Status/Updates on H->γγ Coupling Analysis

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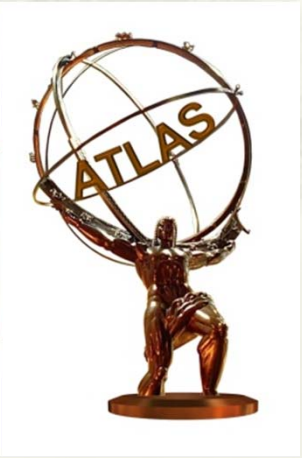
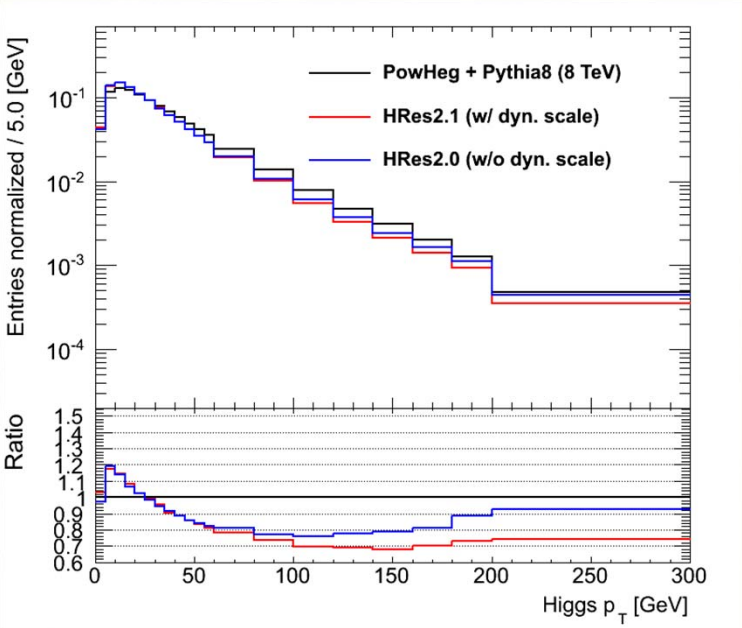


Status of coupling analysis

- Almost all systematics are ready
  - https://espace.cern.ch/atlas-phys-higgs-htogamgam/Lists/post%20Moriond/Attachments/36/Couplings_Analysis_v8.pdf
  - only miss background systematics on mass and photon ID
- New documentation available with corrections to CDS comments
  - https://cds.cern.ch/record/1643297
- The concerned cross checks has been done but need more statistics
- Cross checks on workspace/results and prepare for unblinding

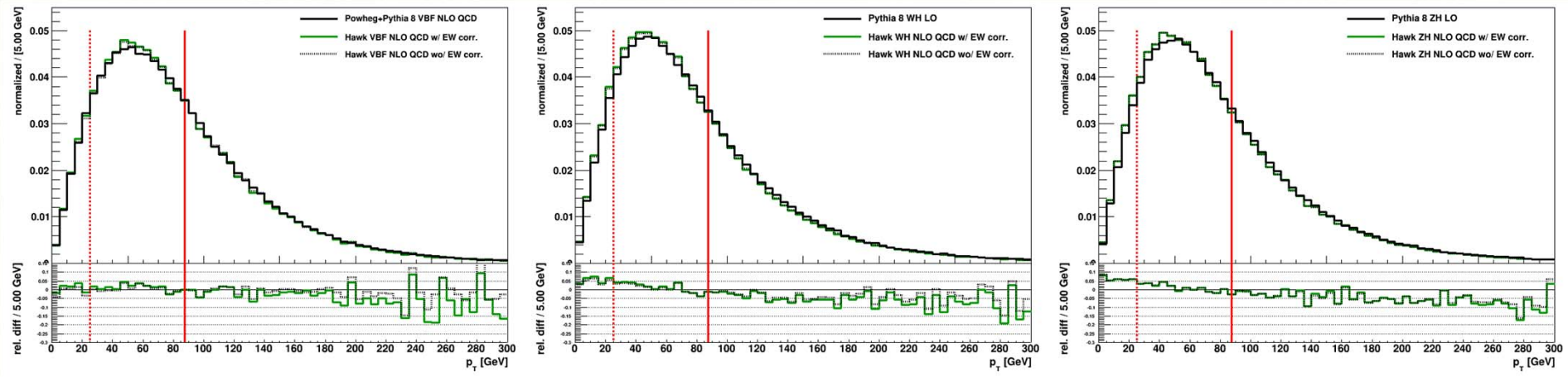
Updates on to p_T reweighting

- For ggF use p_T reweighting with HRes2.1 to include dynamic scale
  - Impact on acceptance is negligible 1%



p_T reweighting for VBF, WH and ZH

- The VBF,WH and ZH p_T distribution is reweighted to match the HAWK distribution.
  - difference between HAWK and POWHEG/PYTHIA
    - HAWK is at NLO and includes EW corrections
  - The size of the effect is of the order of 2%.



VBF WH ZH

Table of signal shape

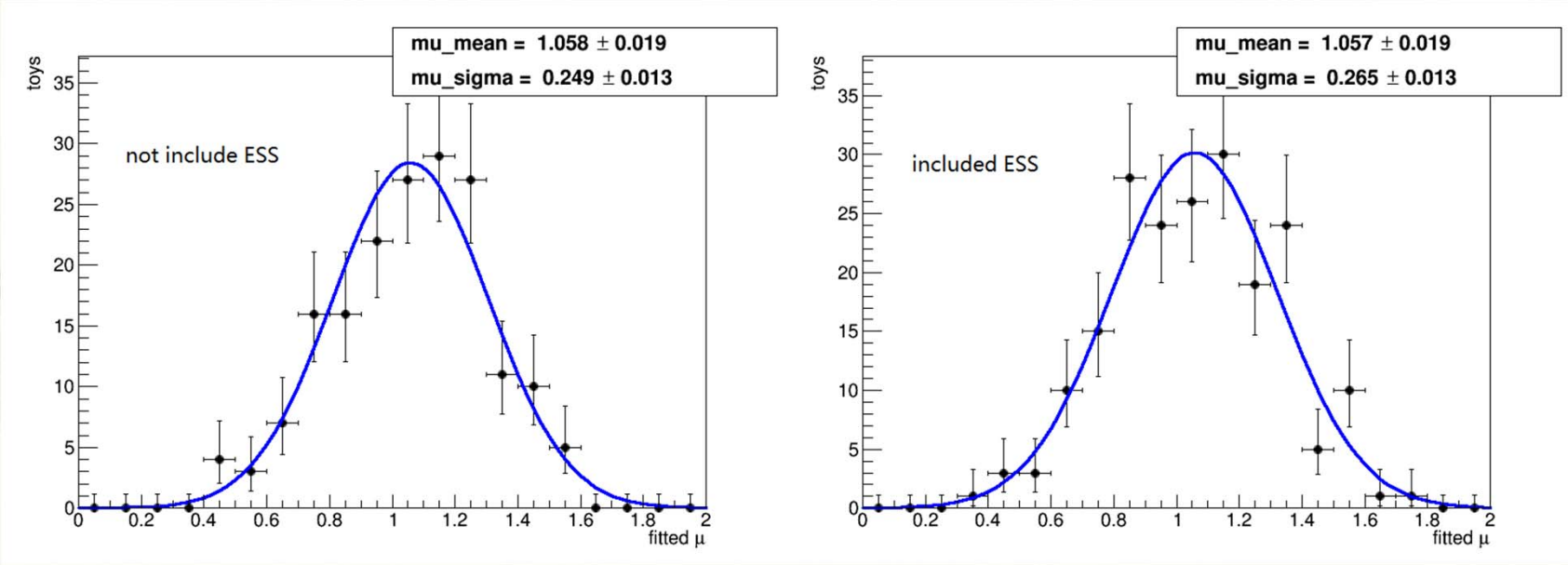
- Signal shape with latest parameterization
  - may be slightly changed after cross checks

Category	nSig	sigmaCB	FWHM	sigmaEff90	nbkg	nbkgEff90	s/b	s/sqrt(b)
1	136.759	1.41647	3.37	1.47	24039	2449.91	0.0558218	2.76299
2	11.4531	1.28018	3.03	1.32	785.368	77.2229	0.148312	1.30331
3	209.104	1.65351	4.13	1.87	66522.2	6770.23	0.0308858	2.54133
4	16.4634	1.51354	3.68	1.65	2505.65	248.165	0.0663405	1.04508
5	8.64174	1.40764	3.48	1.58	397.727	40.2959	0.214457	1.36135
6	5.76186	1.27069	3.21	1.47	62.8889	6.4143	0.898284	2.27504
7	3.07652	1.26404	3.18	1.45	179.709	17.8534	0.172321	0.728114
8	1.14962	1.50243	3.40	1.53	29.99	2.97628	0.386261	0.666374
9	1.75403	1.49792	3.61	1.60	38.5252	3.77344	0.464837	0.902962
10	0.254543	1.41561	3.56	1.60	2.4722	0.241677	1.05324	0.517777
11	0.549132	1.47278	3.49	1.53	27.3684	2.68717	0.204354	0.334988
12	0.541734	1.50888	3.60	1.58	6.27731	0.638207	0.848837	0.678118

Table 6: Signal model parameters and expected background (from fit) (preliminary).

Cross checks: fitted mu bias from ESS

- Check if the ESS will introduce large bias to the mu measurement due to the align of the peaks between categories

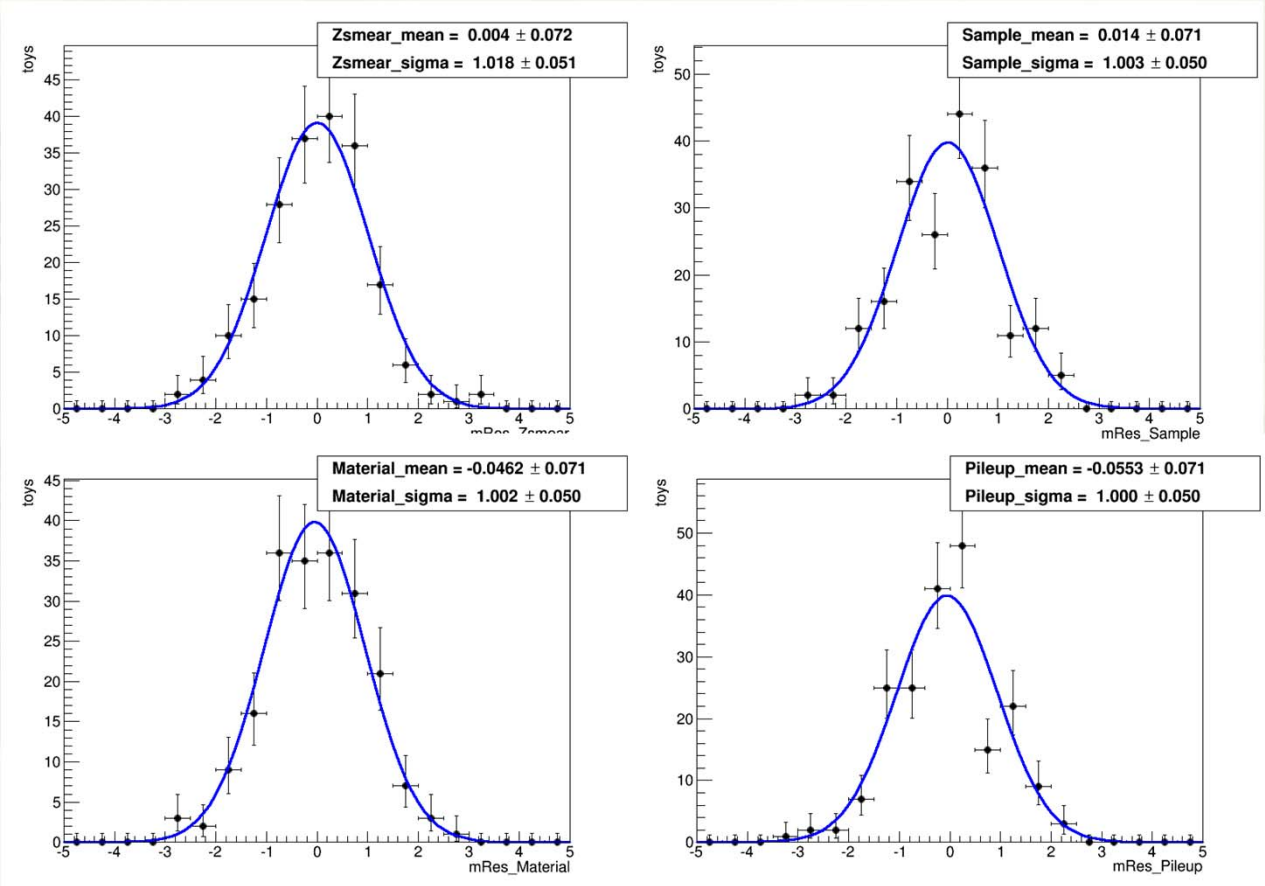


The measured mu is not increased by introducing ESS

Cross checks: resolution nuisance parameters

- Check if we expect large pulls of the mass resolution nuisance parameters

a gausian with mean 0, sigma 1 as expected



Modification on documentation

- Categorization
  - Added background composition plots for VH hadronic, VH MET, WH-1lepton, ZH-dilepton categories
  - Added table with expected signal + fraction +efficiency shown in last meeting
  - Modify VBF, ttH sections to address arisen questions
- Signal and background model
  - Added table with signal shape, expected background and s/b
- Systematics
  - Re-organize MET, JES systematics to separate uncertainties sources