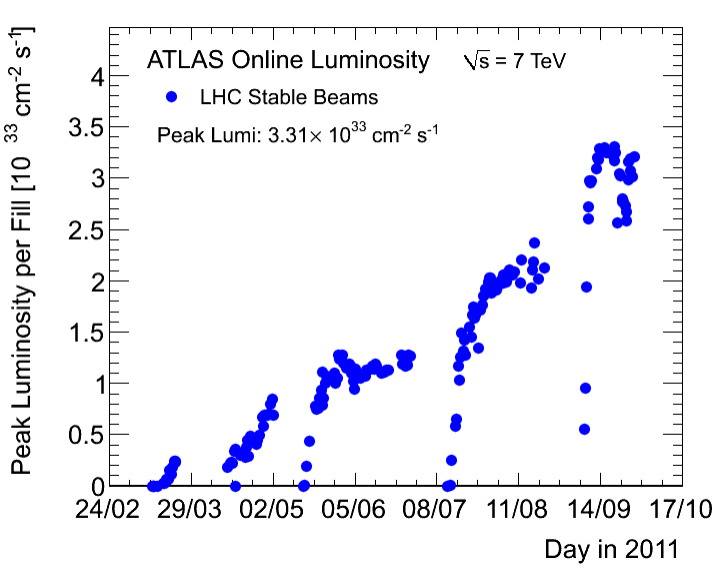
H->bb Weekly Meeting

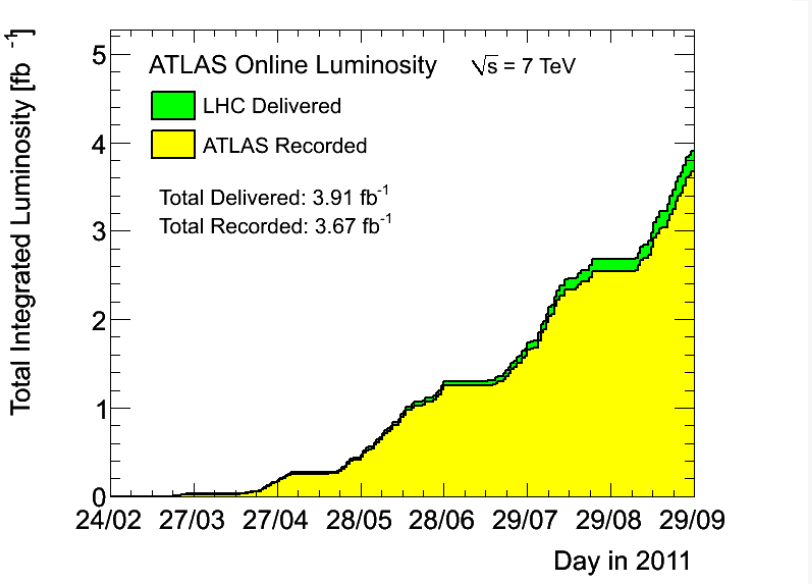
Ricardo Gonçalo (RHUL)

HSG5 H->bb weekly meeting, 20 September 2011

News! News! News!

- Peak stable lumi $3.31 \times 10^{33} cm^{-2} s^{-1}$
- $3.67 fb^{-1}$ with stable beams collected so far
- Pileup at $<\mu> \approx 14$, peak around 19 – 21 (!)





MC requests

- Inclusive and boosted H->bb samples for MC11b:
  - Herwig++ in Powheg
  - Mass points: M_H = 110, 115, 120, 125, 130, 135, 140, 145, 150 GeV
  - WH->lvbb, ZH->llbb, ZH->vvbb
  - Both boosted and inclusive for each mass
- Approved for production – Junichi asking for it to start now
- Next: W+jets

D3PD production

Robert Harrington

- The code is in place and in AtlasPhysics-17.3.3.1 cache
  - Validation ntuples requested - some are already done (tag p717)
  - D3PDs requested for datasets:
    - data11_7TeV.periodE.physics_Muons.PhysCont.AOD.t0pro08_v01/
    - data11_7TeV.periodE.physics_JetTauEtmiss.PhysCont.AOD.t0pro08_v01/
    - data11_7TeV.periodE.physics_Egamma.PhysCont.AOD.t0pro08_v01/
    - mc10_7TeV.116591.WH120lnubb_pythia.merge.AOD.e701_s933_s946_r2302_r2300/
    - mc10_7TeV.109352.WH120lnubb_pythia.merge.AOD.e660_s933_s946_r2302_r2300/
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    - mc10_7TeV.116591.WH120lnubb_pythia.merge.AOD.e701_s933_s946_r2302_r2300/mc10_7TeV.109352.WH120lnubb_pythia.merge.AOD.e660_s933_s946_r2302_r2300/
    - mc10_7TeV.109140.WH120lnbb_Herwig.merge.AOD.e598_s933_s946_r2302_r2300/
    - mc10_7TeV.109300.AlpgenJimmyZeebbNp0_nofilter.merge.AOD.e600_s933_s946_r2302_r2300/
    - mc10_7TeV.109305.AlpgenJimmyZmumubbNp0_nofilter.merge.AOD.e600_s933_s946_r2302_r2300/
- Each ntuple type has a different dataset definition:
  - NTUP_HSG5WH, NTUP_HSGZHLL, NTUP_HSG5ZHMET, NTUP_HSG5ZBB
  - NTUP_HSG5GAMH code is in place but not to be used for now: gamma + Z is current priority (see Bill's talk)
- Useful feedback from Ilektra:
  - Need more detailed truth information, b-tagging weights are missing for some anti-kT jets
- Known problems:
  - Calibration for fat jets needs to be updating in Jos
  - Infinite loop in SM D3PD code for some MC events: http://savannah.cern.ch/bugs/?86666

Reminders…

- Gilad Perez – TH seminar earlier today about template method for jet mass reconstruction
  - Possible new method for boosted H->bb

- Hadronic calibration workshop: https://indico.cern.ch/conferenceOtherViews.py?view=standard&confId=132005

Jet energy scale

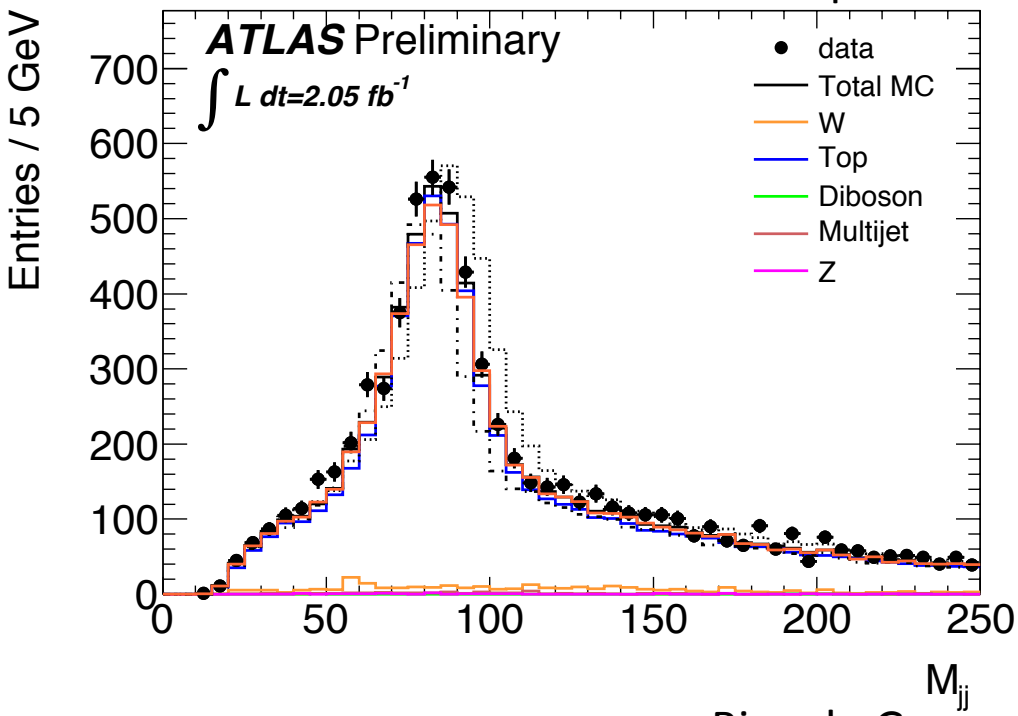
Top:

- mjj for W->jj in top events
- Cuts used: pTjet > 25 GeV, η < 2.5
- The JES uncertainty seems overestimated

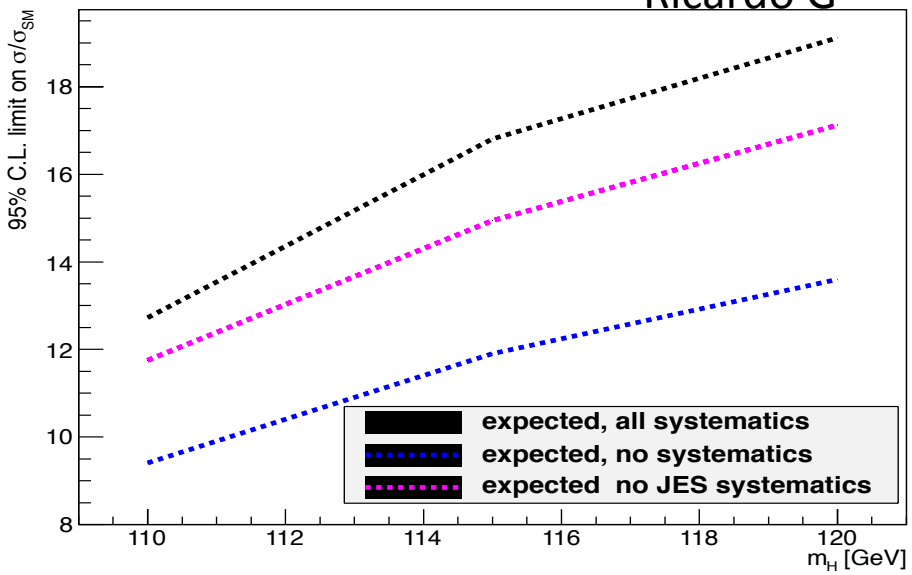
Bottom:

- Effect of JES uncertainty on WH->lvbb analysis expected limit ($1fb^{-1}$)
- Note CMS quote 1% rather than our ≈7%
- B-tag efficiency systematic is still dominant (≈16%) – can we improve on it?

Paul Thompson



Ricardo G



Di-jet mass resolution and limits

- Fitted signal by a gaussian and re-did fits (modified code from Lianliang) after thinning signal m_{bb} histo by several factors

- Plot shows effect of improved di-jet mass:
  - Basically linear in range of interest
  - 10% improvement in m (bb) gives 4% improvement in limit across all masses