Introduction

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H->bb Note Meeting, 15 December 2010

Ongoing issues

- News
- Background CONF note for Moriond
  - Material from WH, H->bb
- Support CONF notes for Summer 2011
  - WH, H->bb
  - Missing support notes
- New people joining

News…

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More News

… well not really news, already mentioned in Bill & Sandra's talk at the Higgs meeting… but it means we're entering interesting times!

Two possible LHC scenarios for next year: expect 2 to 7 fb^{-1} … and pileup!
http://indico.cern.ch/getFile.py/access?contribId=0&sessionId=0&resId=1&materialId=slides&confId=112439

- 4 TeV (to be discussed at Chamonix)
- 936 bunches (75 ns)
- 3 micron emittance
- 1.2 x 10^{11} protons/bunch
- β* = 2.5 m, nominal crossing angle

Peak luminosity	6.4 x 10^{32}
Integrated per day	11 pb^{-1}
200 days	2.2 fb^{-1}
Stored energy	72 MJ

- 4 TeV
- 1400 bunches (50 ns)
- 2.5 micron emittance
- 1.5 x 10^{11} protons/bunch
- β* = 2.0 m, nominal crossing angle

Peak luminosity	2.2 x 10^{33}
Integrated per day	38 pb^{-1}
200 days	7.6 fb^{-1}
Stored energy	134 MJ

Background note for Moriond

- Plan so far was to study only ZH, H->bb backgrounds
- Should note recommendations for Winter conferences:
  https://twiki.cern.ch/twiki/bin/view/AtlasProtected/HiggsRecommendationsForWinterConf2011
  - Luminosity uncertainty.
  - Higgs cross sections and uncertainties.
  - Object selection and uncertainties – muons, electrons, photons, MET, jets, tau-jets, b-tag.
  - Pile-up reweighting recipees.
  - Guidelines for the limit calculation – analyses should use RooStats
- Seems likely that WH, H->bb background study will also be able to contribute
  - Note title should change to: "Data-driven Estimation of the Backgrounds to ZH→llbb and WH→lvbb Search with the ATLAS Detector at 7TeV"
  - This is a separate issue from the WH, H->bb CONF note for Summer 2011
  - See Andrew Mehta's talk later with proposal for WH
- Birmingham/Liverpool status:
  - MET fakes causing MC deficiency at low MET – looking for data-driven method
- Faig Ahmadov (Dubna) and Michiel Sanders, Jonas Will (Munich) interested in joining

Support notes for Summer 2011 - WH

- WH, H->bb note effort started
  - Editors: Patricia Conde, Andrew Mehta, Paul Thompson

- Meeting on Monday 13 to compare Birmingham/Liverpool and Lisbon analyses: http://indico.cern.ch/conferenceDisplay.py?confId=115168
  - Analyses agreed to within 5-10% at first try – see report later from Andrew, Paul and Patricia
  - Details of event selection/object reconstruction discussed:
    - MET reconstruction – MetRefFinal minus muon term plus selected muons (in muon channel only)
    - MET cleaning – remove events with BAD jets above $p_T > 20$ GeV
    - Jet cleaning – remove BAD jets from events if $p_T < 20$ GeV
    - Overlap removal – remove jets at $\Delta R<0.4$ from electrons; remove muons at $\Delta R<0.4$ from jets
    - Trigger in MC – not all triggers exist in MC; request representative trigger (e.g. EF_mu10_MG)

- To-do list:
  - Paul/Andrew: add details of cut-flow and of object reco/event selection to Wiki https://twiki.cern.ch/twiki/bin/view/AtlasProtected/WHNoteSummer2011
  - Patricia/José: refine analysis and re-send updated cut-flow table
  - Others: produce cut-flow tables to compare with wiki

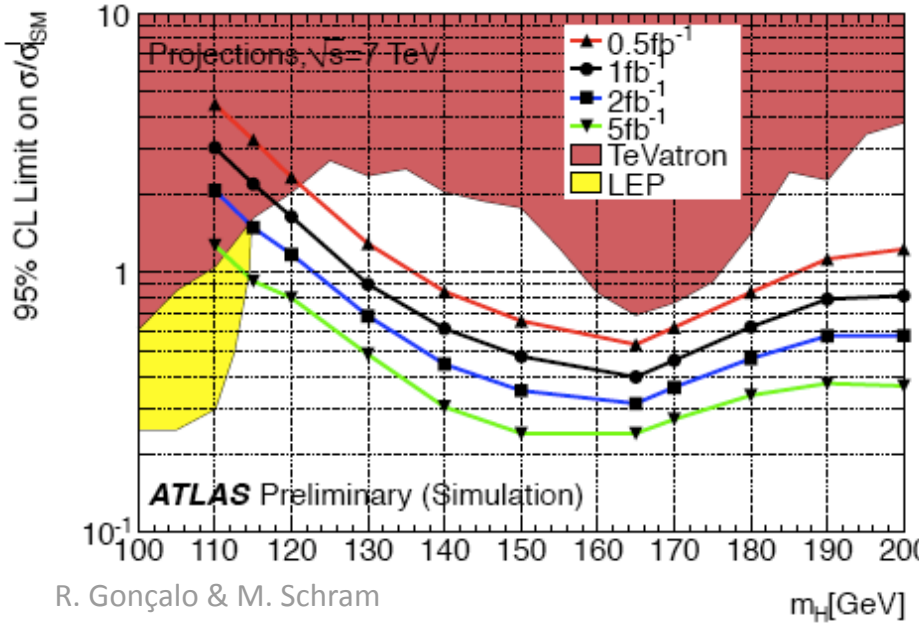
- People:
  - Lashkar Kashif, (Wisconsin) interested in joining
  - Perhaps also group from Glasgow: Stan Thompson, Rick St.Denis, Sasha Cheplakov
  - Perhaps also Jinlong Zhang (ANL)

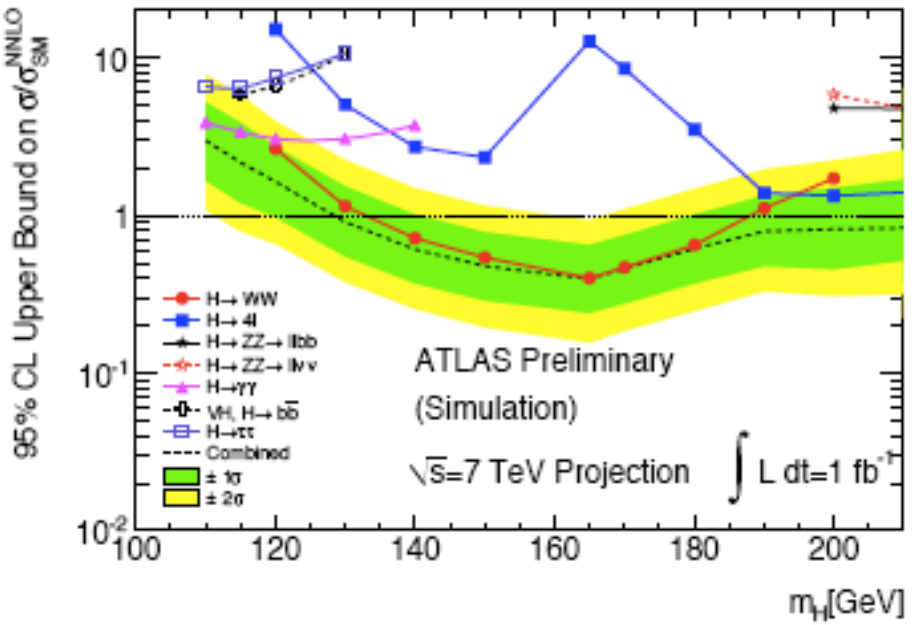
Other Support notes for Summer 2011

- All projections are uncertain, but we can expect to have ≈0.5-1 fb^{-1} by June

- By then, Higgs searches in Atlas will be under intense scrutiny
  - Must plan a set of notes covering H->bb channels for Summer 2011
  - At most by Winter 2011 must be able to produce limits at the "turn of a handle"
  - Need to optimize analyses, learn how to handle pileup (in time and out of time), extract limits, deal with many data periods etc

- ZH, H->bb note should continue from ZH efforts towards Moriond
  - Wisconsin group joining the effort (see Liliang Ma's talk)
- Other possibilities (discussion at the end of the meeting):
  - ttH – semileptonic, fat jets, hadronic – VBF H->bb, MSSM





Today's agenda

Wednesday 15 December 2010

16:30 - 16:35	Introduction & Plans *05'* Speakers: Malachi Schram (McGill University) , Ricardo Jose Morais Silva Goncalo (Royal Holloway)
16:35 - 16:50	ZH, H->bb status for Moriond note *15'* Speaker: Koloina Randrianarivony (Carleton University)
16:50 - 17:00	WH, H->bb plans for Moriond background note *10'* Speaker: Andrew Mehta (Oliver Lodge Laboratory-University of Liverpool)
17:00 - 17:15	Status of Wbbbar studies *15'* Speaker: Jonas Zacharias Will (Ludwig-Maximilians-Univ. Muenchen-Unknown-Unknown)
17:15 - 17:30	Discussion on Moriond background CONF note *15'*
17:30 - 17:45	WH, H->bb status for Summer CONF note *15'* Speakers: Paul Thompson (University of Birmingham) , Patricia Conde Muíño (LIP-Lisbon) , Andrew Mehta (Oliver Lodge Laboratory-University of Liverpool)
17:45 - 18:05	Studies on B-tagging and Analyses of WH/ZH, H->bb *20'* Speaker: Lianliang Ma (University of Wisconsin (Madison))
18:05 - 18:20	Discussion on Summer CONF notes *15'*