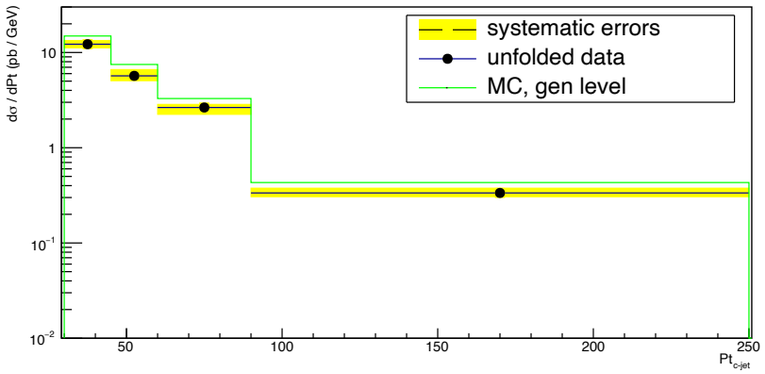
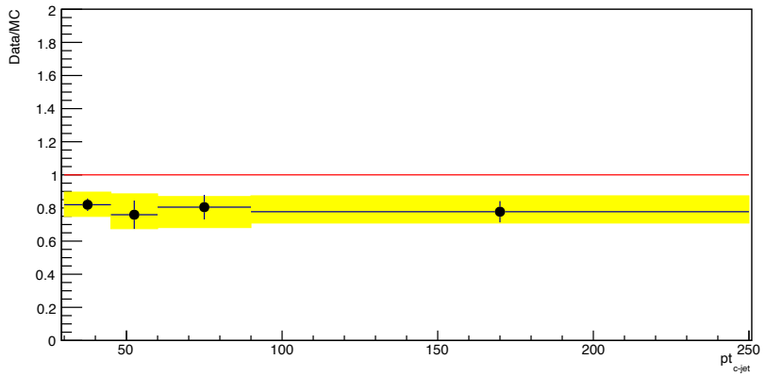
list of updates (after CWR questions)

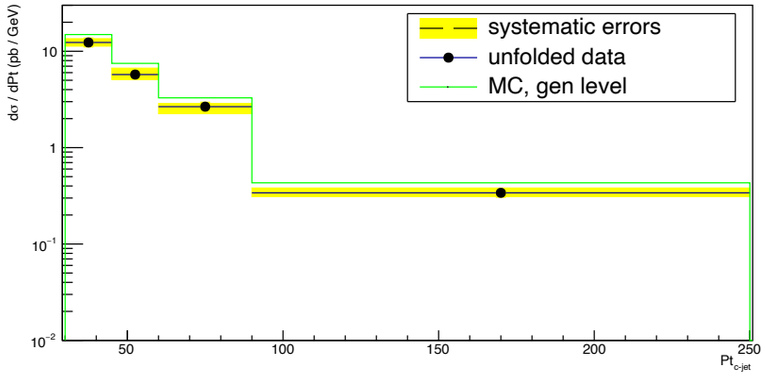
1. MC template stat errors separated (as Th. uncertainty)
2. HLT efficiency combinatoric formula -> matching with highest pt lepton

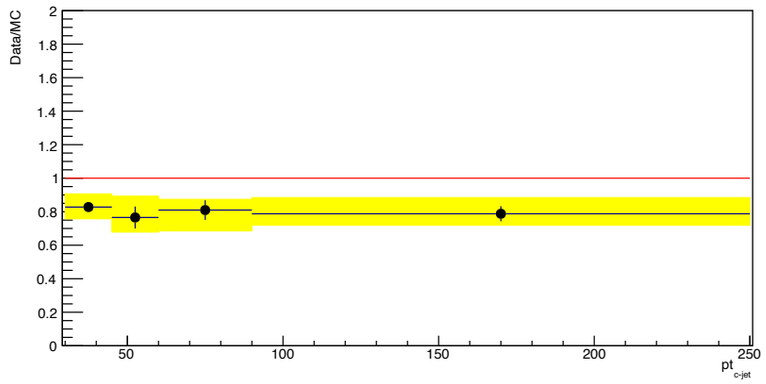
unfolding results

μμ

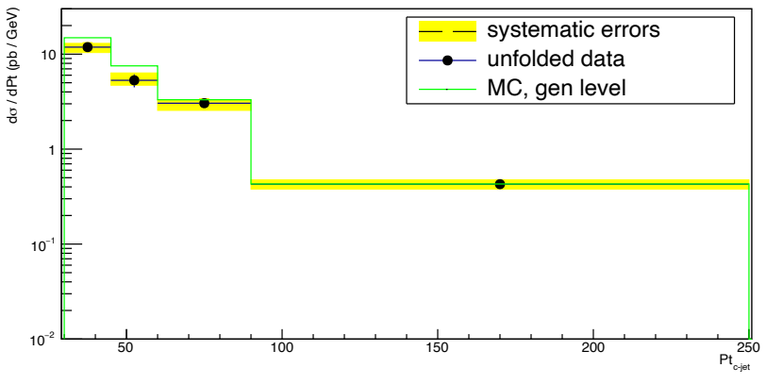


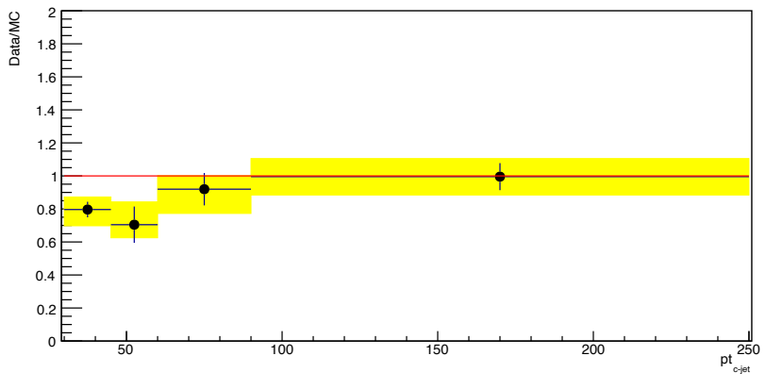


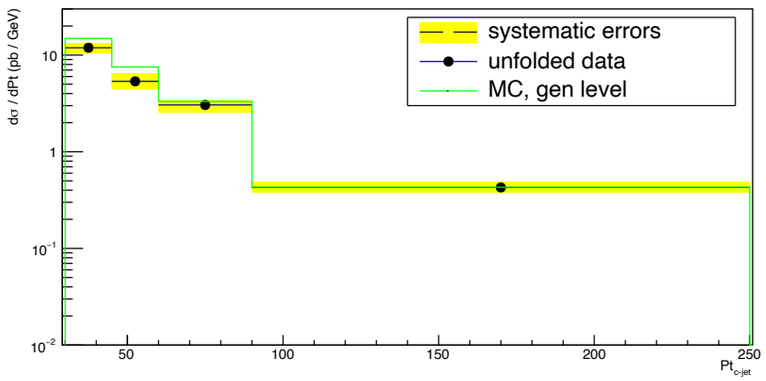


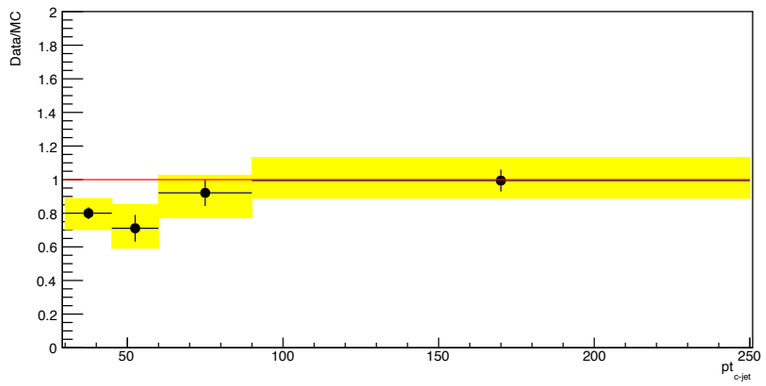


ee



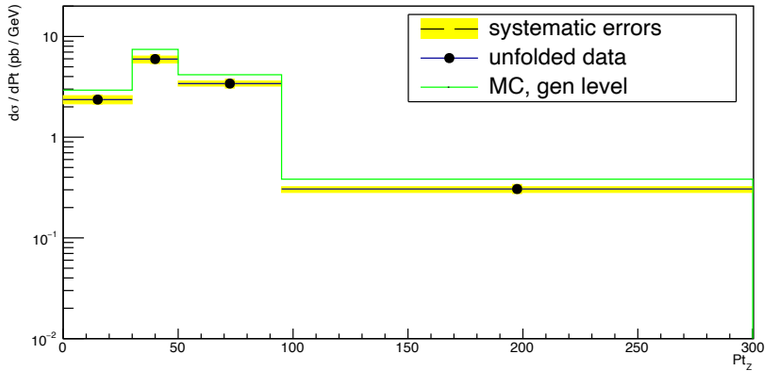


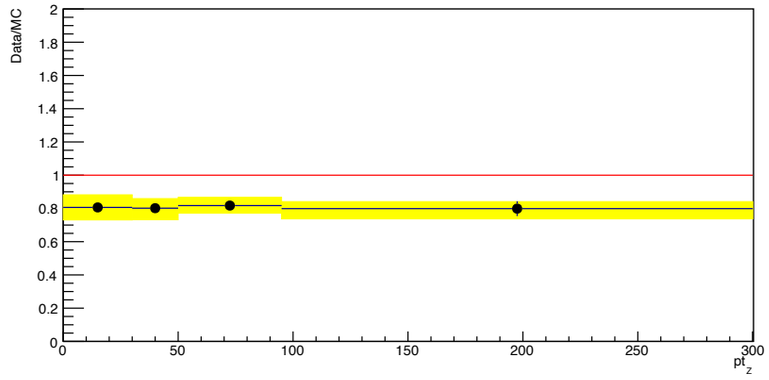




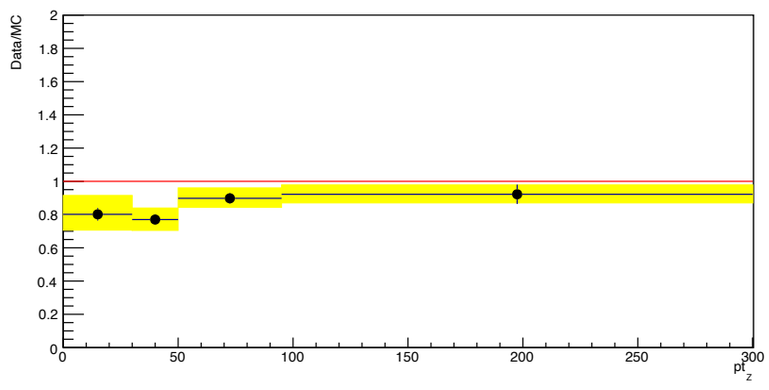
unfolding results

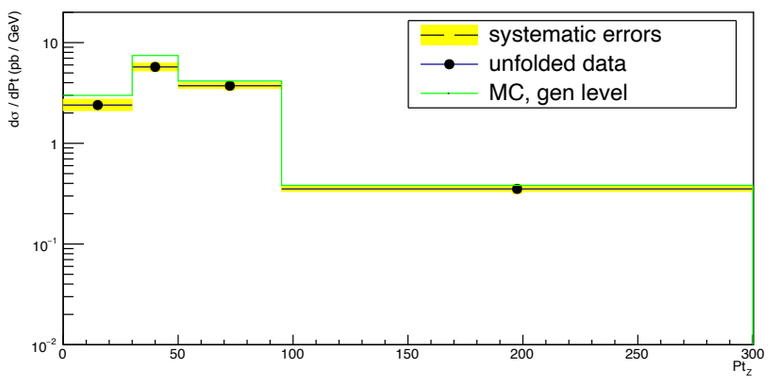
μμ

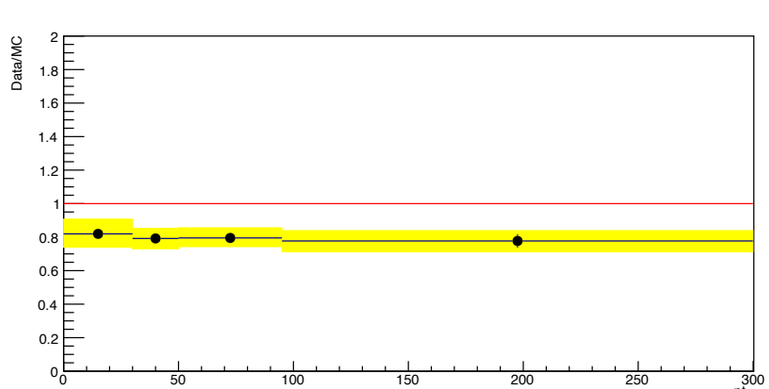


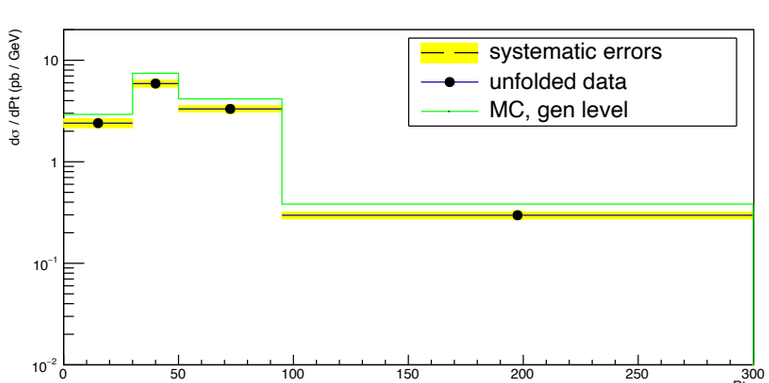


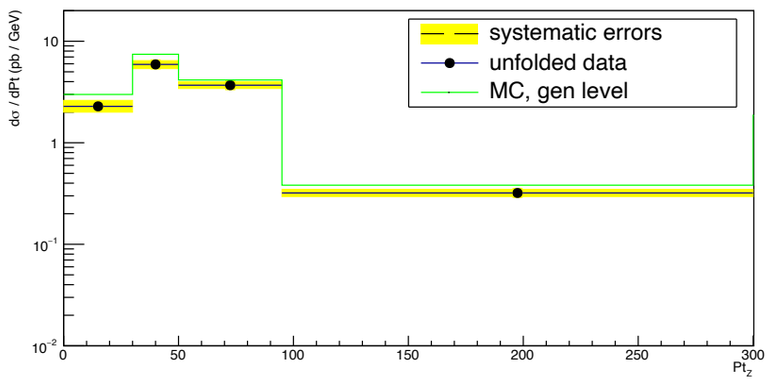
ee

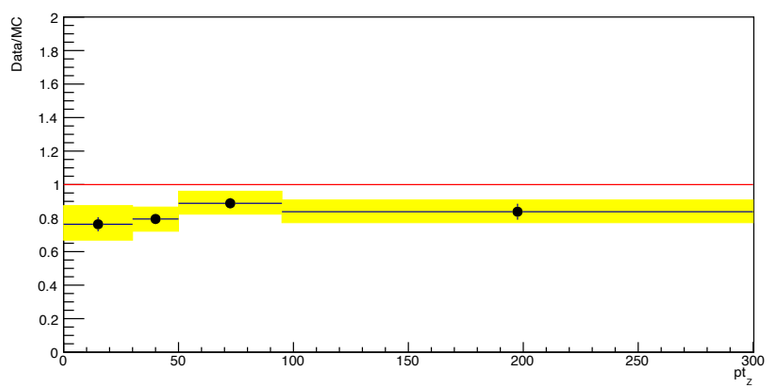


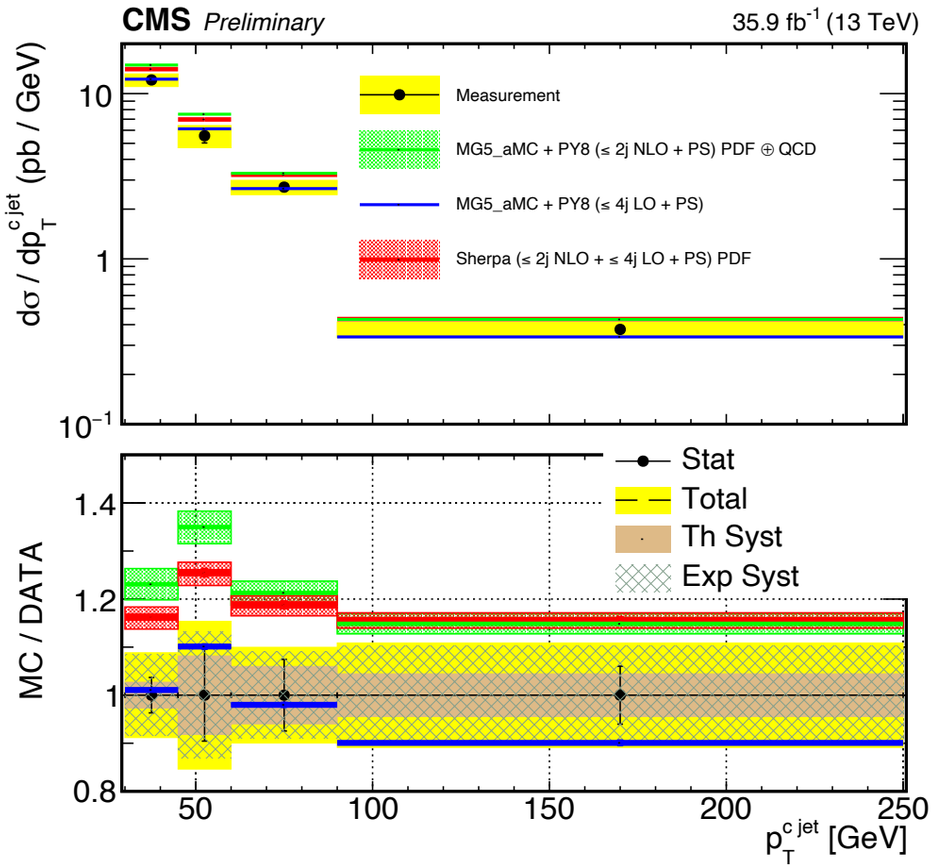


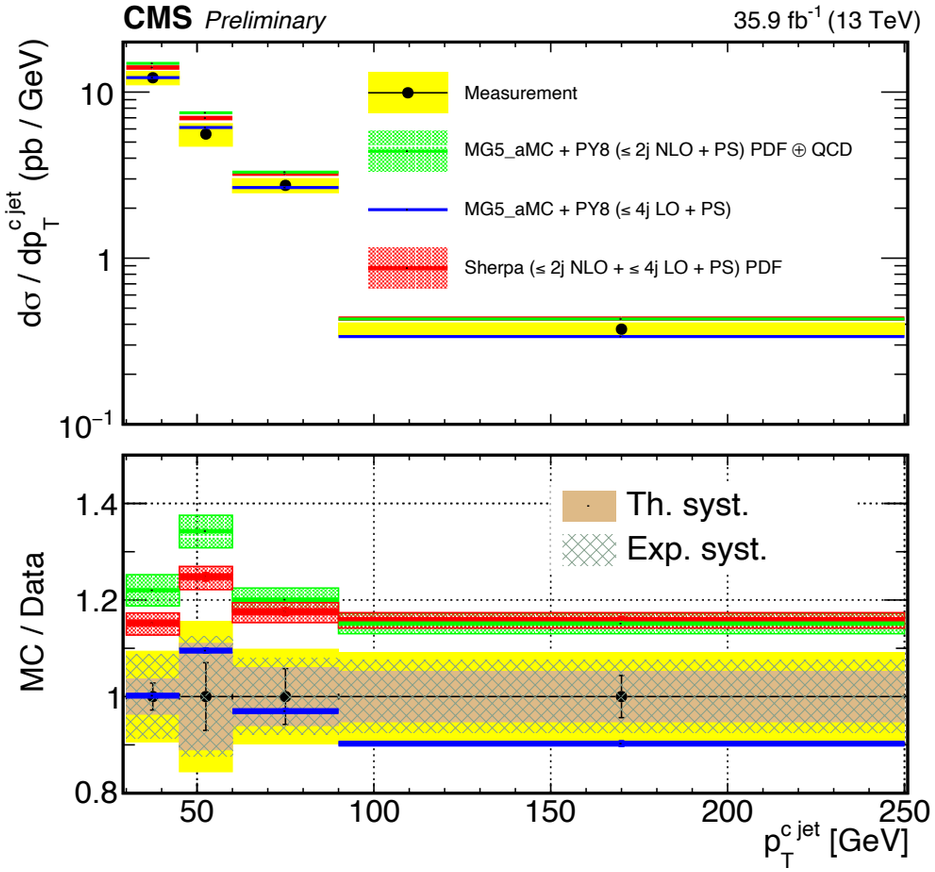


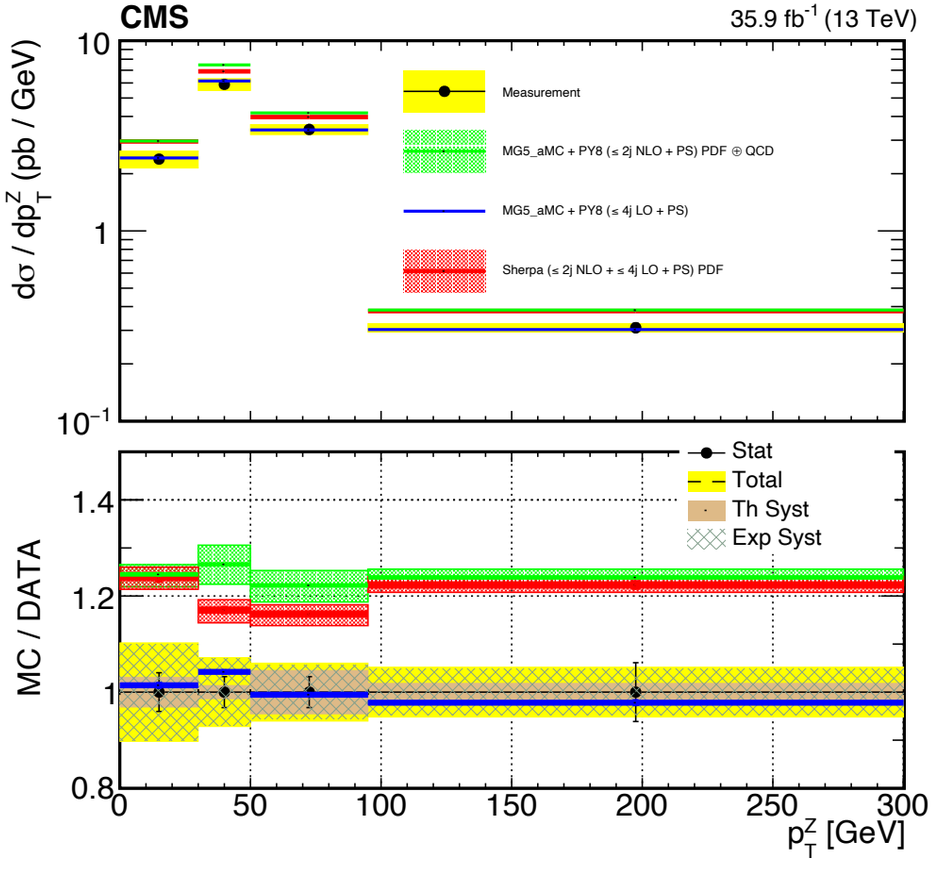


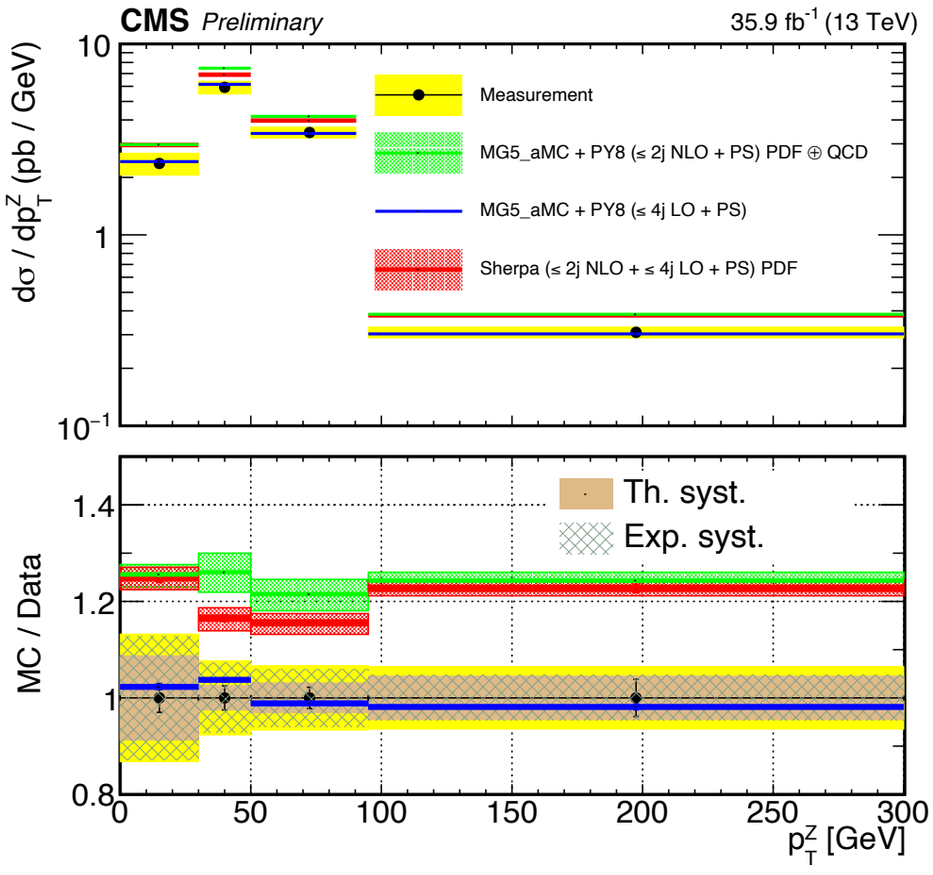





CMS Preliminary
35.9 fb-1 (13 TeV)
dσ / dp_T^c jet (pb / GeV)
Measurement
MG5_aMC + PY8 (≤ 2j NLO + PS) PDF ⊕ QCD
MG5_aMC + PY8 (≤ 4j LO + PS)
Sherpa (≤ 2j NLO + ≤ 4j LO + PS) PDF
MC / DATA
Stat
Total
Th Syst
Exp Syst
p_T^c jet [GeV]


CMS Preliminary
35.9 fb-1 (13 TeV)
dσ / dp_T^c jet (pb / GeV)
Measurement
MG5_aMC + PY8 (≤ 2j NLO + PS) PDF ⊕ QCD
MG5_aMC + PY8 (≤ 4j LO + PS)
Sherpa (≤ 2j NLO + ≤ 4j LO + PS) PDF
MC / Data
Th. syst.
Exp. syst.
p_T^c jet [GeV]


CMS
35.9 fb-1 (13 TeV)
dσ / dp_T^Z (pb / GeV)
Measurement
MG5_aMC + PY8 (≤ 2j NLO + PS) PDF ⊕ QCD
MG5_aMC + PY8 (≤ 4j LO + PS)
Sherpa (≤ 2j NLO + ≤ 4j LO + PS) PDF
MC / DATA
Stat
Total
Th Syst
Exp Syst
p_T^Z [GeV]


CMS Preliminary
35.9 fb-1 (13 TeV)
dσ / dp_T^Z (pb / GeV)
Measurement
MG5_aMC + PY8 (≤ 2j NLO + PS) PDF ⊕ QCD
MG5_aMC + PY8 (≤ 4j LO + PS)
Sherpa (≤ 2j NLO + ≤ 4j LO + PS) PDF
MC / Data
Th. syst.
Exp. syst.
p_T^Z [GeV]

total fiducial cross-section changes (counting experiment)

	σ_{fid}
pt c-jet, μμ	400.1±27.3(syst) ± 9.1 (stat)
pt Z, μμ	397.3±24.7(syst) ± 9.9 (stat)
pt c-jet, ee	418.7±30.6(syst) ± 11.9 (stat)
pt Z, ee	419.8±31.7(syst) ± 13.0 (stat)
pt c-jet, combined	402.0 ± 26.2 (syst) ± 7.3(stat)
pt Z, combined	403.4 ± 24.0 (syst) ± 7.9 (stat)

	σ_{fid}
pt c-jet, μμ	403.8±28.1(syst) ± 7.0 (stat)
pt Z, μμ	400.8±25.4(syst) ± 6.8 (stat)
pt c-jet, ee	421.1±31.8(syst) ± 9.2 (stat)
pt Z, ee	422.1±32.9(syst) ± 9.1 (stat)
pt c-jet, combined	405.5 ± 31.9 (syst) ± 5.6(stat)
pt Z, combined	405.4 ± 24.6 (syst) ± 5.5 (stat)

MC stat errors

1. Fit with both MC and data stat uncertainties
2. unfold result
3. Fit with data stat uncertainties only (MC templates scaled by factor 10)
4. unfold result
5. difference of unfolded stat errors in quadrature is MC stat uncertainty

fit errors cross-check

Z pt bin ee channel	TFractionFitter	TFractionFitter (MC err only)	TFractionFitter (data err only)	TFractionFitter err_MC + err_data in quad.	RooFit
0-30	0.049	0.031	0.035	0.047	0.037
30-50	0.04	0.024	0.032	0.04	0.031
50-65	0.059	0.036	0.047	0.059	0.045
65-95	0.057	0.035	0.038	0.051	0.043
95-300	0.067	0.041	0.044	0.06	0.051

fit errors cross-check

c-tagged jet pt bin ee channel	TFractionFitter	TFractionFitter (MC err only)	TFractionFitter (data err only)	TFractionFitter err_MC + err_data in quad.	RooFit
30-37	0.051	0.041	0.041	0.058	0.039
37-45	0.046	0.029	0.036	0.046	0.035
45-60	0.046	0.028	0.036	0.046	0.035
60-90	0.051	0.031	0.034	0.046	0.039
90-250	0.063	0.052	0.05	0.072	0.047

fit errors cross-check

Z pt bin mumu channel	TFractionFitter	TFractionFitter (MC err only)	TFractionFitter (data err only)	TFractionFitter err_MC + err_data in quad.	RooFit
0-30	0.039	0.024	0.027	0.035	0.031
30-50	0.03	0.018	0.021	0.027	0.023
50-65	0.045	0.038	0.037	0.052	0.035
65-95	0.041	0.025	0.032	0.041	0.031
95-300	0.059	0.036	0.037	0.051	0.046

fit errors cross-check

c-tagged jet pt bin mumu channel	TFractionFitter	TFractionFitter (MC err only)	TFractionFitter (data err only)	TFractionFitter err_MC + err_data in quad.	RooFit
30-37	0.041	0.035	0.03	0.046	0.033
37-45	0.037	0.022	0.031	0.038	0.029
45-60	0.034	0.026	0.028	0.038	0.027
60-90	0.04	0.027	0.032	0.042	0.03
90-250	0.055	0.042	0.035	0.055	0.038