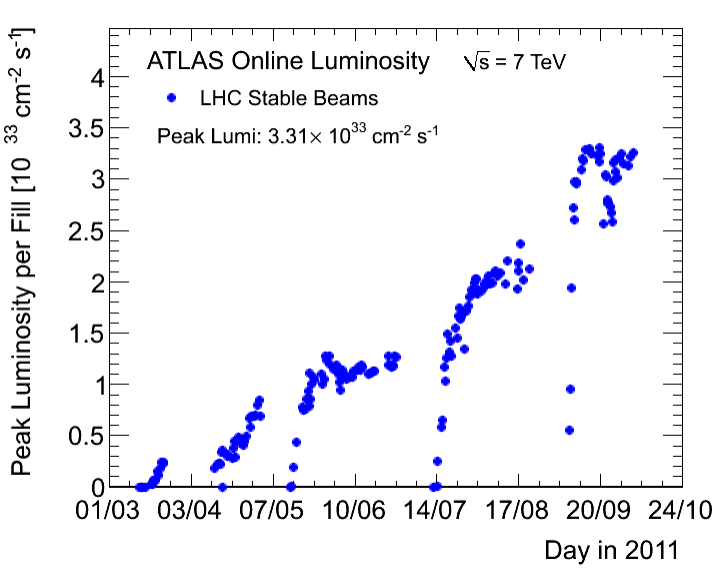
# H->bb Weekly Meeting

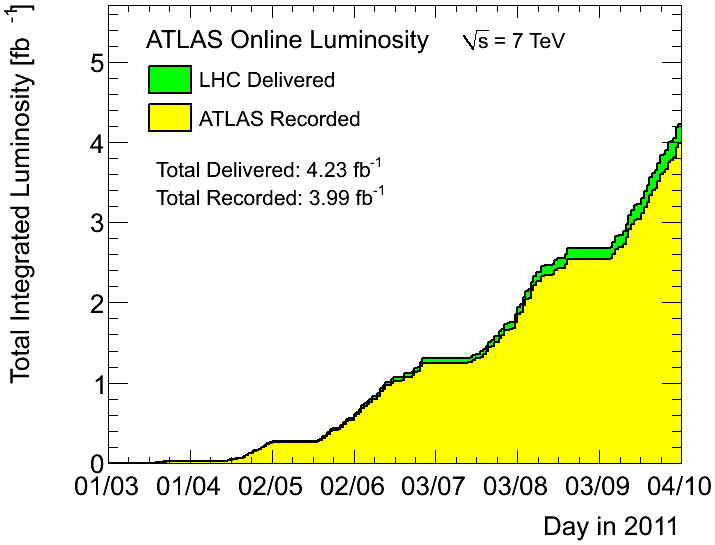

Ricardo Gonçalo (RHUL)

HSG5 H->bb weekly meeting, 4 October 2011

# News! News! News!

- Peak stable lumi $3.31 \times 10^{33} cm^{-2} s^{-1}$
- 3.99 $fb^{-1}$ with stable beams collected so far – 320 $pb^{-1}$ during the last week – 4.23 $fb^{-1}$ delivered
- Pileup at $<\mu> \approx 15.5$, peak around 19 – 21 (!)
- May go to 25ns running this week!



# 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

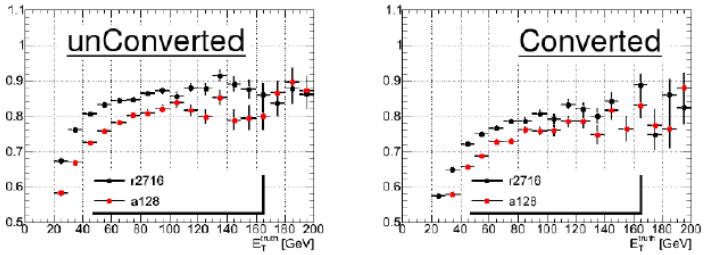
- Approved for production – in waiting list for MC11b production (delays in MC11a)

- Next: need to discuss W+jets/Z+jets
- Sherpa samples vs Alpgen vs Powheg
- Fast simulation:
  - Being validated/used by SUSY and top groups
  - Would be very useful for us (and several others) to produce large background samples

## AFII MC11 status

**Summary (for AFII tag a128, phys.val. 30.09.):**
https://twiki.cern.ch/twiki/bin/viewauth/Atlas/AtlfastIIValidationMC11

- **Electrons:** efficiency and Escale OK, fakes OK in MC10b
- **Muons:** true muons OK, fake muons factor 2-3 off
- **Photons:** 3-5% efficiency difference. No comparison with data, but most likely overtuned. The same tune is used for electrons and photons (can be changed).




- G4 should be used for real photon samples for the time being. Photon fakes not tested yet.



## AFII MC11 status

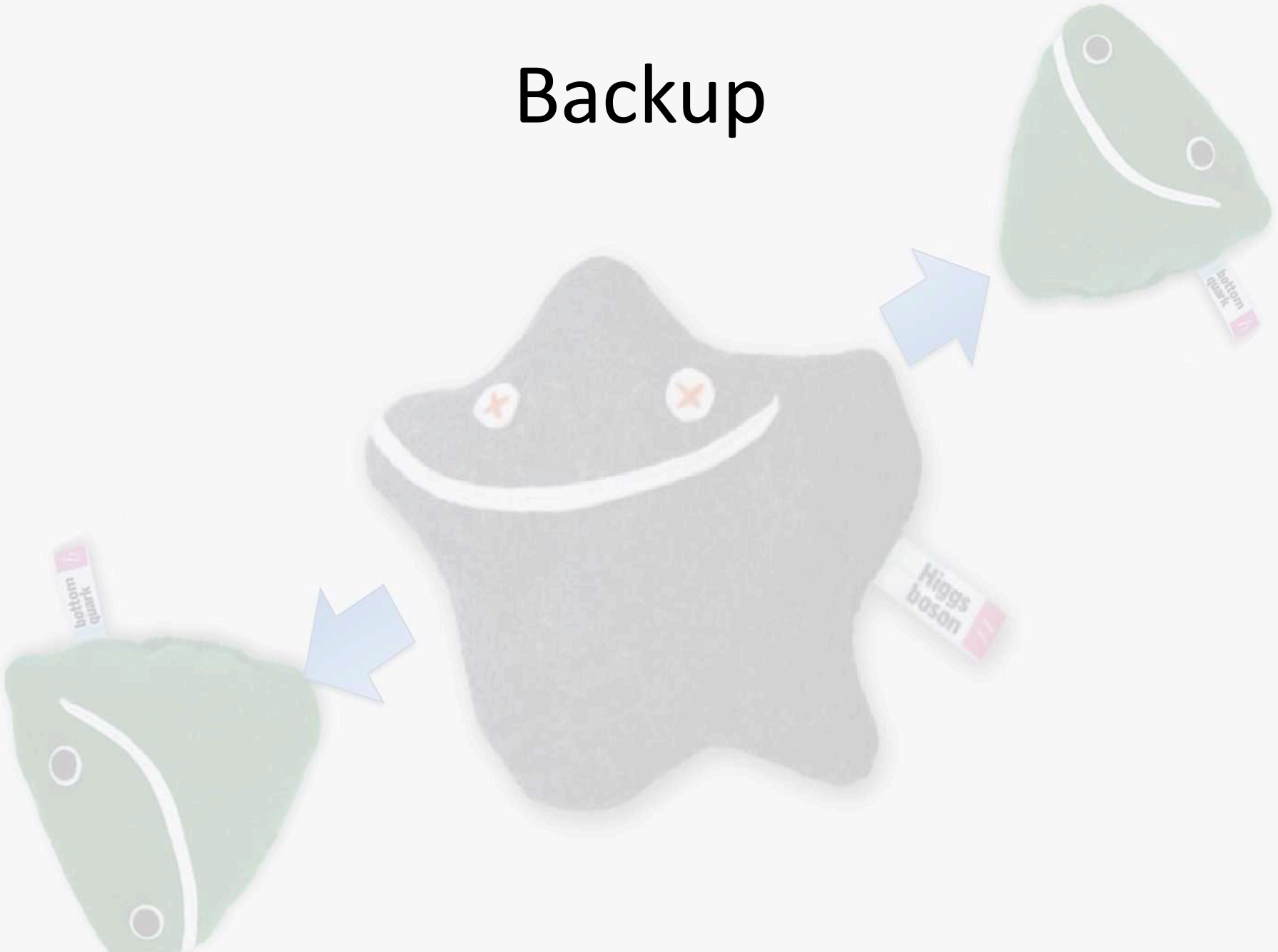
**Summary (for AFII tag a128, phys.val. 30.09.):**
https://twiki.cern.ch/twiki/bin/viewauth/Atlas/AtlfastIIValidationMC11

- **Taus:** more details needed. True and fakes seem off by ~5%, Escale OK. G4 should be used for real taus for the time being until we have more validation
- **MET:** all OK (but only tested W→tau sample)
- **JETs:** JES still missing. b-tagging is OK. If needed, JES can be adjusted to the MC11 scale via AODfix (or even on D3PDs if propagated by hand to MET)
- **Tracking:** all OK

- **CPU (from grid):** 7-8 times faster, digi+reco ~50%

- **Photons and taus should not be a show stopper for most AFII samples. Correct?**

# Backup

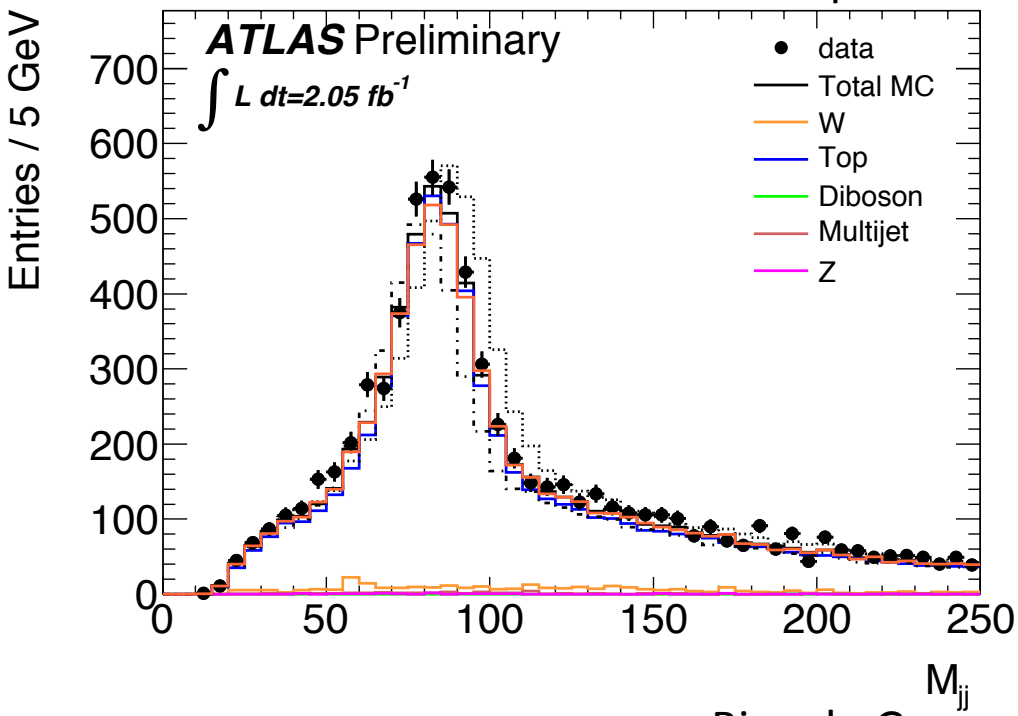


# Jet energy scale

Top:

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

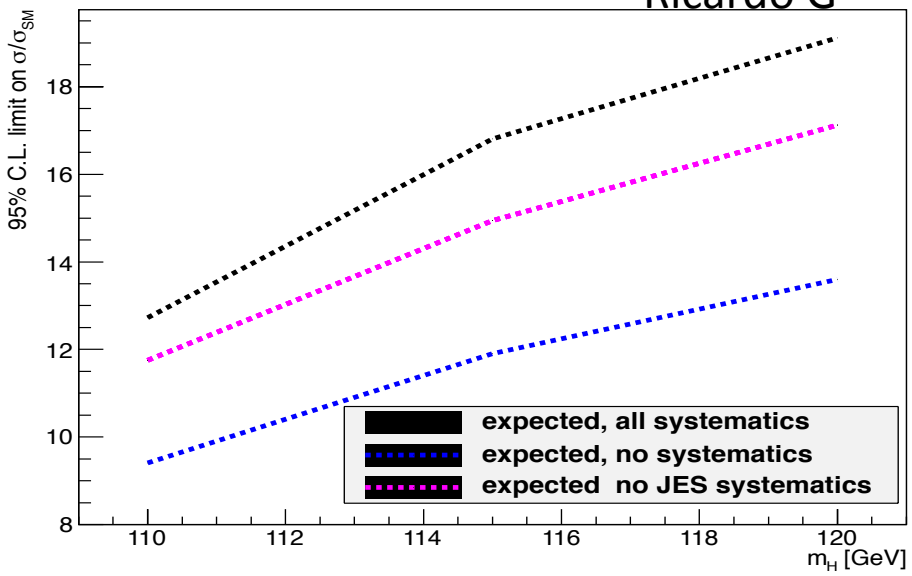
Paul Thompson




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?

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