# 18th Open LHCtopWG Meeting

November 23-24, 2020

**Virtual Edition**

# Introduction


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Maria Aldaya (DESY)

# LHCtopWG: Introduction

- 18th 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) – aim always to allow time for discussion

- Documentation and coordinates
  - Integrated in the LPCC structure at CERN: http://lpcc.web.cern.ch/lhc-working-groups
  - Agendas available at https://indico.cern.ch/categoryDisplay.py?categId=4463
  - Public summary plots at https://twiki.cern.ch/twiki/bin/view/LHCPhysics/LHCTopWGSummaryPlots
  - Subscribe to main open mailing list: lhc-toplhcwg@cern.ch

**Welcome to the second open session of 2020!**

# LHCtopWG in the virtual world


- Online-only meeting due to the continuing Covid19 situation
  - Back to the usual 2-day structure, but only afternoons --trying to be as timezone-friendly as possible
  - We hope the workshop will stimulate as many discussions as the “in-person” version
  - Questions can be asked using the “raise hand” option and typed in the zoom chat
  - The “coffee-break” can also be used to continue discussions!

- Positive note:
  - Increased attendance from interested people with travelling issues

- For the future: keep the best of both worlds
  - Also consider recording future meetings
  - Let us know if you have any suggestions for improving the meeting!

# LHCtopWG Contacts

- **Theory:** Michelangelo Mangano
- **ATLAS:** Reinhard Schwienhorst
- **CMS:** Maria Aldaya
- **LHCb:** Steve Farry

## Contacts for on-going combinations / working groups:

New since last Open Meeting

- **Top pair cross section:** Veronique Boisvert (ATLAS), Jan Kieseler (CMS)
- **Delta Phi Spin Correlation:** Miriam Watson & James Howarth (ATLAS), Giulia Negro & Afiq Anuar (CMS)
- **Top mass:** Mark Owen (ATLAS), Steve Wimpenny, Martijn Mulders, Matteo Defranchis (CMS)
- **Top pair differential cross sec. 8 TeV:** Francesco Spanò (ATLAS), Jan Kieseler & Maria Aldaya (CMS)
- **Top pair differential cross sec. 13 TeV:** James Howarth (ATLAS), Otto Hindrichs (CMS)
- **EFT:** Laura Barranco and Peter Berta (ATLAS), Kirill Skovpen (CMS)
- **Common MC:** Michael Fenton (ATLAS), Giulia Negro (CMS)

Also contacts for dedicated topics as needed (JES, b-tagging, generators, pseudo-top definitions, etc)

Also contacts for global EFT effort within **LHC EFT WG**: https://lpcc.web.cern.ch/lhc-eft-wg
Nuno Castro (ATLAS), Florencia Canelli (CMS), Eleni Vryonidou (Theory)

# Ongoing Combinations

## Ongoing combinations under review within the collaborations:

- **Top quark pair cross-section 7 & 8 TeV** + extraction top pole mass & $\alpha_s$ - in review by ATLAS and CMS
- **Delta Phi Spin Correlation at 13 TeV** (started with comparison plots)

## Planned Run1 combinations that are a bit further away:

- **Top mass -** preparatory discussions and studies ongoing
- **Differential ttbar** distributions (started with comparisons)

## Ongoing efforts for upcoming Run2 combinations:

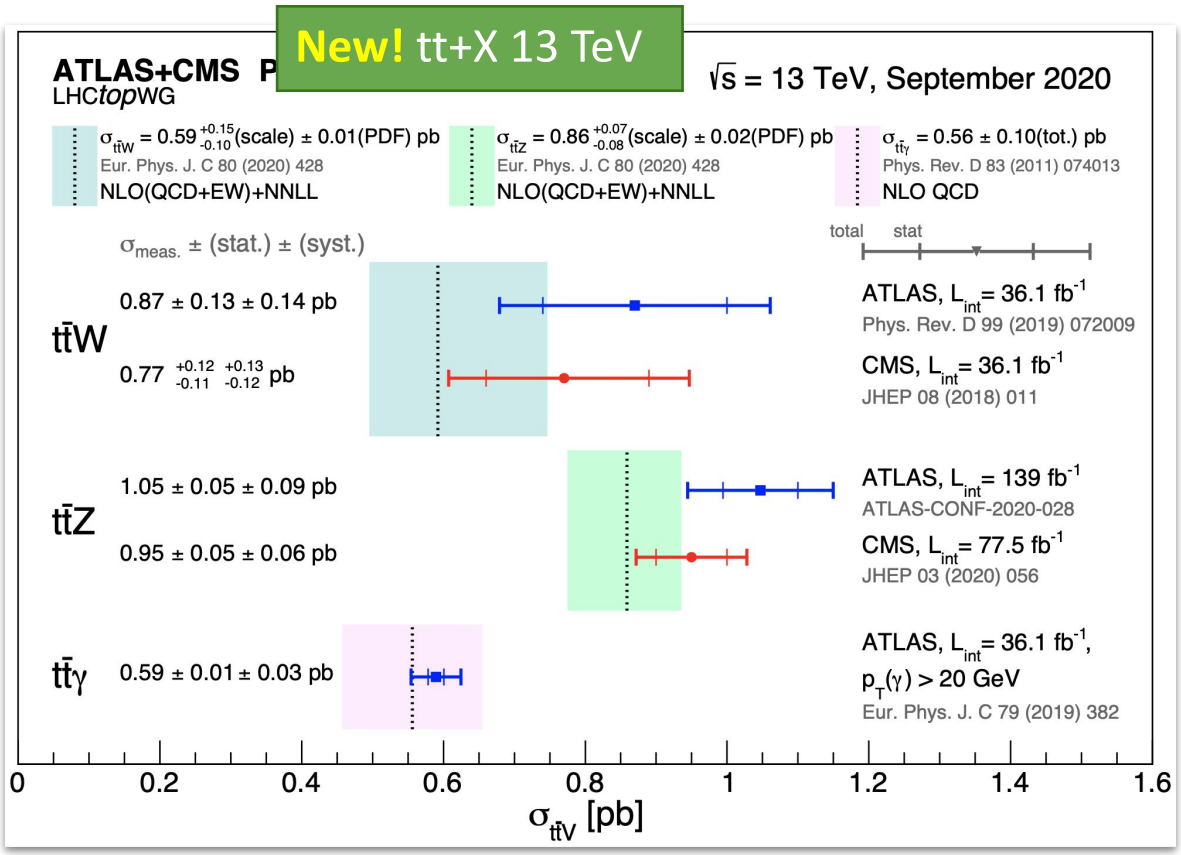
- **Common MC sample studies -** update today
- **Discussion on harmonization of systematic uncertainties**
- **Revisiting phase-space definitions (experiment + theory)**

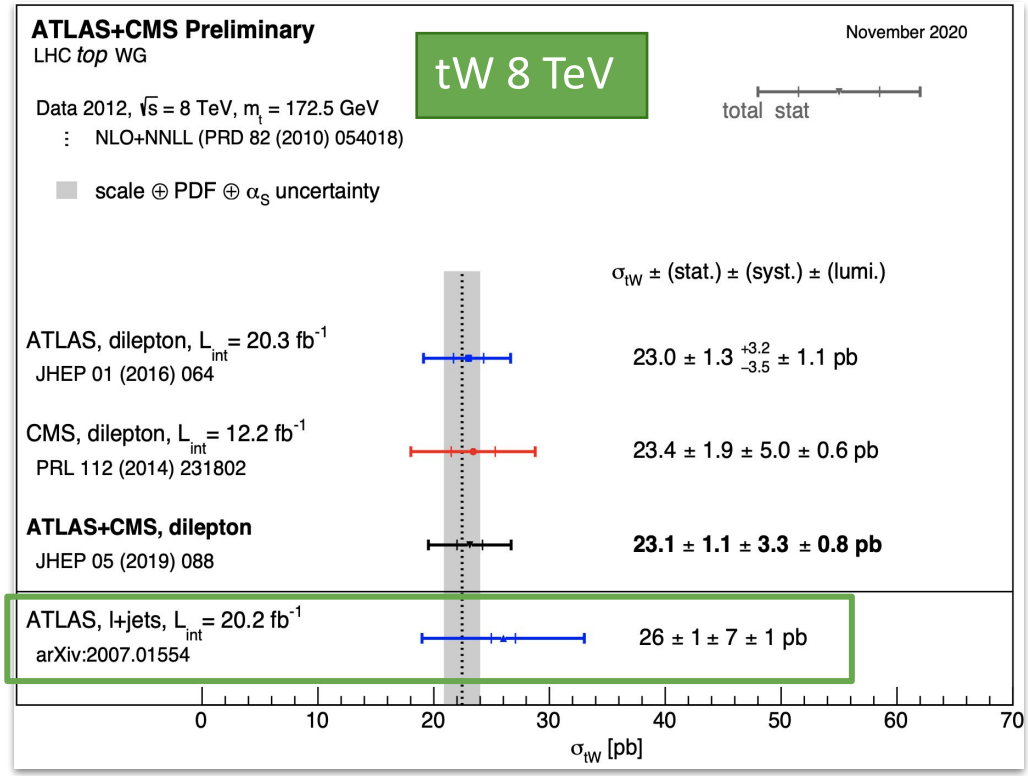
## Need to address JES and b-tagging correlations for Run2

# Summary plots

https://twiki.cern.ch/twiki/bin/view/LHCPhysics/LHCTopWGSummaryPlots

New plot since last Open Meeting and other updates:



# Agenda

## Monday, 23 November

**14:00** → 14:10 **Introduction**
Speakers: Maria Aldaya Martin (DESY), Reinhard Schwienhorst (Michigan State University (US))

**14:15** → 14:35 **ATLAS highlight**
Speaker: Chris Pollard (Deutsches Elektronen-Synchrotron (DE))

**14:45** → 15:05 **CMS Highlight**
Speaker: Seungkyu Ha (Yonsei University (KR))

Intro, highlights (experiment and theory)

**15:15** → 15:30 **non-resonant channels in the low-Mtt region**
Speakers: Silvia Ferrario Ravasio (University of Milan - Bicocca), Tomas Jezo (University of Zurich), silvia ferrario ravasio

**15:35** → 15:50 **Simultaneous extraction of mt and alphaS from LHC tt differential distributions**
Speaker: Matthew Lim

**16:10** → 16:40 Coffee Break

**16:40** → 16:55 **Common MC update**
Speakers: Giulia Negro (Purdue University (US)), Michael James Fenton (University of California Irvine (US))

Common MC

**17:00** → 17:20 **tt+quarks production in ATLAS and CMS**
Speaker: Seth Moortgat (Vrije Universiteit Brussel (BE))

tt+jets

**17:30** → 17:50 **Input from LHC Higgs XS WG on tt+quarks needs**

tt+Z

**18:00** → 18:20 **tt+Z comparison ATLAS and CMS**
Speaker: Fabio Cardillo (Univ. of Valencia and CSIC (ES))

## Tuesday, 24 November

**14:00** → 14:20 **LHC EFT workshop summary and next steps for EFT interpretations**
Speaker: Eleni Vryonidou

**14:30** → 14:50 **PDF fits including top and learning from PDF fits for EFT fit**
Speakers: C.-P. Yuan (Michigan State University), C.-P. Yuan (Michigan State University)

EFT

**15:00** → 15:20 **What can top EFT fits learn from Higgs EFT fits**
Speaker: Adinda De Wit (Universitaet Zuerich (CH))

**15:30** → 16:00 **Discussion on how to include EFT dependence in unfolding/background**
If you have any input on how to handle the dependence of acceptances and background estimates on anomalous operators, send your points to t
listed here.
Speakers: Kirill Skovpen (Ghent University (BE)), Laura Barranco Navarro (Stockholm University (SE)), Peter Berta (Deutsches Elektronen-Synchrotron (DE))

**16:00** → 16:30 Coffee Break

**16:30** → 16:45 **Elastic production of top quarks**
Speaker: James William Howarth (University of Glasgow (GB))

Exclusive top production

**16:50** → 17:05 **Exclusive top-quark production**
Speaker: Marek Tasevsky (Czech Academy of Sciences (CZ))

**17:15** → 17:35 **Higher-level comparison of multiple distributions for MC generators**
Speaker: Dr Marino Romano (INFN Bologna (IT))

Top modelling

**17:45** → 18:05 **Modeling of uncertainties in Sherpa**
Speaker: Frank Siegert (Technische Universitaet Dresden (DE))

**18:15** → 18:35 **MiNNLOPS and prospects for top**
Speakers: Javier Mazzitelli (Universidad de Buenos Aires (AR)), Javier Mazzitelli