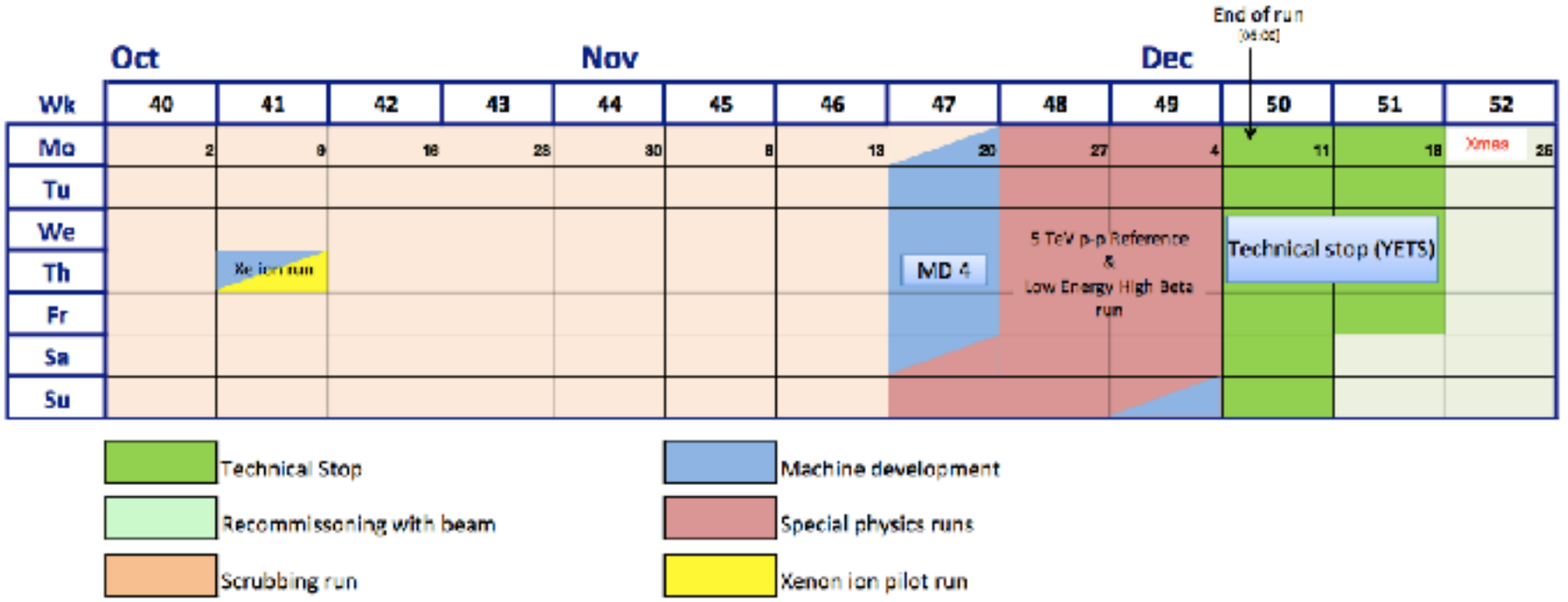
Status report

Status

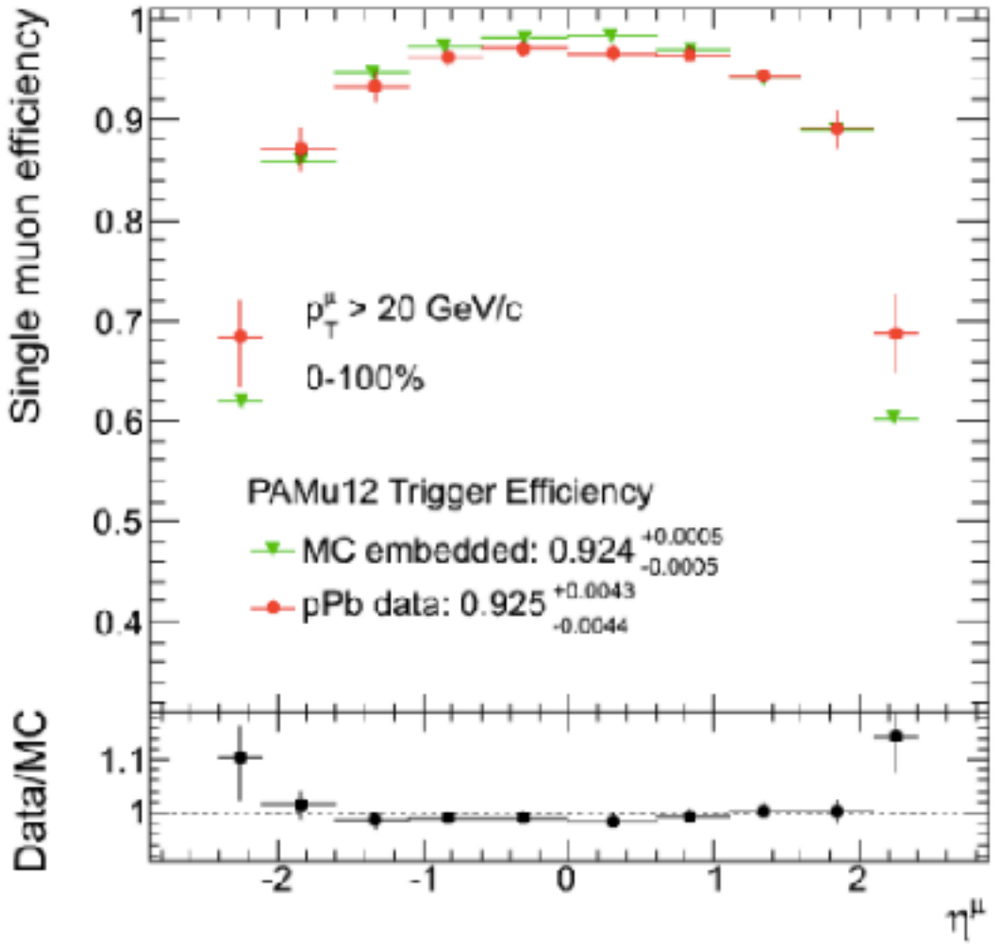


- **XeXe Pilot Run : 5.44 TeV - not much in interest**
  - **~80M events total**
  - **2015 PbPb L1DoubleMu0 dataset ~2400M events (roughly x30)**
  - **Expect ~1k J/ψ, ~200 Y(1S)**

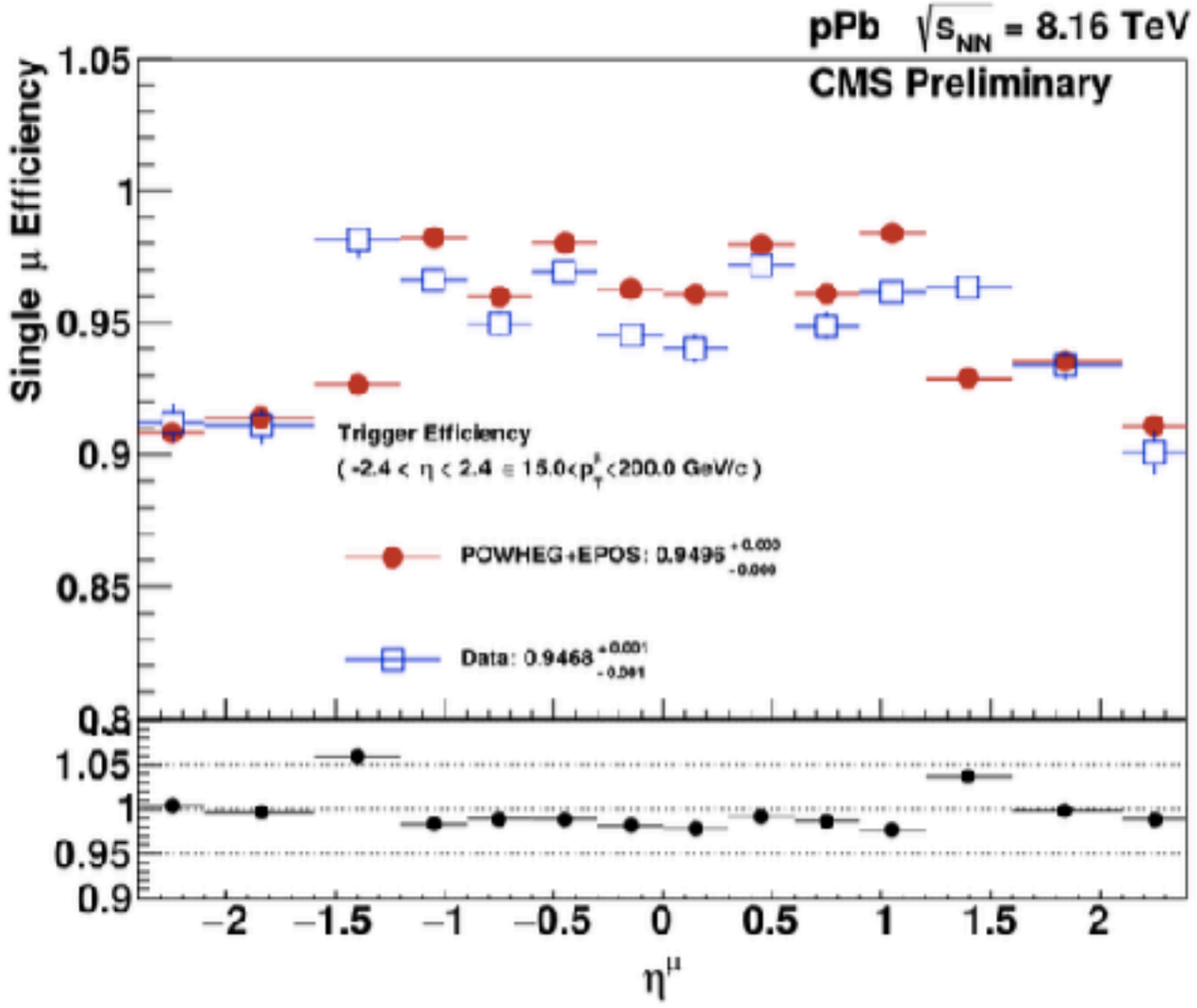
- **pp Run : 5.02 TeV**
  - **goal : ~200 pb-1**
  - **reference for PbPb run in 2018**
  - **developed reconstruction algorithm**

TnP efficiency

pPb 2013



pPb 2016



pp run trigger work task

HIN Muon Trigger Workflow

PREPARATION

1) Prepare the samples (MC and DATA)
2) Prepare the ntupelizers (tree producers)

DEVELOPMENT

3) Develop the L1 trigger paths ⟶ Geonhee
4) Develop the HLT trigger paths ⟶ JaeBeom

ANALYSIS

5) Determine the L1 and HLT trigger rates
6) Produce Trigger Efficiency plots

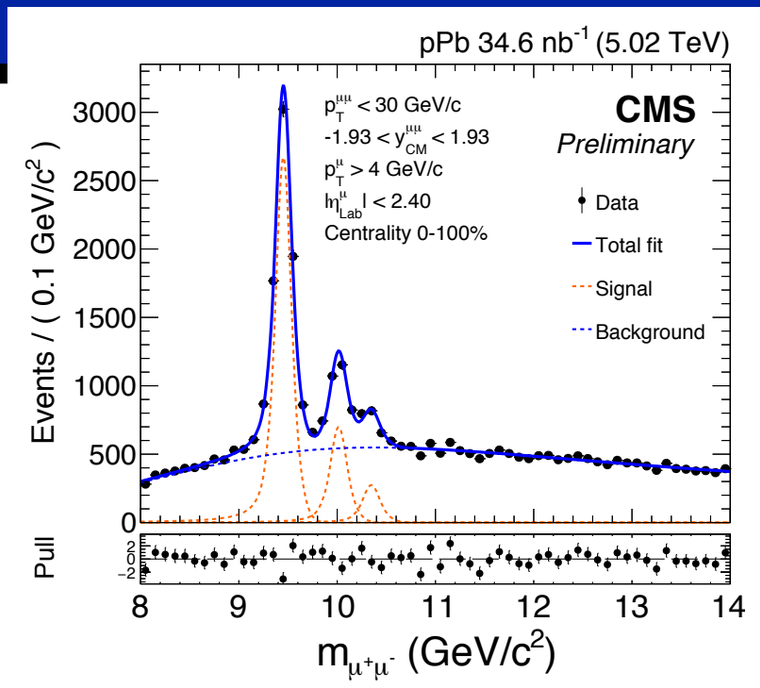
MONITORING

7) Create the Trigger Prompt Monitoring plots (DQM)

INTEGRATION

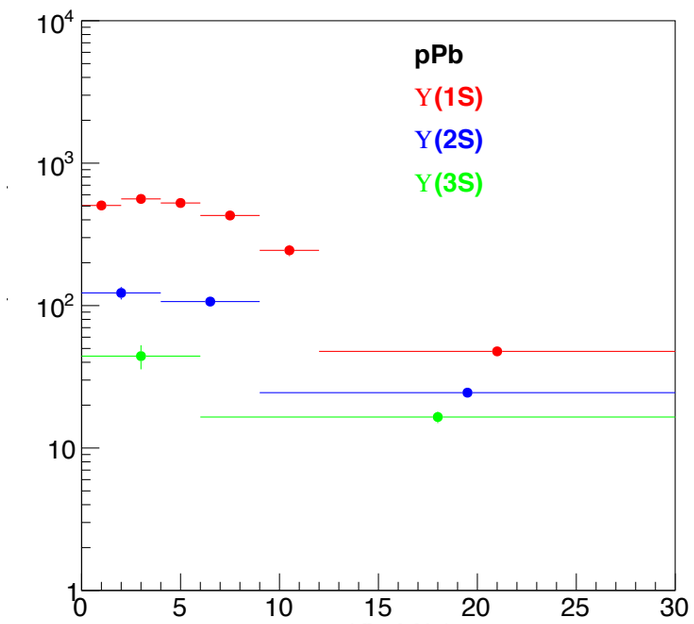
8) Integrate the trigger paths into the full trigger menu

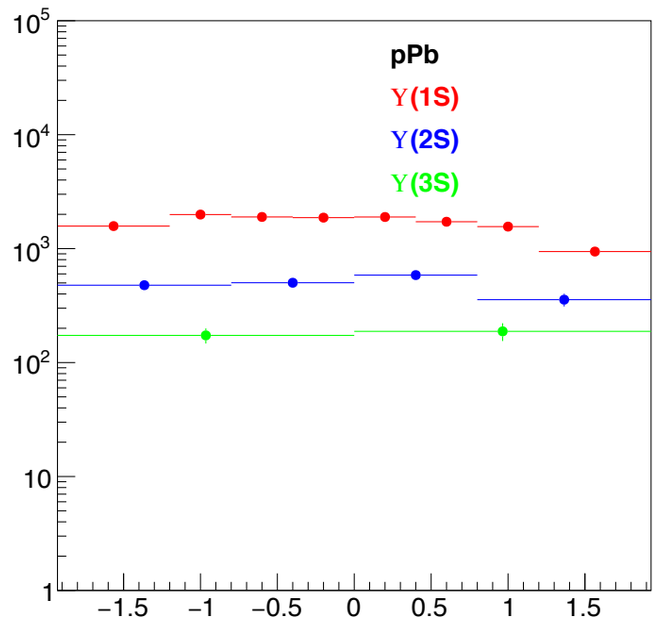
Status



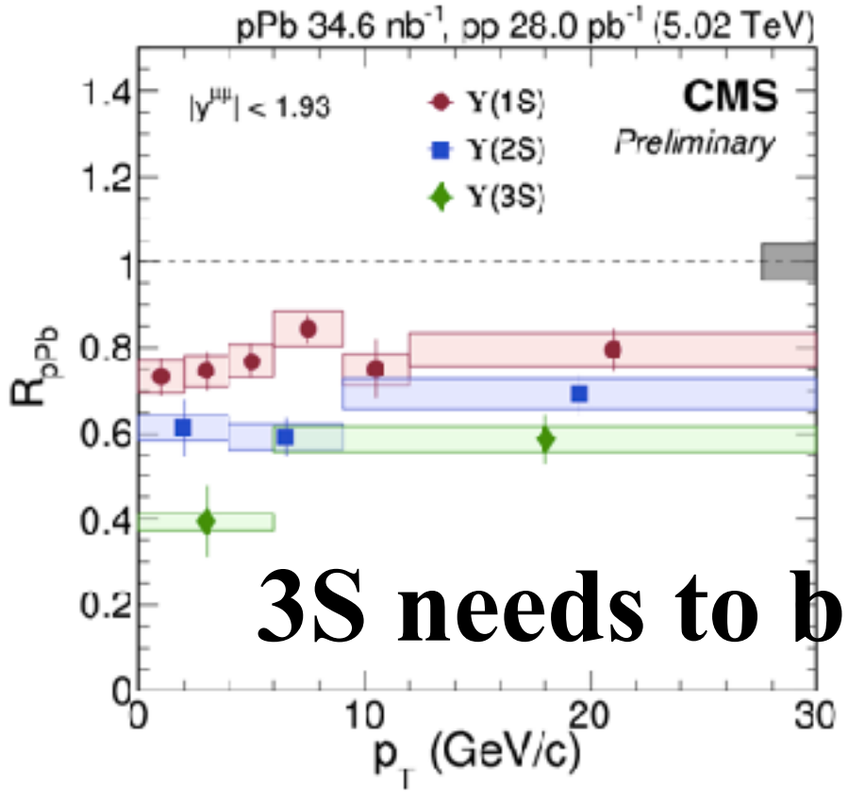
- **Goal - Aim to QM 2018 (May)**
  - **R_{pPb} vs p_T, y_{CM}, centrality (Not sure if possible)**
  - **R_{FB} with 5TeV & 8TeV (Not decided)**
- **Signal Extraction (Done by JaeBeom)**
  - **Signal PDF : Double CB**
  - **Bkg PDF : Exp*Erf**
- **Correction**
  - **Acceptance : MC samples reweighed from DATA/MC pT distribution (Done by Geonhee)**
  - **Efficiency : MC samples reweighed from DATA/MC pT distribution (Need only 3S - Ongoing by Santona)**
  - **TnP : Use same numbers as HIN-14-009 (Jpsi in pPb) (Use numbers from Jpsi analysis)**
- **Systematics**
  - **Signal PDF Variation : Double CB (nominal) vs CB+Gaus (Ongoing by JaeBeom)**
  - **Bkg PDF Variation : Use of toy MC generation (Ongoing by Jared, Heather, Graham)**
  - **Correction Factor**
    - **Acceptance (Done by Geonhee)**
    - **Efficiency (Ongoing by Santona)**
    - **TnP (Use numbers from Jpsi analysis)**
  - **Global : Luminosity from pp & pPb data (Use numbers from Jpsi analysis)**
- **ManPower : Geonhee, Dongho, Santona, Graham, Heather, Jared, Manuel, JaeBeom**
- **Documents (AN-17-221)**

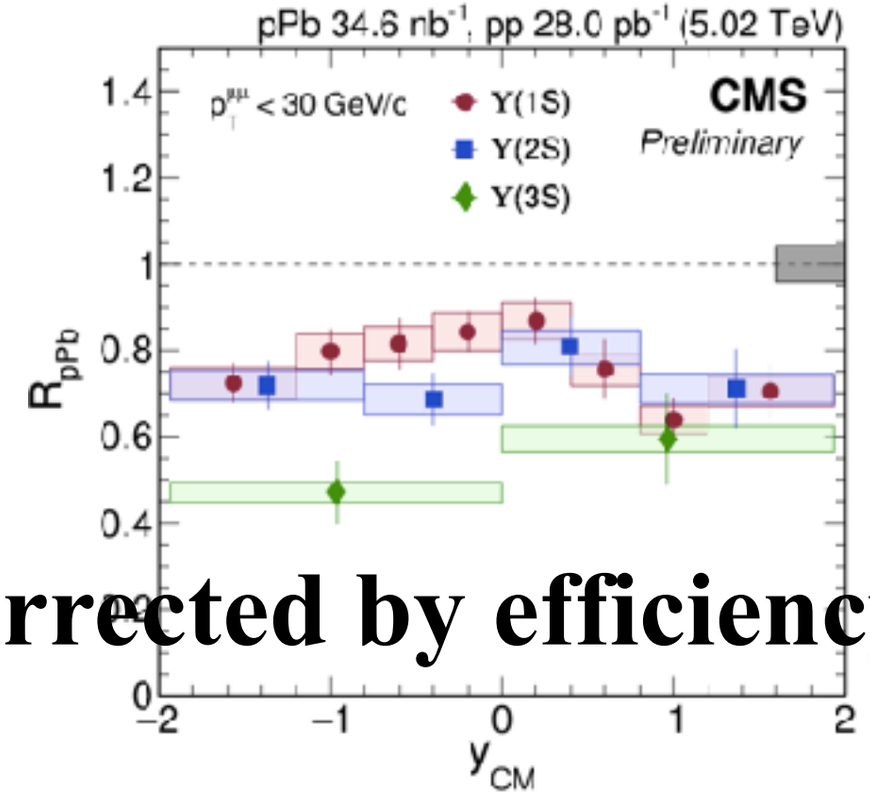
Yield & R_{pPb}





Arbitrary 5% systematic unc.

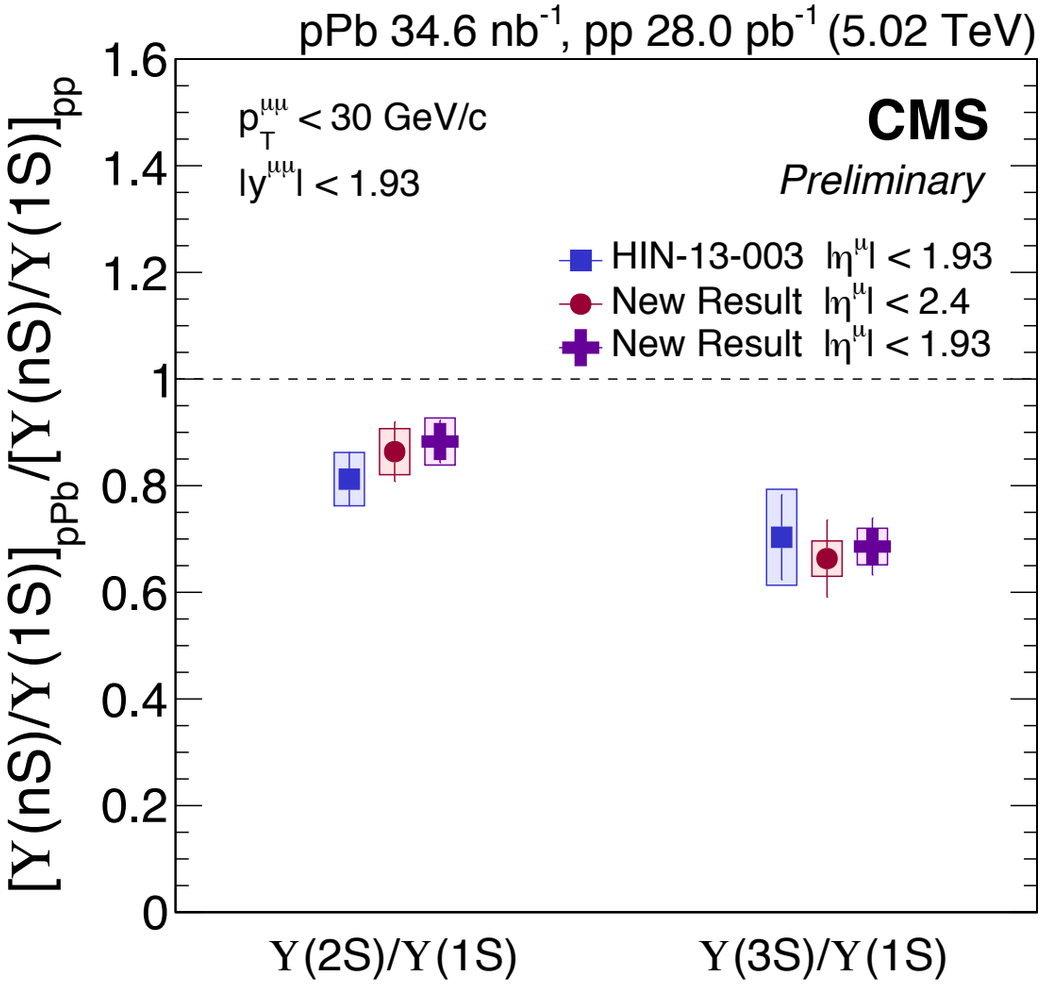




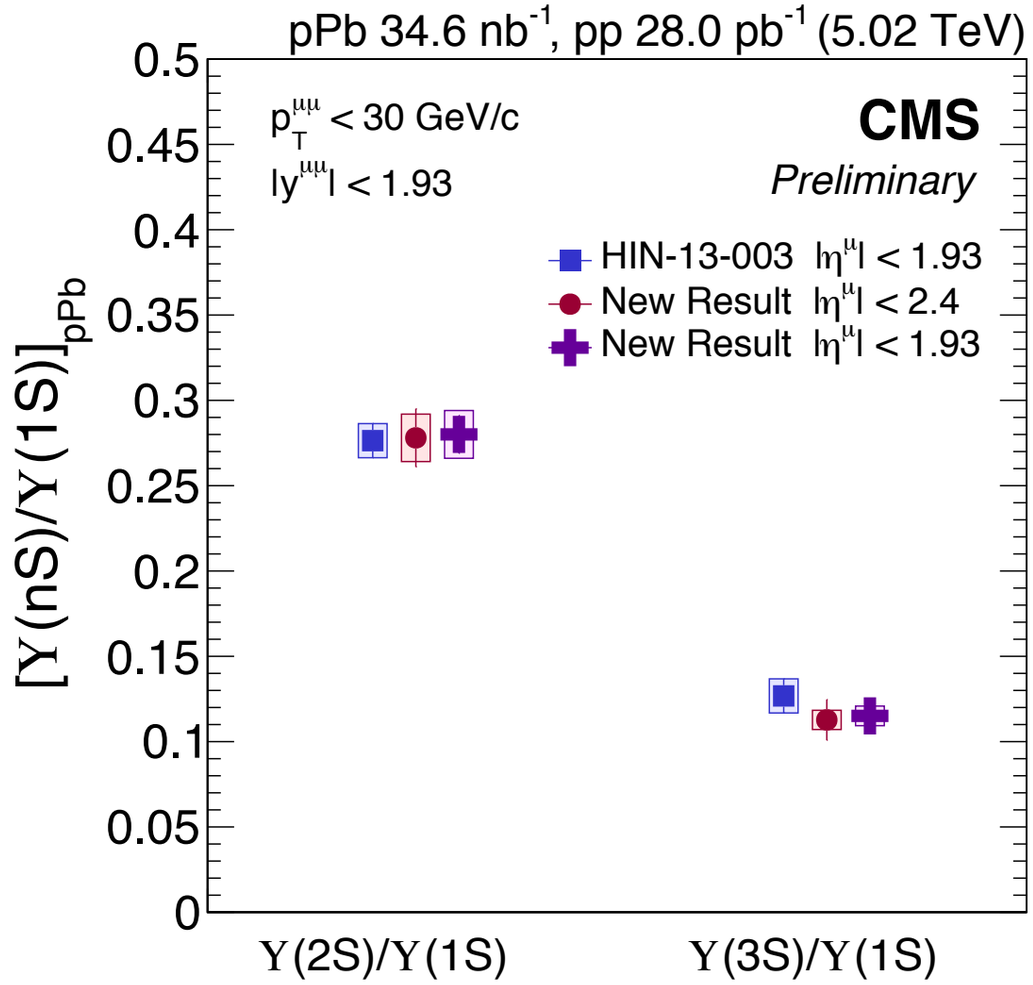
3S needs to be corrected by efficiency

HIN-13-003 (uncorrected) vs New Result (uncorrected)

Double Ratio



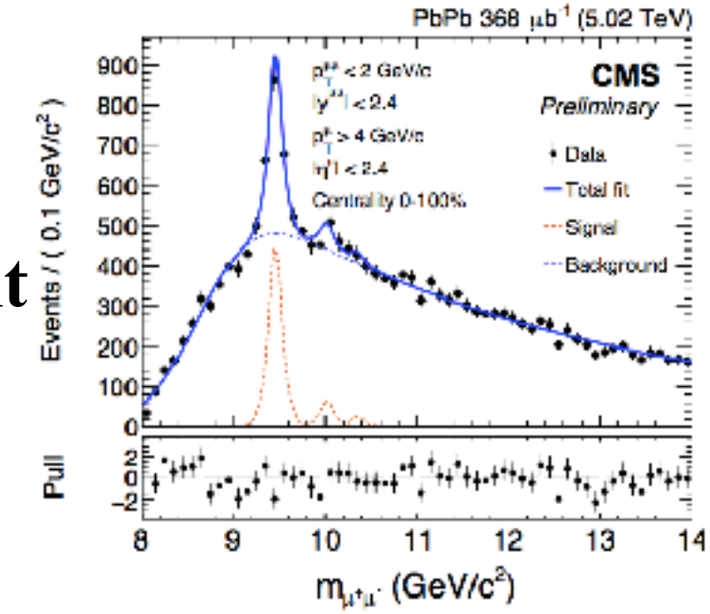
Single Ratio

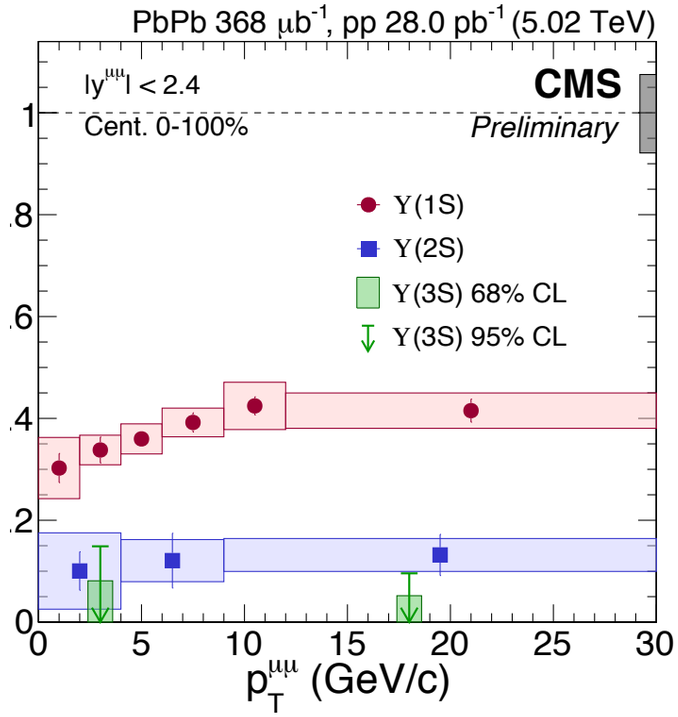


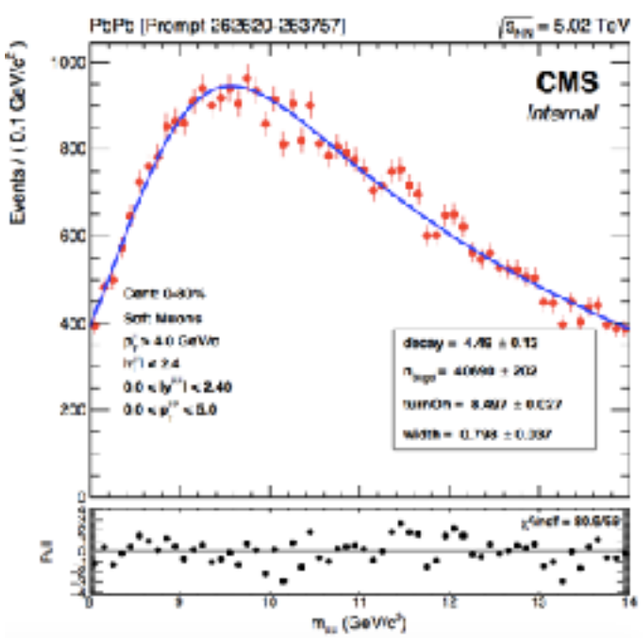
Arbitrary 5% systematic unc.

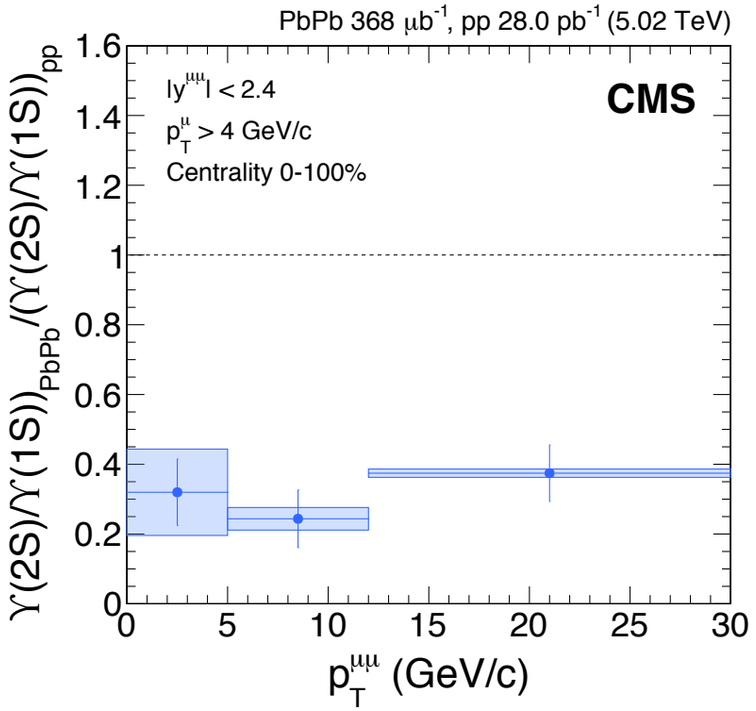
Bkg systematic issue

- Large systematic unc. in low pT region
- Dominated by bkg systematics
  - Erf*Exp (nominal)
  - 4th order cheby. poly.
- Lots of comments for the bkg fit
  - same sign event
  - higgs combined model
  - toy MC
  - side band fit
- Any chance to improve the huge uncertainty?
  - Try to simulate the background shape



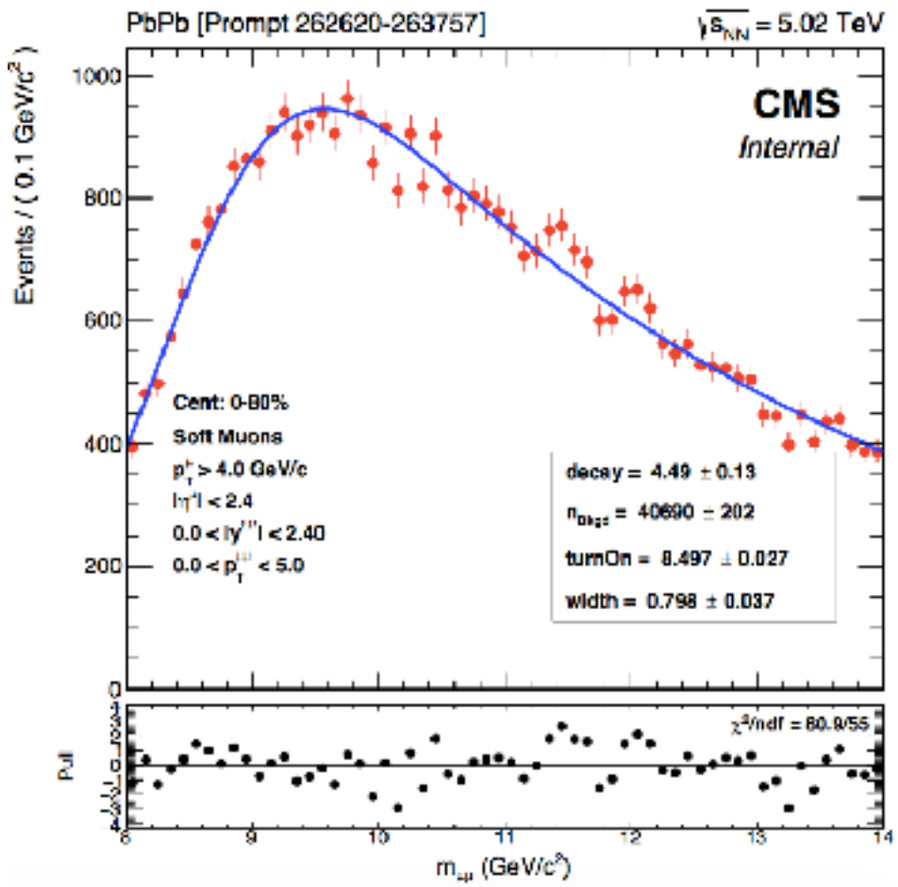






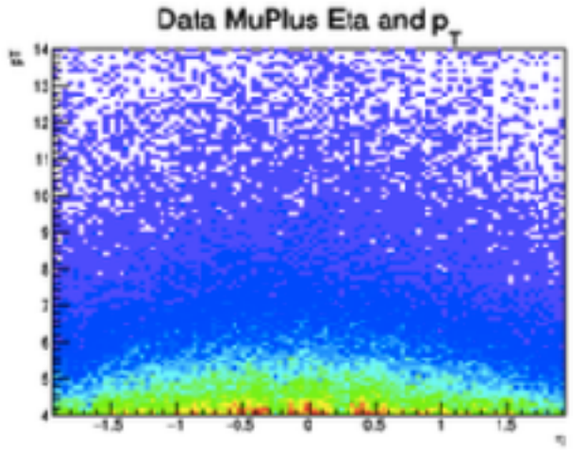
Bkg shape generation

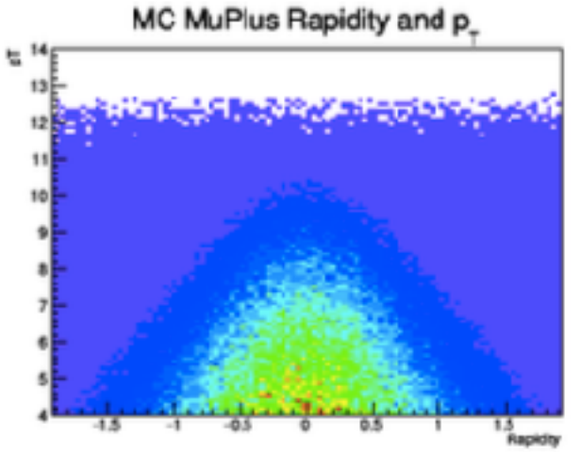
- **Goal : reproduce the bkg shape**
- **Low pT region : 0-5 GeV/c**
- **First attempt**
  - **Mass btw 6-20 GeV**
  - **dN/dpT ~ pT/[exp(pT/T)+1]**
  - **Gaussian rapidity**
- **Did not work well (too simple model)**
  - **Mass distribution depends on pT (acceptance)**
  - **Mass distribution depends on y (mass resolution)**
  - **Reweight pT vs rapidity to same sign dimuon event in data**

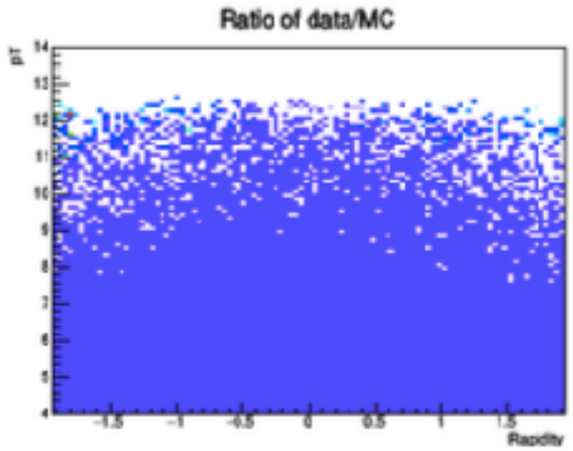


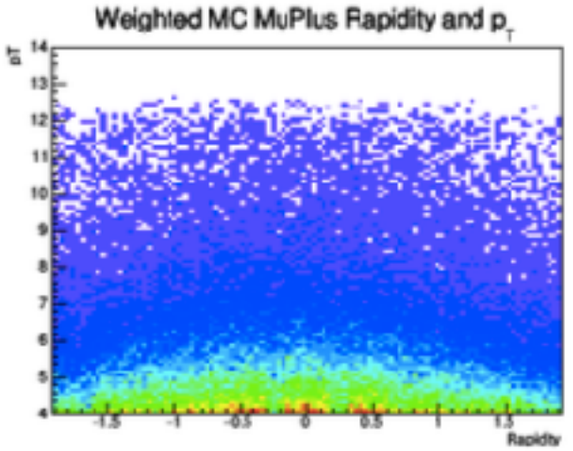
Bkg shape generation

- **Re-weighted Data & MC**



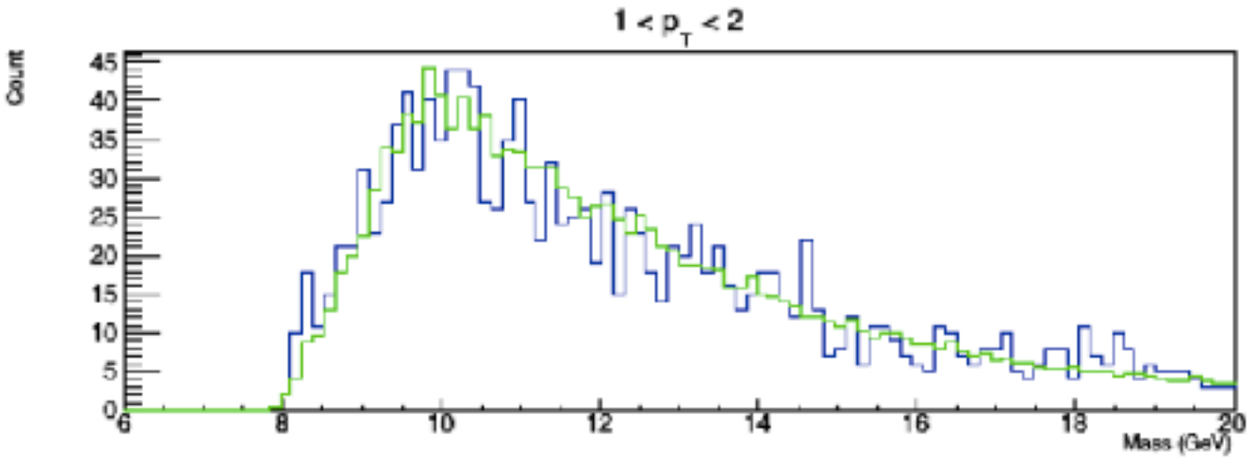






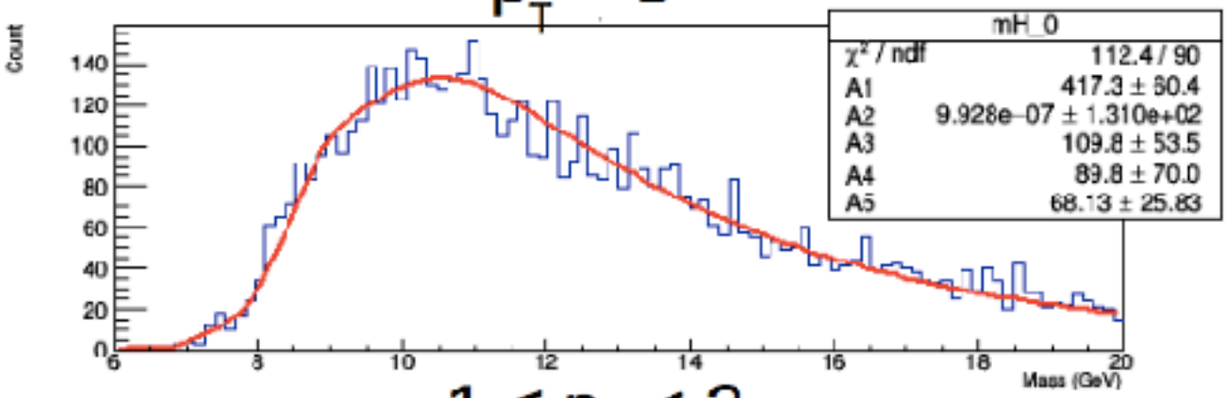
- **Fit the same-sign events**

$$A \cdot \left(R \left(Erf \left(\frac{x-\mu_1}{\sqrt{2}\sigma} \right) + 1 \right) + \left(1 - Exp \left(- \frac{x-\mu_2}{\lambda} \right) \right) \right) \cdot Exp \left(- \frac{x}{\lambda_d} \right)$$ (1-Exp truncated for $x<\mu_2$)

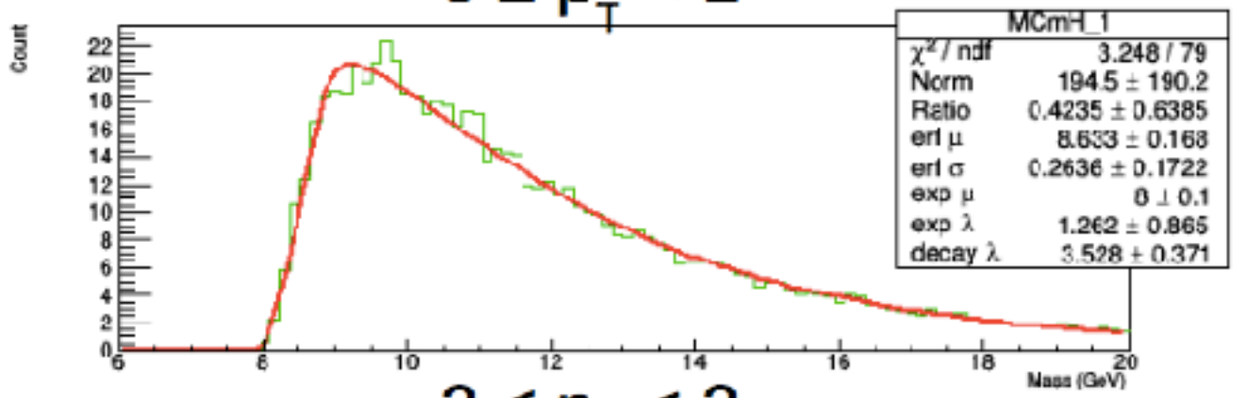


Bkg shape generation

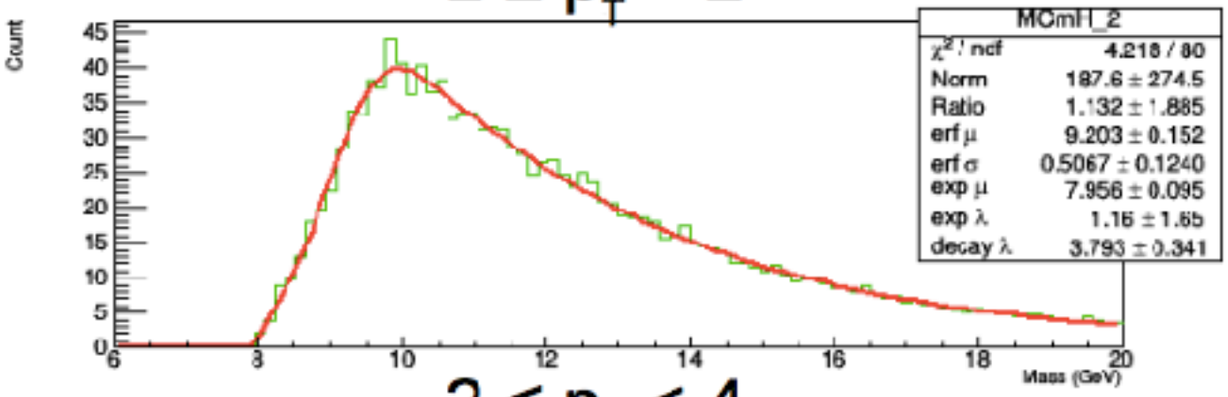
$p_T < 5$



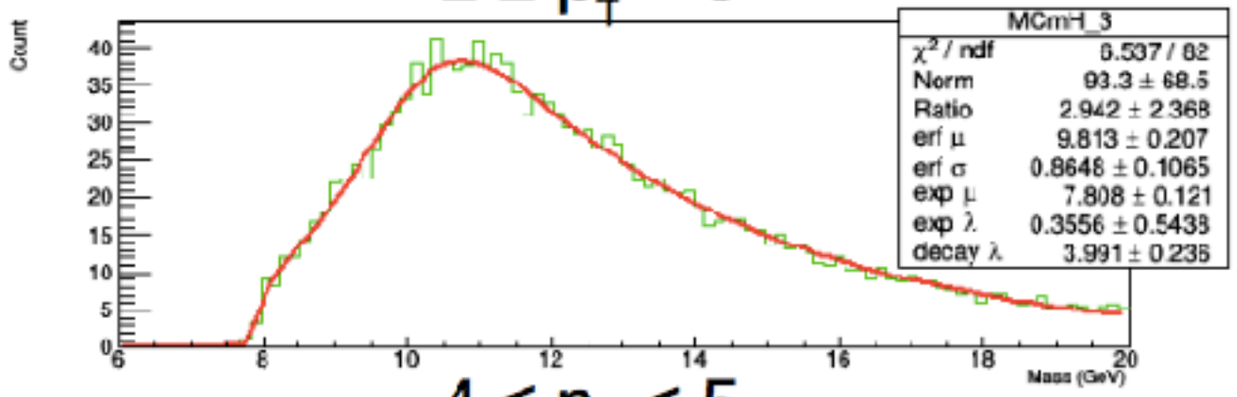
$0 \le p_T < 1$



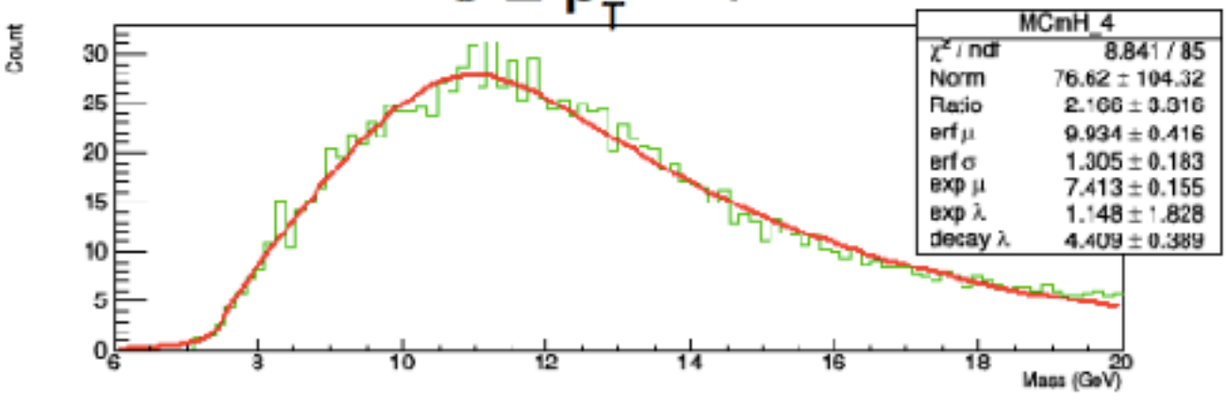
$1 \le p_T < 2$



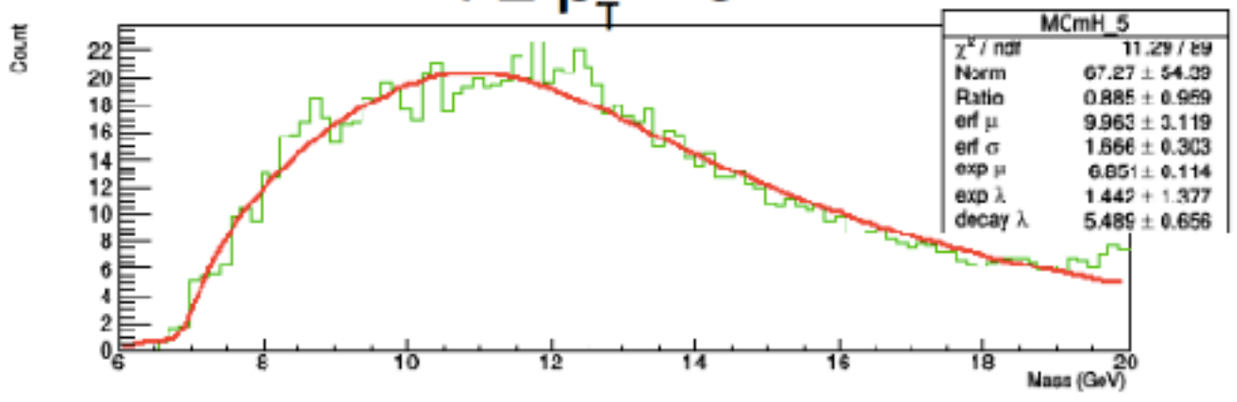
$2 \le p_T < 3$



$3 \le p_T < 4$



$4 \le p_T < 5$



Bkg shape generation