



Flavour Composition Studies

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28 Oct 2015



- We want to understand how varying the flavour composition will affect the fitting function.
- Are the fitting functions robust to flavour composition?
 - Fit a di-b-jet spectrum and show the different flavour compositions.
 - Next step is to weight all b's or c's to increase their contribution.
- We want to see if we can break the fit...

Details

Pythia8EvtGen MC Di-Jet Sample
- di-b-jet Ntuple production

Standard Dijet Resonance Cuts
- Leading Jet $p_T > 410$ GeV
- Sublead Jet $p_T > 50$ GeV
- $|y^*| < 0.6$
- $m_{jj} > 1100$ GeV

Using fixed cut 85% for both jets.
- mbb_fix_8585

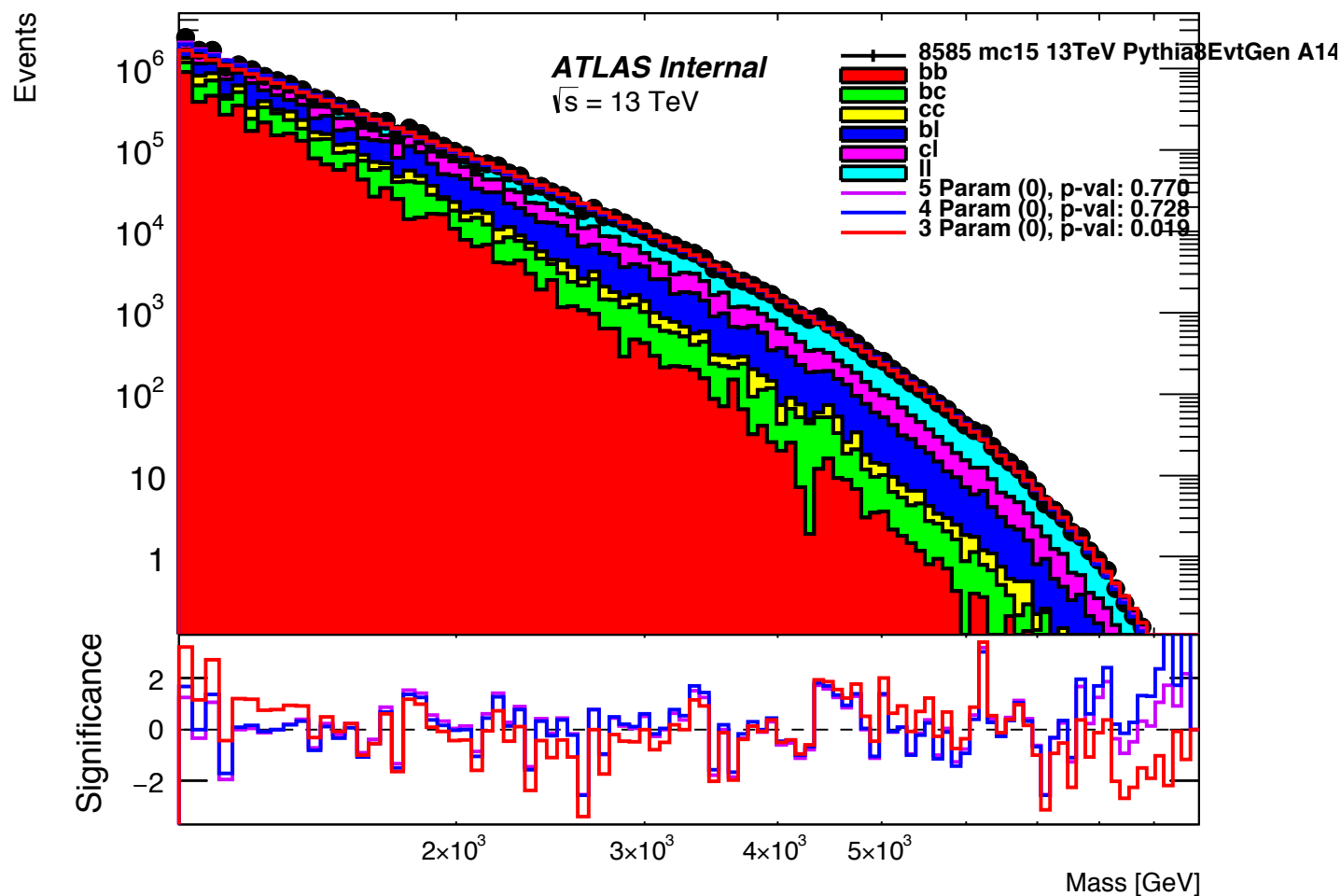
Cone matching truth flavour
- jetHadronConeExclTruthLabelID

Work Flow

Samples from Andrea:
- /eos/atlas/atlascerndisk/phys-exotics/
jdm/dijet/inputs/Btag/MC15a_DiJet_20151005

Use DijetHelpersPackage-00-04-02
(but have tinkered with this)

- makeStandardHistograms.py
- plotStandardPlots.py
- singleFit.py
- plotSingleFit.py



4 Param Fit:

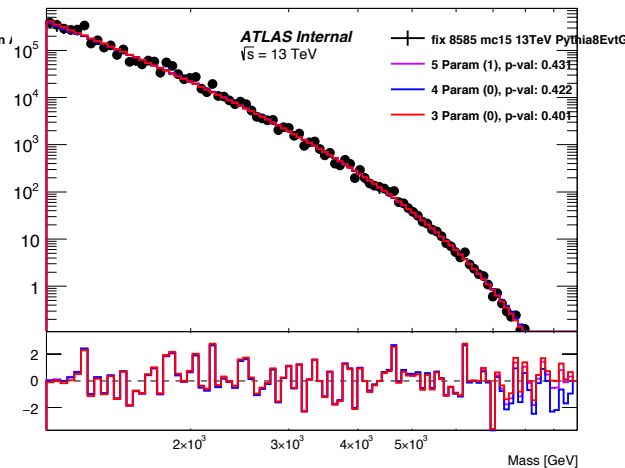
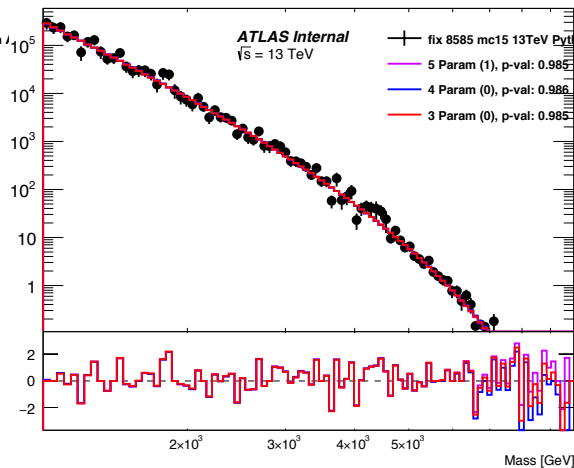
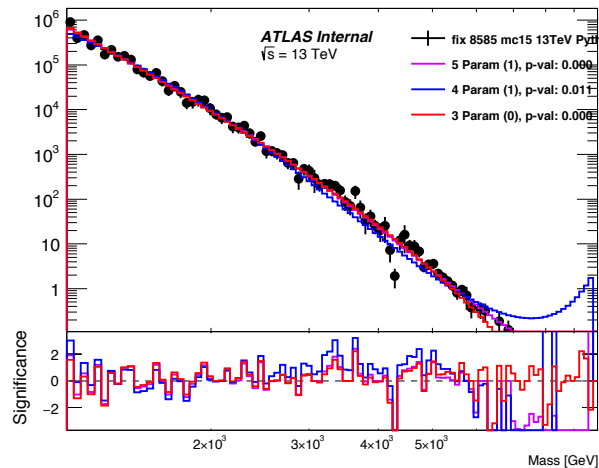
Chi2: 91.970 p-val: 0.728
P0: 27.309 P1: 10.237
P2: -2.198 P3: 0.536



4 Individual Components

Total:

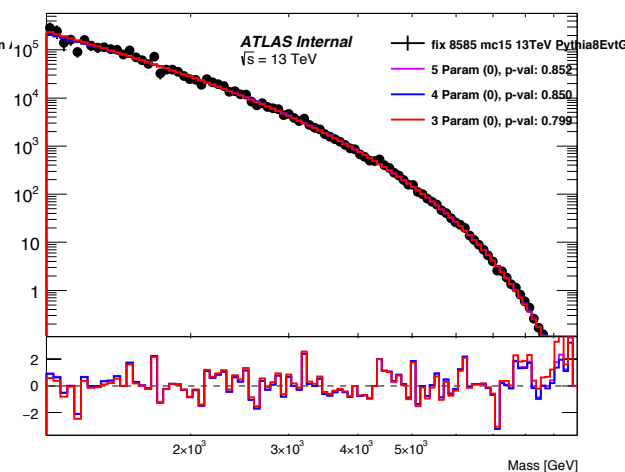
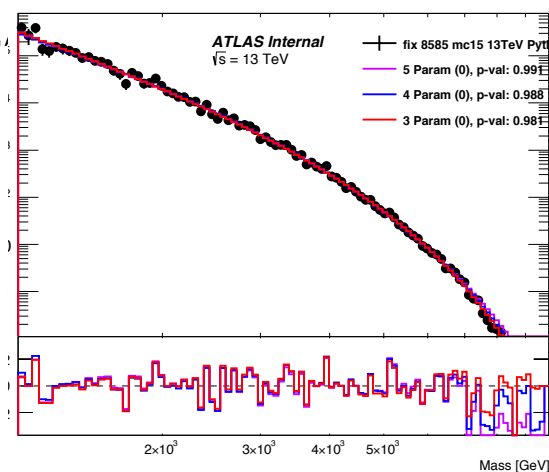
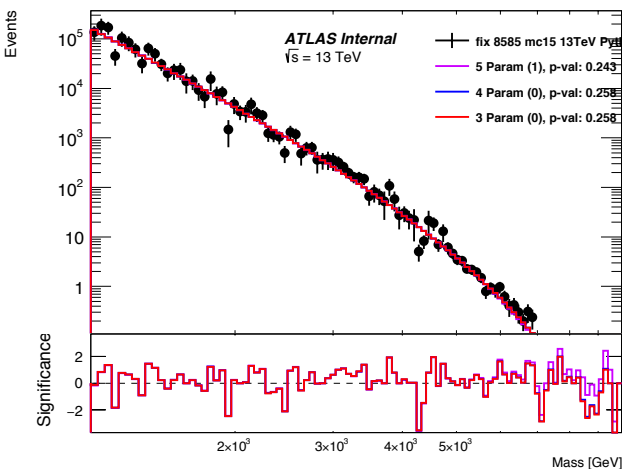
Chi2: 91.970 p-val: 0.728
P0: 27.309 P1: 10.237
P2: -2.198 P3: 0.536



bb Chi2: 136.550 p-val: 0.011
P0: 0.000 P1: -15.700
P2: -26.950 P3: -4.044

bc: Chi2: 72.275 p-val: 0.986
P0: 0.008 P1: 8.031
P2: -6.370 P3: -0.169

bl: Chi2: 103.137 p-val: 0.422
P0: 0.104 P1: 8.052
P2: -5.719 P3: -0.279



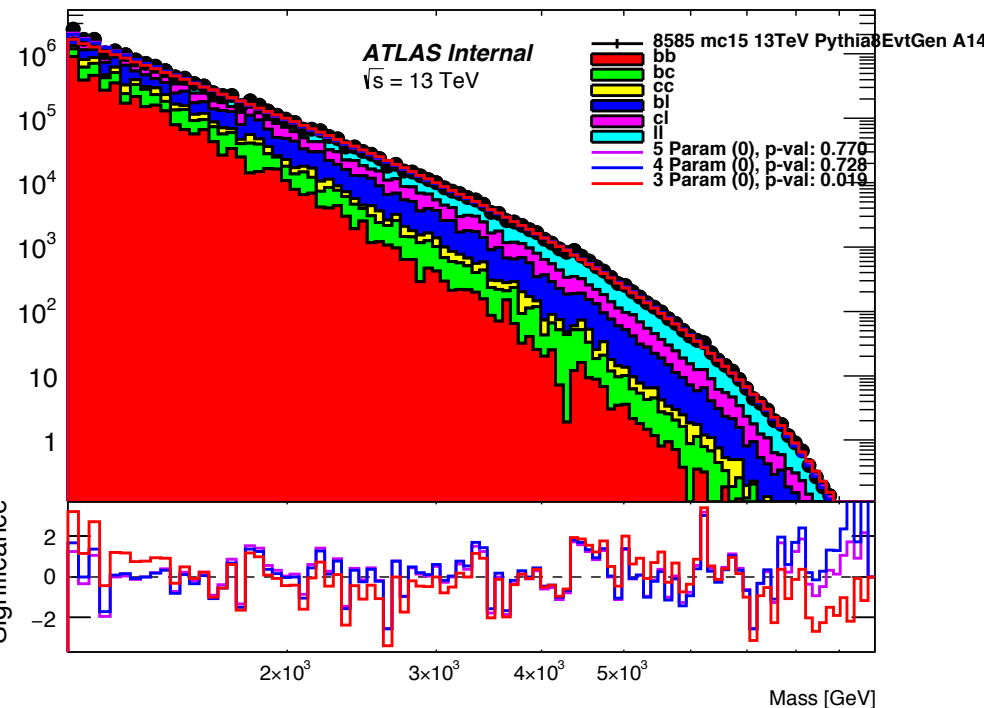
cc: Chi2: 109.807 p-val: 0.258
P0: 0.006 P1: 7.527
P2: -5.752 P3: 0.015

cl: Chi2: 71.809 p-val: 0.988
P0: 0.111 P1: 7.528
P2: -5.738 P3: -0.358

ll: Chi2: 86.354 p-val: 0.850
P0: 4.354 P1: 9.414
P2: -3.877 P3: -0.227

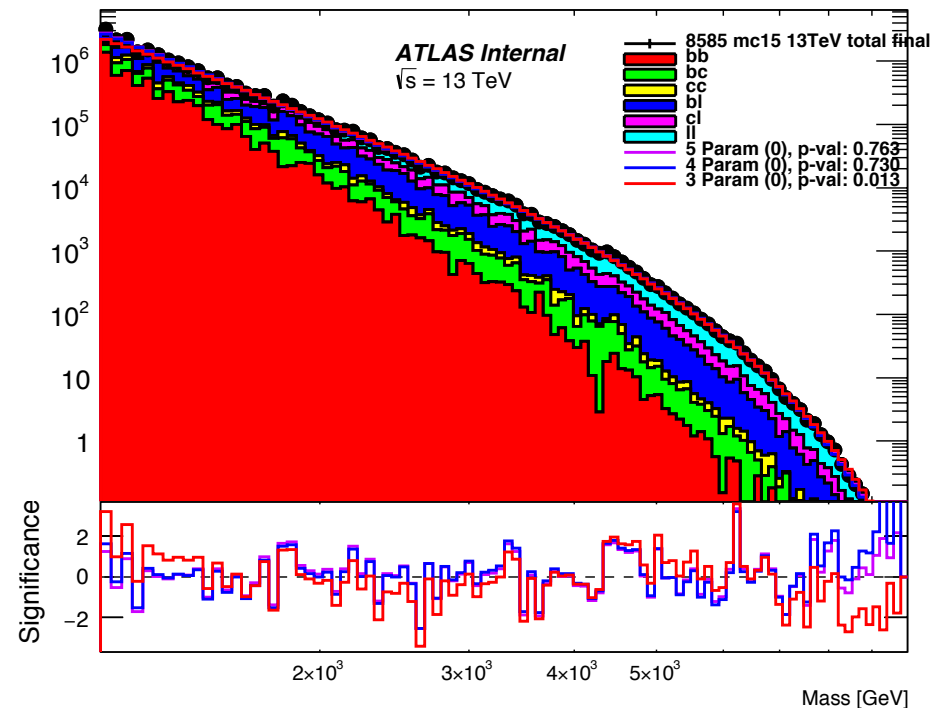


Standard (As seen before)



Chi2: 91.970 p-val: 0.728
P0: 27.309 P1: 10.237
P2: -2.198 P3: 0.536

Weight b by 1.5 (Weight bb, bc and bl by 1.5)



Chi2: 91.912 p-val: 0.730
P0: 26.446 P1: 10.169
P2: -2.271 P3: 0.558



- Try to fit the bb spectrum again
 - Mass range cut
 - Set initial parameters as cc fit
- Try different variations of weighting flavour fractions and fit
 - Check how robust our fitting function is.
 - Think about normalising this to realistic luminosity for Moriond
 - MakeDataLike?
- Fit to stacks of fractions as taken from fits to individual spectra
- Also mc/data comparisons of b-tagging variables at high p_T
- Any other suggestions?

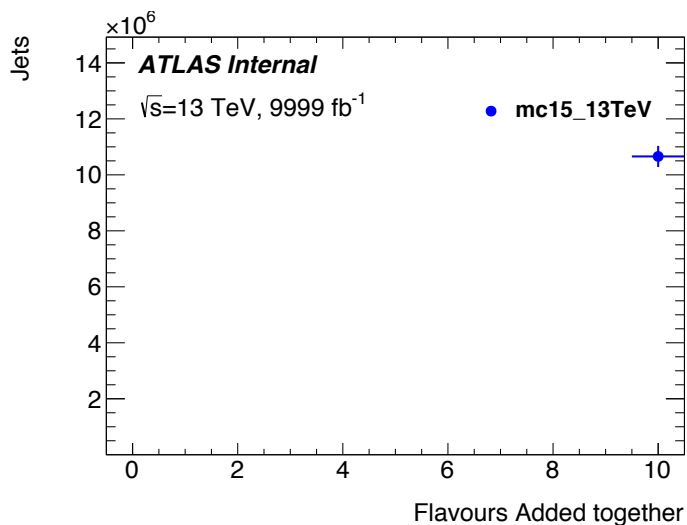


UCL

Backup



Standard (As seen before)



Weight b by 1.5 (Weight bb, bc and bl by 1.5)

