Status for Bana analysis

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Status for Bana analysis

- **All the result is(and will be) updating with rapidity shift correction (on-going)**
- **All the code is running on slc(scientific linux CERN)6**
  - After September slc5 will not be served
- **Unifying under Bfinder code**
- **Acceptance systematics (on-going)**
  - Weighting with difference between MC and data
  - For the acceptance variation, toy MC will be set
- **TnP code cross-check (on-going)**
  - Updating the definition of TnP in Bfinder TnP code

Backup

Reminder of strategy for weight calculation for the acceptance

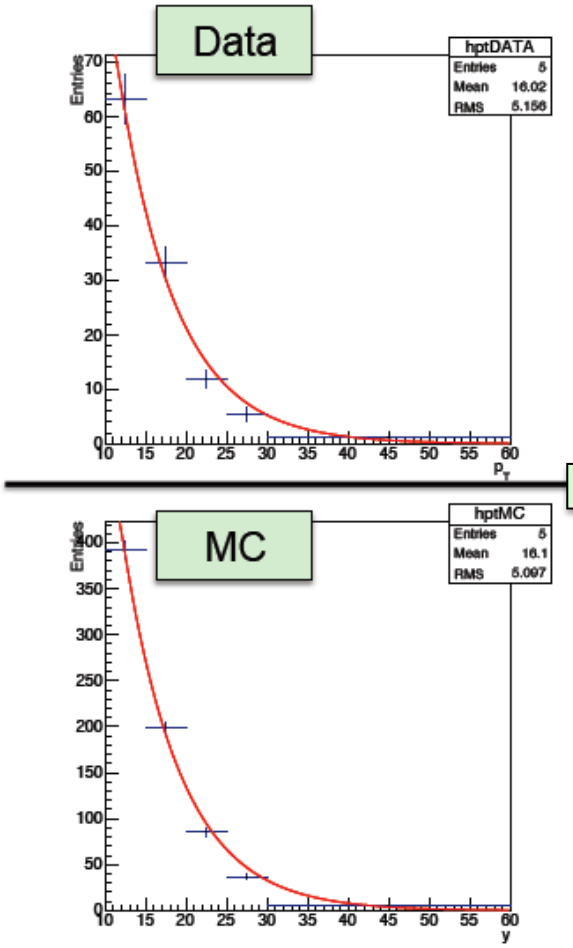
Last decision

- QM2014 methods : rule out with problems
- Fit and divide methods : proper for pT dependence
- Divide and fit methods : rule out because of failing fit

New proposal after collection of y

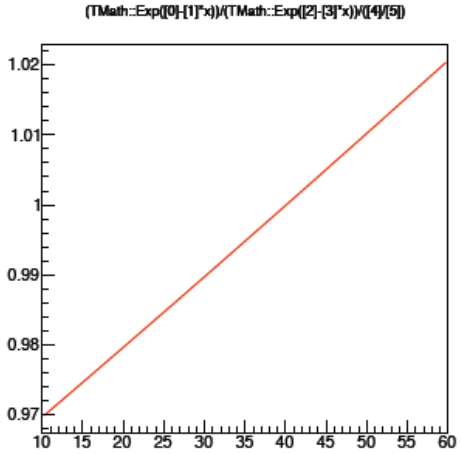
- QM2014 methods : rule out with problems
- Fit and divide methods : proper for pT dependence
- Divide and fit methods : proper for y dependence – find the candidate fitting function

Method 2 : Fit and divide methods

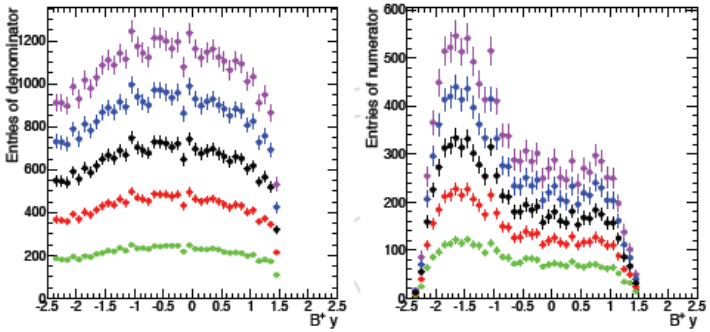


With the raw yields from MC and data, fit by exponential function

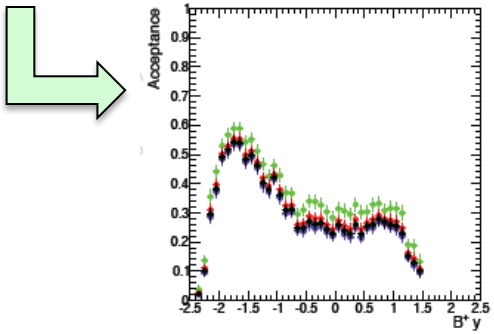
$$\frac{e^{p0-xp1}\big|_{data}}{Total\ B\ cand.\big|_{data}} \Big/ \frac{e^{p0-xp1}\big|_{MC}}{Total\ B\ cand.\big|_{MC}}$$



Divide fitting functions from MC and data, then get the weighting function W
Consider the errors from each parameters

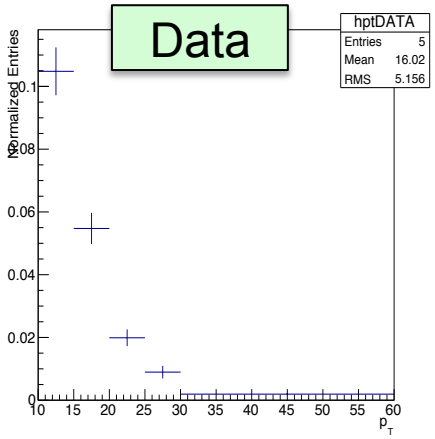


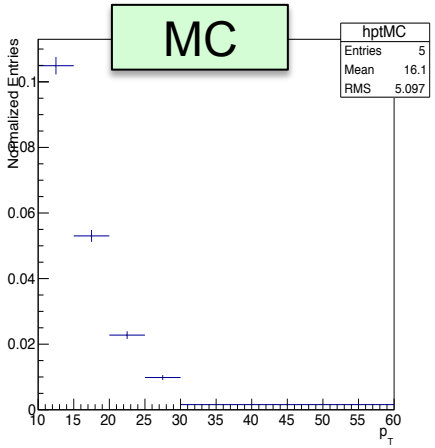
Weight the denominator and numerator : Fill(y,W)



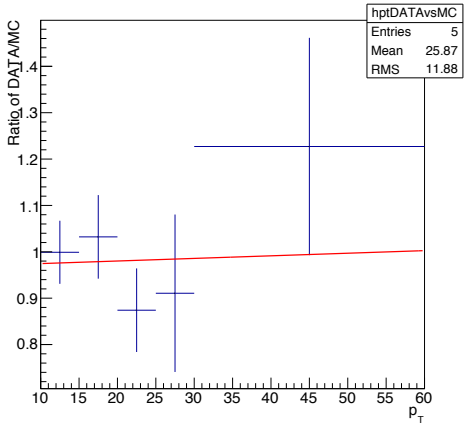
Calculate the acceptance from dividing the numerator by the denominator, and redo with the varying the parameters consideration with errors, then compare the difference and set the systematics

Method 3 : Divide and fit methods

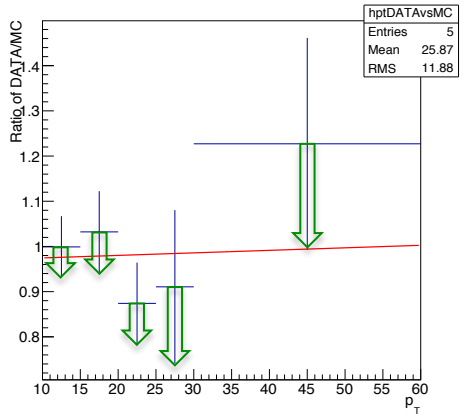




Get the normalized raw yields from MC and data

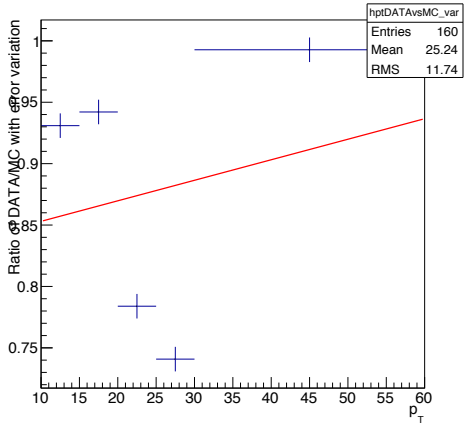


Divide the normalized raw yields then fit points by 1st order polynomial function(like method 1), that is weighting function W



With up or down variation of error in each points, get the fitting function again

(ex. down, down, down, down)

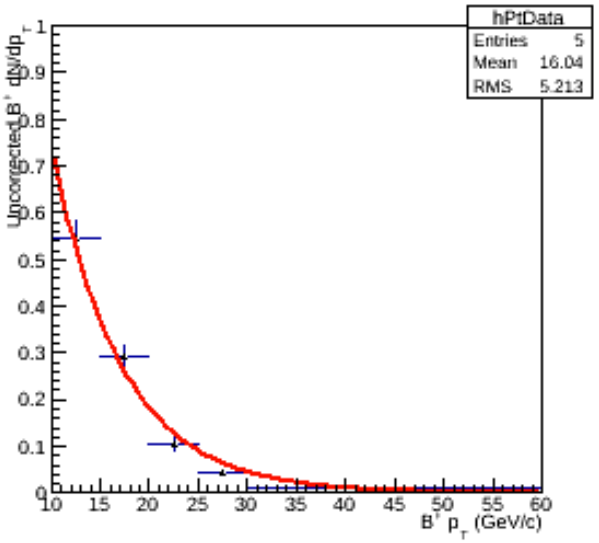


Get the acceptance with various weighting function and check the difference between maximum and minimum, set as the systematics

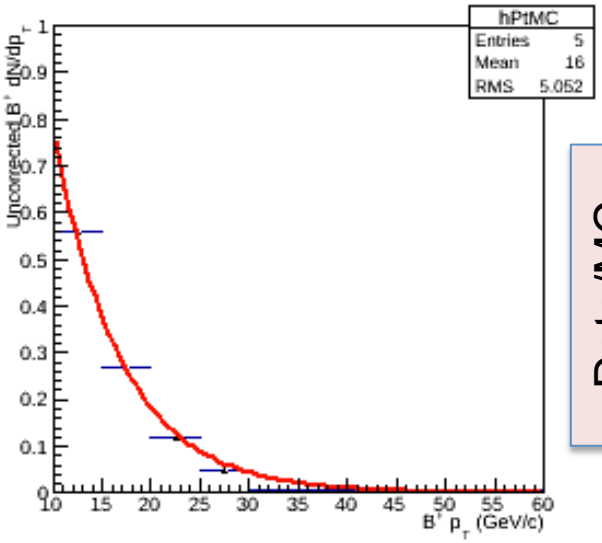
p_T dependence

exp/exp without fitting
exp/exp with fitting
1st order polynomial with fitting

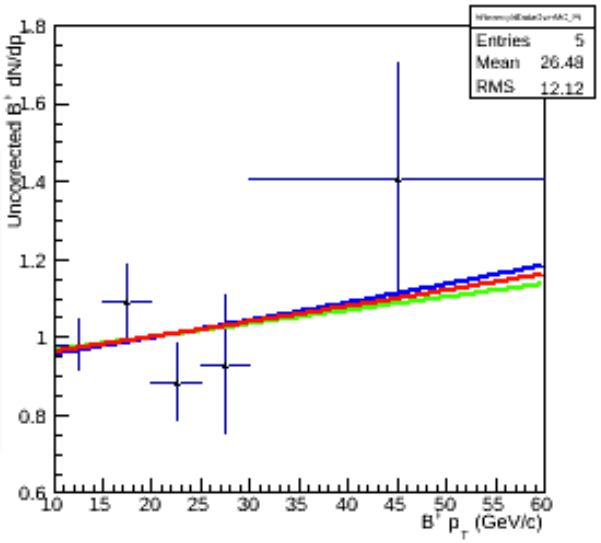
Reco. B+ in Data



Reco. B+ in MC



Data/MC

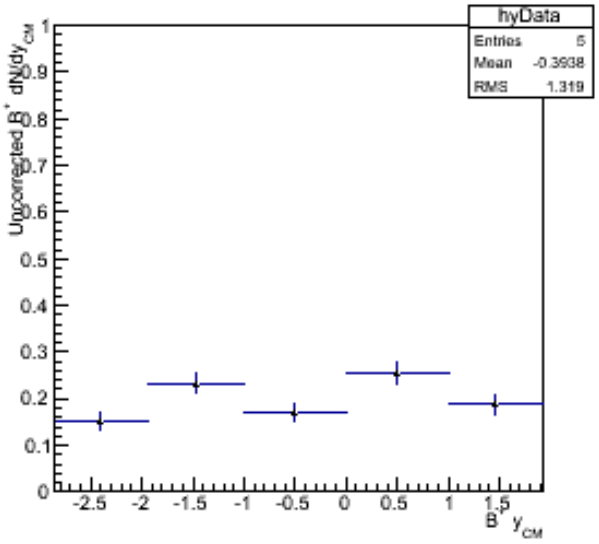


Divide with “B” option

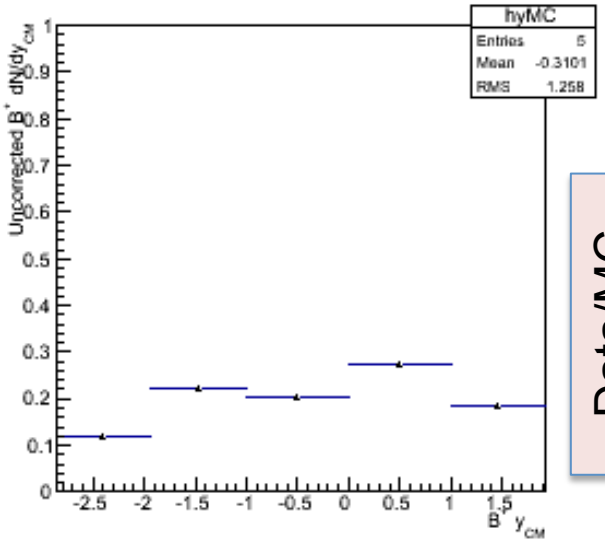
- Apply method 2 (fit and divide)

y dependence

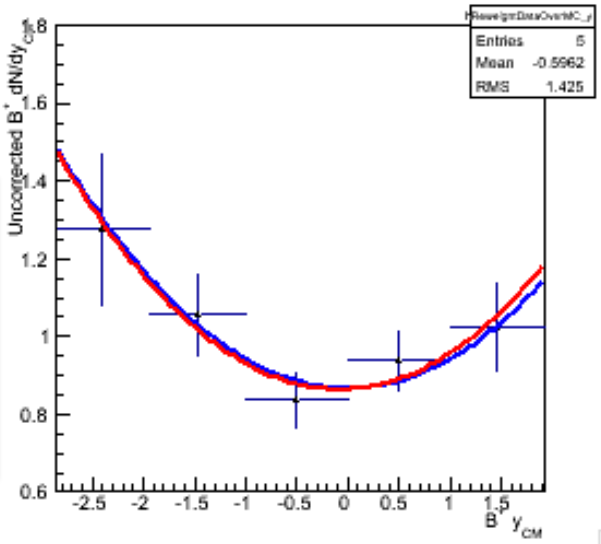
Reco. B+ in Data



Reco. B+ in MC



Data/MC



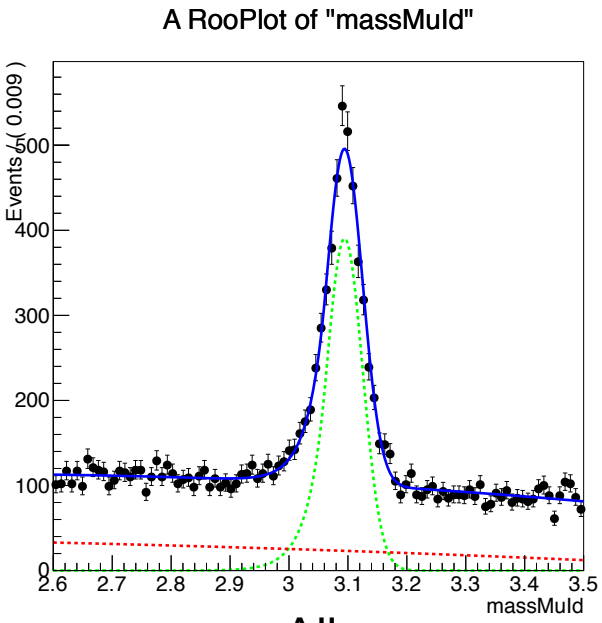
Divide with “B” option

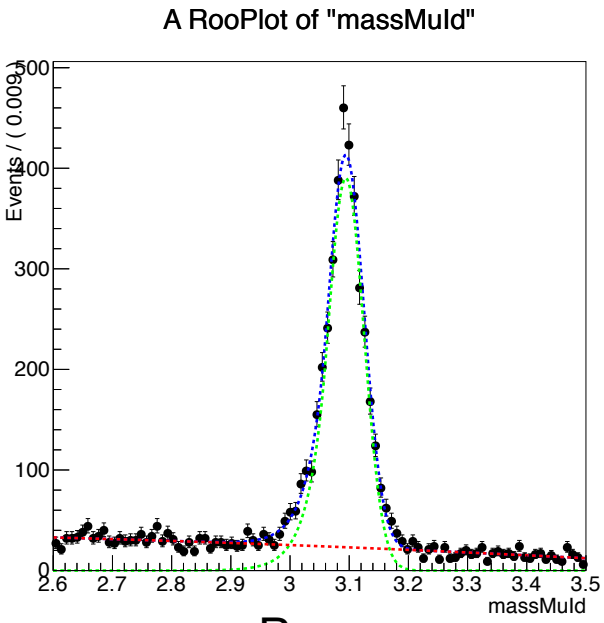
2nd order polynomial with fixed y shift (minimum is at y=0)

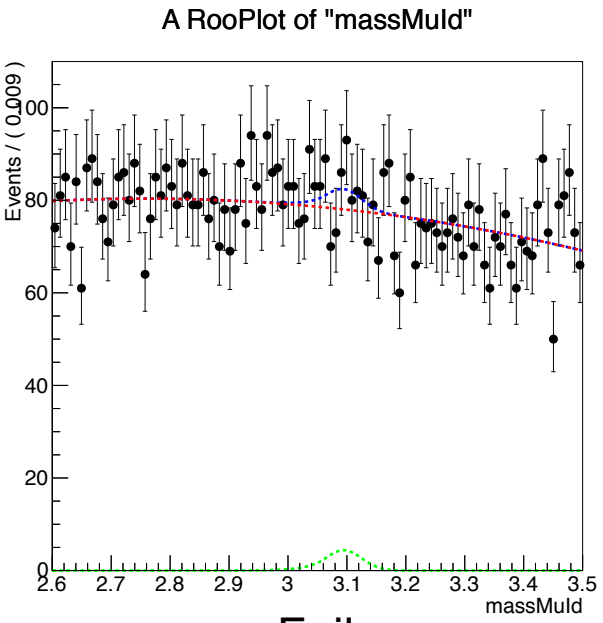
2nd order polynomial without fixed y shift (minimum y is conrolled by fitting

- Apply method 3 (divide and fit)
- Find proper fitting function, revive method 3

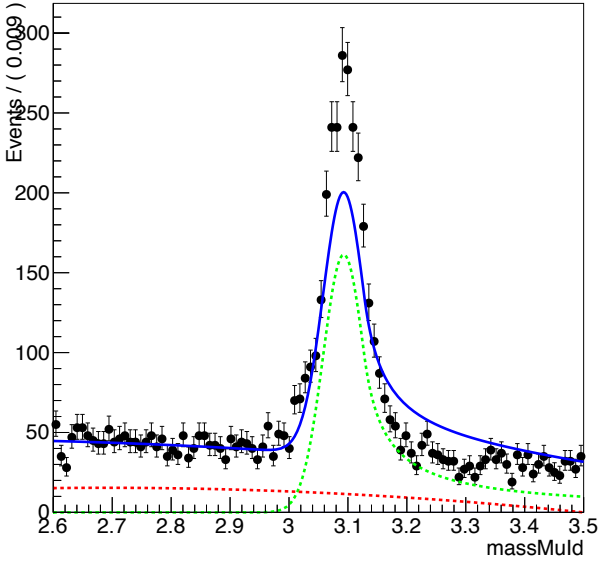
T&P resulted plots – MuId_Pt_bin3,bin4



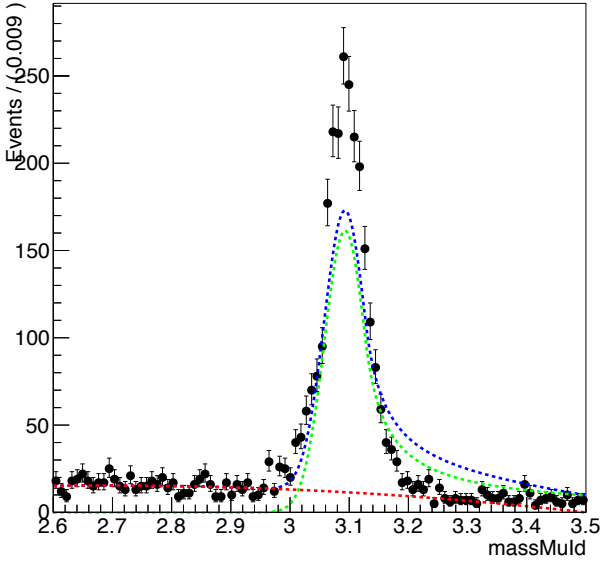




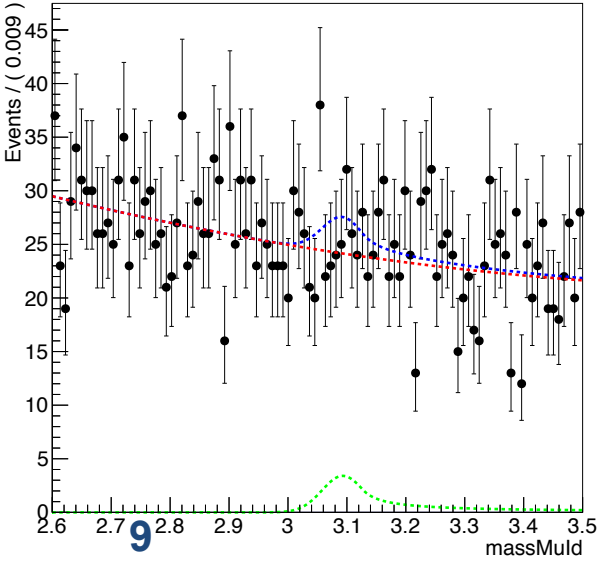
All



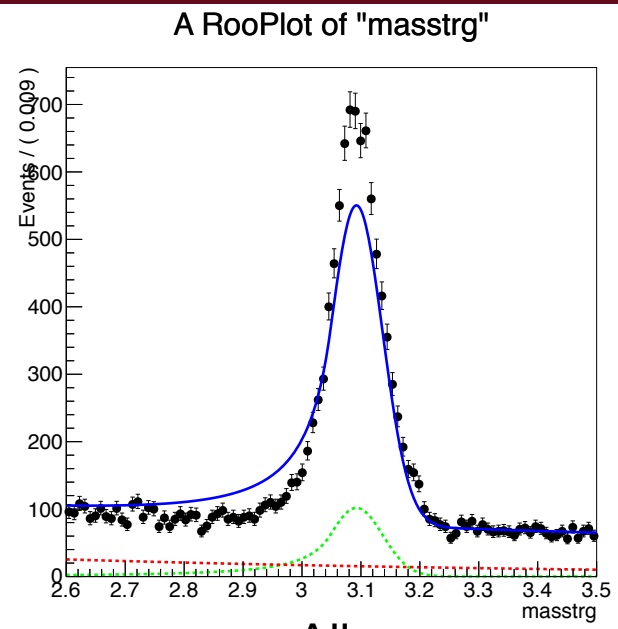
Pass

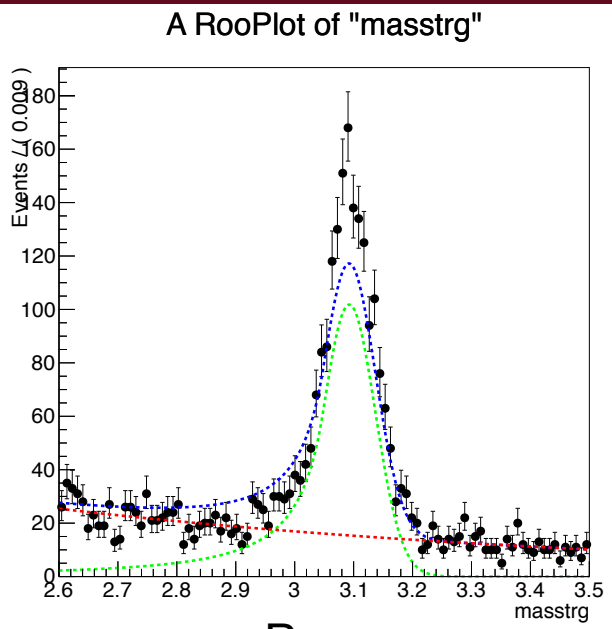


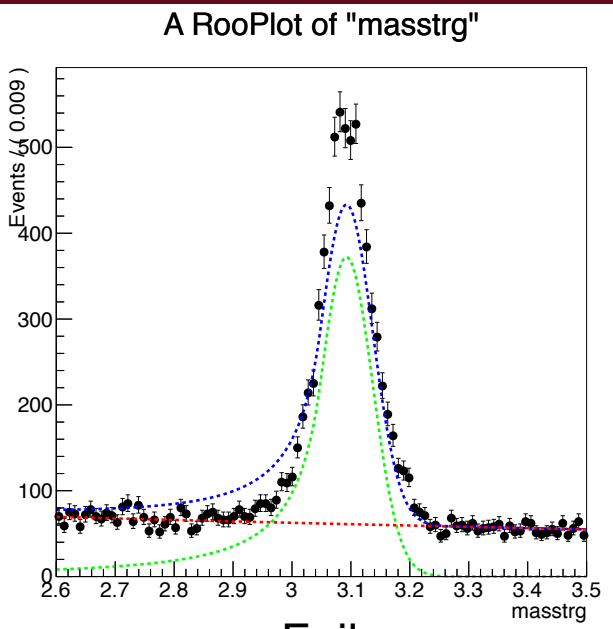
Fail



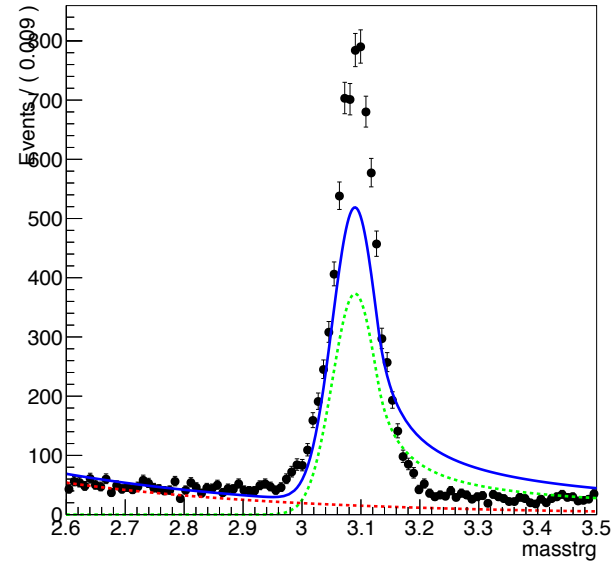
T&P resulted plots – Trg_Pt_bin1,bin2



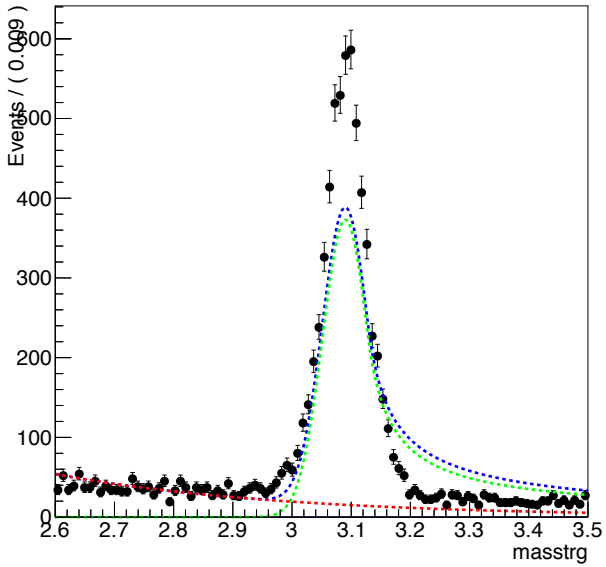




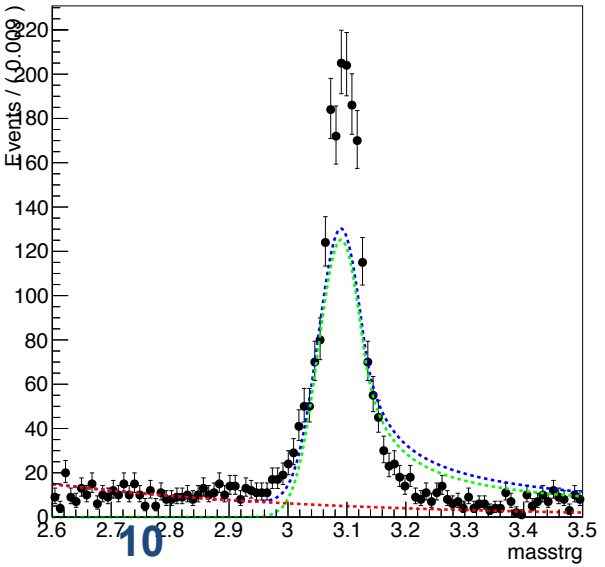
All



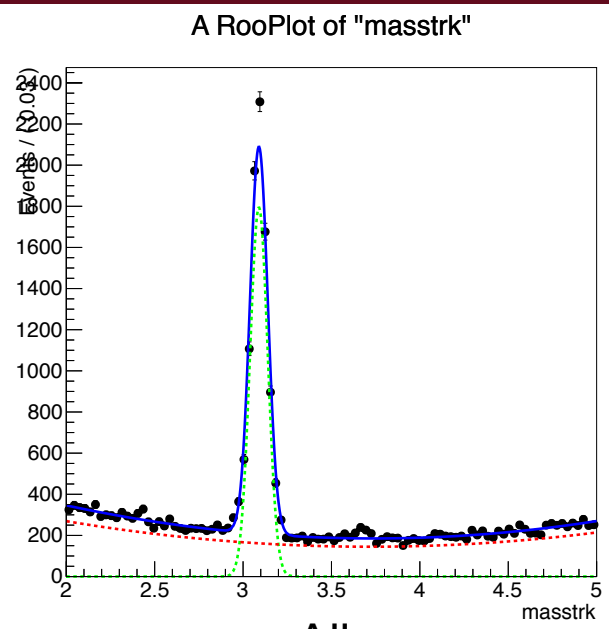
Pass

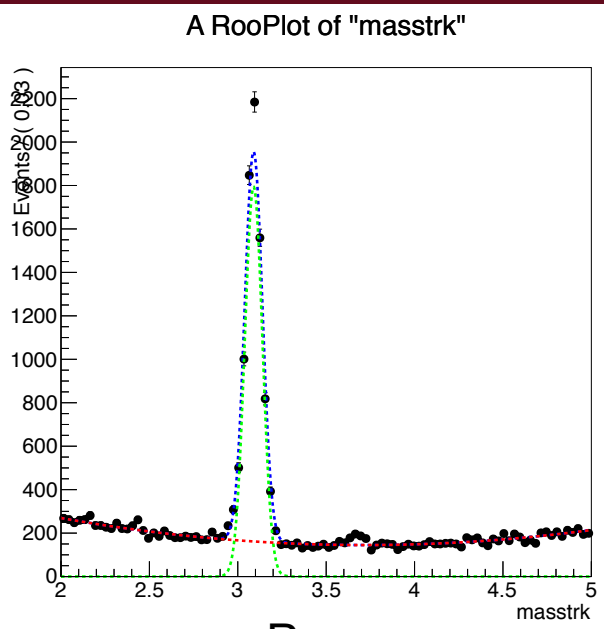


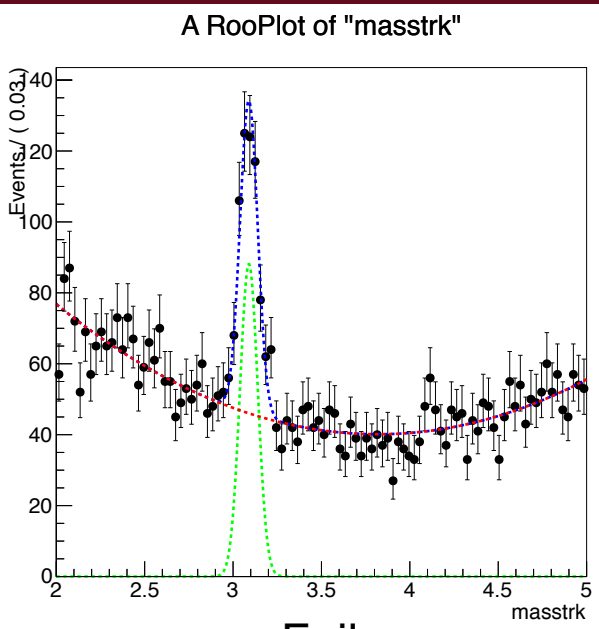
Fail



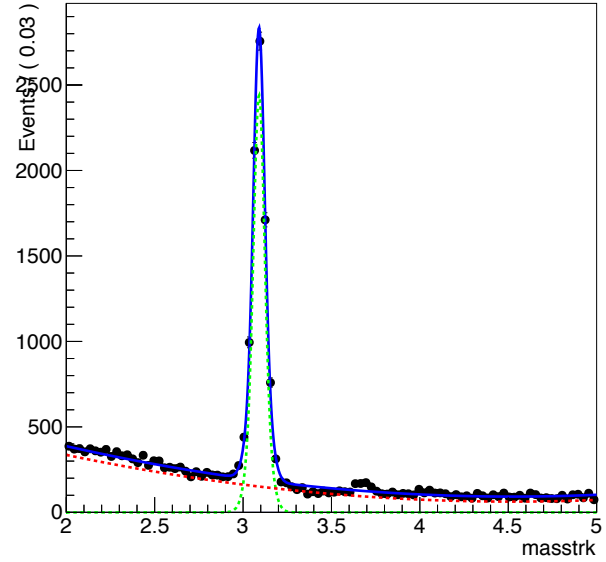
T&P resulted plots – Trk_Pt_bin1,bin2



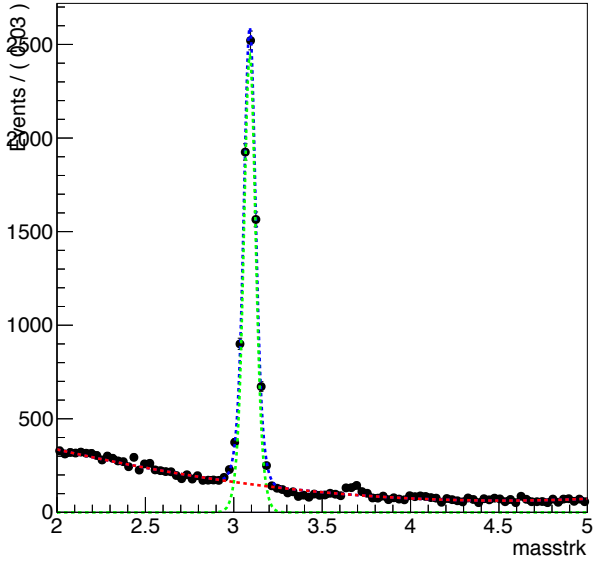




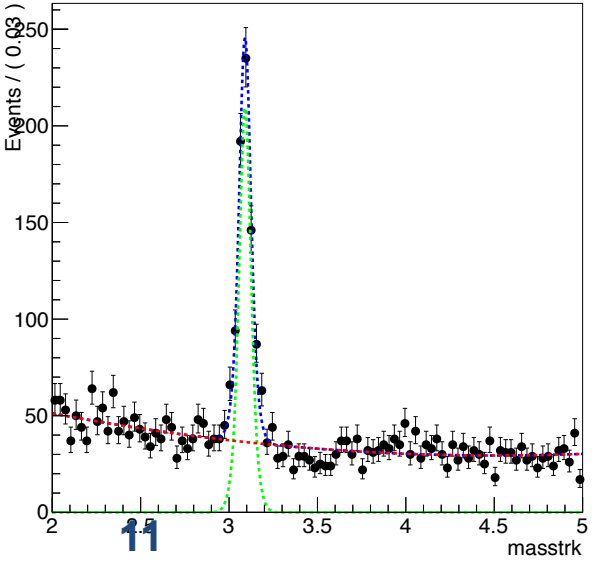
All



Pass



Fail



Summary of fitting trend

- **Mu ID efficiency**
  - At bin 0~2, all the fitting(all, pass, fail) are failed
  - At bin 3~5, for all and passing probe can't explain the peak
- **Trigger efficiency**
  - At all pT bins, peak can't be explained by fitting
- **Tracking efficiency**
  - At bin 2~6, fitting looks safe including peak points

Next homework

- **Acceptance**
  - Recalculate the weight and central value from MCs with and without pre-filter
- **Tag and Probe**
  - Test the fitting functions with various options
    - change the fitting functions
    - check the results from MC

Rapidity conversion in between lab and CM frame

- **General**
  - Proton going direction have plus rapidity in CM frame
  - Merge bins with same rapidity in CM frame(same color in tables)
- **1st run**
  - proton going to minus eta $y_{CM} = -y_{lab} - 0.465$

yLAB	-2.4	-1.465	-0.465	+0.535	+1.470	+2.4
yCM	1.935	1.0	0.0	-1.0	-1.935	-2.865

proton going direction

- **2nd run**
  - proton going to plus eta $y_{CM} = y_{lab} - 0.465$

yLAB	-2.4	-1.470	-0.535	+0.465	+1.465	+2.4
yCM	-2.865	-1.935	-1.0	0.0	1.0	1.935

proton going direction