MB-YR: plan / discussion

CMS: Matthias Mozer (KIT), Chia-Ming Kuo (National Central)

ATLAS: Kristin Lohwasser (Sheffield), Yusheng Wu (USTC)

Theory: Celine Degrande (CERN), Jonas Lindert (Durham)

LHC Electroweak WG meeting 22. June 2018

Main Idea

- ▶ short experimental reviews of prior analyses, drafted per analysis channel
- ▶ short theoretical overviews of state-of-the-art tools and predictions
- ▶ short review for ETF interpretations
- ▶ recommendations for combinations
- →Motivation for reviews: quick and clear references for analysis teams working with future data
- →Recommendations for measurements using LHC full Run-II data and early Run-III data:
 - MC event generation, definitions of common fiducial regions and BSM-sensitive variables/regions, EFT and anomalous coupling studies, measurement combinations, and possible other new ideas.

Note: subject to changes after further discussions!

- 1. Introduction: general overview of multiboson studies; motivation
- 2. Experimental reviews & recommendations
 - planned structure (2-4 authors and 1-2 pages per channel):
 - diboson: WW, ZZ, WZ, W/Z+γ,
 - VBF/VBS: VBF-V, VBS-Vγ, VBS-WW, VBS-WZ, VBS-semileptonic
 - other: Triboson, photon-induced diboson
 - coordinated between ATLAS and CMS (+ potentially LHCb) contributors
 - Goals:
 - main features of the channels
 - past and future precision
 - limitations
 - common fiducial definitions / strategy
 - etc...

Note: subject to changes after further discussions!

- 3. Theory reviews & recommendations
 - A. review of theory predictions (I-2 authors and I-2 pages per class):
 - a) **VV** b) **VBF** c) **VBS** d) **Triboson**Topics: NNLO QCD, NLO EW, ggVV@NLO, Resummation, Uncertainties
 - B. Monte Carlo generators: MadGraph_aMC@NLO, Sherpa, Herwig7, POWHEG

Goals: detail recommended settings, strengths, caveats+limitations for the various multiboson processes

C. Theory comparisons: see last talk

Note: subject to changes after further discussions!

- 4. EFT review & recommendation
 - A. Parametrizations, basis
 - B. MC tools for EFT interpretations
 - C. Sensitive observables
 - D. Theory uncertainties
 - E. Possible combination of multiple channels (related to also next chapter)
- 5. Recommendations for combination of measurements
 - A. Examples: (e.g. 7 TeV ATLAS+CMS ZZ combination)
 - B. Technicality discussions: presentation of individual measurement results, uncertainty correlations, machinery, etc.
 - C. Prospects for future combinations

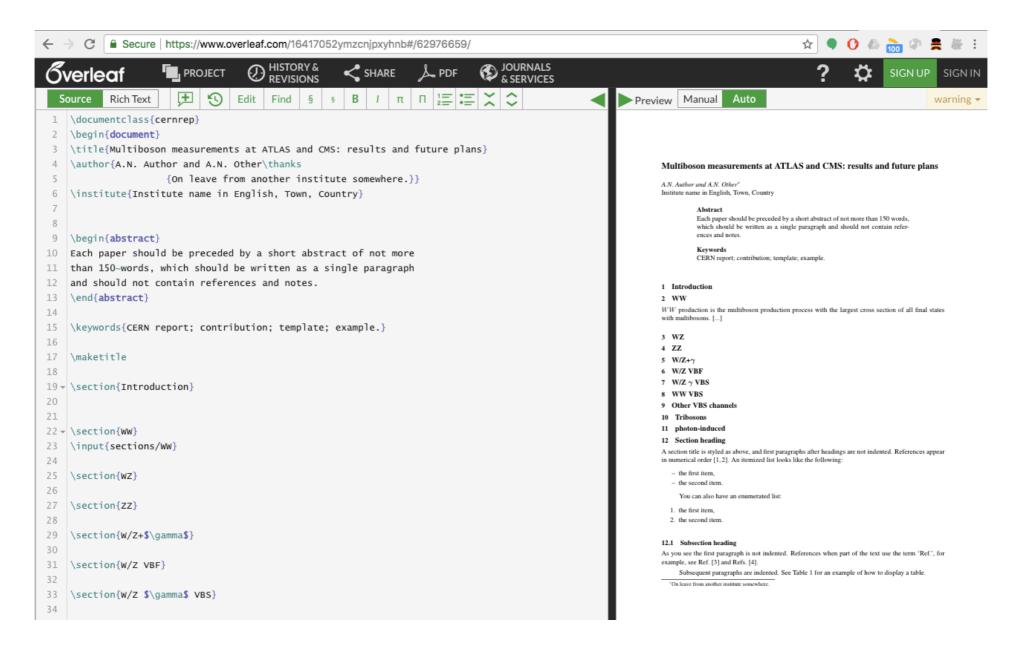
Note: subject to changes after further discussions!

- 6. Others (TBD)
 - A. Ratio measurements: uncertainties (theory & experiment), potential for EFT
 - B. EFT interpretation at the level of fiducial measurements vs. detector-level
 - pros & cons
 - benchmark BSM models

. . . .

7. Conclusions

Technical Details for editing



Access via the web:

https://www.overleaf.com/16417052ymzcnjpxyhnb

Access via git:

https://git.overleaf.com/16417052ymzcnjpxyhnb