

8th Open LHC*Top*WG Meeting

November 17-18, 2015

Introduction

María José Costa (IFIC-Valencia)
Michelangelo Mangano (CERN)
Martijn Mulders (CERN)



LHC*Top*WG : Introduction

- 8th open session of the LHC Top Working Group
 - Forum for public discussions (ATLAS+CMS+LHCb+TH) on combination and interpretation of top physics measurements at the LHC
 - Open sessions (twice per year) organized in a way that allows ample time for discussion
- Documentation and coordinates
 - Integrated in the LPCC structure at CERN
 - Agendas available at <https://indico.cern.ch/categoryDisplay.py?categId=4463>
 - Twiki page and link to public plots and documents at http://lpcc.web.cern.ch/LPCC/index.php?page=top_wg
 - Subscribe to main open mailing list lhc-toplhwcwg@cern.ch
- Welcome to the second open session of 2015 !

LHCTopWG

Contacts

Contact person for Theory :	Michelangelo Mangano
Contact person for LHCb :	Victor Coco
Contact person for CMS :	Martijn Mulders
Contact person for ATLAS :	Maria Costa

(Alison Lister will replace Maria after this WG meeting)

- **Top pair cross section:** Elizaveta Shabalina (ATLAS), Maria Aldaya [**→ ?**] (CMS)
- **Single top cross sections:** Reinhard Schwienhorst (ATLAS), Nadjieh Jafari (CMS)
- **Top mass:** Giorgio Cortiana (ATLAS), Steve Wimpenny (CMS)
- **W helicity:** Kevin Kröniger (ATLAS), Mara Senghi (CMS)
- **Charge asymmetry:** Frederic Deliot (ATLAS), Thorsten Chwalek (CMS)
- **Top pair differential cross sections:** Francesco Spanò (ATLAS), Maria Aldaya (CMS)
- **ttV :** **Markus Cristinziani (ATLAS), Andrew Brinkerhoff (CMS)**

Task forces for dedicated topics:

- **Jet/MET:** **Steven Schramm and Dimitris Varouchas** (ATLAS), Mikko Vitoulainen and Henning Kirschenmann (CMS)
- **Common acceptance / Pseudo Top:** Kevin Finelli and Dominic Hirschi (ATLAS), Junghwan Goh, Orso Iorio and **Mara Senghi** (CMS)
- **Radiation and Generators:** James Ferrando and Dominic Hirschi (ATLAS), Benedikt Maier and **Markus Seidel** (CMS)
- **b-Tagging:** Martin zur Nedden and Liza Mijovic (ATLAS), Luca Scodellaro (CMS)

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We would like to thank very much the outgoing contacts, for their contributions and efforts (Maria Costa, Caterina Doglioni, Bogdan Malescu) and welcome the new contacts

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Run I activities: combinations

- In most cases we plan to **wait for final Run I results** (at least in the main channel(s)) before performing the ‘legacy’ combination
- Started discussing the first **publications of combined results**, eg for the measurements of ttW/Z and the ttbar charge asymmetry

A. Maier (Top2015)

Move from combining published measurements to publishing combined measurements?

“at LEP we did both”

- One important ingredient: ATLAS-CMS **Jet energy scale** uncertainty correlations at 8 TeV → **public Note** in preparation, and 8 TeV CMS jet publication to appear soon. Will be discussed at this meeting.

Run I activities: combinations

- **Ongoing combinations** (more details in talks at this meeting):
 - **Charge asymmetry** at 8 TeV, inclusive and differential
 - **ttW/Z** cross-section combination and limits on anomalous couplings
 - **Inclusive ttbar and single top** (t, tW, s-channel) cross-sections
 - **Differential ttbar** distributions (starting with comparisons)
- **Other combinations** still a bit further away
 - **Top mass**: preparatory discussions and studies ongoing ... focus of today's morning session with experimental and theory inputs
 - **Wtb vertex** constraints and combined limits on anomalous couplings
→ experimental and theory talks tomorrow morning

Towards Run II combinations

- Work ongoing in various areas to achieve further improvements in harmonization and synchronization between ATLAS and CMS for Run II
 - **Comparisons of new Monte Carlo setups** for Run II and first results of validation with data will be presented tomorrow, to be followed by further internal discussions and common studies
 - **Particle** objects, fiducial volume definitions and **pseudo-top**: internal discussions and studies ongoing; more results expected in the next meeting
 - **Jets and b-tagging**: new contacts appointed (for Jets) and discussions ongoing for final Run I and first Run II agreements. More details tomorrow.

Announcement:

TOP2016 in Olomouc, CZ

Dates: 19th -- 23th September 2016 (Mon -- Fri).

More info [here](#)



Tuesday, 17 November 2015

09:00 - 13:15 Top Mass

09:00 **Introduction 15'**

Speakers: Martijn Mulders (CERN), Michelangelo Mangano (CERN),
Maria Jose Costa (IFIC Valencia (ES))

09:15 **New top quark mass measurements from CMS 30'**

Speaker: Markus Seidel (CERN)

09:45 **Impact of fragmentation modelling on the jet energy and the top-quark mass measurement using the ATLAS detector 30'**

Speaker: Tancredi Carli (CERN)

10:15 **ATLAS and CMS pole mass measurements 30'**

Speaker: Efe Yazgan (Ghent University (BE))

10:45 **Coffee break 30'**

11:15 **4-loop corrections M_{pole} vs M_{ms} 30'**

Speaker: Matthias Steinhauser (KIT)

11:45 **Theoretical considerations on top mass observables 30'**

Speaker: Paolo Nason

12:15 **Precision determinations of the top-quark mass 30'**

Speaker: S. Moch (UHH)

12:45 **Thoughts about precision top mass observables 30'**

Speaker: Kirill Melnikov (Karlsruhe Institute of Technology, Germany)

13:15 - 15:15 Lunch break

15:15 - 18:15 Top quark pair production

15:15 **Update on systematics of m_{top} extraction from b energy peak (TBC) 30'**

Speaker: Roberto Franceschini (CERN)

15:45 **ATLAS and CMS inclusive top quark pair cross section measurements from Run1 30'**

Speaker: Carmen Diez Pardos (Deutsches Elektronen-Synchrotron Hamburg and Zeuthen (DE))

16:15 **ATLAS and CMS 8 TeV differential top quark pair cross section measurements 30'**

Speaker: Francesco Spano (Royal Holloway, University of London (GB))

16:45 **Coffee break 30'**

17:15 **Sub-leading shower effects on top quark distributions 30'**

Speaker: Peter Richardson (Durham University)

17:45 **Summary of $t\bar{t}$ differential Top2015 session 30'**

Speaker: Alexander Dimitrov Mitov (University of Cambridge (GB))

Agenda

Wednesday, 18 November 2015

09:00 - 12:00 Probing top quark couplings and charge asymmetry

09:00 **Single top production and Vtb combination plans 30'**

Speaker: Alberto Orso Maria Iorio (Universita e INFN, Napoli (IT))

09:30 **Ideas for combinations of measurements constraining Wtb vertex 30'**

Speaker: Nuno Filipe Castro (LIP, University of Minho and University of Porto (PT))

10:00 **Determination of the top EW couplings via an EFT approach: theoretical aspects 30'**

Speaker: Fabio Maltoni (Universite Catholique de Louvain (UCL) (BE))

10:30 **Coffee break 30'**

11:00 **ATLAS and CMS Run1 $t\bar{t}b\bar{\nu}$ production 30'**

Speaker: Tamara Vazquez Schroeder (McGill University (CA))

11:30 **ATLAS and CMS 8 TeV charge asymmetry measurements 30'**

Speaker: Thorsten Chwalek (Institut fuer Experimentelle Kernphysik, Universitaet Karlsruhe)

12:00 - 13:00 Run 2 results, Monte Carlo and techniques

12:00 **Overview of Run2 results 30'**

Speaker: Otto Heinz Hindrichs (University of Rochester (US))

12:30 **PDF4LHC recommendations update 30'**

Speaker: Pavel Nadolsky (Southern Methodist University)

13:00 - 15:30 Lunch break

15:30 - 17:00 Run 2 results, Monte Carlo and techniques

15:30 **Monte Carlo comparisons and particle level and pseudo-top definitions 30'**

Speaker: Ben Nachman (SLAC National Accelerator Laboratory (US))

16:00 **ATLAS and CMS jet calibration and uncertainties 30'**

Speaker: Steven Randolph Schramm (Universite de Geneve (CH))

16:30 **ATLAS and CMS b-tagging calibration and uncertainties 30'**

Speaker: Liza Mijovic (Universitaet Bonn (DE))

17:00 - 17:30 Concluding remarks