactive material in the tracker. It affects mainly for the low pT tracks. The size of the dip gets smaller with pT > 0.5 GeV

Track Distributions with no pT cut (4/4)





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