Flavour Tagging DQ Feedback From 50ns Data

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Flav. Tag Algorithms Weekly

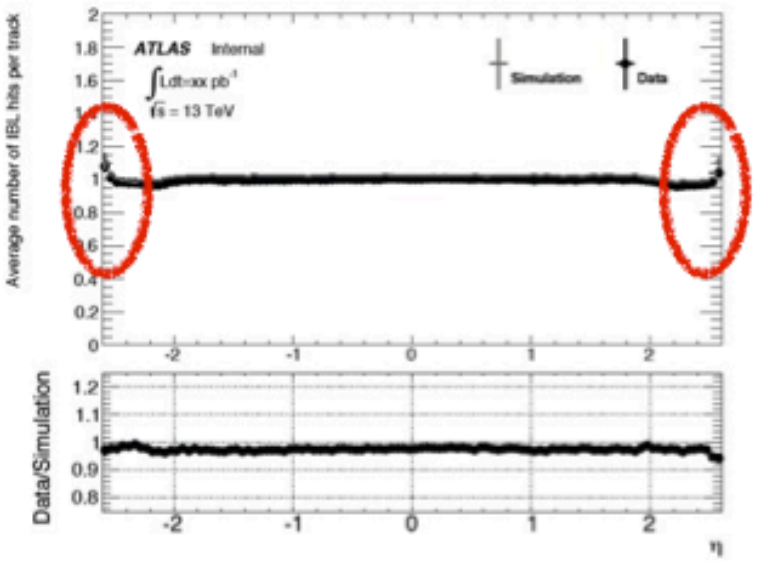
30/07/15

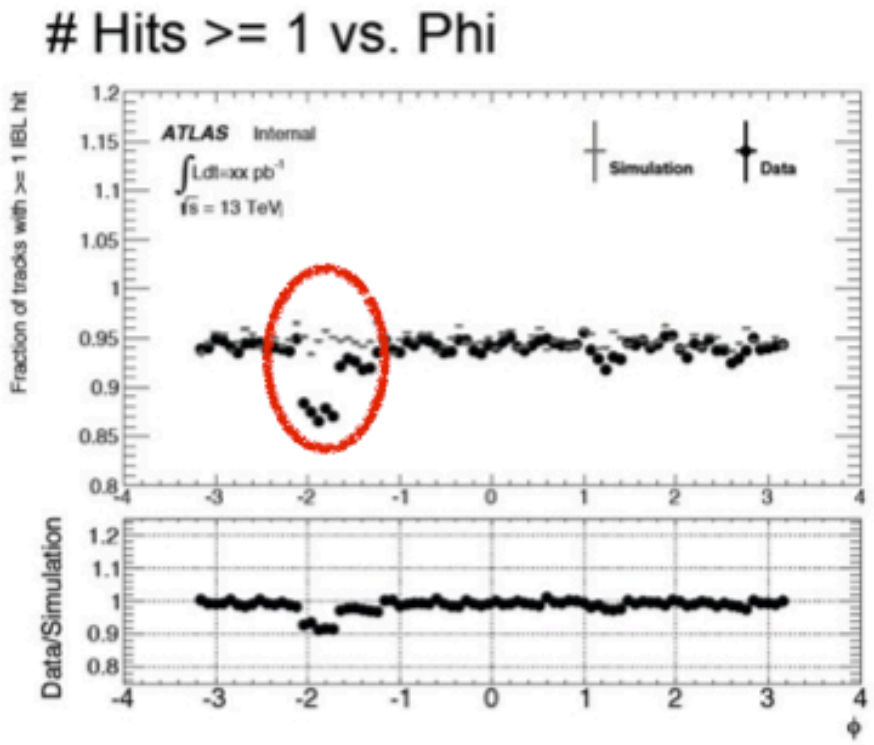
- **Calo/Jet hot spots** in runs 266904, 266919, 267152, 267638, 267639
  - OK after kinematic/quality cuts --> sign off with no defect
- **IBL and Pixel_Layer0 low hit efficiency** in runs 270441, 270953, 271048, 271298, 271421, 271516
  - BTAG_BLAYER_PROBLEM
- **IBL STANDBY** in runs 265573, 270448, 270588
  - BTAG_BLAYER_SERIOUS_PROBLEM

Kristian Gregersen (UCL), Tatjana Lenz (Bonn)

IBL Low Hit Efficiency

- mainly at phi ~ -2.0 and high eta
- clearly visible in data/MC comparison plots





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Flavour Tagging DQ

- **LAr synchronisation issue** visible in jet 2D plots but low stats in run 270949
  - BTAG_TAGGABILITY_FLUCTUATIONS
- **hot cells in failed pixel hits** at phi=1.4, eta=-2.2 and phi=0.6, eta=2.2 but look OK after quality cuts in run 271595, 271744
  - set BTAG_TAGGABILITY_FLUCTUATIONS
- **TRT issue** (no cut on number of TRT hits in flavour tagging) in runs 272529, 272531
  - BTAG_TAGGABILITY_FLUCTUATIONS

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Which Plots Are Which?

No Problem

BTAG_BLAYER_PROBLEM

All Runs
- Dominated by problem runs

Run 270806
- No Defect
- Low Stats

Run 270953
- Low eff at phi = -2.1
- Failed IBL hit cuts

Run 271048
- low efficiency at phi = -2.2
- disabled modules in the LB

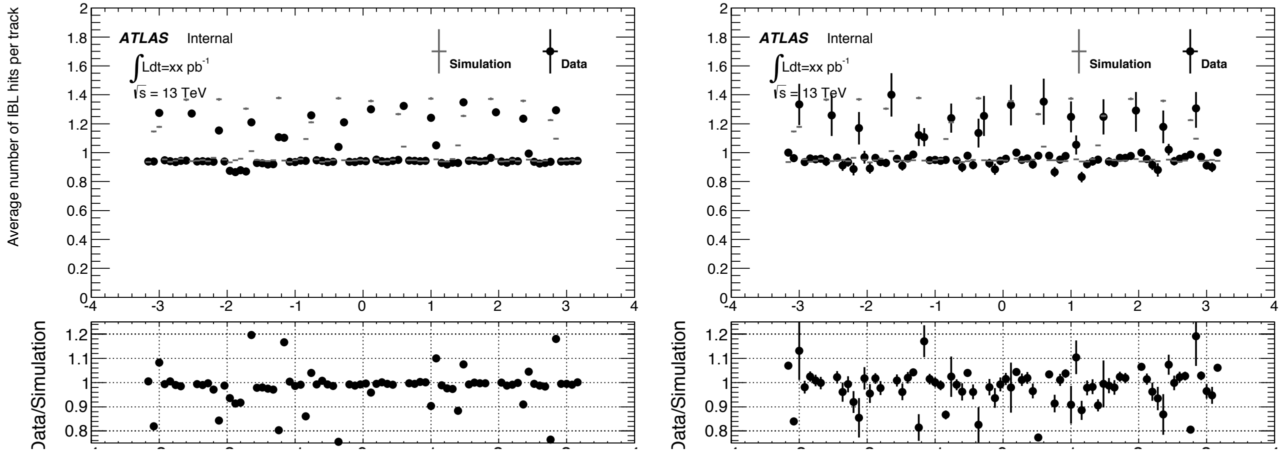
Run 271298
- Low efficiency at phi = -2
- disabled IBL modules

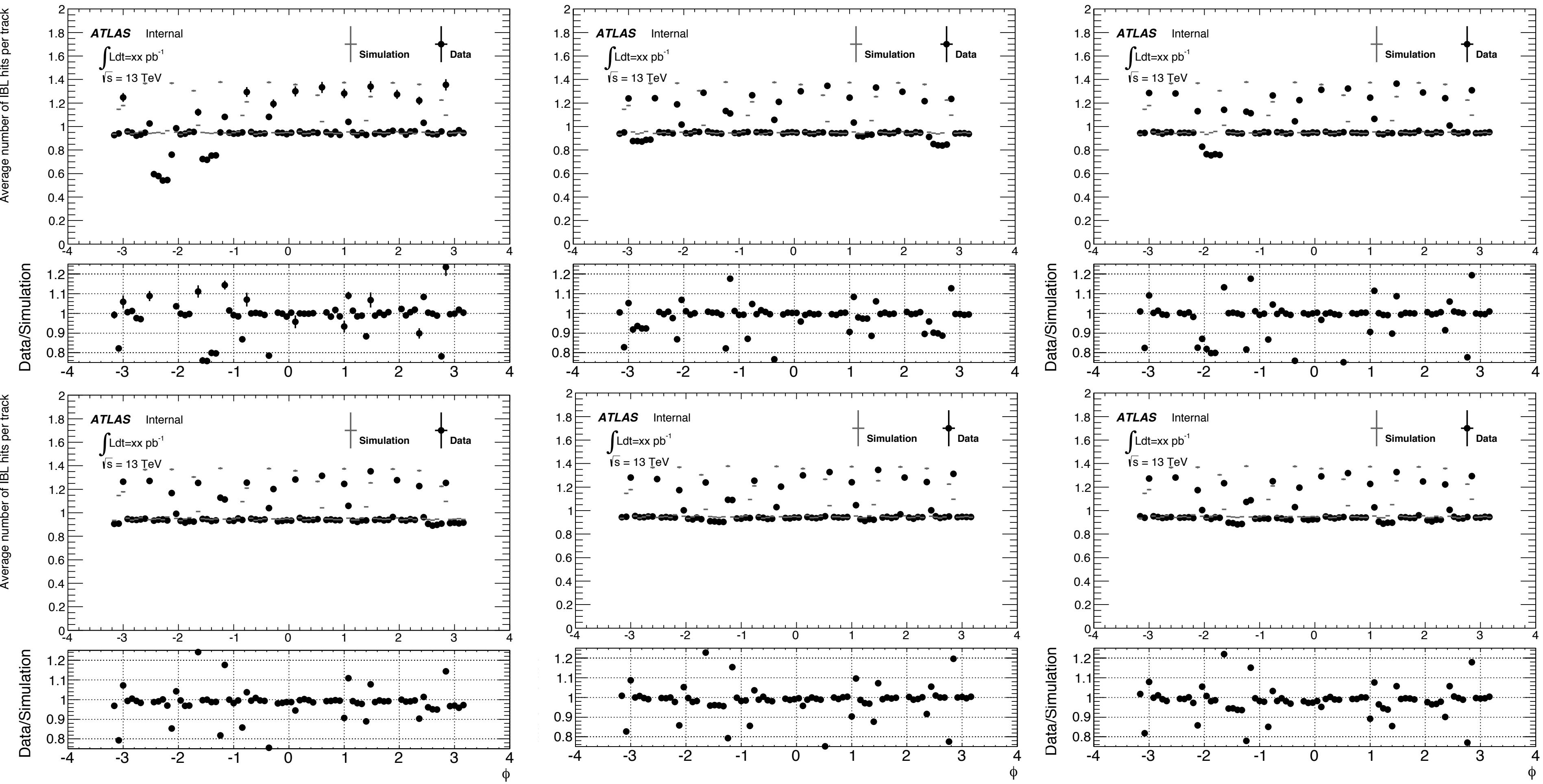
Run 271421
- hot spot in failed IBL hits cut in phi =-1.6 eta= 2.4

Run 271516
- failed IBL hit cut (phi = -2 and eta = 2.4)

Run 271595
- hot cells in failed hit pixels (TRT and SCT also)
- (phi = 1.4, eta = -2.2)
- (phi = 0.6, eta = 2.2)

Ave # IBL Hits vs. Phi.

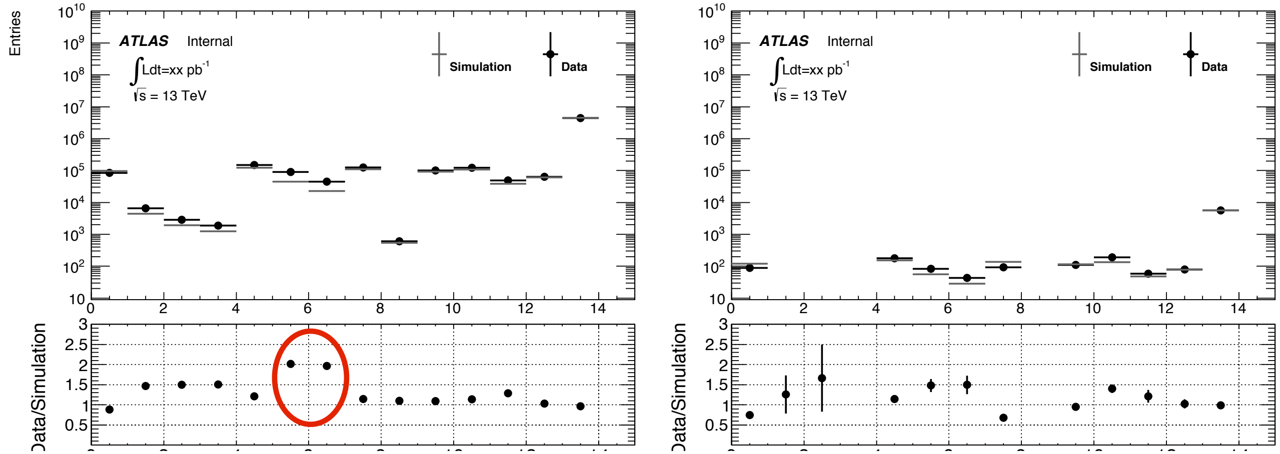


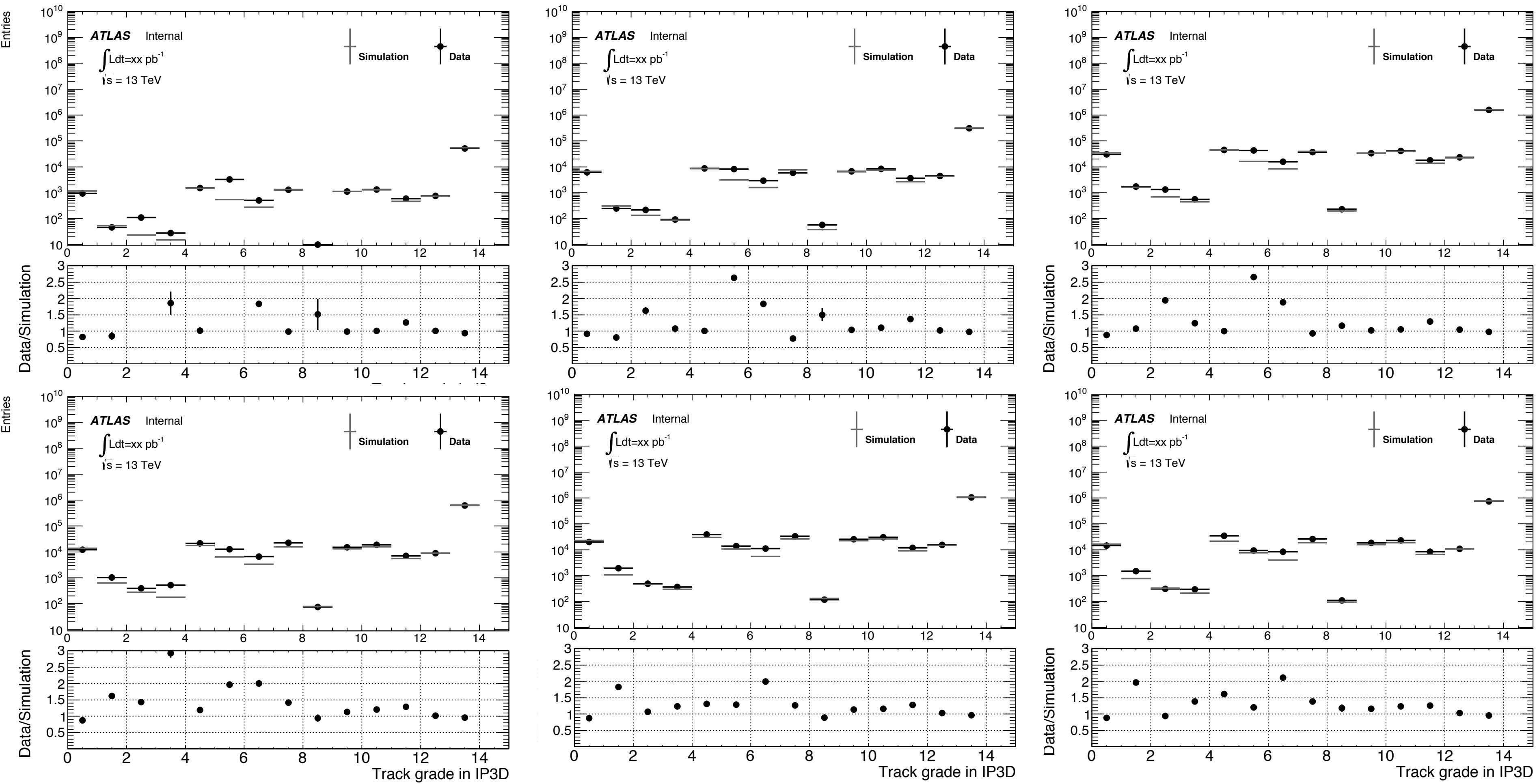


IP3D Track Categories

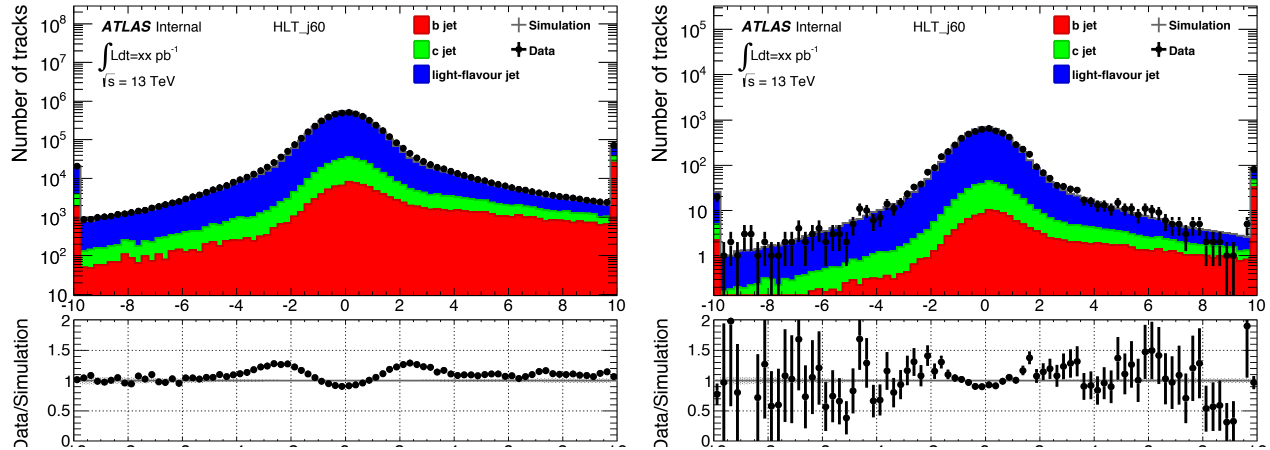
5 = No Hit in L0, No exp. hit in L0

6 = No hit in L1; exp. hit in L1





IP3D d0 Sig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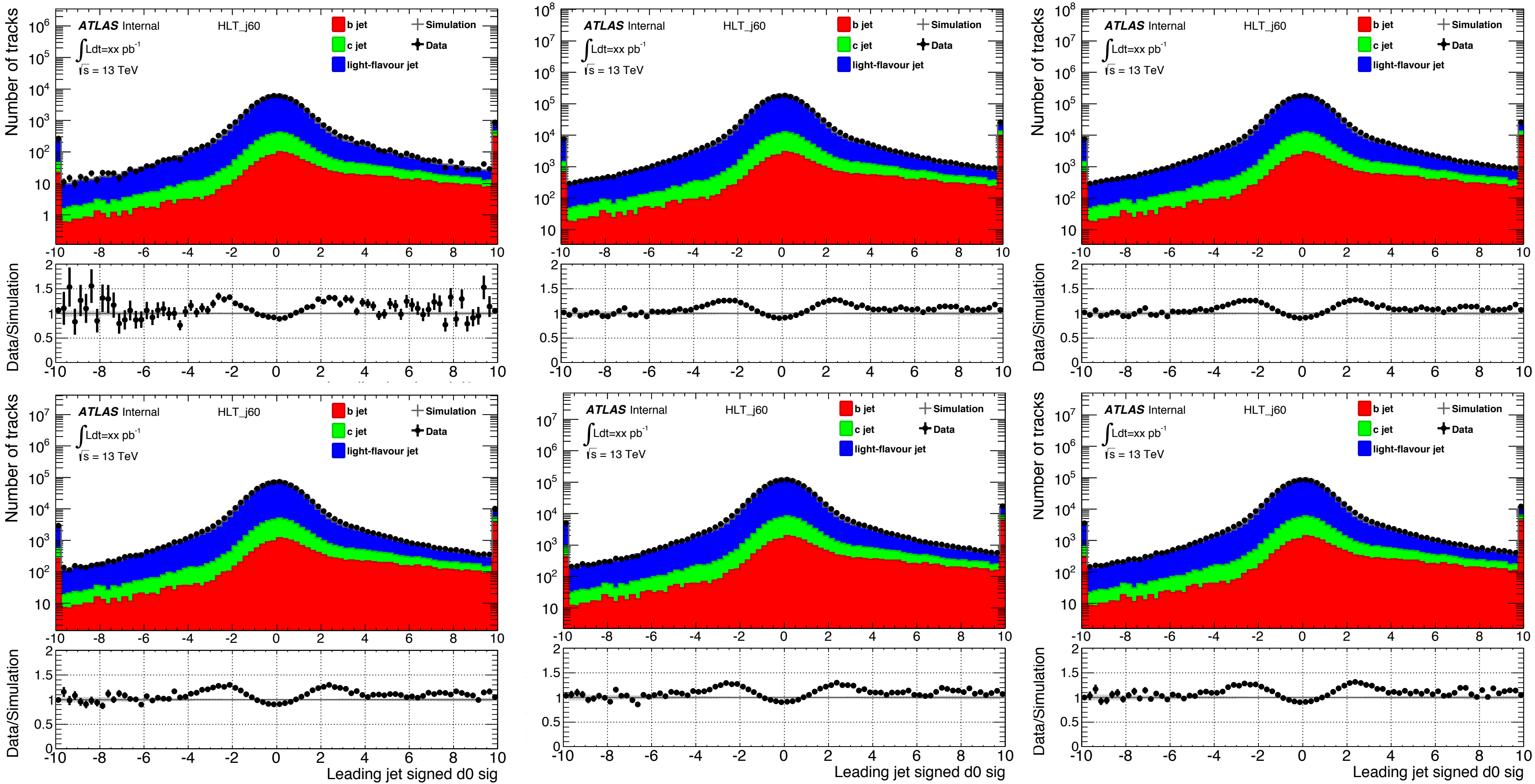
c jet
light-flavour jet
Simulation
Data
Number of tracks
Data/Simulation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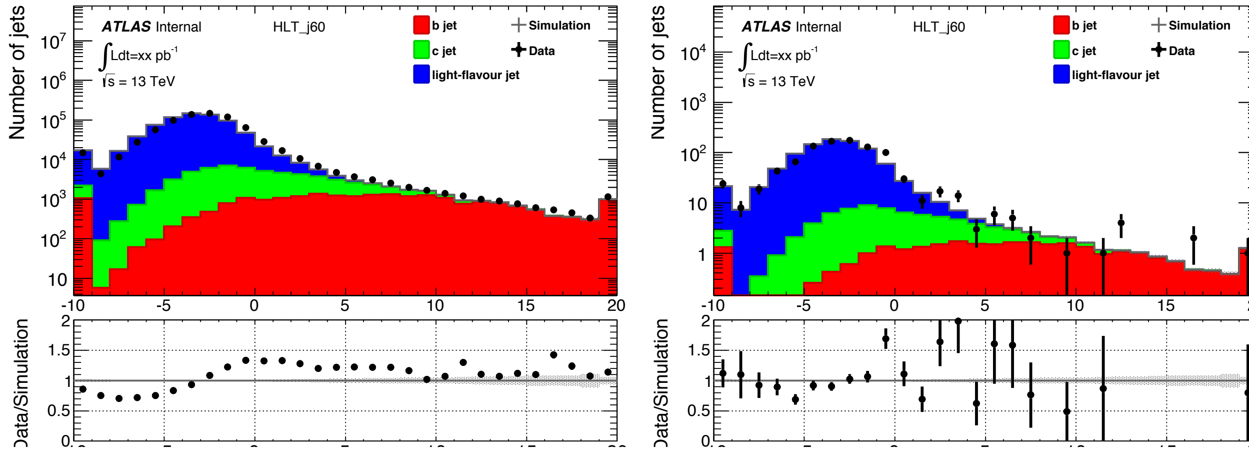
Leading jet signed d0 sig

IP3D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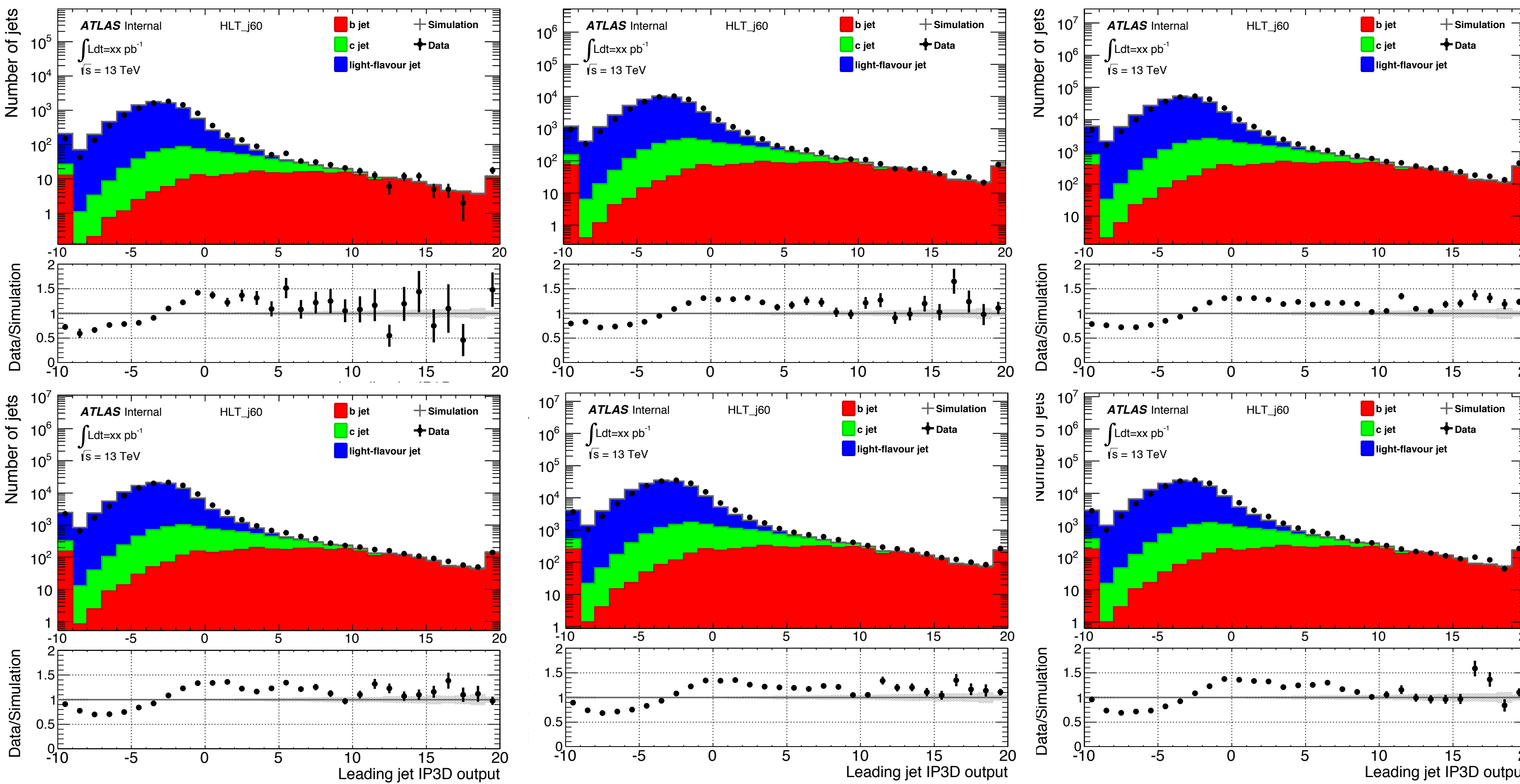
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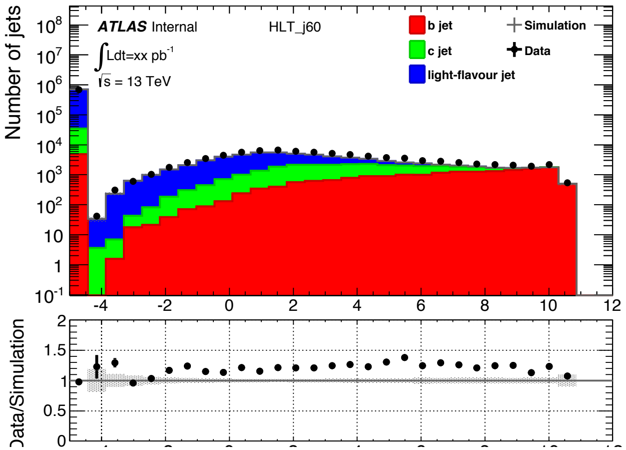
Leading jet IP3D output

SV1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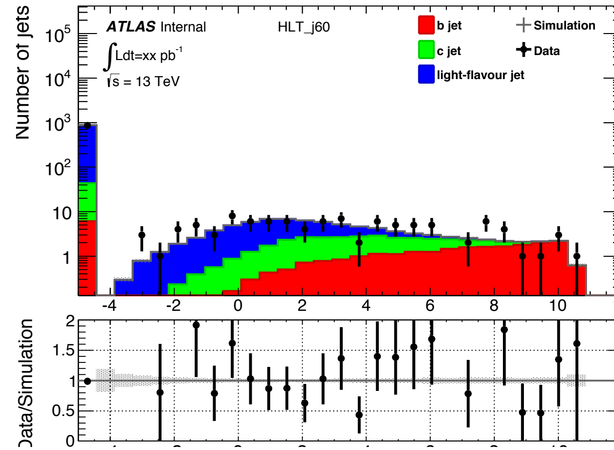
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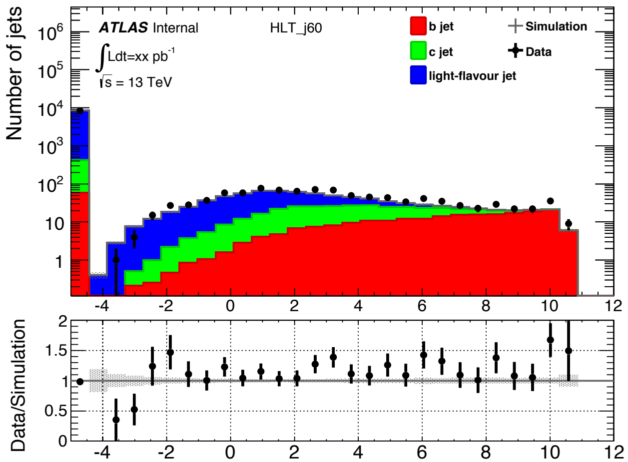
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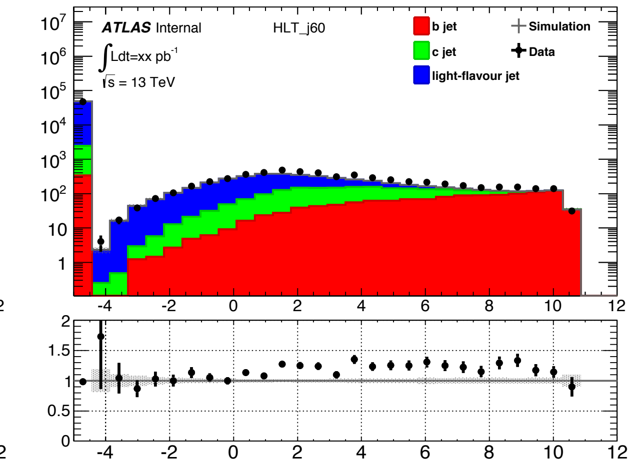
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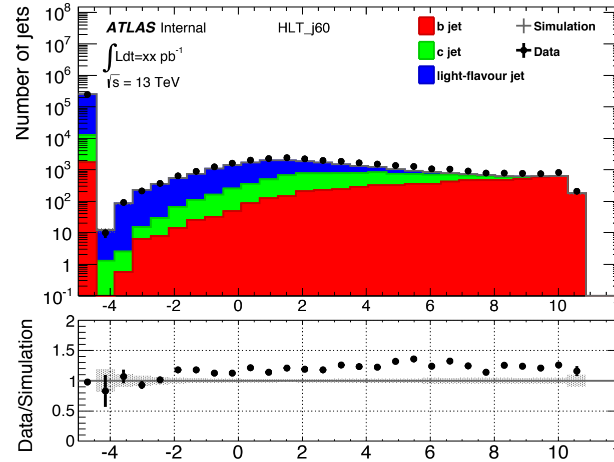
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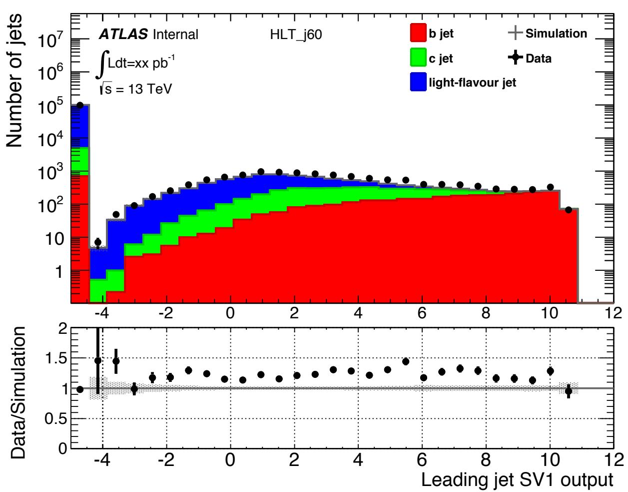
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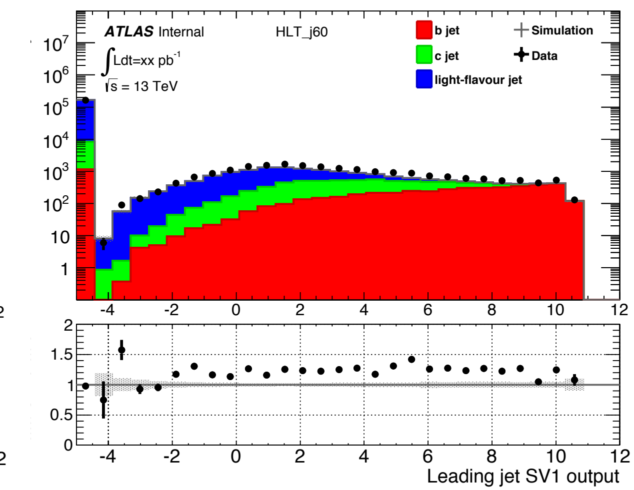
Leading jet SV1 output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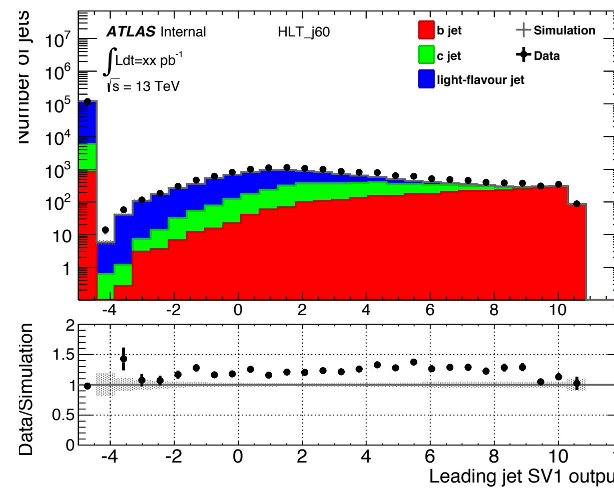
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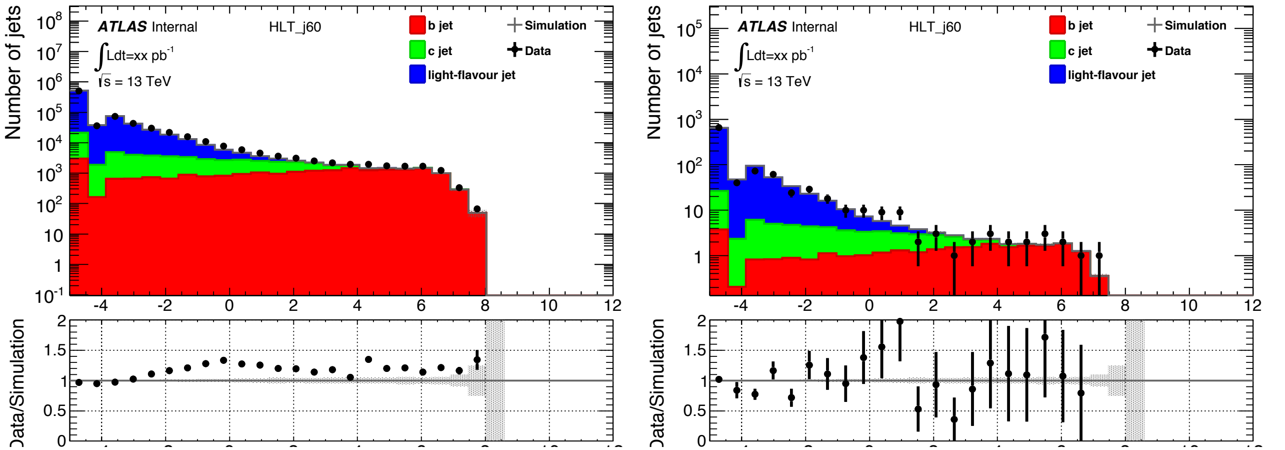
Jet Fitter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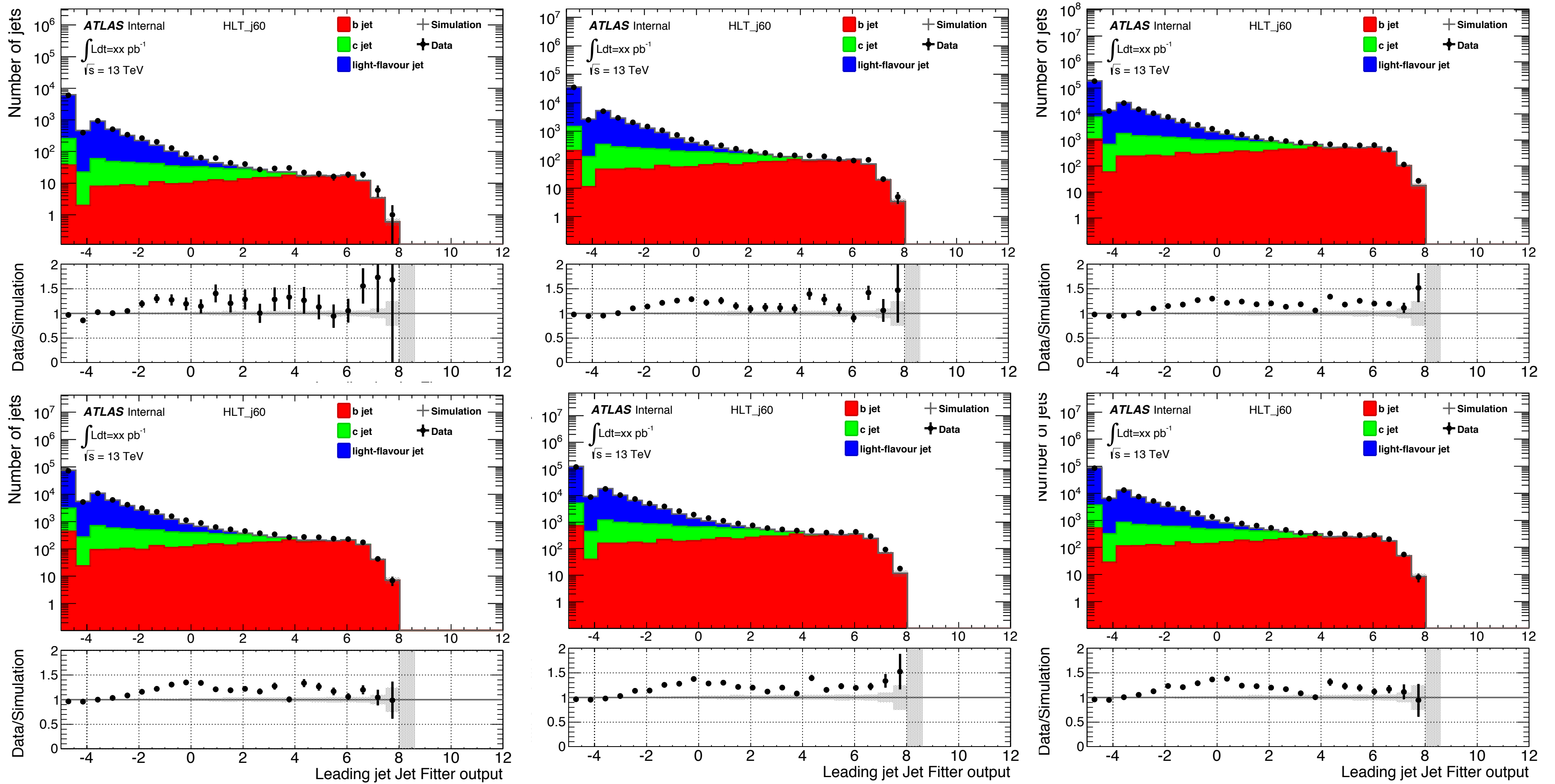
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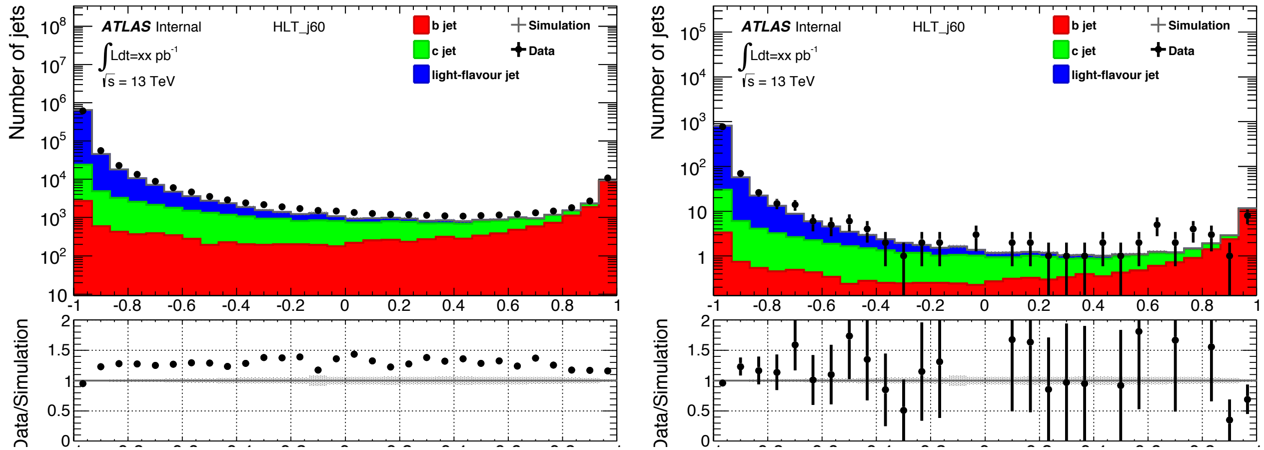
Leading jet Jet Fitter output

MV2c20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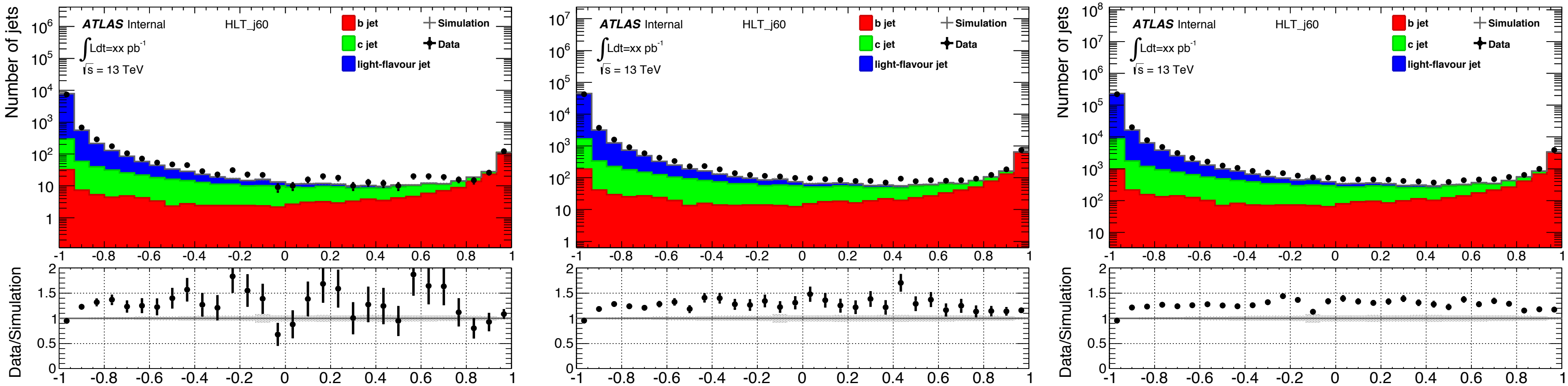
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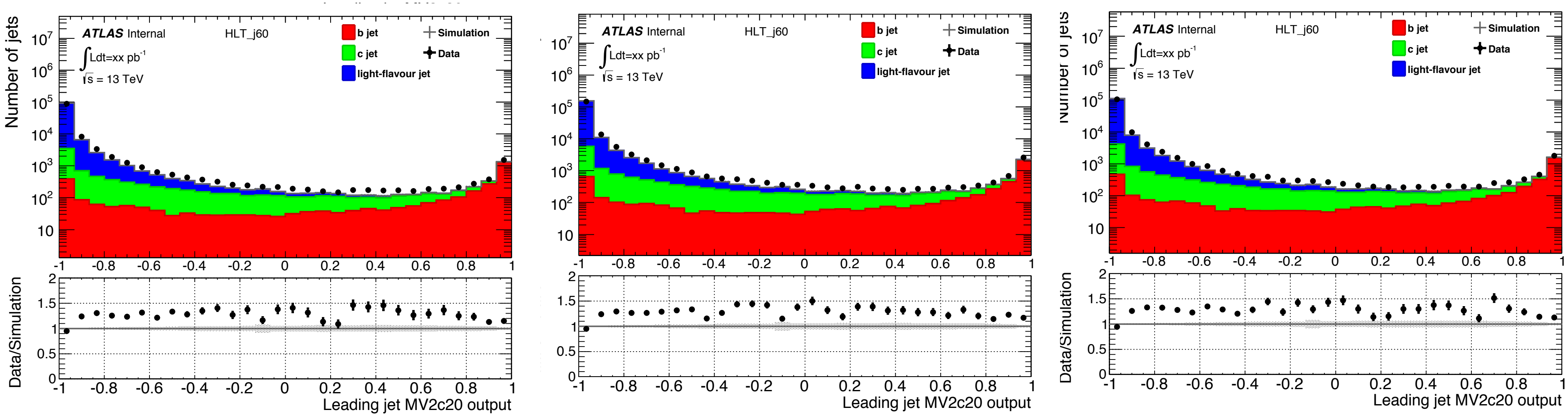
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Leading jet MV2c20 output

Summary

Are IBL issues intolerable for b-tagging?

Low stats in run 270806 with no defects makes comparisons quite hard but...
- No evidence that there is a drop of performance due to DQ problems.
- Clearly our biggest problem is the IP significance

We will keep monitoring DQ in the 25ns data
- Hopefully more stats
- Improved IP significance performance

DQ To Do List

- Add more low level plots e.g. track d0/z0 plots
- Add some information on other jet collections e.g. track jets.
- Improve some plots - better ranges, log-scale