

# 8 and 13 TeV Powheg predictions

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- Observable: Born level  $A_4(m, y)$
- (N)LO EW Powheg + NLO QCD  
generated with Powheg Z(\_ew) + Pythia8
- $\sin^2 \theta_{\text{eff}}^\ell : 0.23150(\pm 0.00050)$
- NNPDF31\_nnlo\_hessian\_pdfas
- 6 equal  $y_{\ell\ell}$  bins with width of 0.4
- 7  $m_{\ell\ell}$  bins: **52,66,76,86,96,106,116,150**
  
- muon and electron channels
- total of about 2.5 billion 8TeV and 5 billion 13 TeV events

- 18  $A_4(y, m)$  histograms
  - 8 and 13 TeV
  - $\sin^2 \theta_{\text{eff}}^\ell = 0.23150, 0.23100, 0.23200$
  - “ewkZnoew”, “nomZmod”, “ewkZnom”
- all 3 configs use  $\sin^2 \theta_{\text{eff}}^\ell = 0.23150$  default as input
  - **ewkZnoew**: “Z\_ew” program with  $no\_ew = 1$
  - **ewkZnom**: “Z\_ew” program with  $no\_ew = 0, ew\_ho = 0$
  - **nomZmod**: “Z” program with adjusted Z mass and width
- alternative  $\sin^2 \theta_{\text{eff}}^\ell$  predictions are done with reweighting
- histograms will be included in

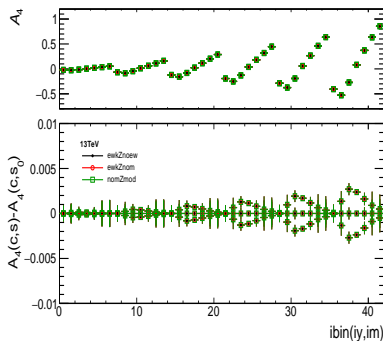
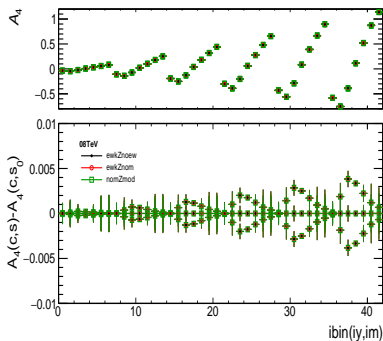
`/afs/cern.ch/user/a/akhukhun/public/LHCsw2PseudoData/aleko_sw2_v1.root`

# Predictions for 8 TeV nomZmod last 3 y bins

	ewkZnoew_23100	ewkZnoew_23150	ewkZnoew_23200
22	-0.2997 +/- 0.0008	-0.2997 +/- 0.0008	-0.2996 +/- 0.0008
23	-0.3888 +/- 0.0010	-0.3898 +/- 0.0010	-0.3908 +/- 0.0010
24	-0.1988 +/- 0.0006	-0.2008 +/- 0.0006	-0.2028 +/- 0.0006
25	0.0617 +/- 0.0002	0.0599 +/- 0.0002	0.0581 +/- 0.0002
26	0.2788 +/- 0.0006	0.2776 +/- 0.0006	0.2764 +/- 0.0006
27	0.4805 +/- 0.0014	0.4798 +/- 0.0014	0.4791 +/- 0.0014
28	0.6568 +/- 0.0015	0.6564 +/- 0.0015	0.6560 +/- 0.0015
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29	-0.4303 +/- 0.0009	-0.4302 +/- 0.0009	-0.4301 +/- 0.0009
30	-0.5568 +/- 0.0011	-0.5582 +/- 0.0011	-0.5596 +/- 0.0011
31	-0.2846 +/- 0.0006	-0.2874 +/- 0.0006	-0.2903 +/- 0.0006
32	0.0875 +/- 0.0002	0.0850 +/- 0.0002	0.0825 +/- 0.0002
33	0.3931 +/- 0.0007	0.3914 +/- 0.0007	0.3897 +/- 0.0007
34	0.6680 +/- 0.0014	0.6671 +/- 0.0014	0.6661 +/- 0.0014
35	0.8948 +/- 0.0015	0.8943 +/- 0.0015	0.8938 +/- 0.0015
-			
36	-0.5829 +/- 0.0009	-0.5828 +/- 0.0009	-0.5827 +/- 0.0009
37	-0.7522 +/- 0.0011	-0.7541 +/- 0.0011	-0.7560 +/- 0.0011
38	-0.3860 +/- 0.0006	-0.3898 +/- 0.0006	-0.3937 +/- 0.0006
39	0.1164 +/- 0.0002	0.1131 +/- 0.0002	0.1098 +/- 0.0002
40	0.5219 +/- 0.0007	0.5197 +/- 0.0007	0.5175 +/- 0.0007
41	0.8756 +/- 0.0015	0.8744 +/- 0.0015	0.8732 +/- 0.0015
42	1.1426 +/- 0.0016	1.1419 +/- 0.0016	1.1412 +/- 0.0016

# Predictions in bins of mass and rapidity

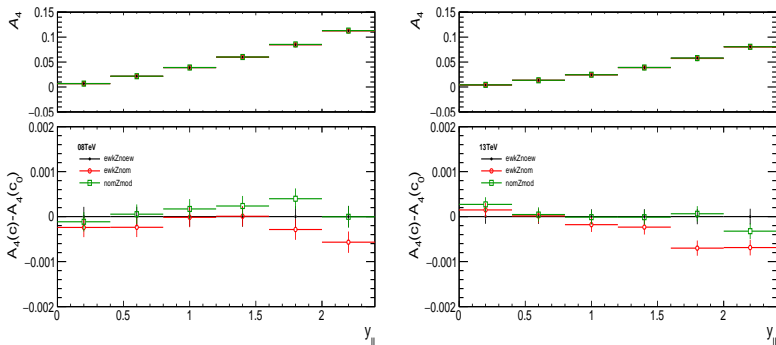
- variations are generated with reweighting



- changes seem identical for 3 setups

# Predictions in rapidity for Z peak bin

- central  $\sin^2 \theta_{\text{eff}}^\ell$  and Z peak bin predictions



- ewkZnom seems slightly lower on average
- need to understand (if there are significant) differences between 8 and 13 TeV
- next: need to quantify in terms of resulting fit  $\sin^2 \theta_{\text{eff}}^\ell$