Working group 1 summary

VBSCan Kick-off Meeting
28-30 June 2017, Split

Marco Zaro
LPTHE - Université Pierre et Marie Curie
Paris - France

Mathieu Pellen
TP2 - Universität Würzburg
Würzburg - Germany

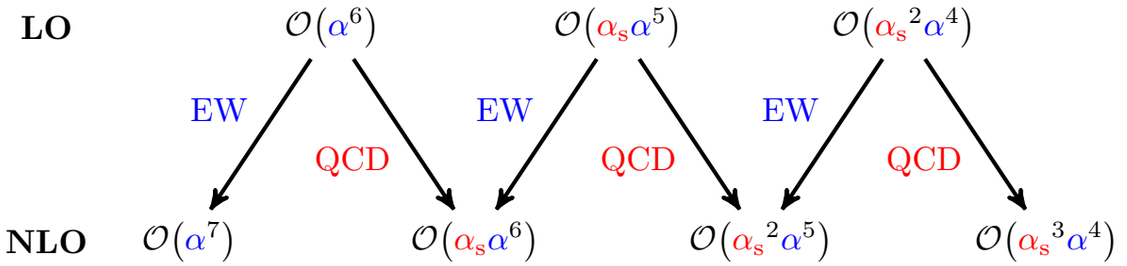
Les Houches activities

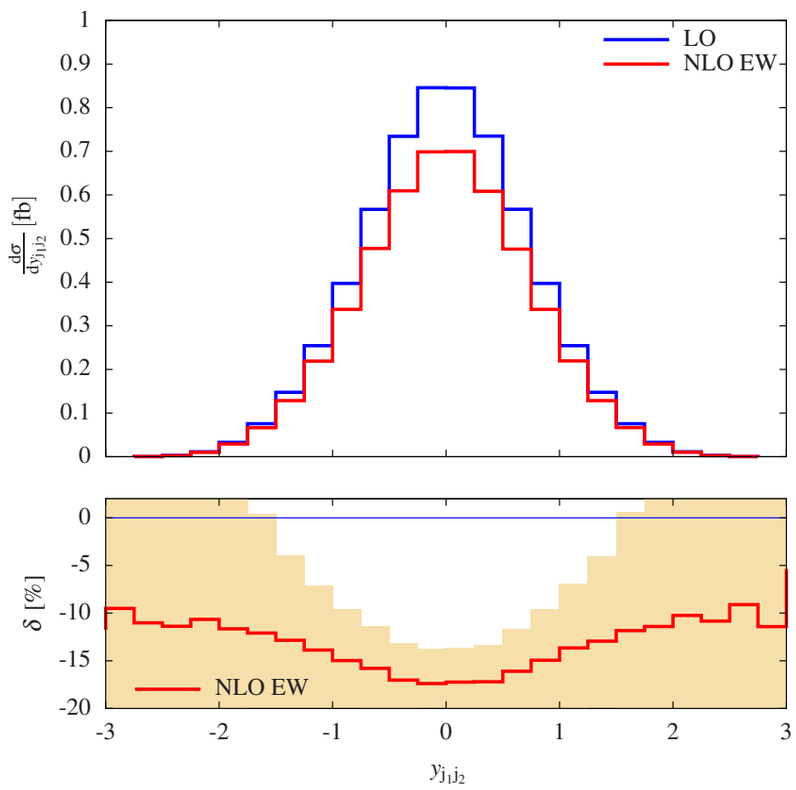
- SM: LO study of WZjj (and W^+W^-jj) on Δy_{jj} and M_{jj}
  - If you want to join send an email to mpellen@physik.uniwuerzburg.de and kdlong@wisc.edu
- BSM (Thanks Kristin!):
  - EFT validity and dim 8 operators https://phystev.cnrs.fr/wiki/2017:groups:np:efttherror
  - Staged approach towards constraining the SMEFT and the LHC https://phystev.cnrs.fr/wiki/2017:groups:higgs:lhsmeftroadmap
  - Please contact Kristin if interested (kristin.lohwasser@cern.ch)

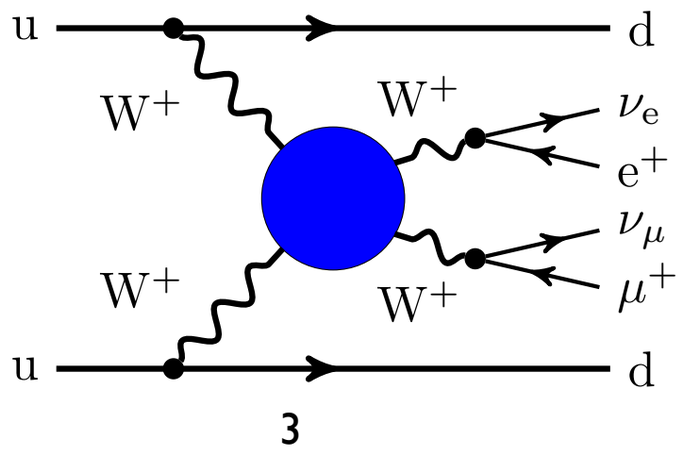
Radiative corrections to VBS

Benedikt Biedermann, Ansgar Denner, MP

- Complete set of NLO QCD+EW corrections to W^+W^+jj
  - Take home message: EW corrections are dominant at NLO
  - Combine measurement of QCD and EW processes together, separation is ill-defined at higher orders
- Large EW corrections come from VV→VV scattering



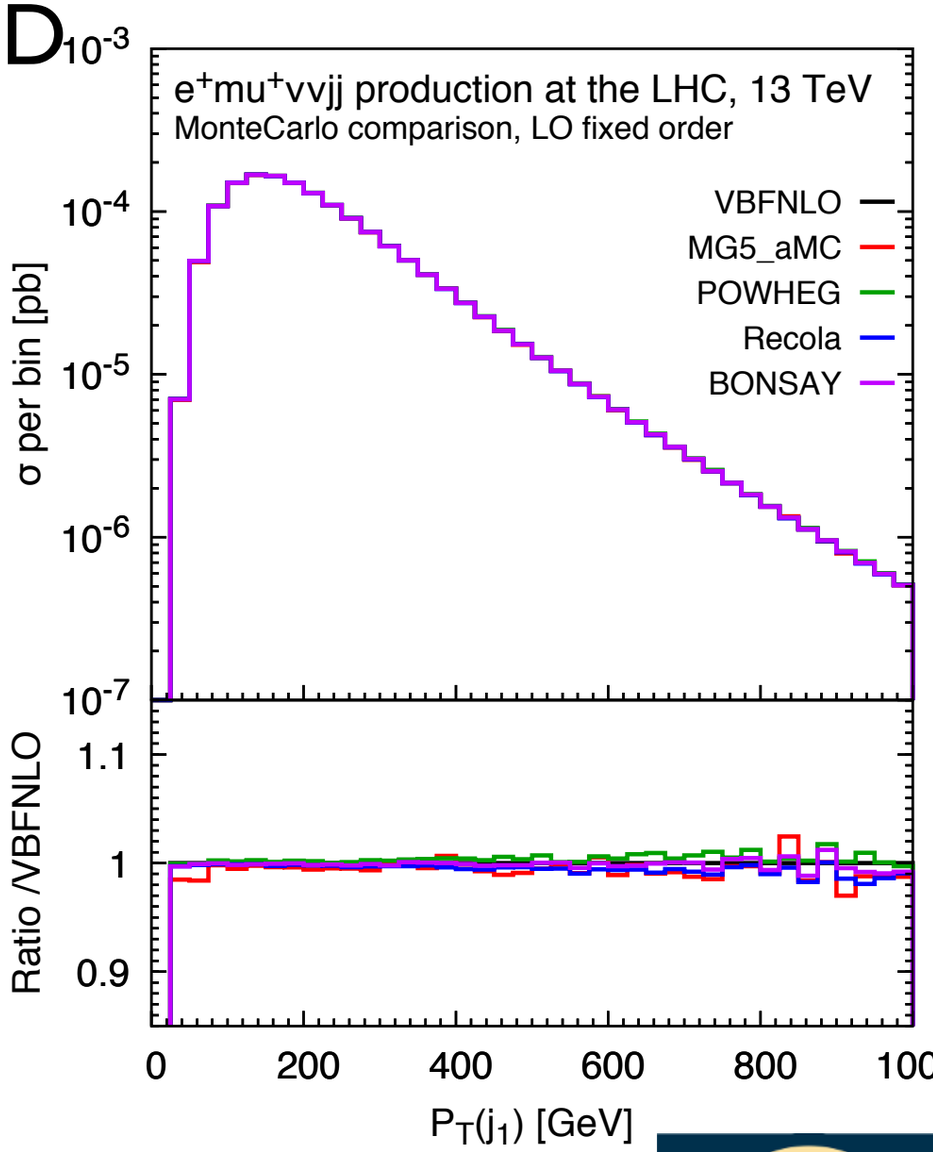




Tool comparison

Alexander Karlberg, MP, Michael Rauch, Jurgen Reuter, Christopher Schwan, MZ

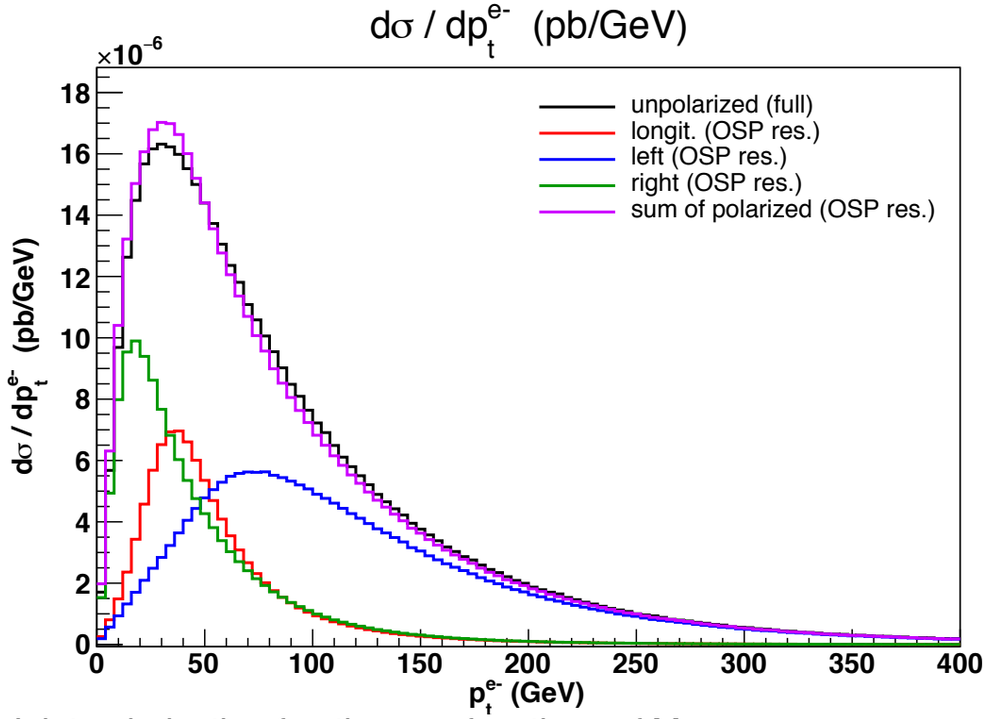
- Preliminary results at LO and NLO QCD available
- Excellent agreement at LO, differences appear at NLO (understood)
- Next steps:
  - NLO+PS
  - QCD background at NLO
  - Δy_{jj} and M_{jj} dependence of S/B ratio



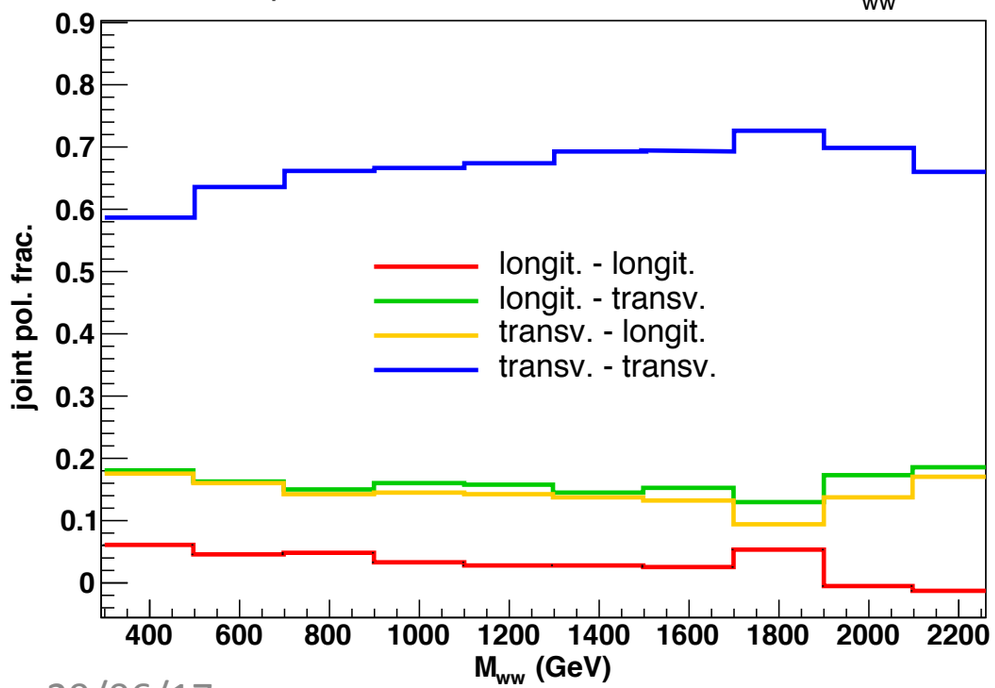
W-boson polarisation

Ezio Maina

- First framework to describe boson polarisation in VBS (based on double pole approx.)
- Works very well for observables which do not restrict the lepton decay angles
- Method can be exploited to measure polarised VBS at the LHC
- To become available in Phantom

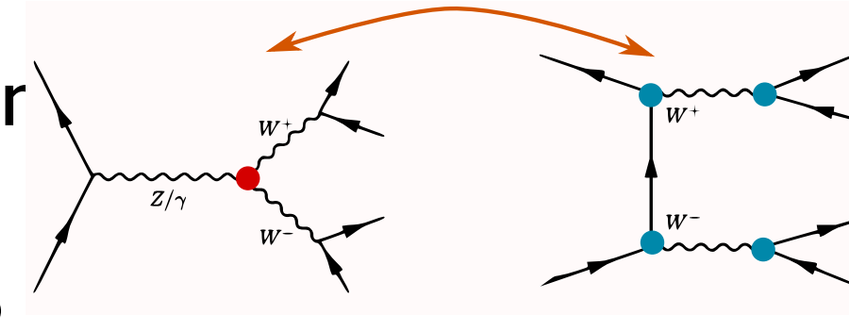


Joint polarization fractions as functions of M_{ww}



EFT and VBF

Ilaria Brivio



- SM EFT can be used as a model-independer physics
- 76 operators @Dim-6; 20 relevant for VBS
- Gauge invariance: operators in different vertices are linked!
- Assessing the EFT validity is non-trivial
- Plans for the future:

1. Figure how to produce experimental constraints on EFT parameters
   - Determine a parameterization with **d=6**, trying to keep gauge invariance and avoiding setting stuff to zero. How many are feasible?
   - UFO model with the complete SMEFT on the way!
   - SMEFT vs **HEFT**: extremely interesting!
   - Combination with other datasets?

Dim-8 operators might also be relevant

Final words

- WG1 meeting at MBI workshop (Karlsruhe, 28-30 August), on Thursday 31 (to be confirmed)
- Meetings for the different activities will be announced
- Please subscribe to the WG1 mailing list!
  https://groups.google.com/forum/#!forum/vbscan-wg1