

ROOT/RooFit fit difference

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Introduction

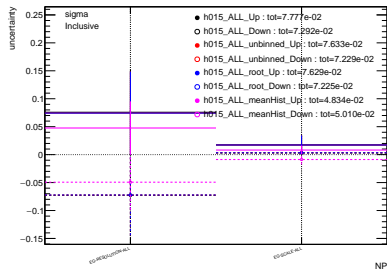
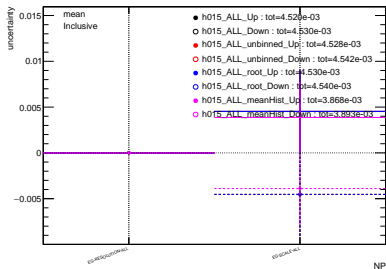
- Marc observed a difference in fit results depending on using ROOT or RooFit
 - ▶ "looks like" RooFit does not consider uncertainties in weighted RooDataHist
- Checked if effect has visible effects on calibration systematic determination for couplings analysis.
- 4 fit methods compared :
 - ▶ nominal : fit of weighted binned RooDataHist
 - ▶ unbinned : fit of weighted unbinned RooDataSet
 - ▶ root : fit of weighted binned TH1
 - ▶ meanHist : mean and RMS of weighted binned TH1

Inclusive Fit Values

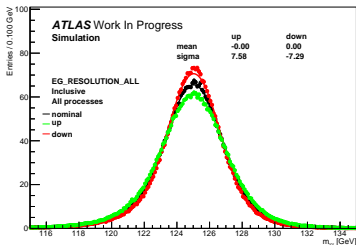
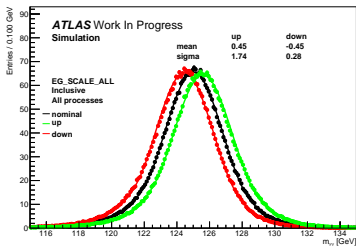
NP	mean	sigma	alphaHi	alphaLow	nHi	nLow
RooFit						
Nominal	125.026	1.80019	1.40272	1.27818	42.7717	10.9658
EG-RESOLUTION-ALL-1down	125.029	1.67024	1.40272	1.27818	42.7717	10.9658
EG-RESOLUTION-ALL-1up	125.022	1.93601	1.40272	1.27818	42.7717	10.9658
EG-SCALE-ALL-1up	125.59	1.83223	1.40272	1.27818	42.7717	10.9658
EG-SCALE-ALL-1down	124.46	1.80542	1.40272	1.27818	42.7717	10.9658
Root						
Nominal	125.032	1.84212	1.6817	1.37856	6.73971	7.27819
EG-RESOLUTION-ALL-1down	125.033	1.70918	1.6817	1.37856	6.73971	7.27819
EG-RESOLUTION-ALL-1up	125.03	1.97901	1.6817	1.37856	6.73971	7.27819
EG-SCALE-ALL-1down	124.464	1.8484	1.6817	1.37856	6.73971	7.27819
EG-SCALE-ALL-1up	125.598	1.87389	1.6817	1.37856	6.73971	7.27819

Inclusive results in ALL model

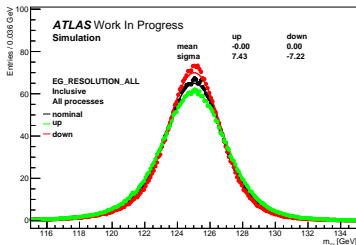
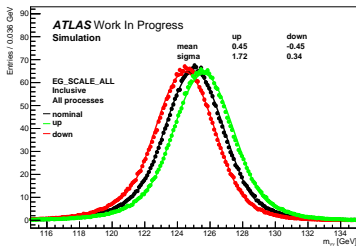
- Binned or unbinned fit with RooFit give similar results
- RooFit or Root give slightly different systematics



RooFit



ROOT



RESOLUTION VHBSM

NP	mean	sigma	alphaHi	alphaLow	nHi	nLow
RooFit						
Nominal	125.144	0.120372	0.207774	0.1117	1.24293	13.9984
EG _{RESOLUTIONALL} _1down	125.338	0.111511	0.207774	0.1117	1.24293	13.9984
EG _{RESOLUTIONALL} _1up	125.053	0.129649	0.207774	0.1117	1.24293	13.9984
EG _{SCALEALL} _1down	124.352	0.117578	0.207774	0.1117	1.24293	13.9984
EG _{SCALEALL} _1up	125.941	0.12559	0.207774	0.1117	1.24293	13.9984
ROOT						
Nominal	124.919	0.919806	0.487448	1.08326	6.73773	3.7769
EG _{RESOLUTIONALL} _1down	125.001	0.828496	0.487448	1.08326	6.73773	3.7769
EG _{RESOLUTIONALL} _1up	124.877	0.890828	0.487448	1.08326	6.73773	3.7769
EG _{SCALEALL} _1down	124.211	0.955802	0.487448	1.08326	6.73773	3.7769
EG _{SCALEALL} _1up	125.624	0.919994	0.487448	1.08326	6.73773	3.7769

