

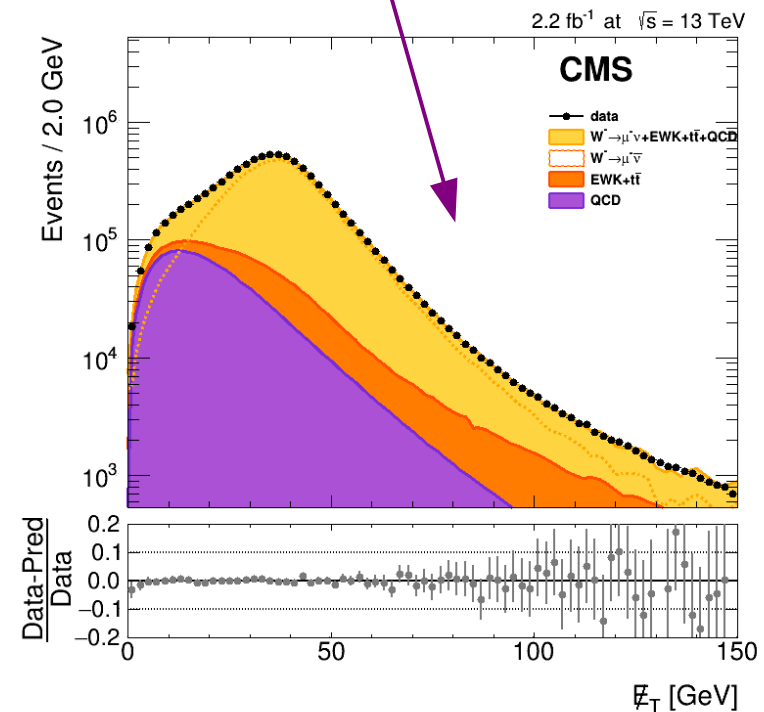
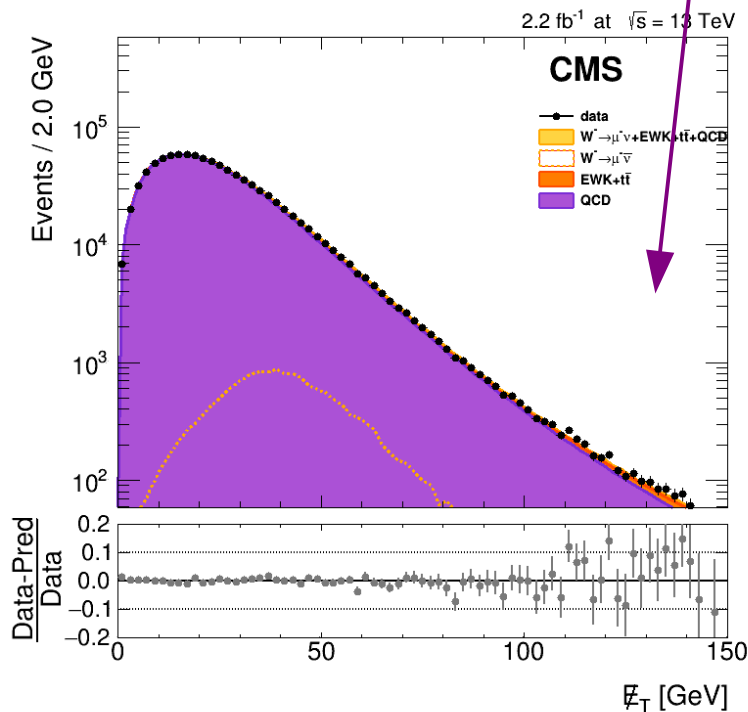
QCD background fits in eta bins

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QCD fit function

$$f_{\text{QCD}}(E_T^{\text{miss}}) = E_T^{\text{miss}} \exp \left(- \frac{a3 \quad a1 \quad E_T^{\text{miss}2} \quad a2}{\sigma_0 + \sigma_1 E_T^{\text{miss}2} + \sigma_2 E_T^{\text{miss}}} \right)$$

- Fitted simultaneously in control and signal region
- For nominal results σ_1 the same for both regions
- For systematic uncertainties σ_1 different for different regions
 - How does fits look like?



Consider various fits and binnings

→ Looked at a1, a2, a3 parameters in eta bins

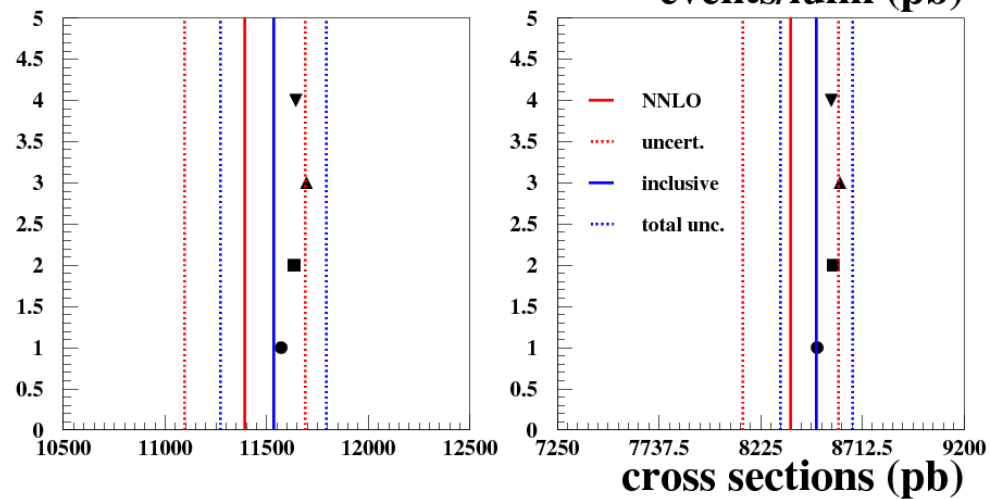
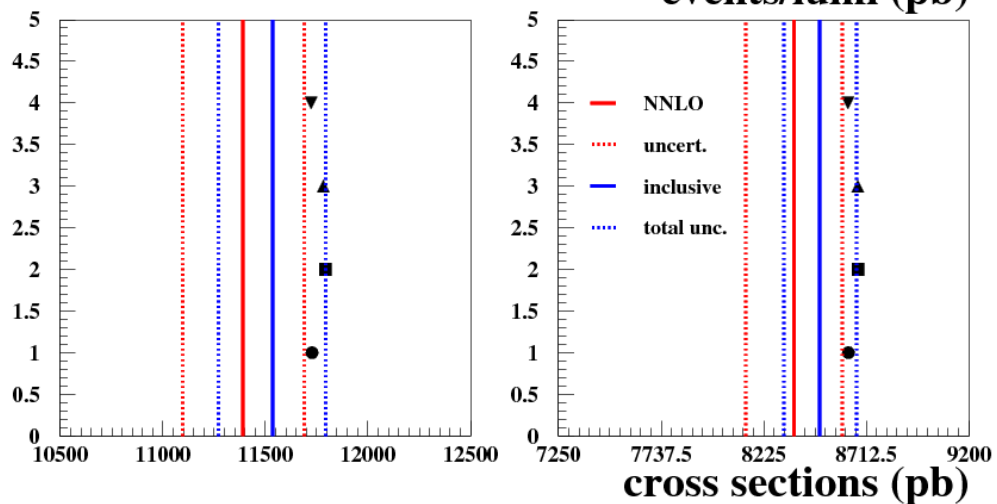
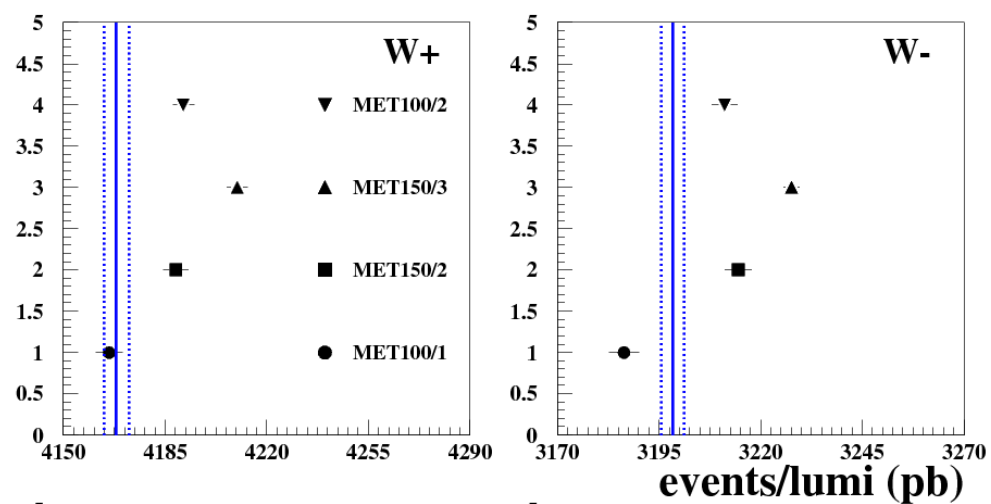
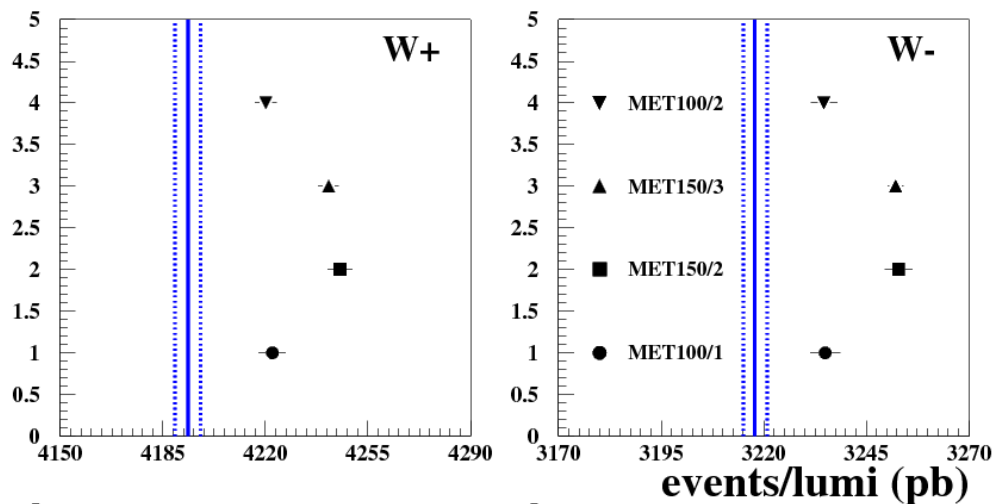
- 1) $0 < \text{MET} < 150$ GeV, 2 GeV bins, a1 for control and signal different → EXCLUDED
-
- a1_control = a1_signal
 - 1) MET 0-150, 1 GeV bins → EXCLUDED
 - 2) MET 0-150, 2 GeV bins
 - 3) MET 0-150, 3 GeV bins
 - 4) MET 0-150, 5 GeV bins → EXCLUDED
 - 5) MET 0-100, 1 GeV bins
 - 6) MET 0-100, 2 GeV bins

4 fits, total cross sections

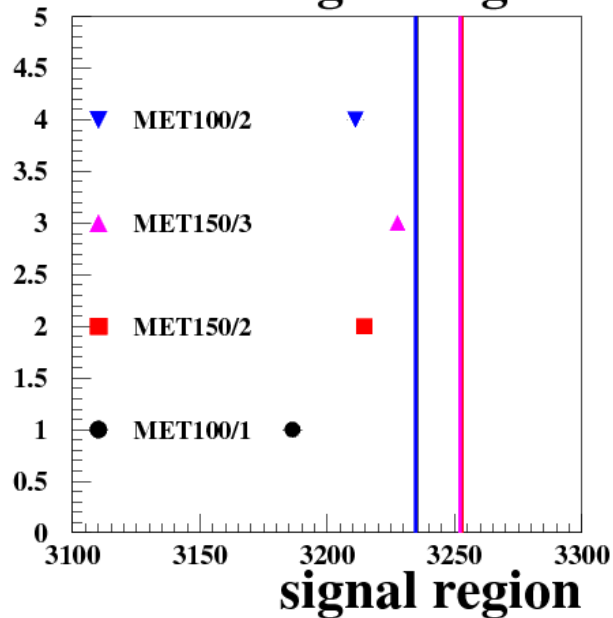
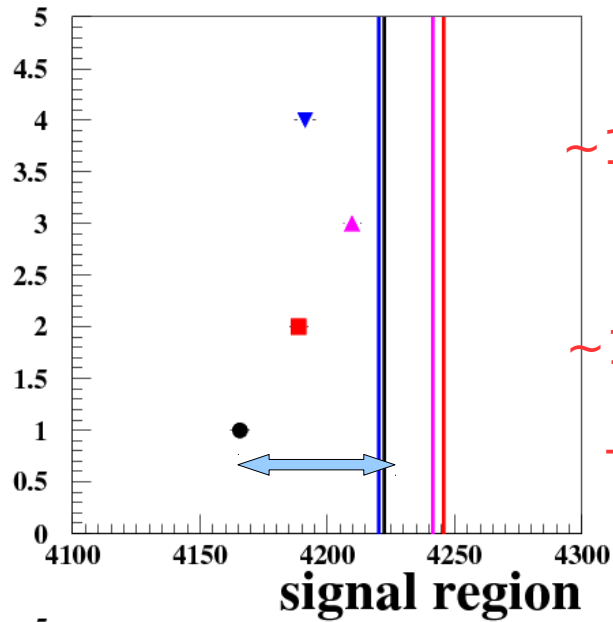
- Inclusive cross sections from latest SMP-16-013 note
 - NNLO calculations, FEWZ, NNPDF3.0
 - W^+ : 11392 ± 296 pb
 - W^- : 8369 ± 229 pb
 - Measurement
 - W^+ to μ^+ : 11534 ± 12 (stat) ± 262 (syst) ± 311 (lumi)
 - W^- to μ^- : 8493 ± 8 (stat) ± 173 (syst) ± 229 (lumi)

FULL eta range

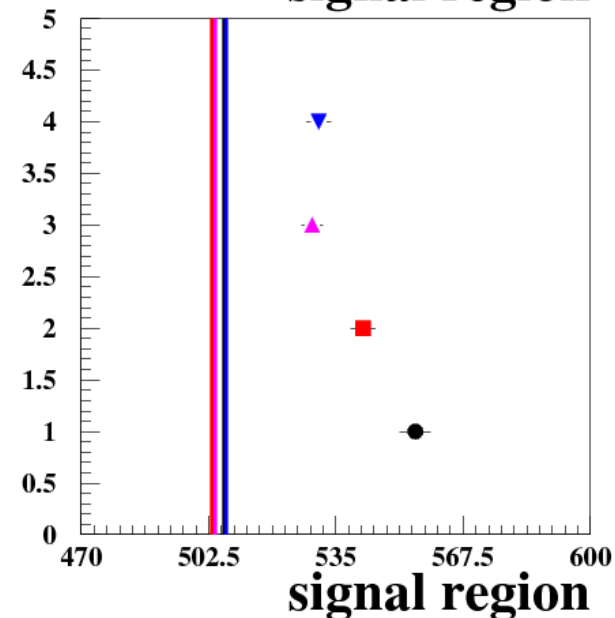
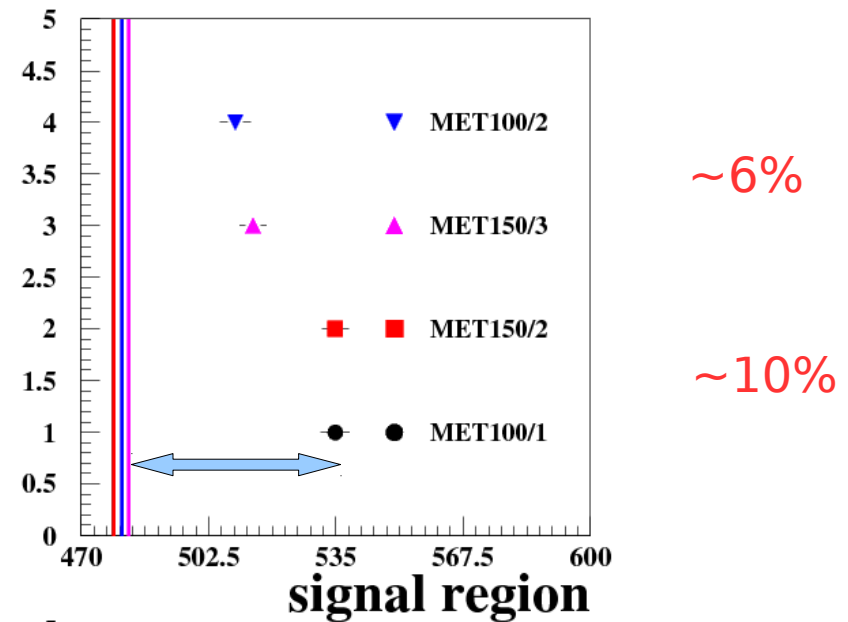
SUM(eta ranges)



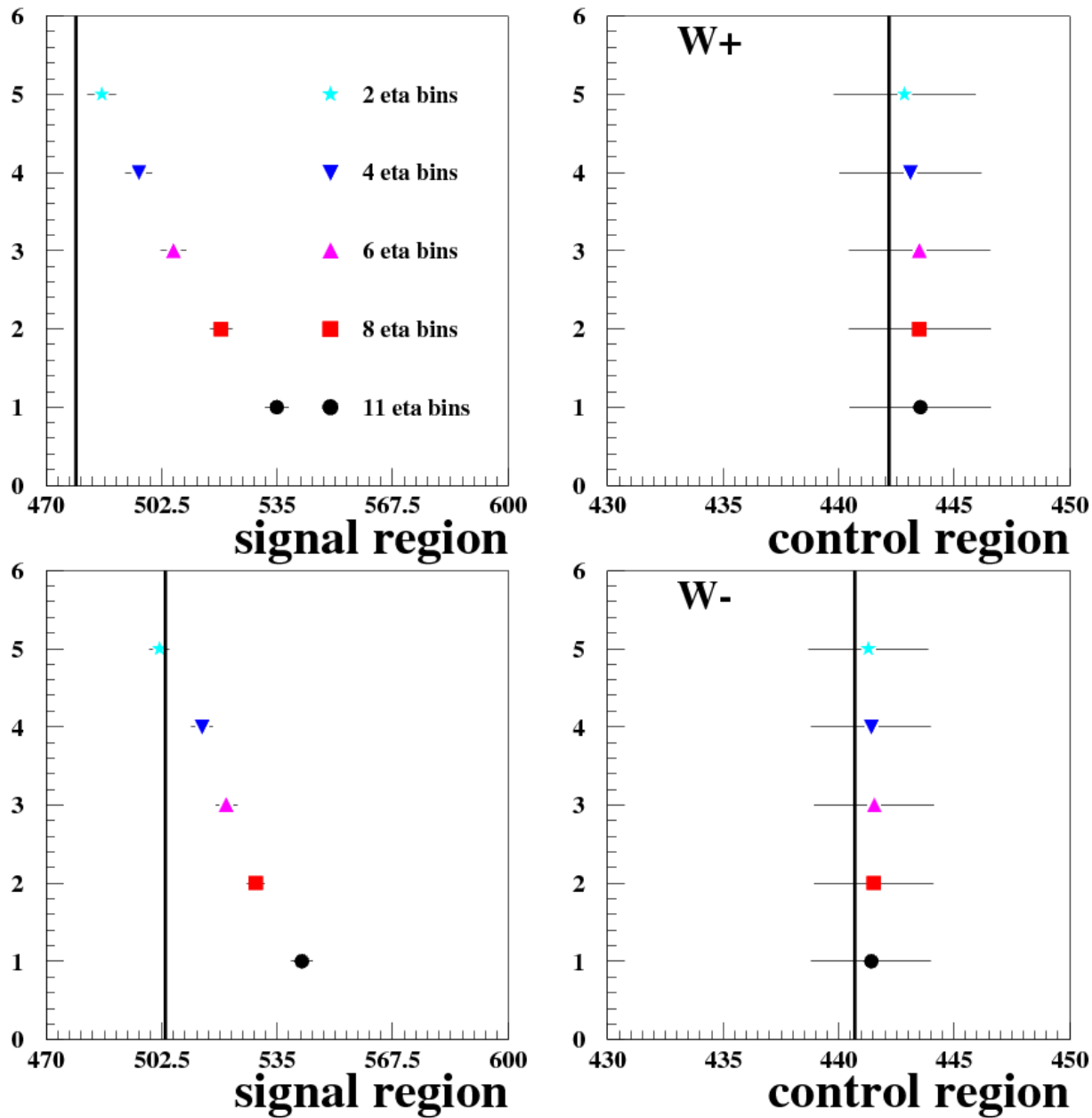
Signal



QCD BG



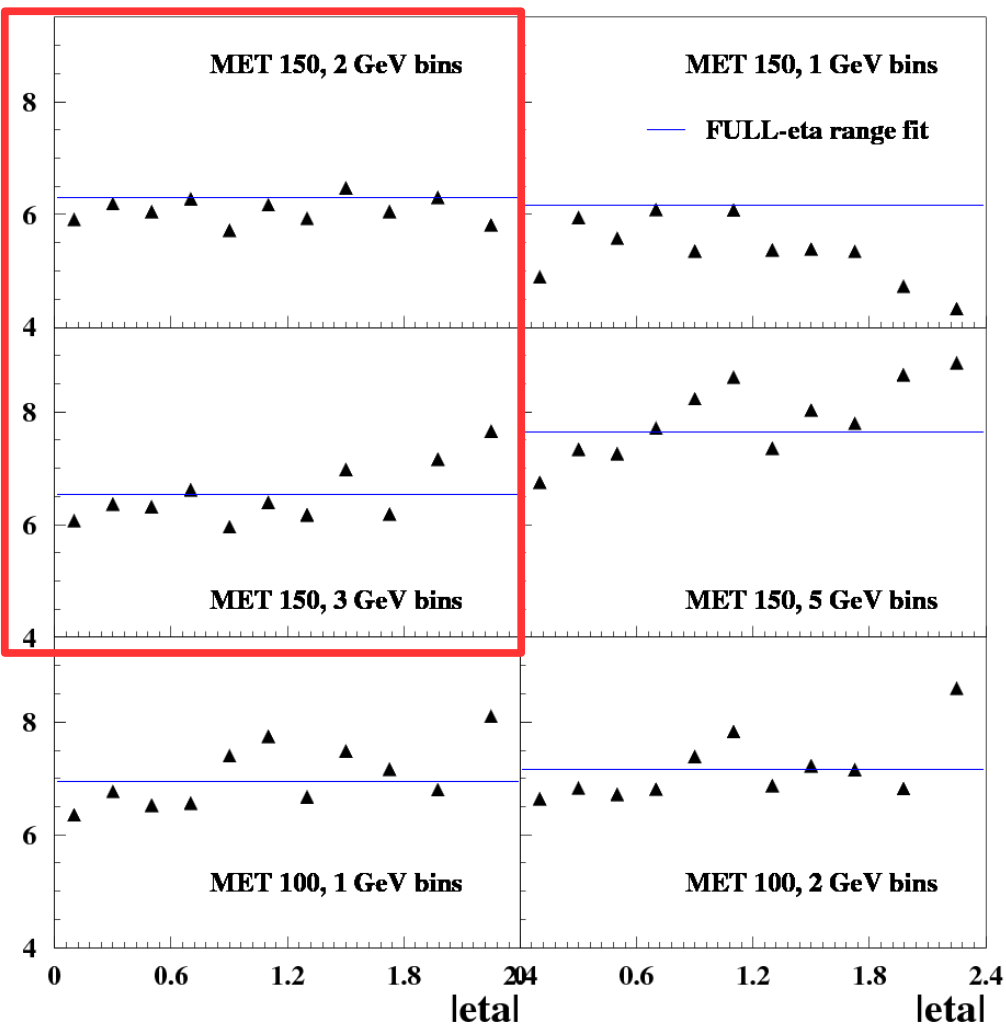
QCD BG



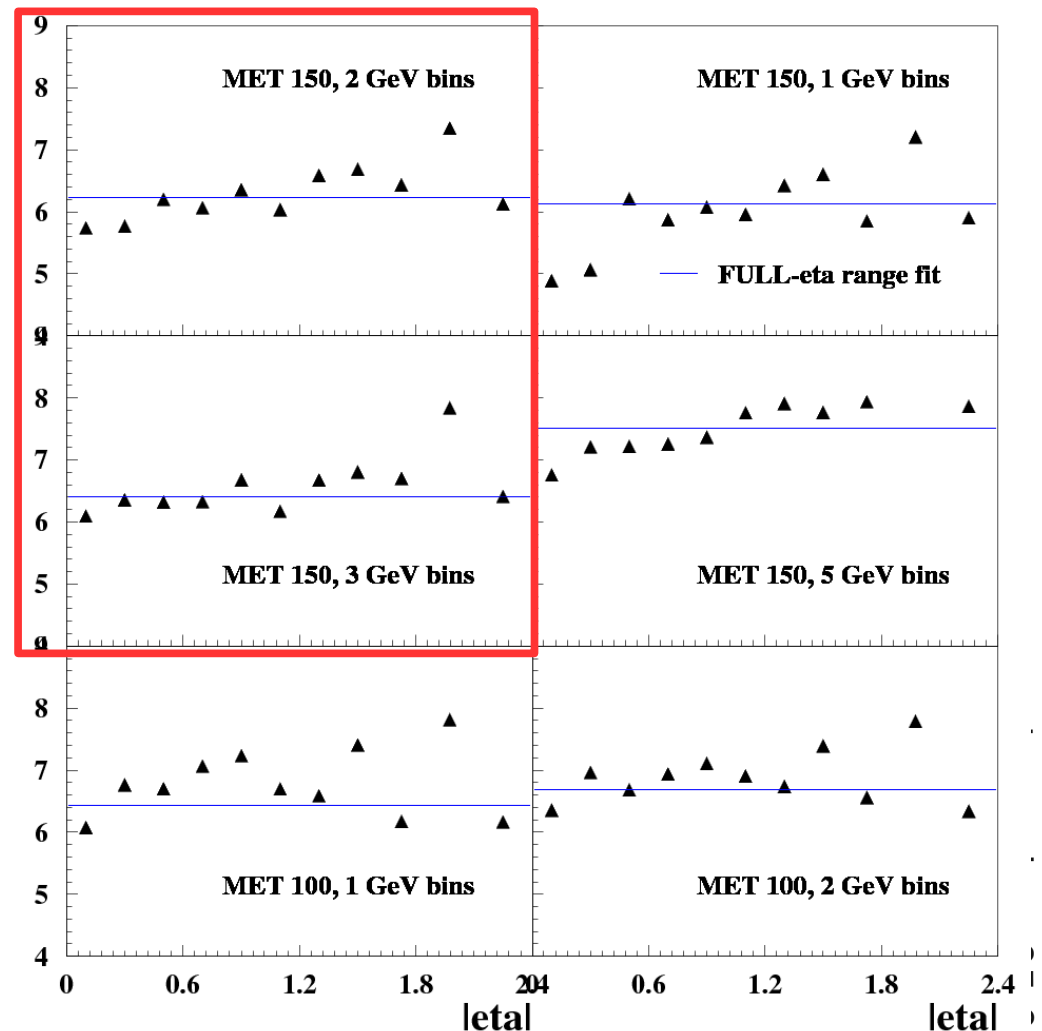
- More eta bins $\rightarrow$ more QCD BG ...

Look at a2, control region

a2 parameter, control region, W+



a2 parameter, control region, W-



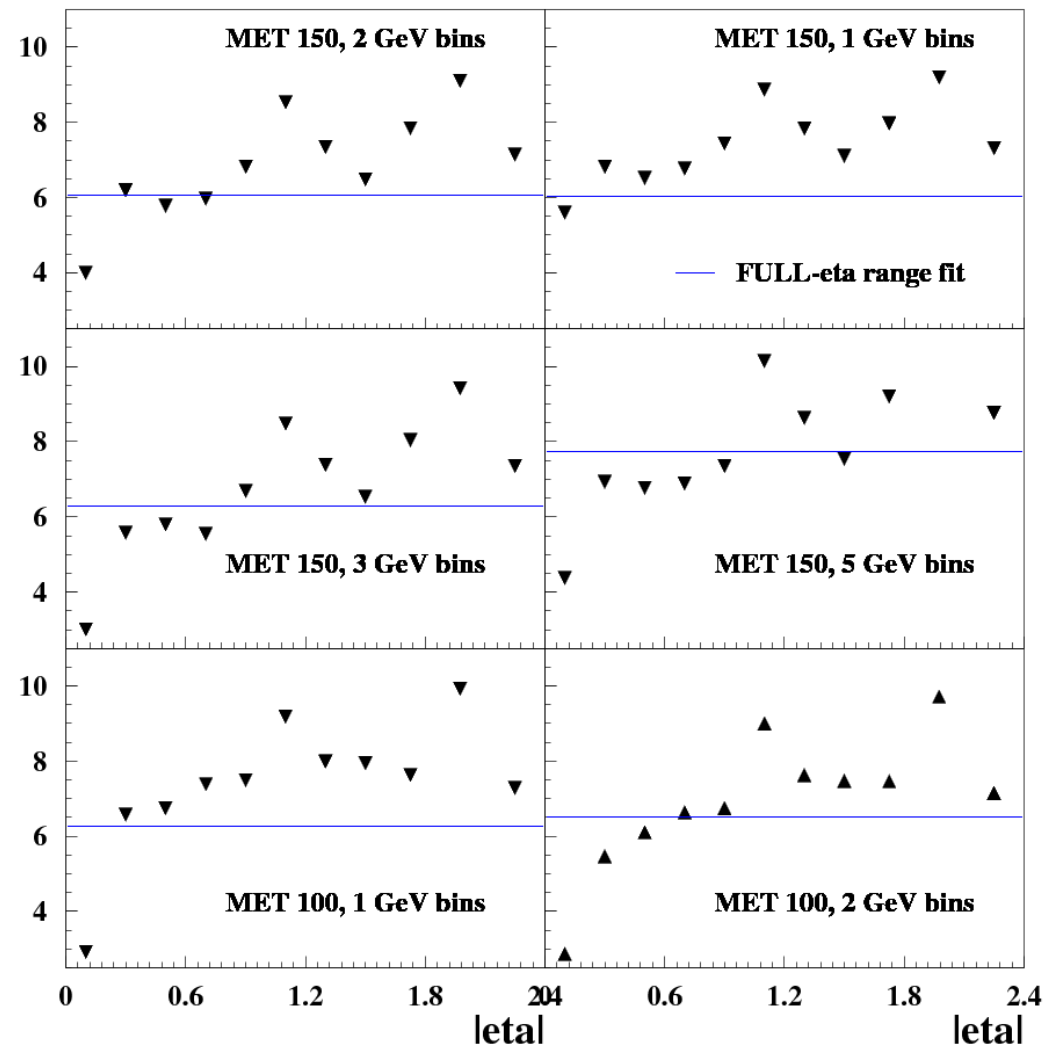
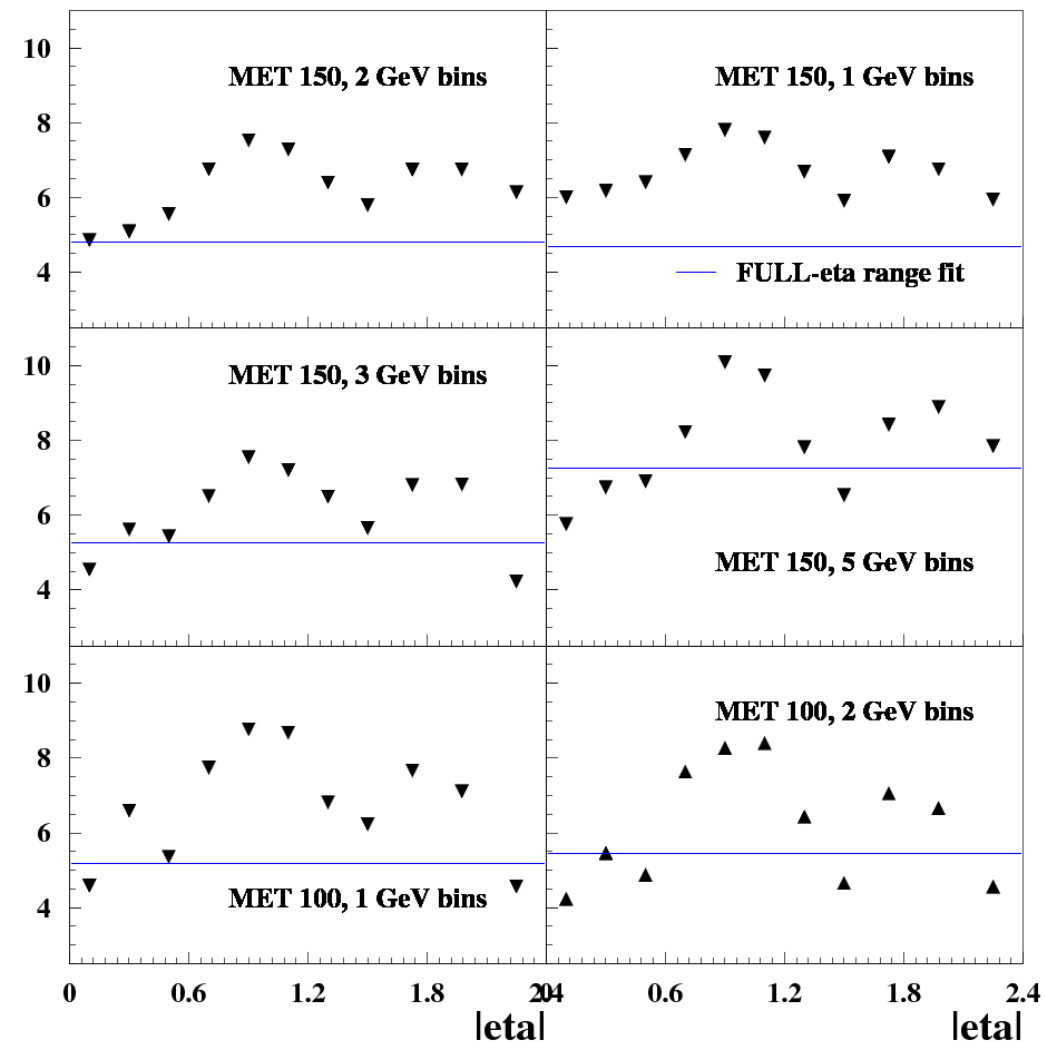
- Parameter a_2 stable in fits in different η bins

Look at a2, signal region

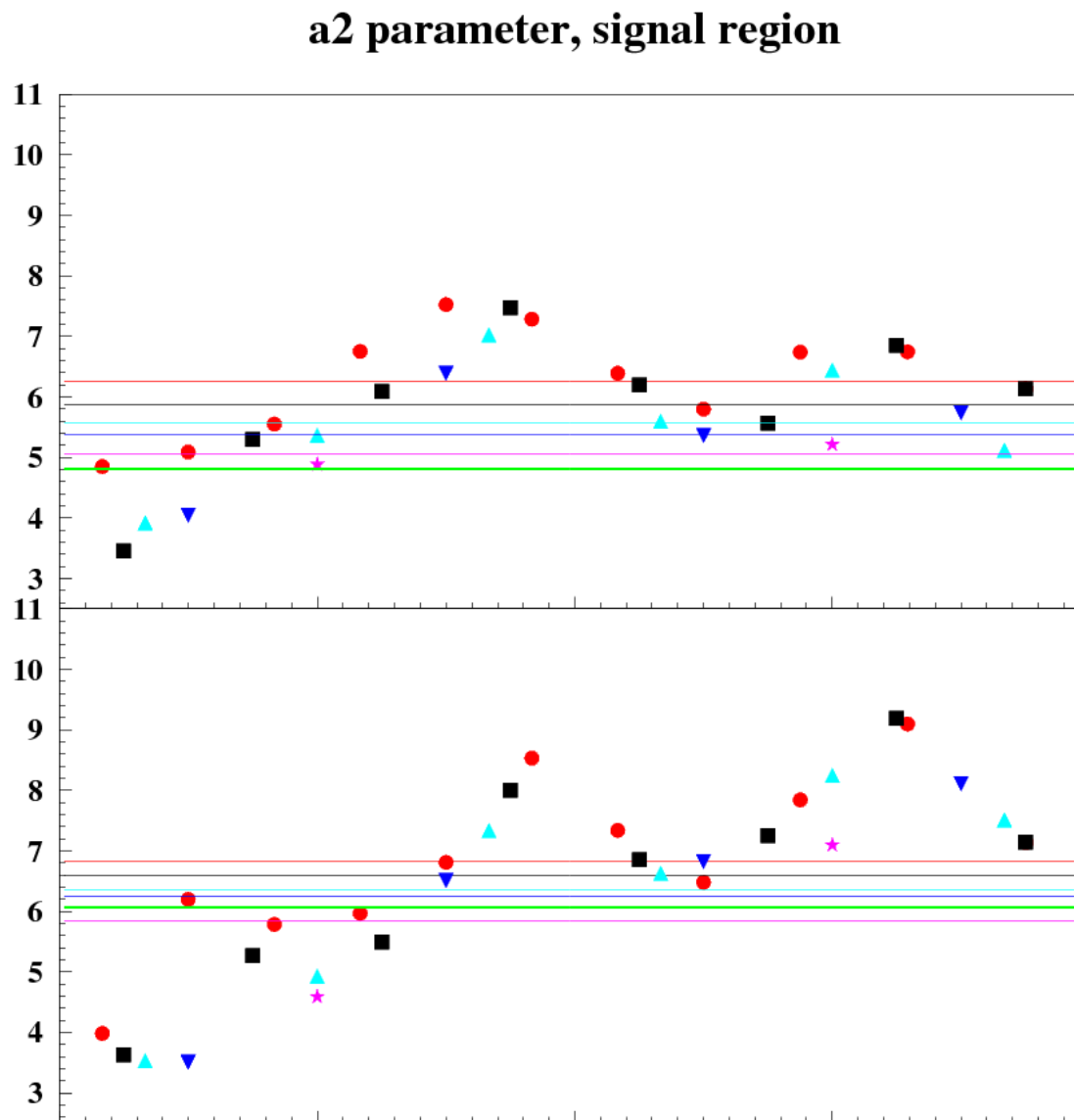


a2 parameter, signal region, W+

a2 parameter, signal region, W-



- Parameter a2 unstable

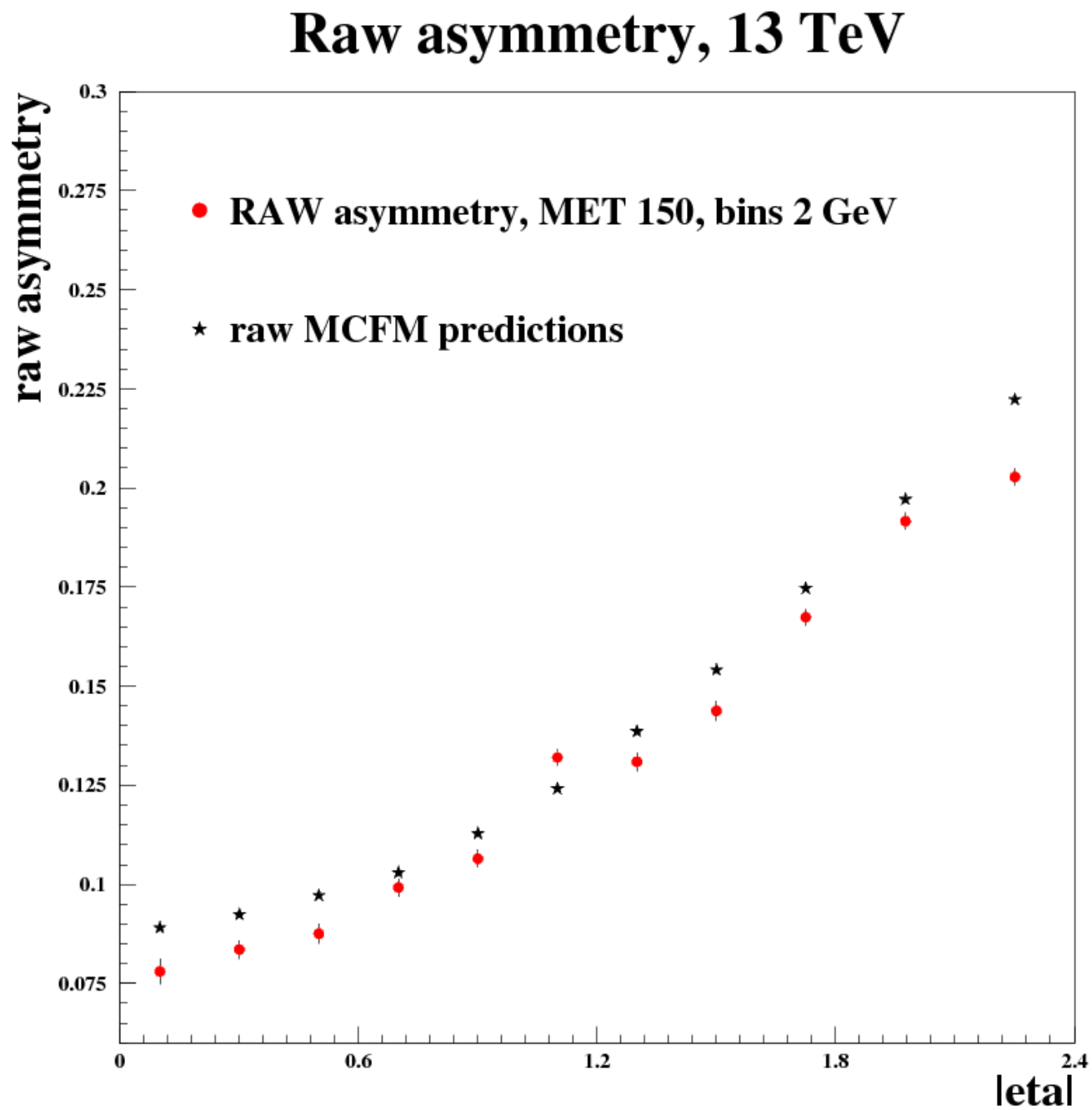


- A2 parameter unstable in eta-bin fits in SIGNAL region
 - Control region - OK
- bind a2 parameters for control and signal region → working on it

For Vlad's presentation

For Vlad's presentation

- Introduction/motivation
- Something about inclusive analysis
 - Selection, efficiencies etc
- Fit details
 - QCD BG estimation
 - Binning studies (not too much)
- Fits in eta bins (plots)
- Raw asymmetry – comparison with MCFM at NNLO
- Cross sections – maybe if acceptance calculated
 - Maybe asymmetry, if acceptance calculated
- MCFM work



Cross sections

- Present acceptance does not include $p_T > 25$ GeV cut for the generated variables (denominator)
- If acceptance taken from signal MC and MCFM predictions $\rightarrow$ reasonable agreement with MCFM
- Working on proper acceptance

