New fits on K^+ with/without E_{loss}+B correction

A. Scordo, LNF (INFN)

18/08/2015

Contents

Mass vs Momentum with/without correction (ProfileX)

Mass vs Momentum with/without correction (From Fits)

Bin x Bin ($p\theta$) fit with gaus+expo+polN

Bin x Bin ($p\theta$) fit with exp tails and K histograms

Events selection

PID with dE/dX vs P cuts

Vertex cut

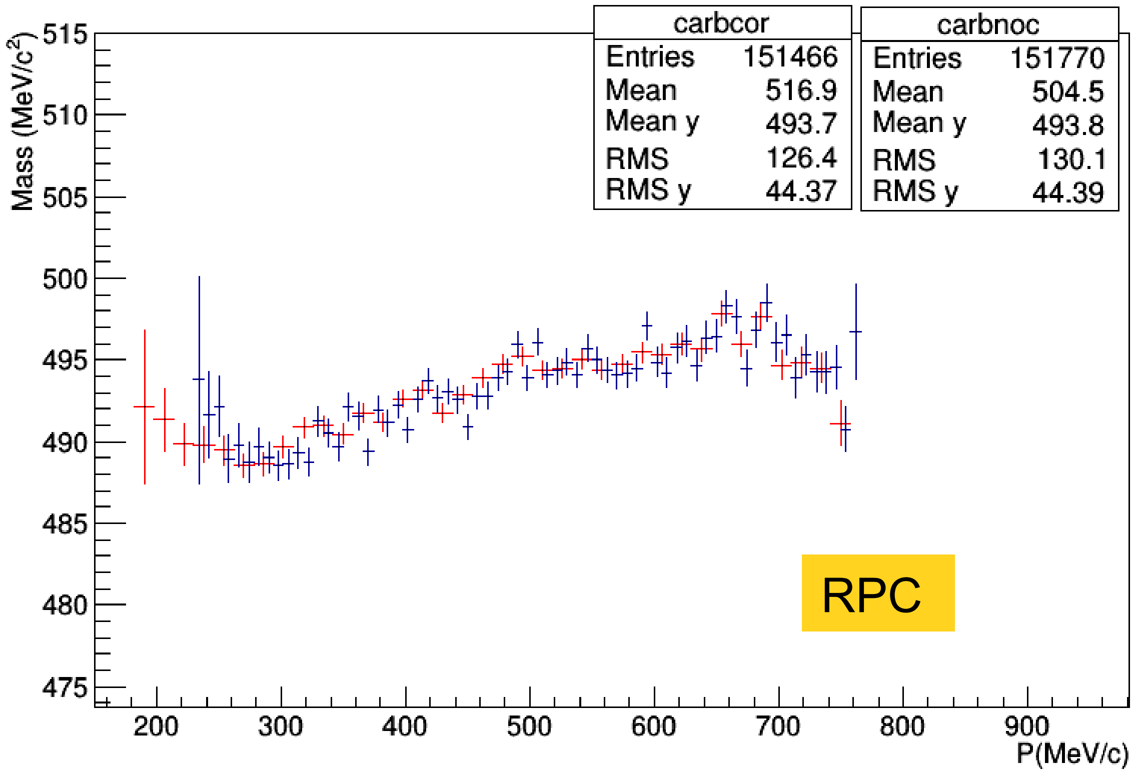
0<β<1

Eloss + B correction

Bad strips rejected

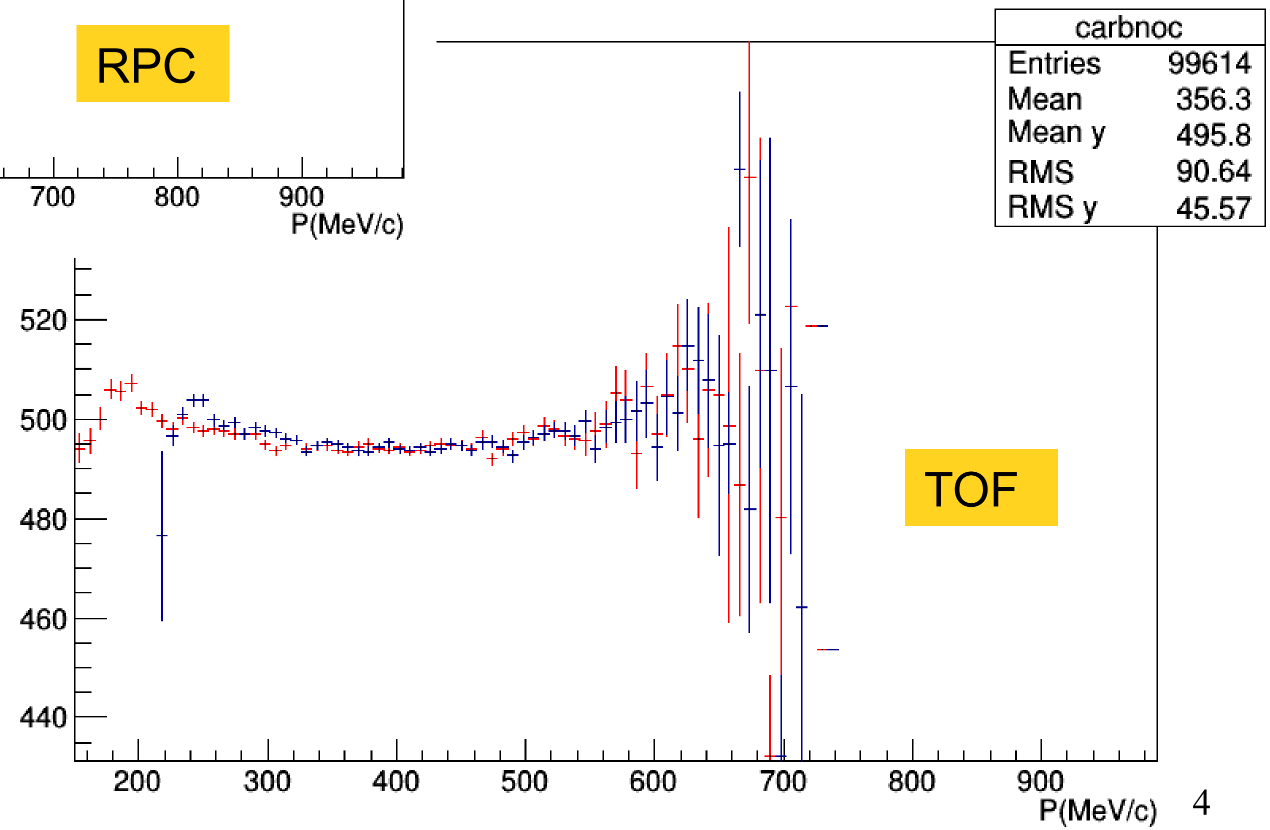
kIsUsed to reject multi hits

Mass vs P in Carbon (ProfileX)

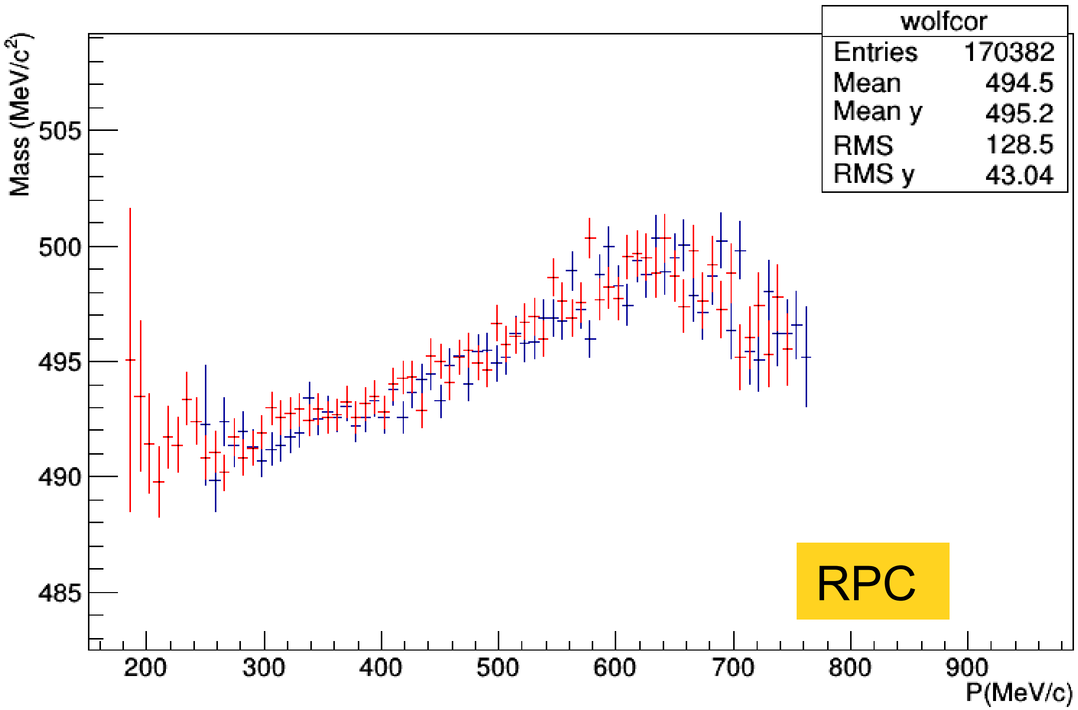


With cor

No cor

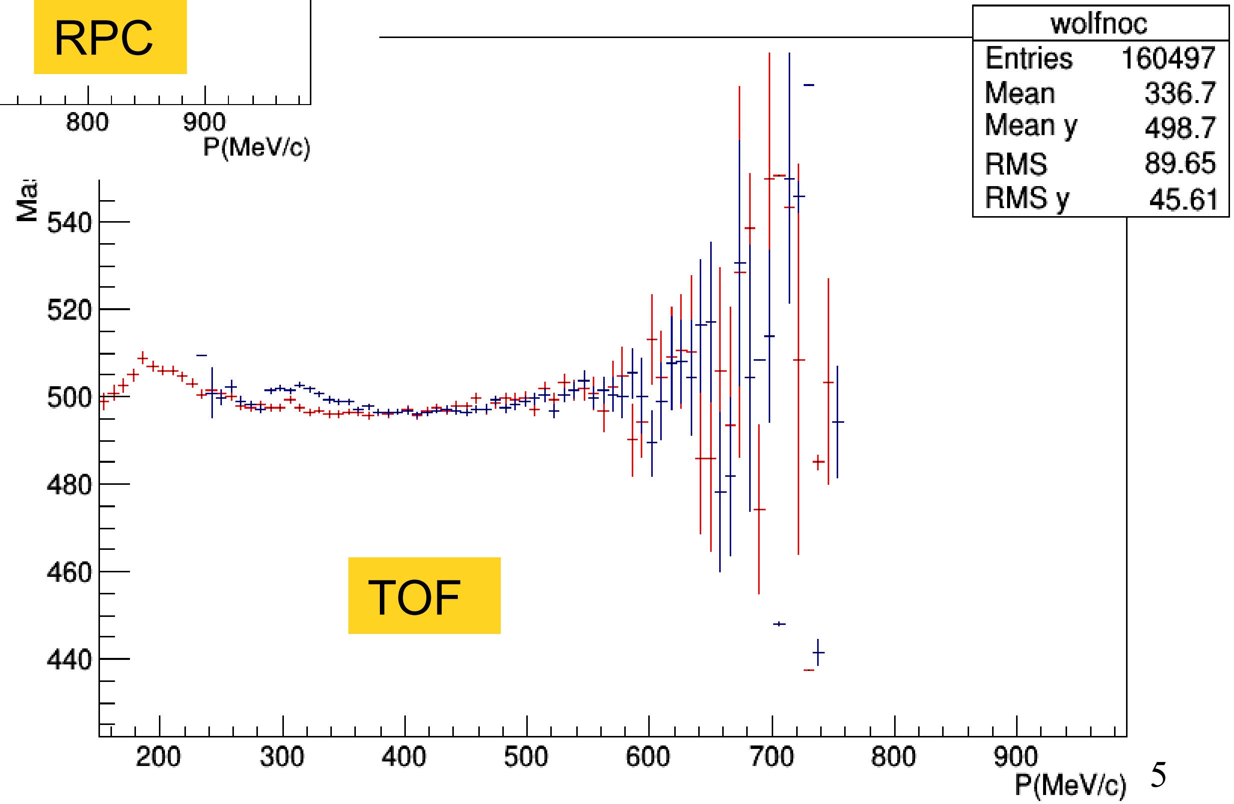


Mass vs P in Wolfram (ProfileX)

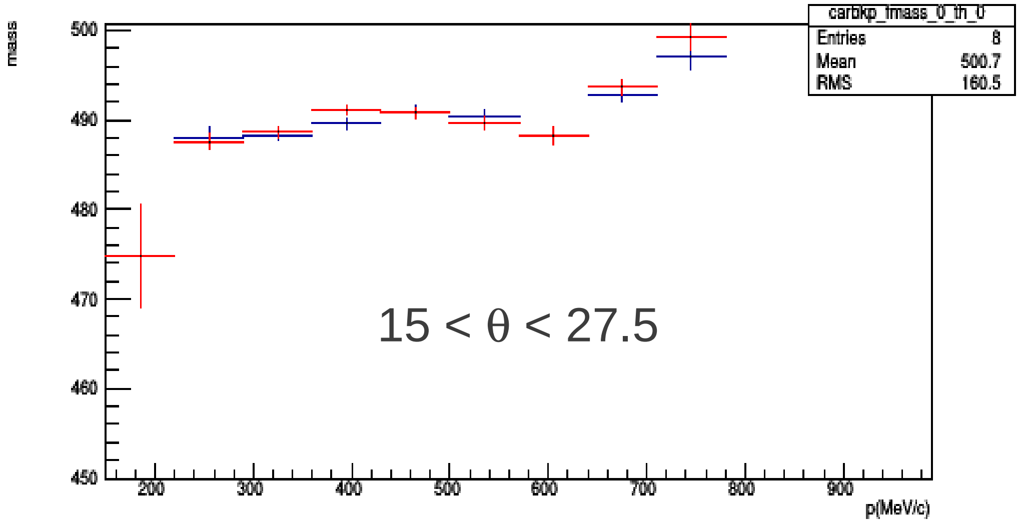


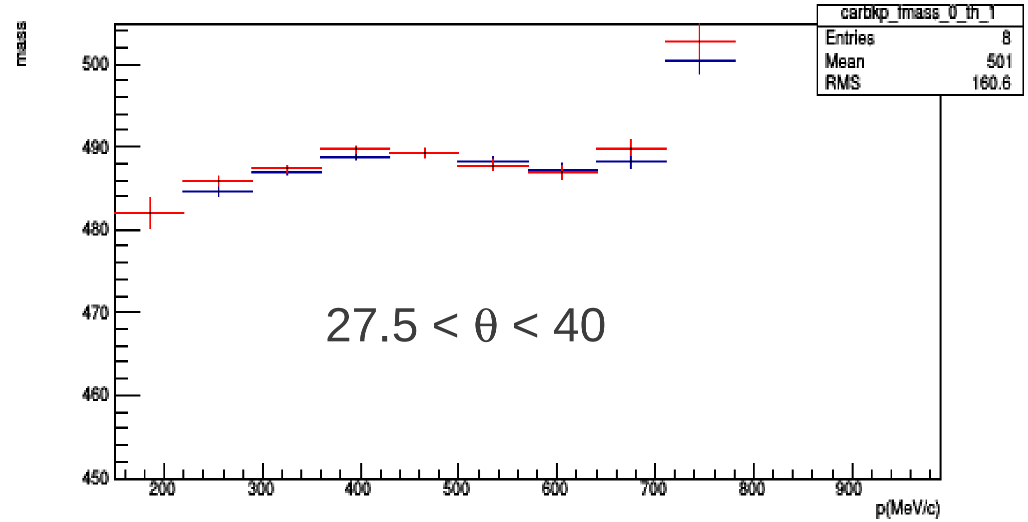
With cor

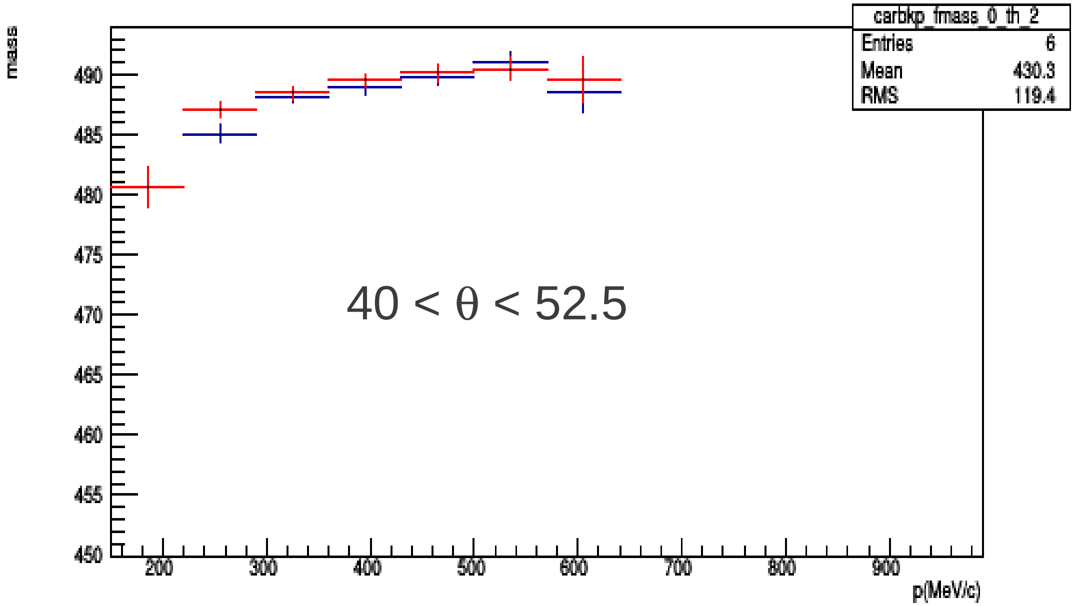
No cor



Mass vs P in Carbon RPC (fits)



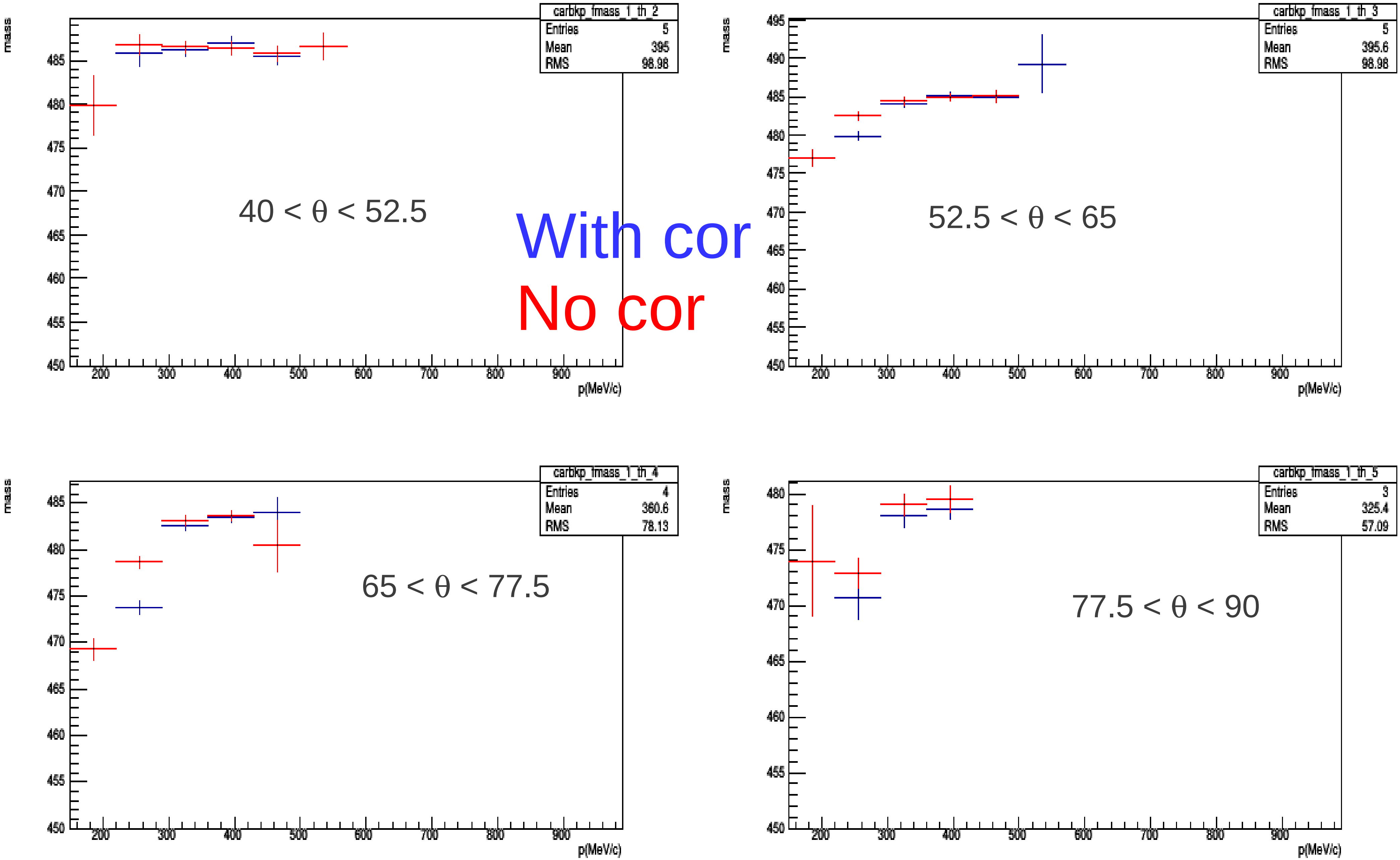




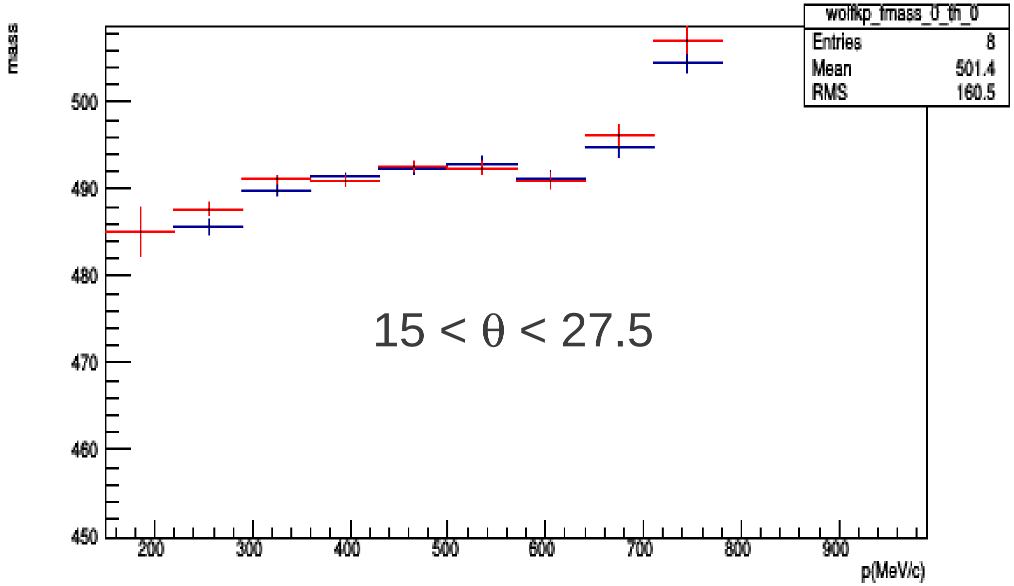
With cor

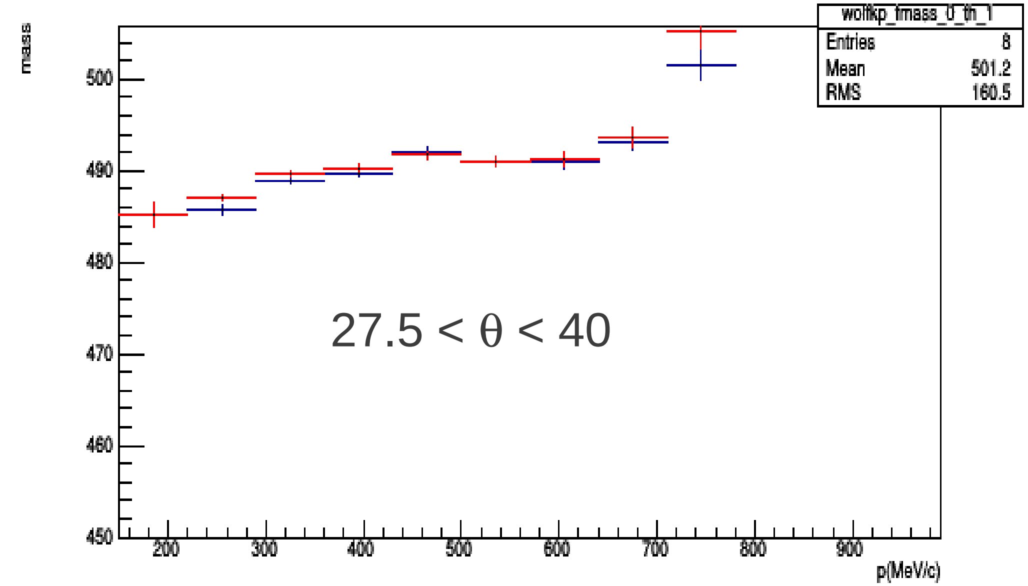
No cor

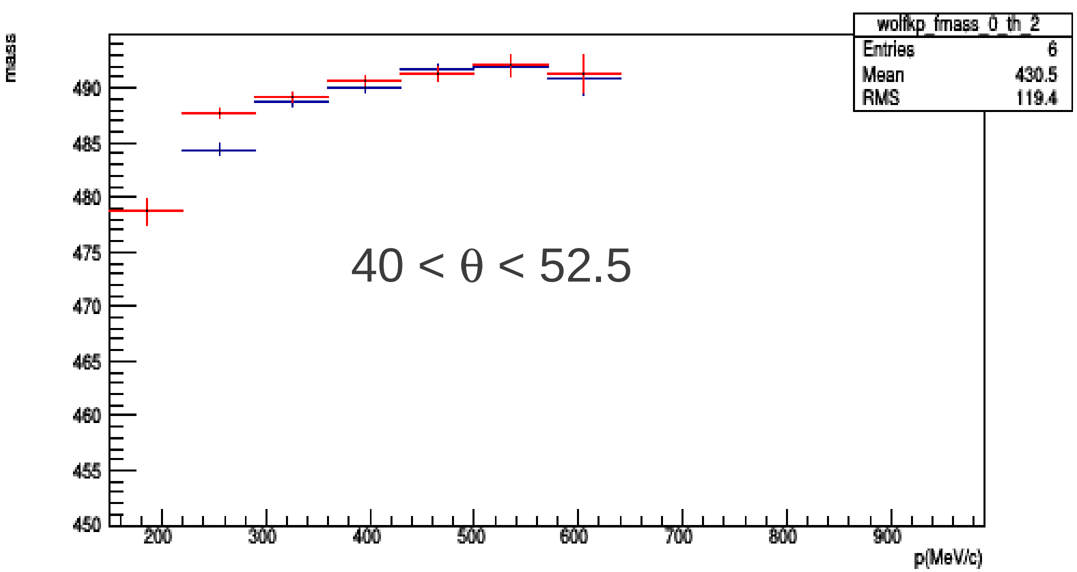
Mass vs P in Carbon TOF (fits)



Mass vs P in Wolfram RPC (fits)



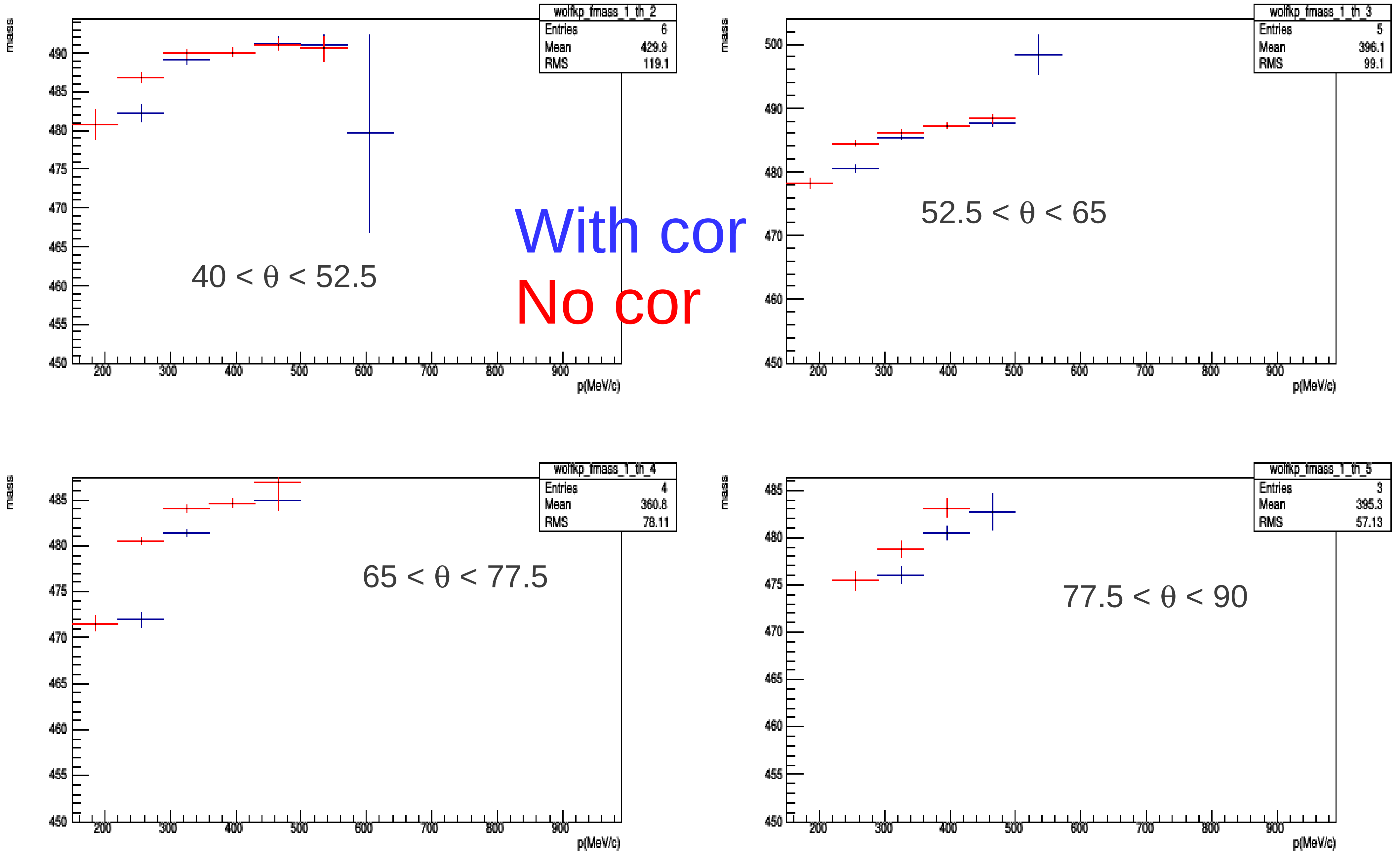




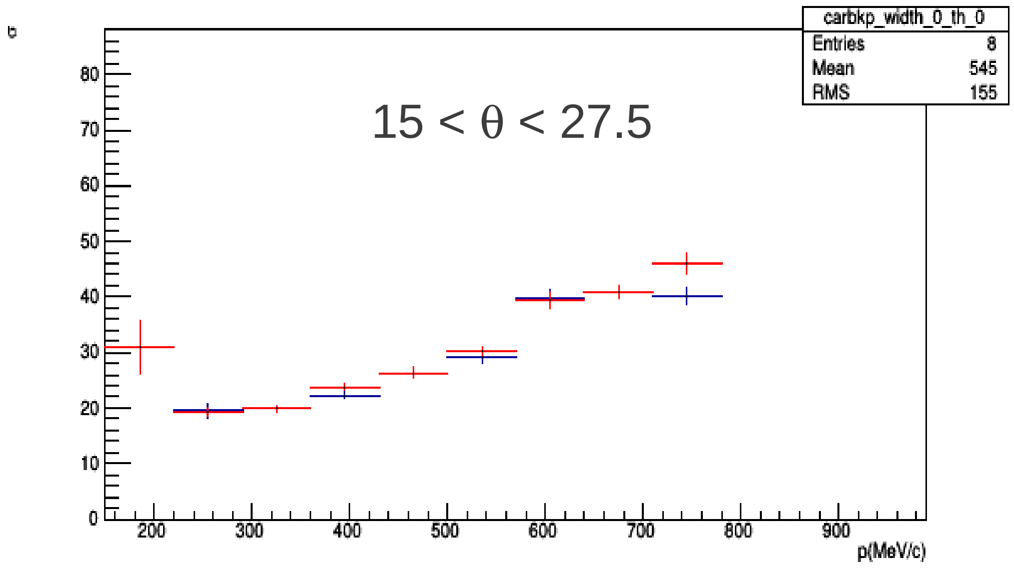
With cor

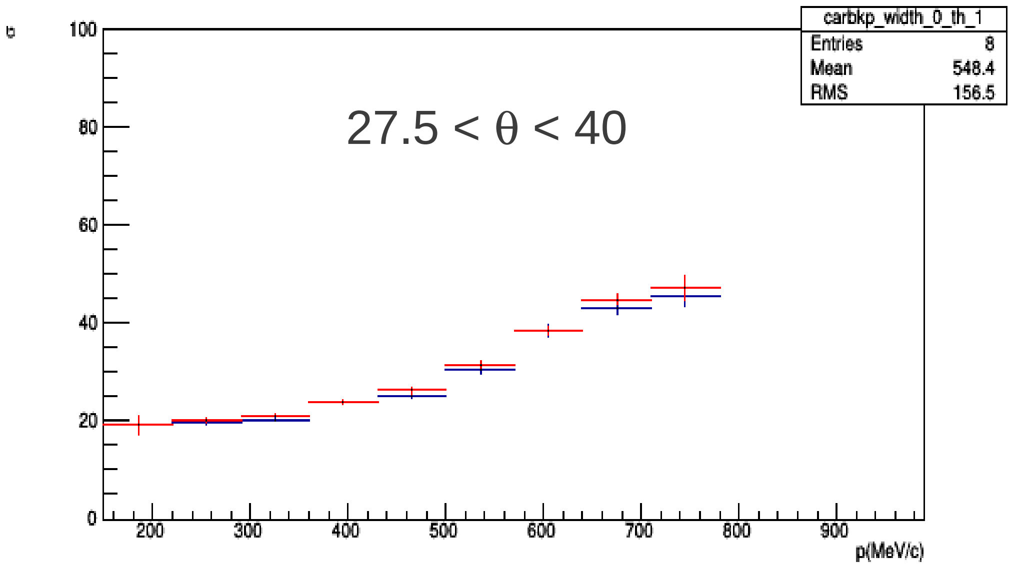
No cor

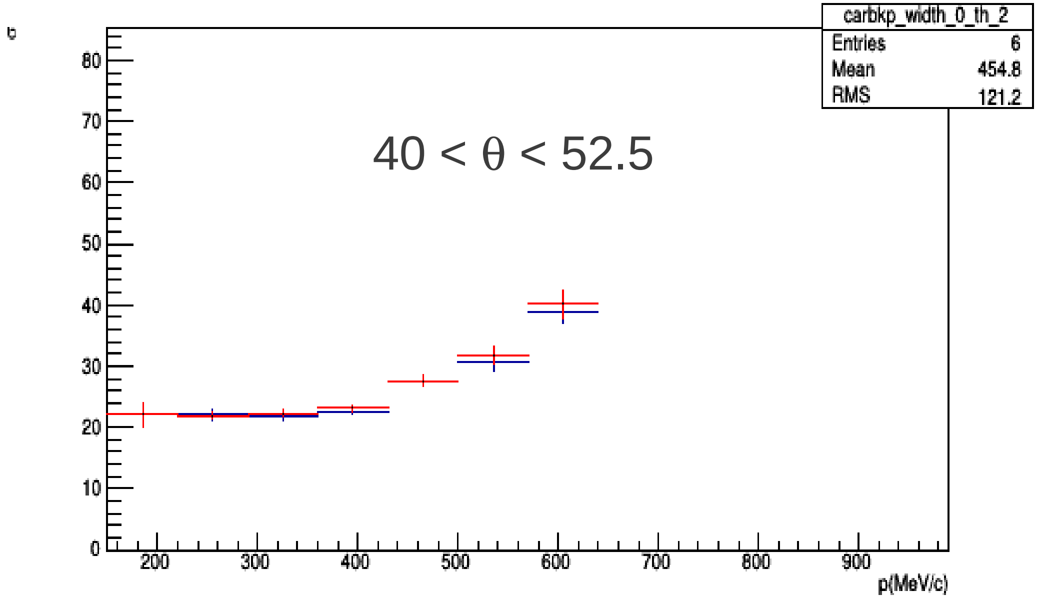
Mass vs P in Wolfram TOF (fits)



Sigma vs P in Carbon RPC (fits)

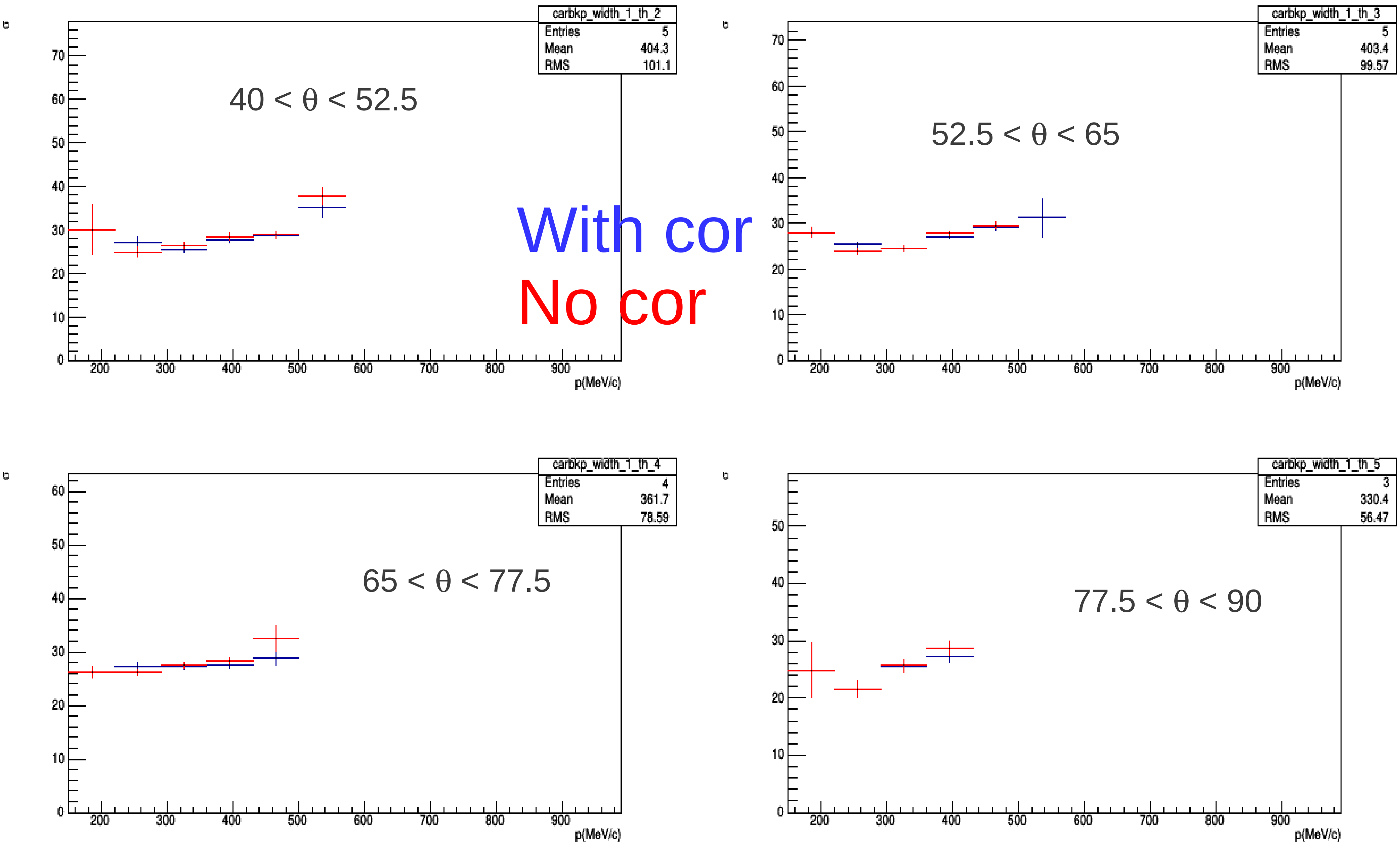




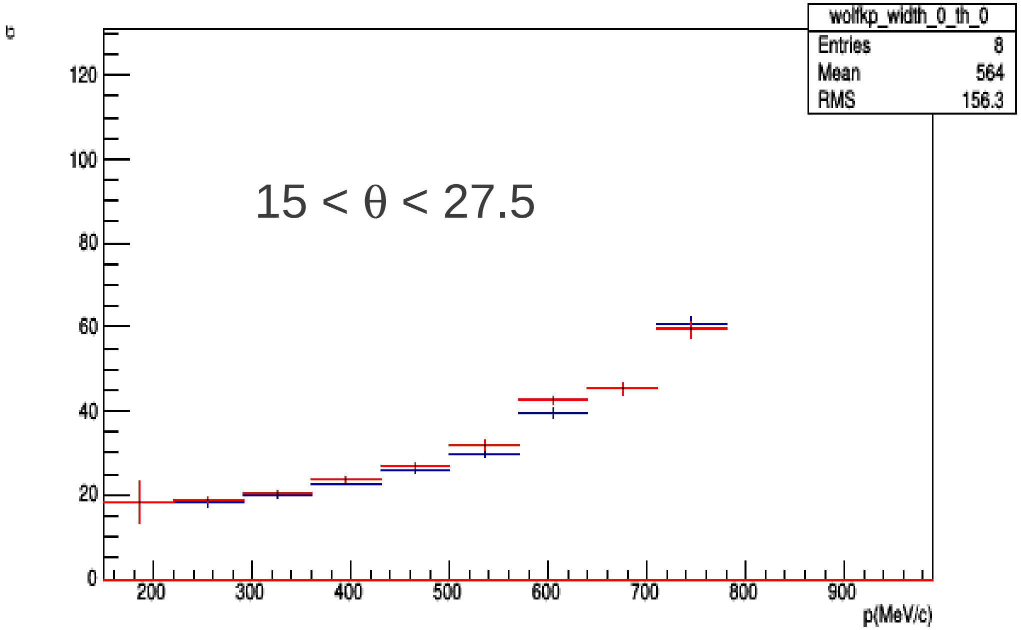


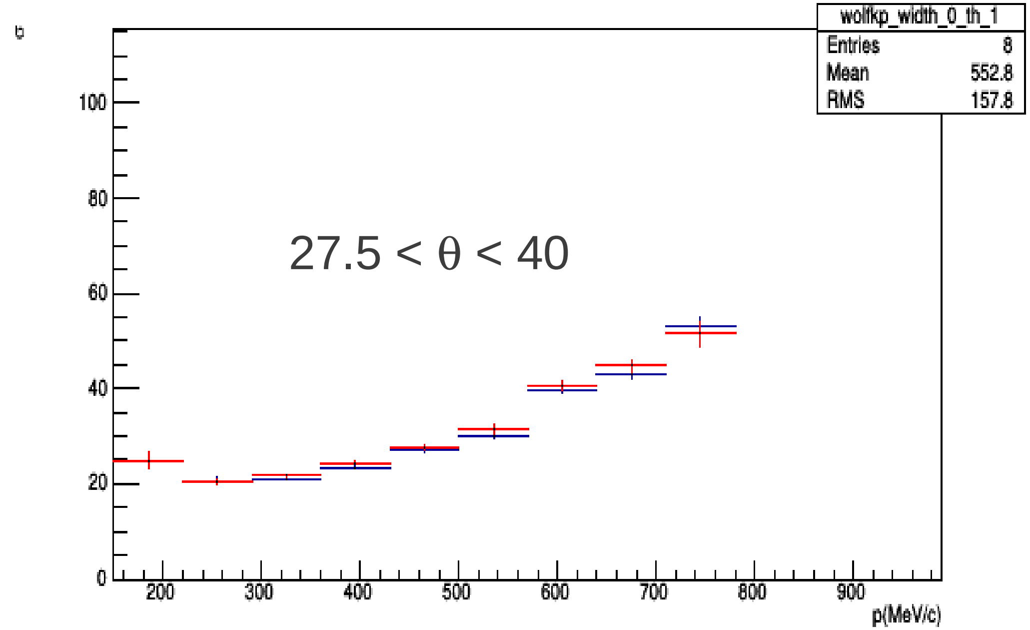
With cor
No cor

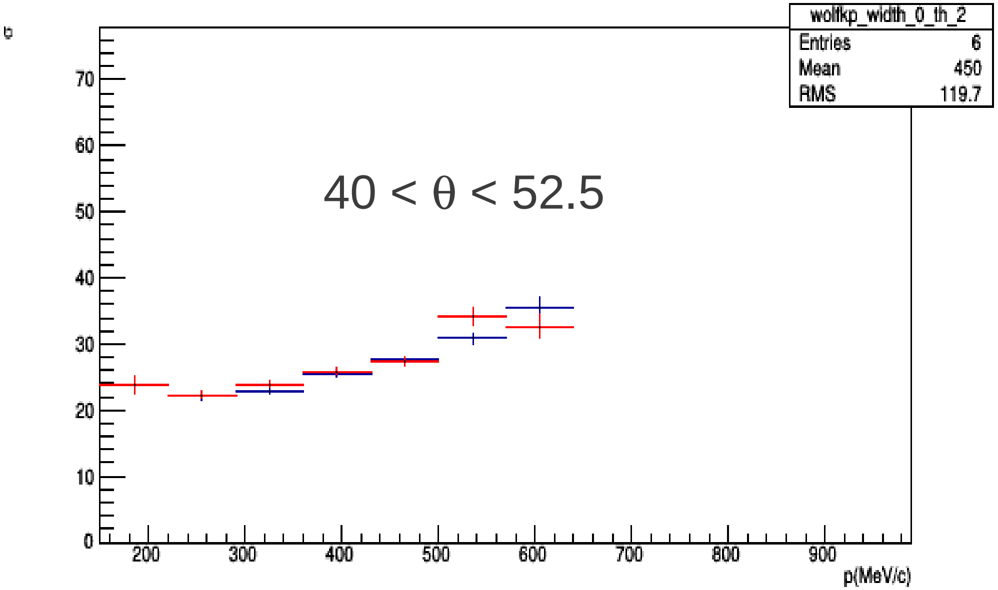
Sigma vs P in Carbon TOF (fits)



Sigma vs P in Wolfram RPC (fits)



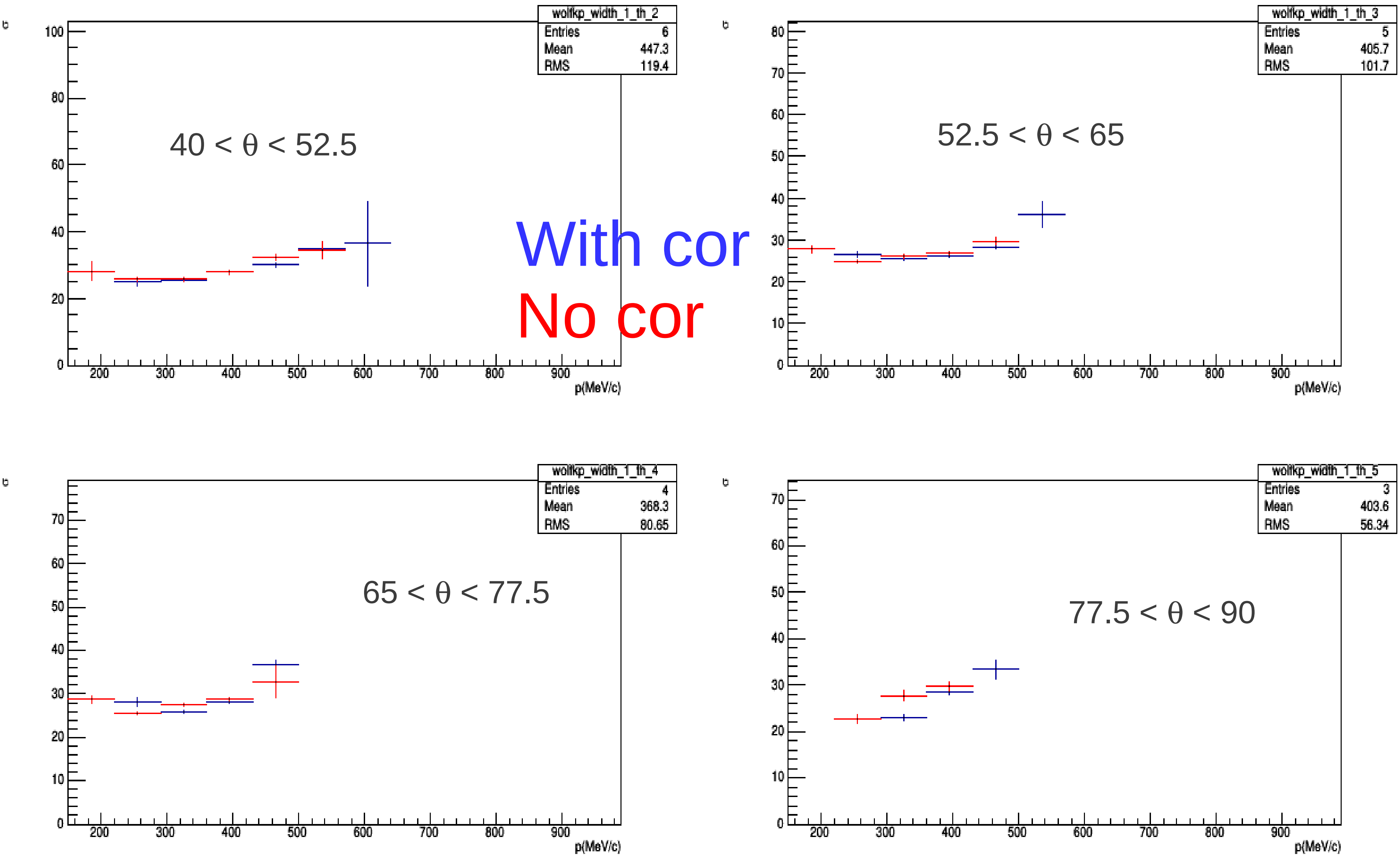




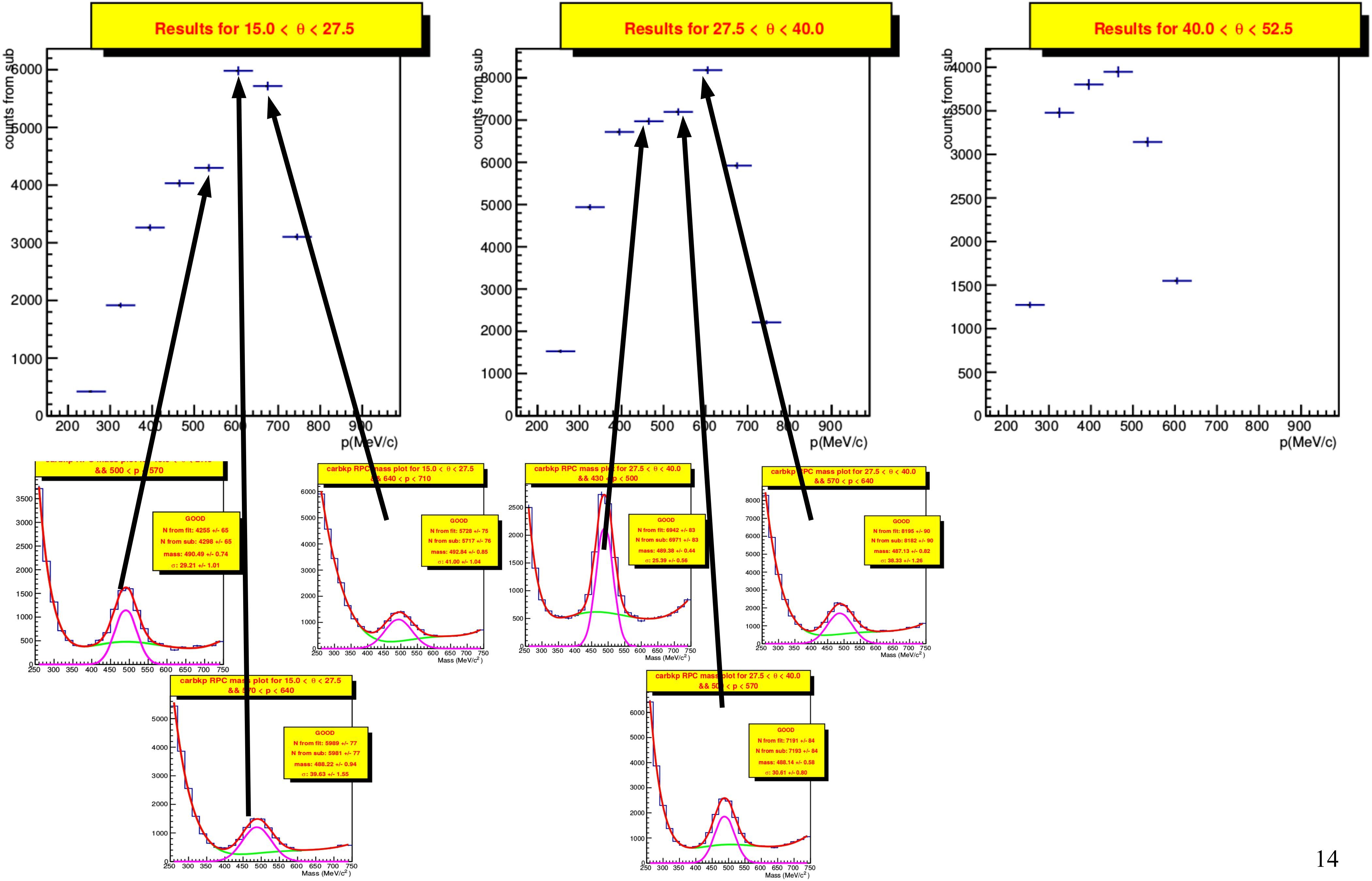
With cor

No cor

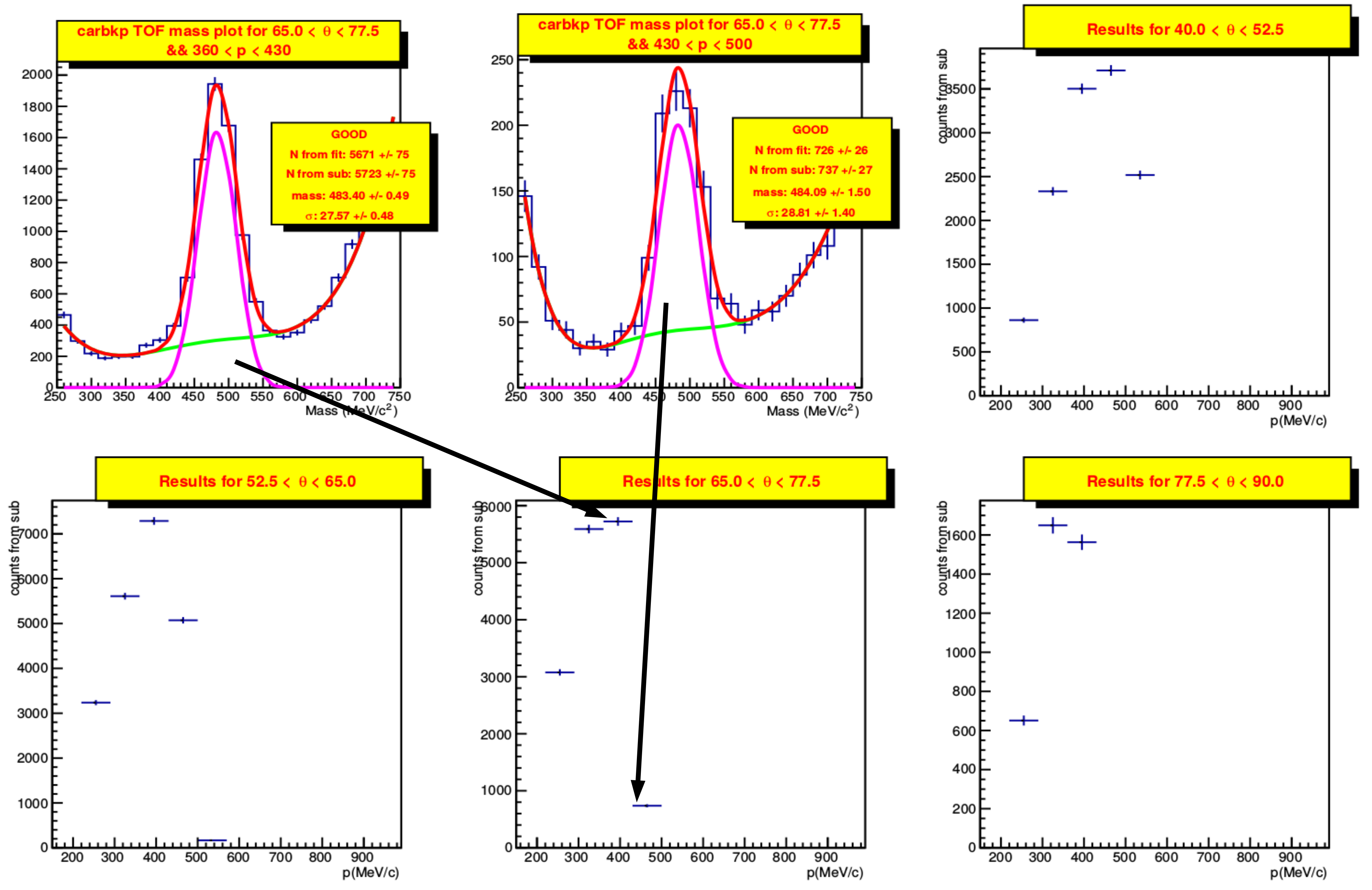
Sigma vs P in Wolfram TOF (fits)



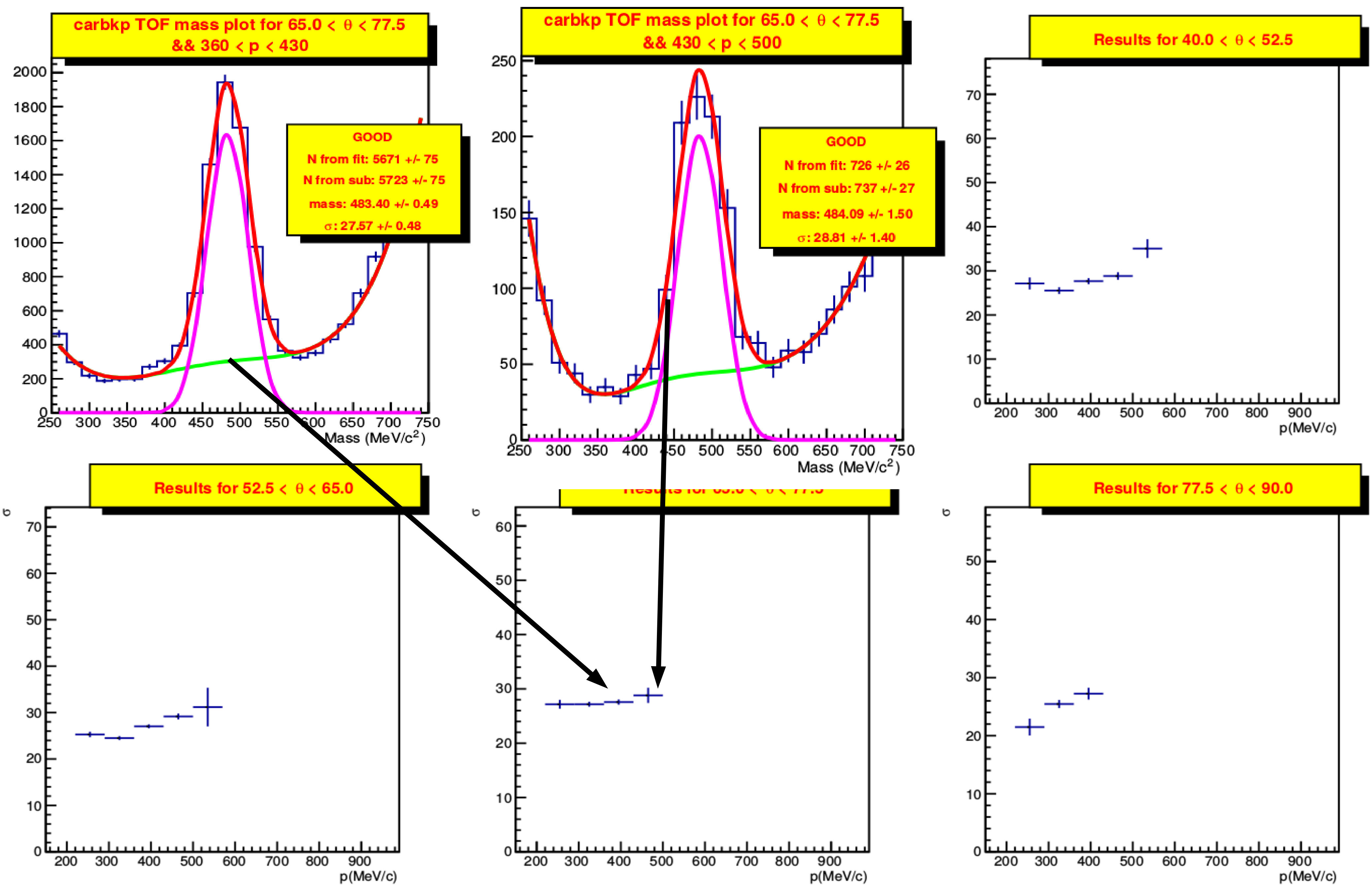
Knum vs P in Carbon RPC (cor)



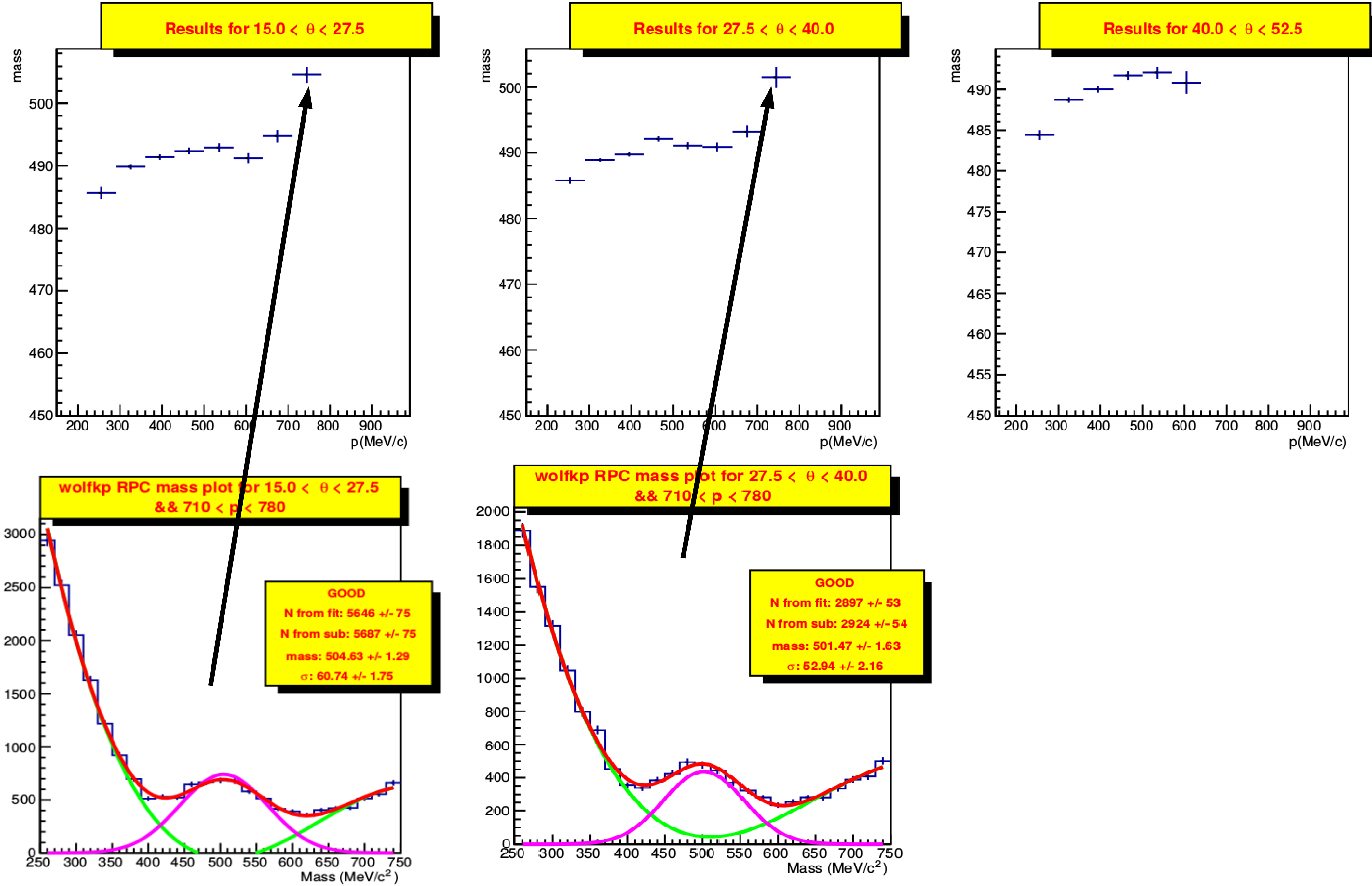
Knum vs P in Carbon TOF (cor)



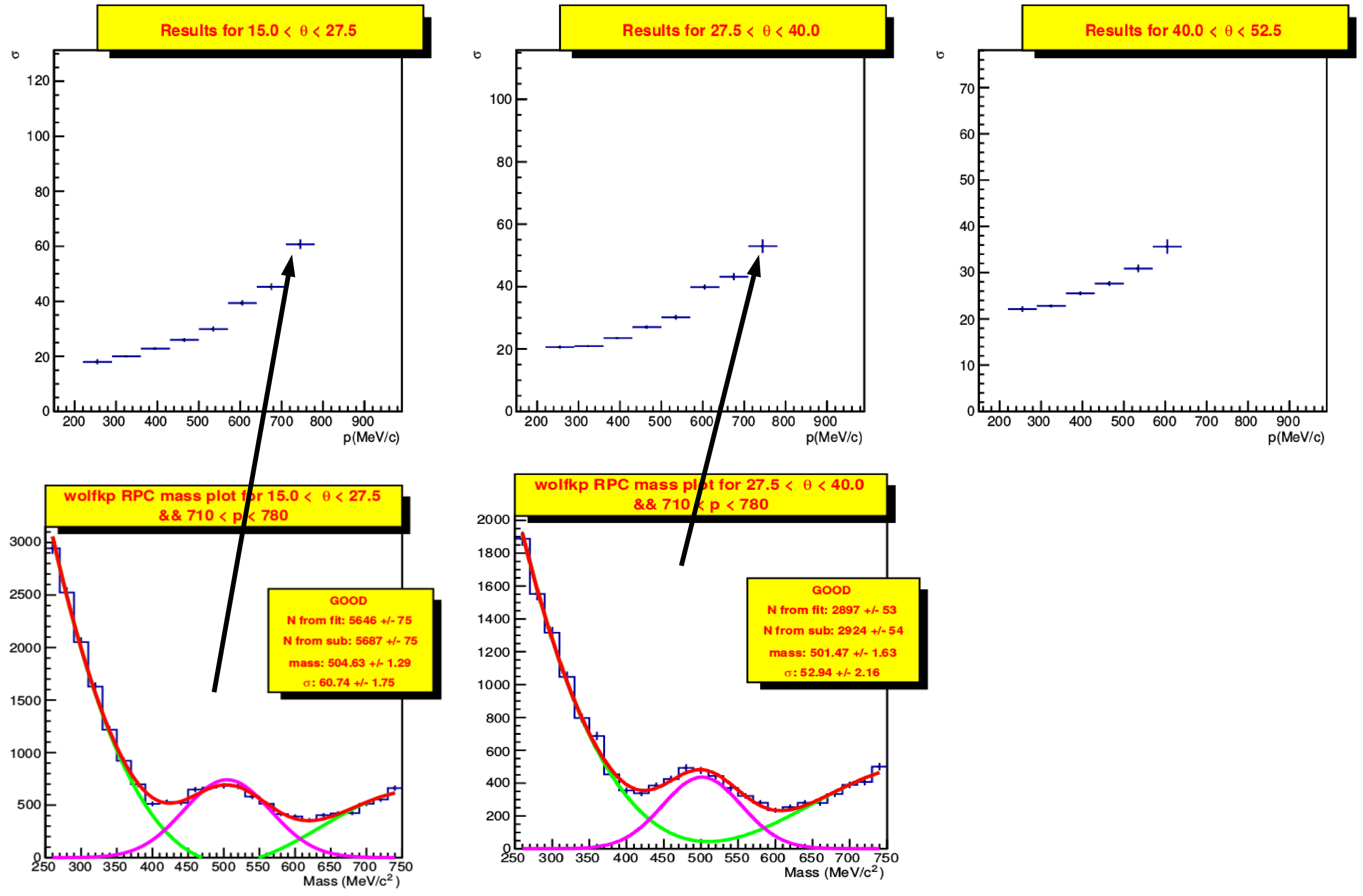
Sigma vs P in Carbon TOF (cor)



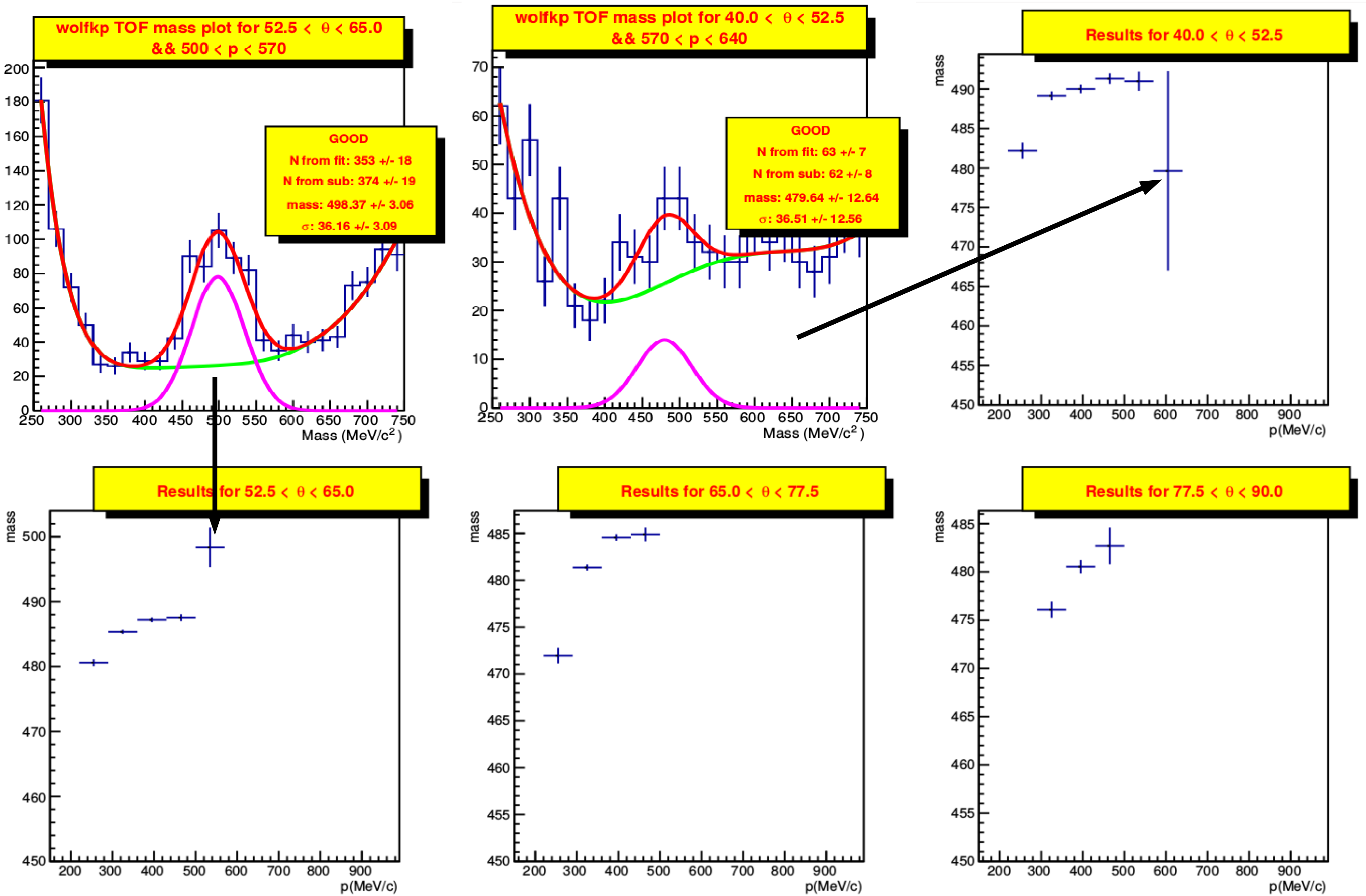
Mass vs P in Wolfram RPC (cor)



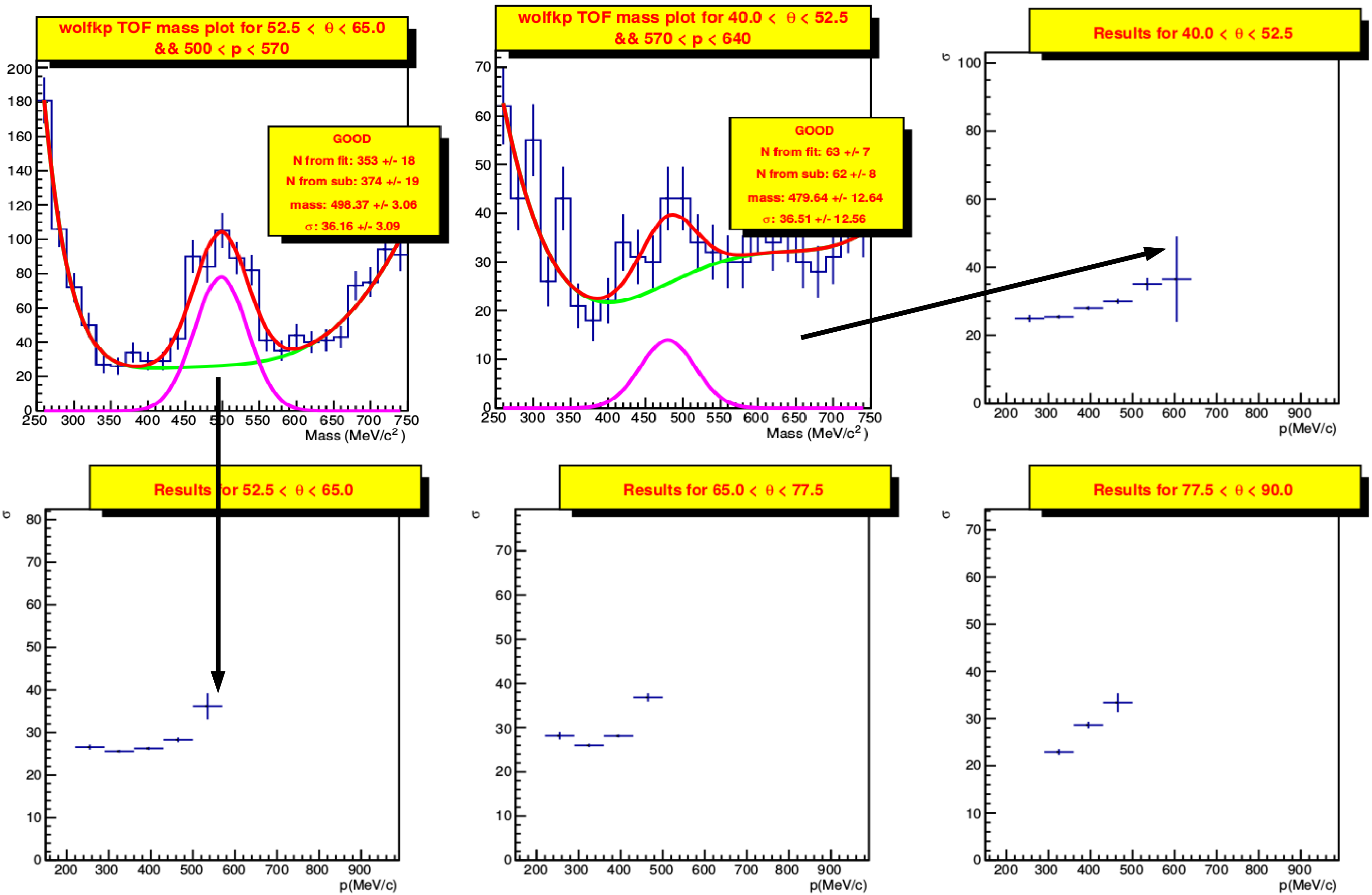
Sigma vs P in Wolfram RPC (cor)



Mass vs P in Wolfram TOF (cor)



Sigma vs P in Wolfram TOF (cor)



Fits with exp tails

This are the 2 procedures used to test this possible solution (pθ bin x bin):

1) – Normalize the MC K+ mass spectra to $N_{allmass}/N_{Kmass}$
   – Normalize the exp π and p mass spectra to $N_{allmass}/N_{\pi mass}$ & $N_{allmass}/N_{pmass}$
   – Fit the allmass distribution with p(0)*Kmass+p(1)*πmass+p(2)*pmass
   – Plot fit results and residuals to check feasibility of the method → Knum (not yet done)

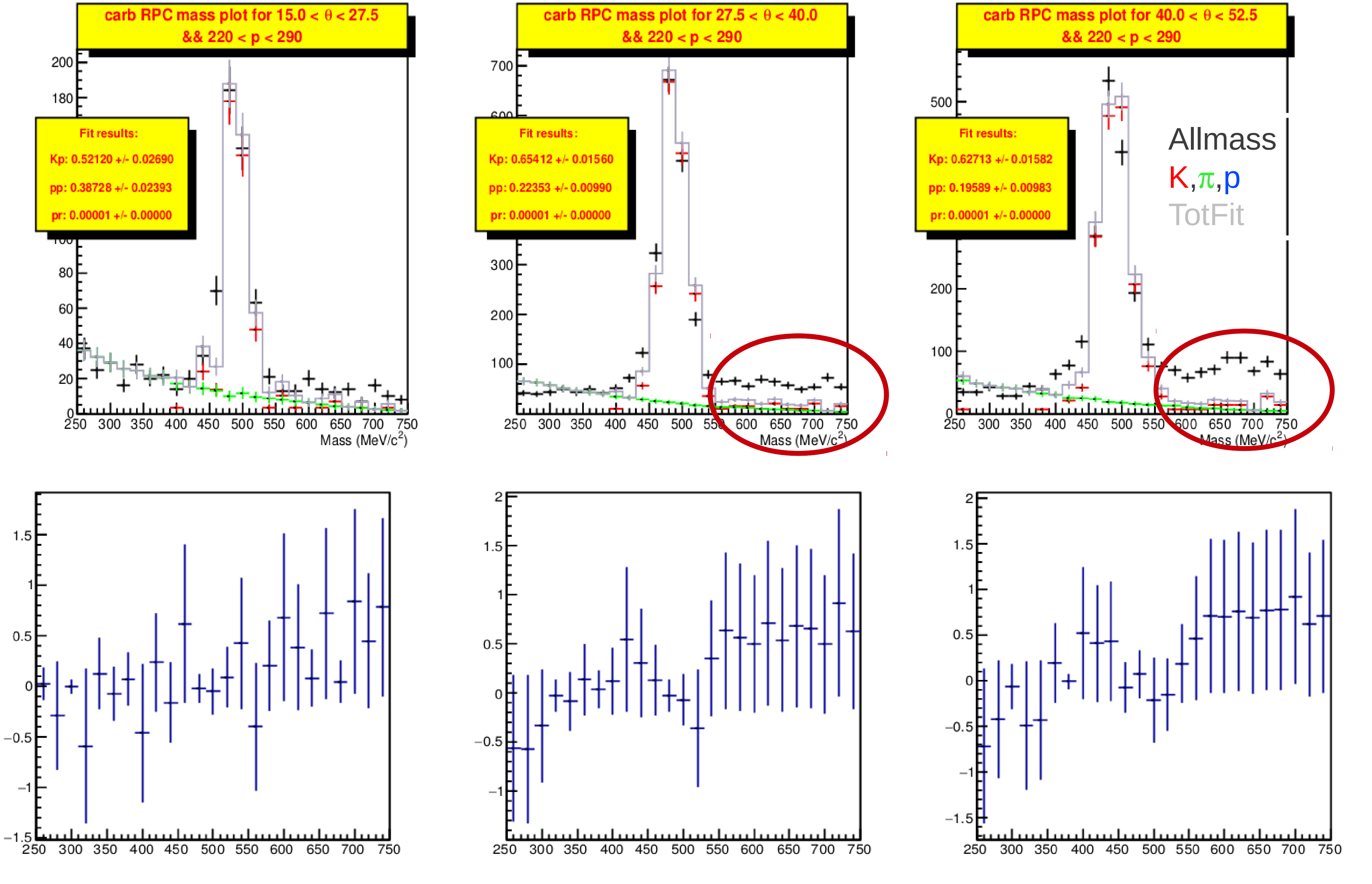
RESIDUALS = (Nexp-NTotfit)/Nexp

2) Same as before but using exp K+ mass instead of MC; in particular, K+ mass distributions are obtaind AFTER the gaus+expo+polN fit by subtraction of the bkg from the allmass spectra.

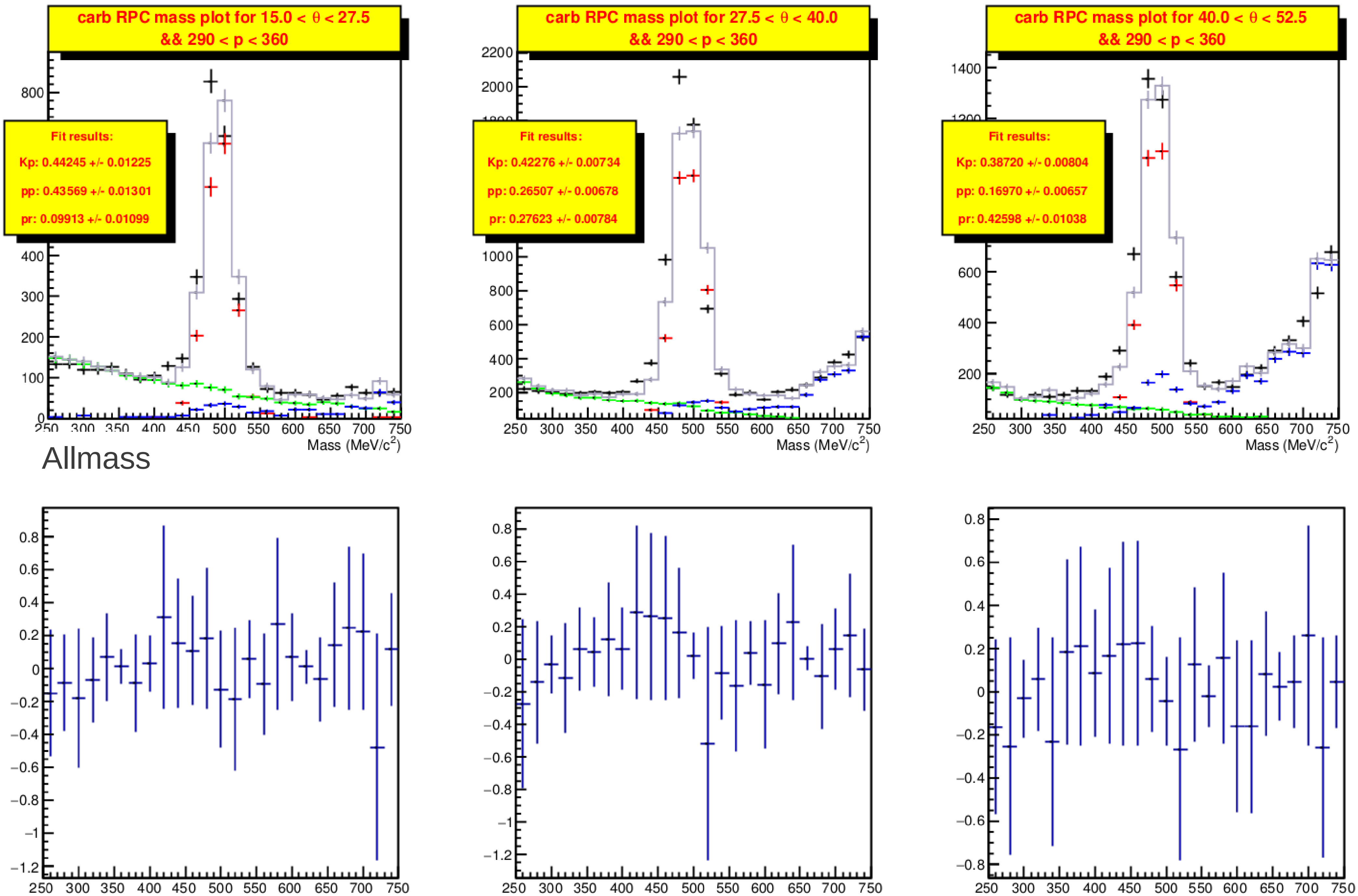
Problems of meth 1 → We know that dE/dX selection is not properly working for MC so we are probably introducing biases

Problems of meth 2 → We know that the fit procedure from which we get the exp distribution is not properly working so we are probably introducing biases

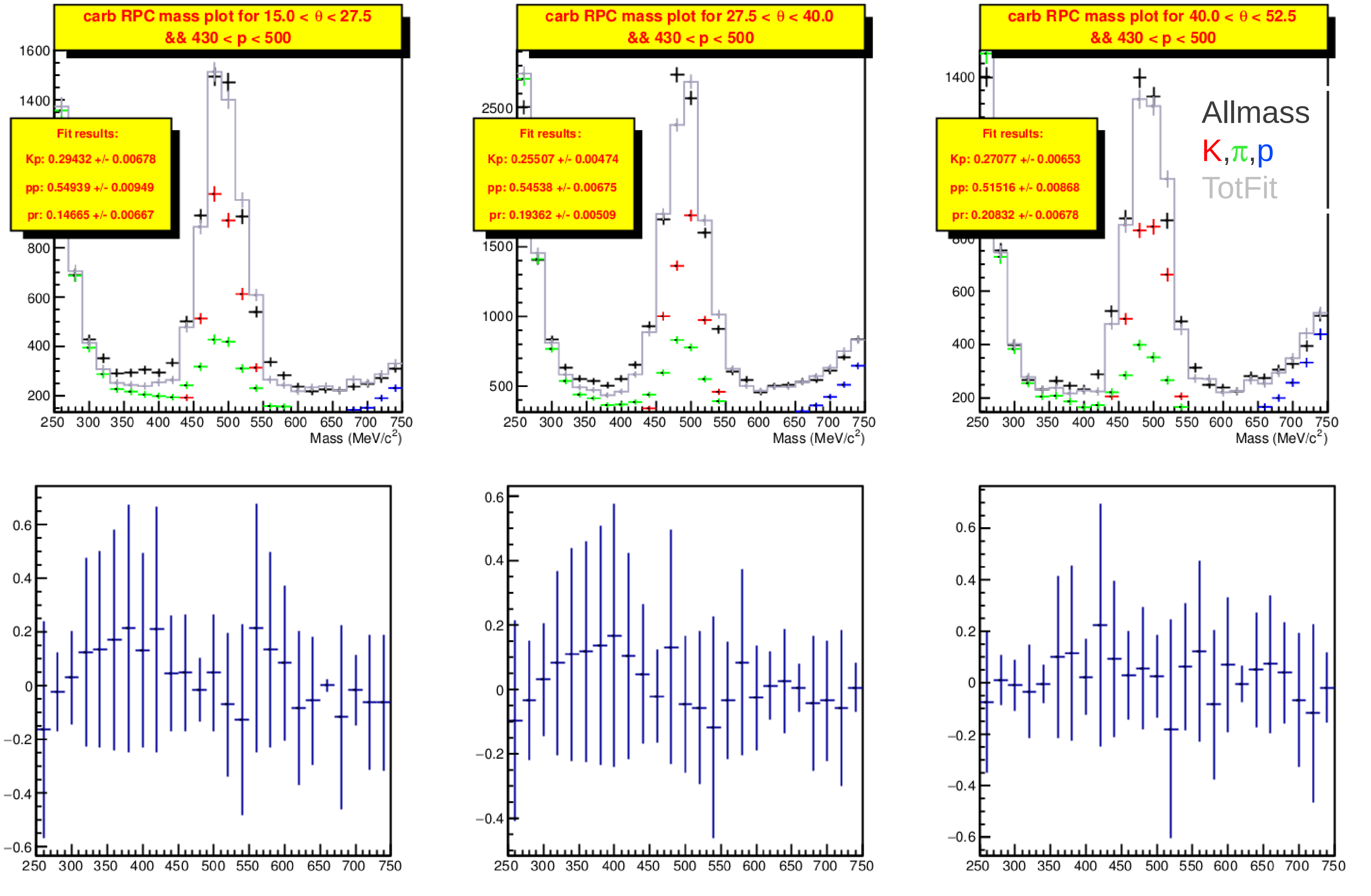
Fits in Carbon RPC (MC K+)



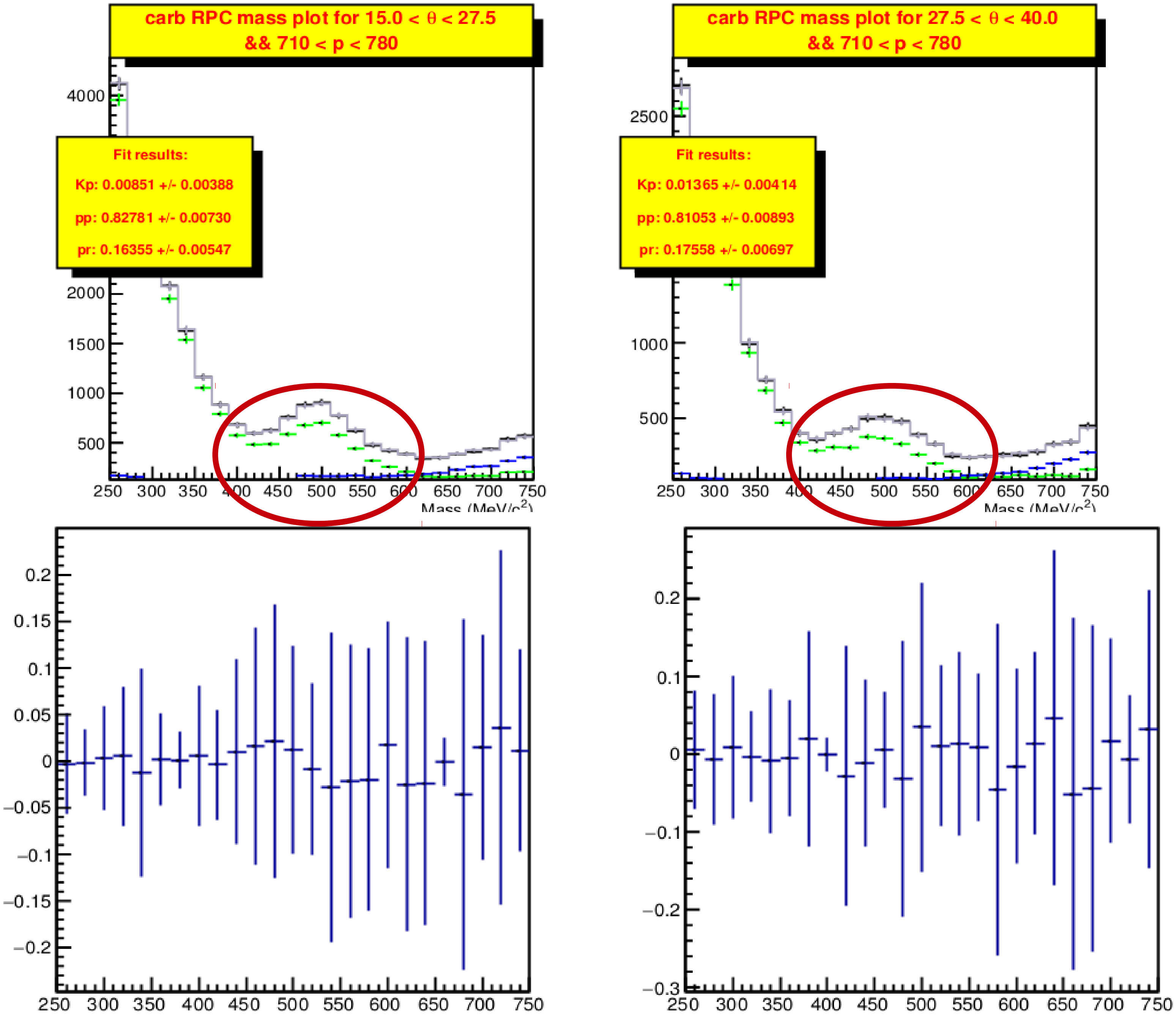
Fits in Carbon RPC (MC K+)



Fits in Carbon RPC (MC K+)

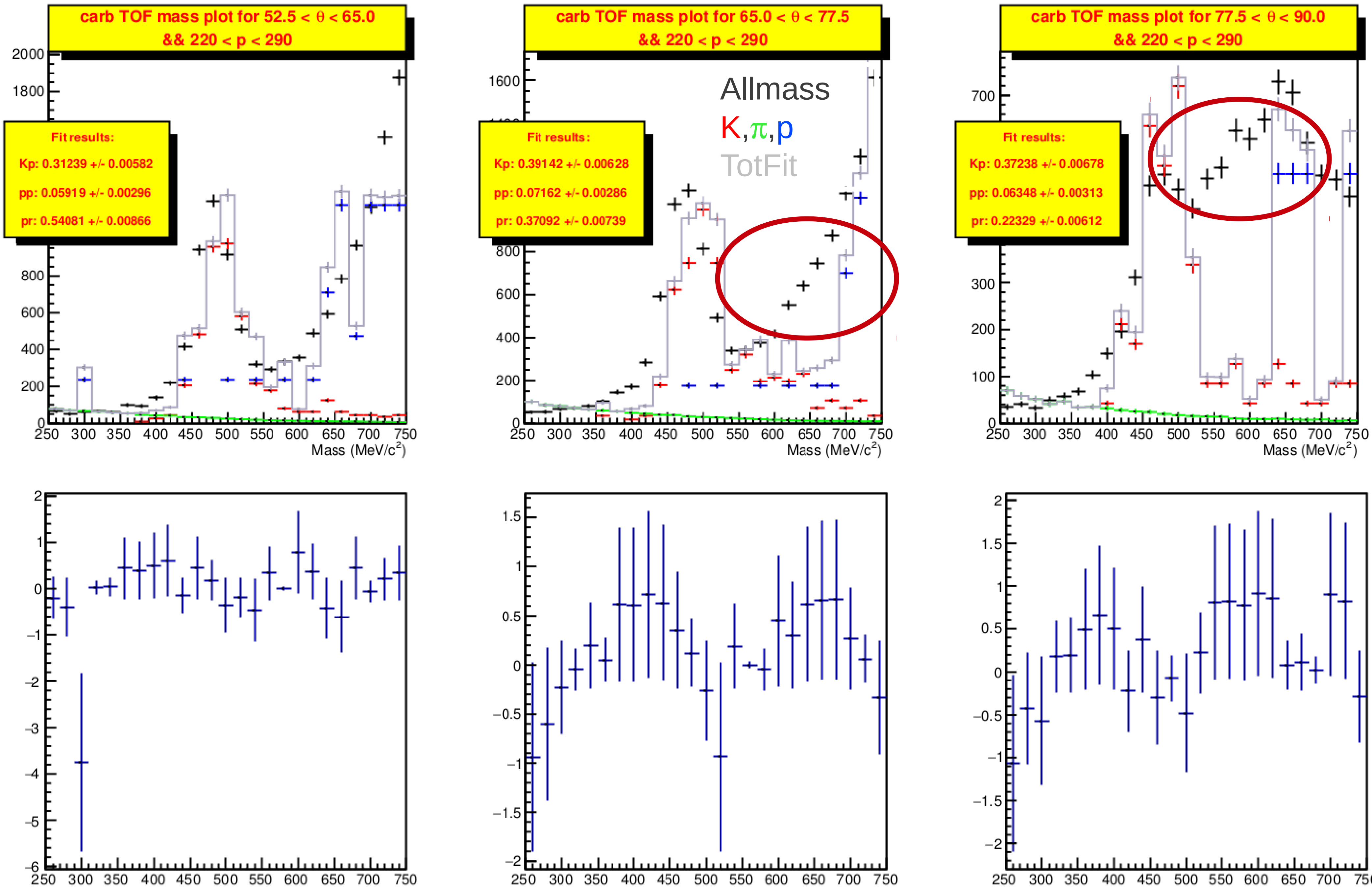


Fits in Carbon RPC (MC K+)

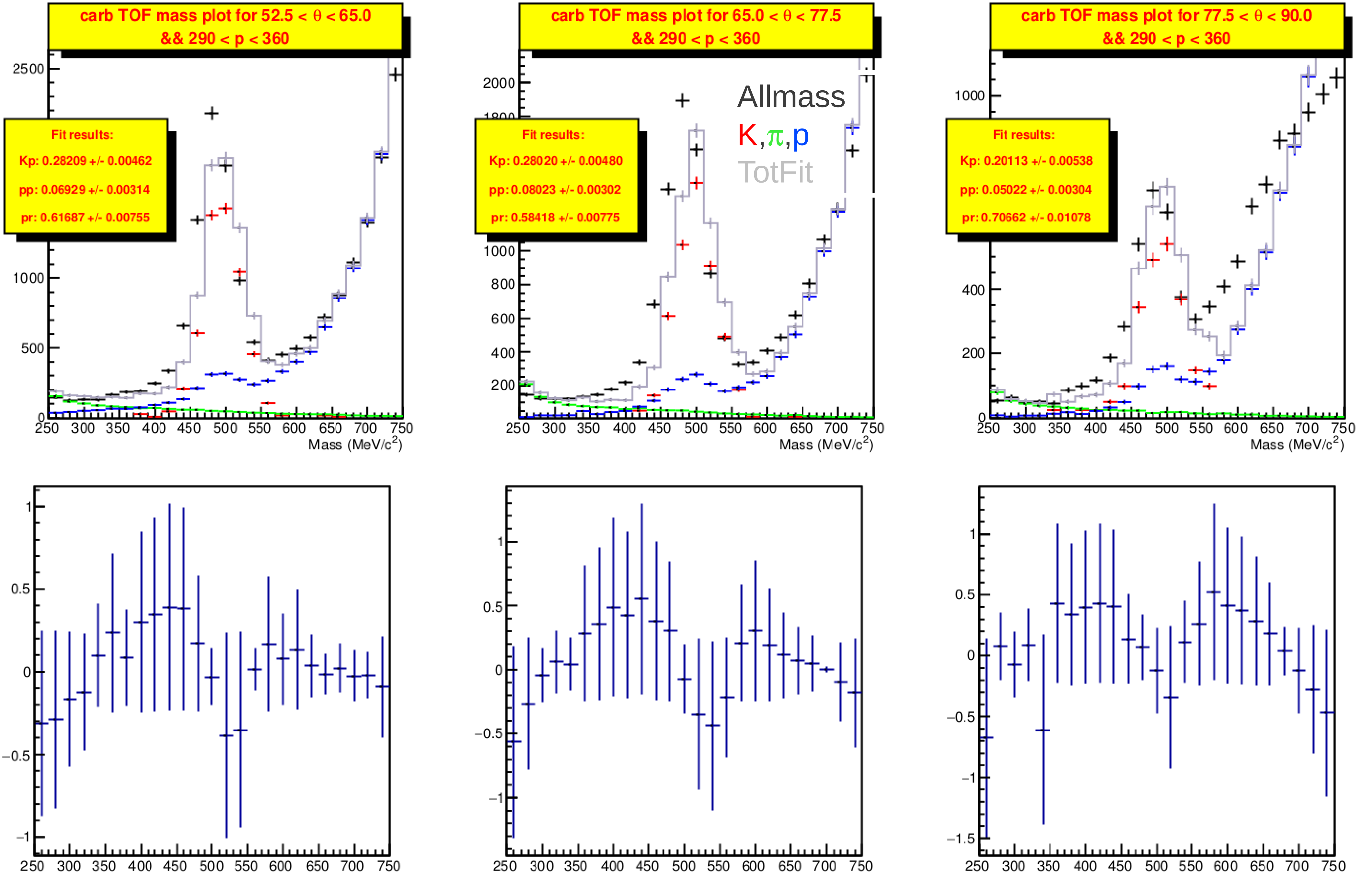


Allmass
K,π,p
TotFit

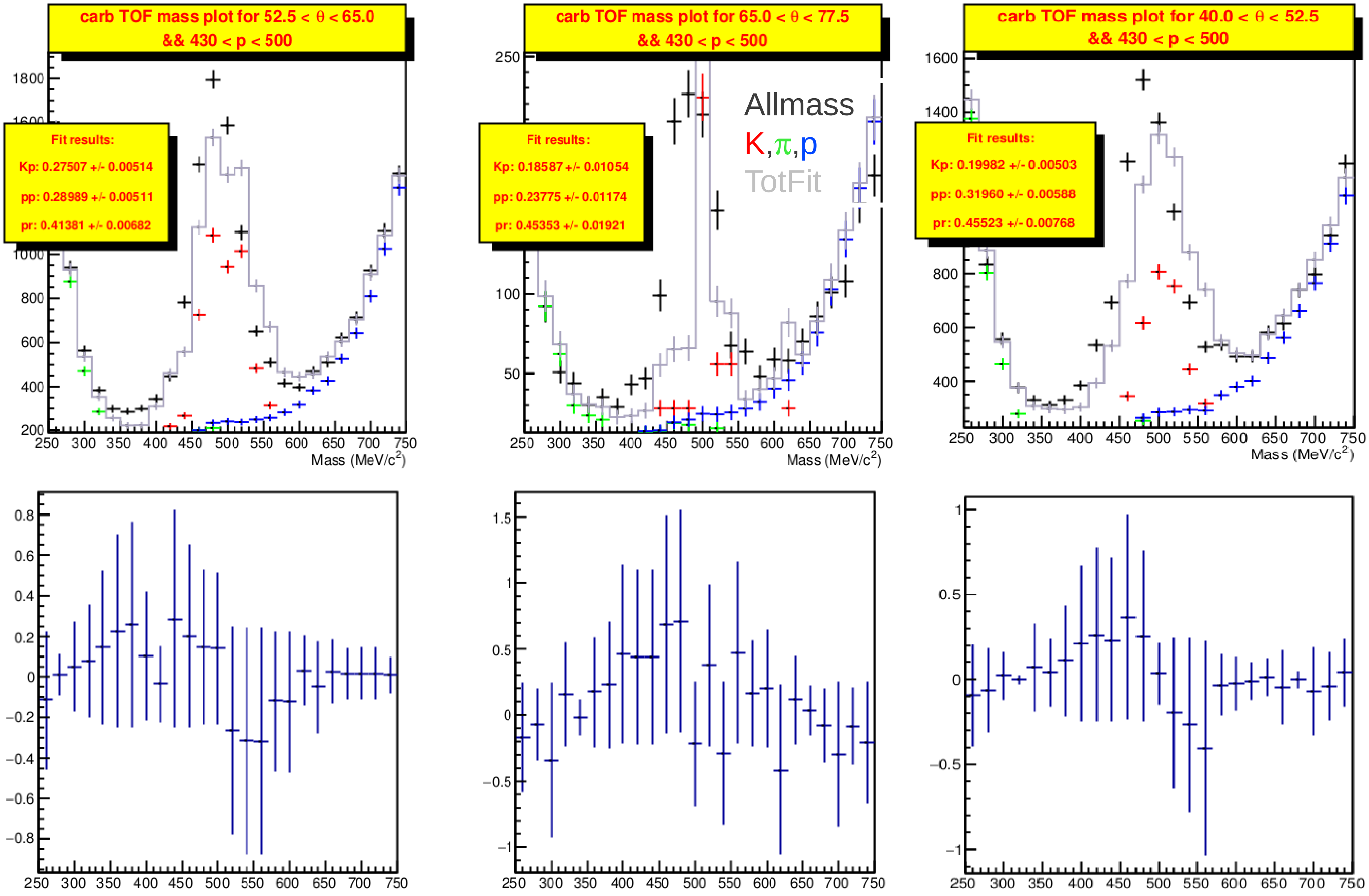
Fits in Carbon TOF (MC K+)



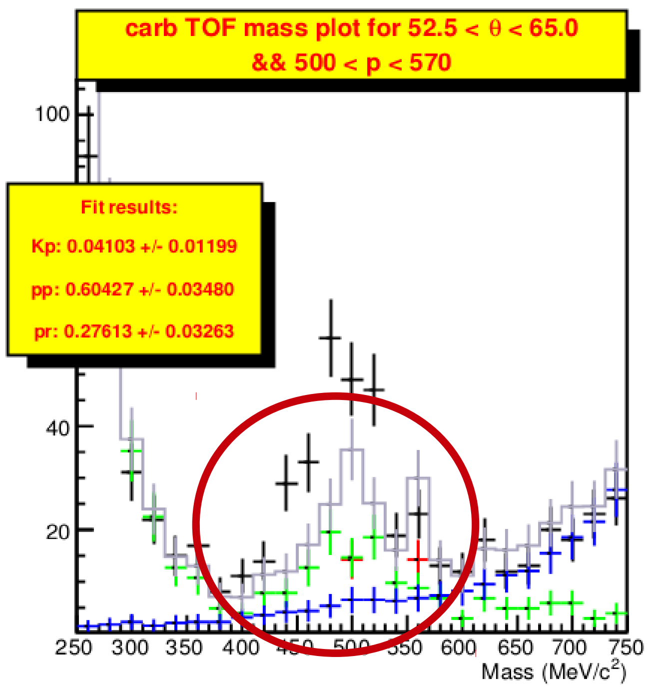
Fits in Carbon TOF (MC K+)

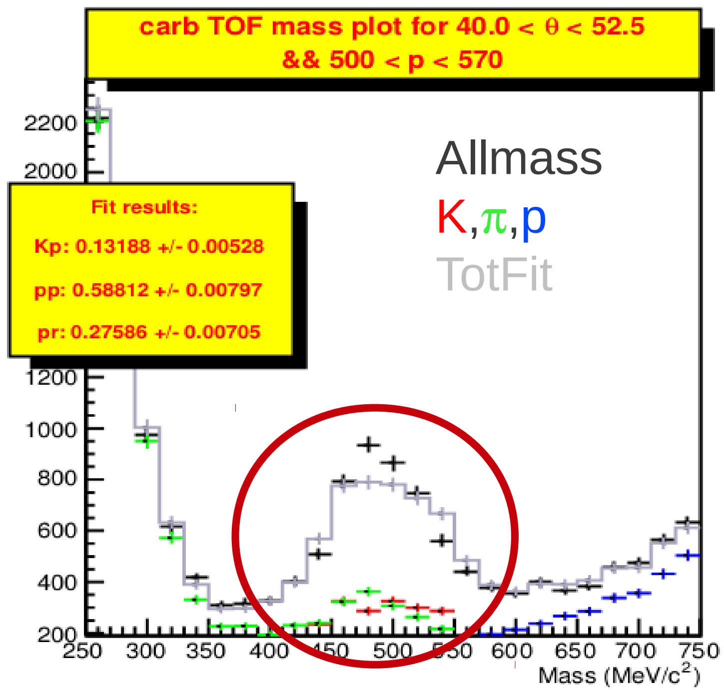


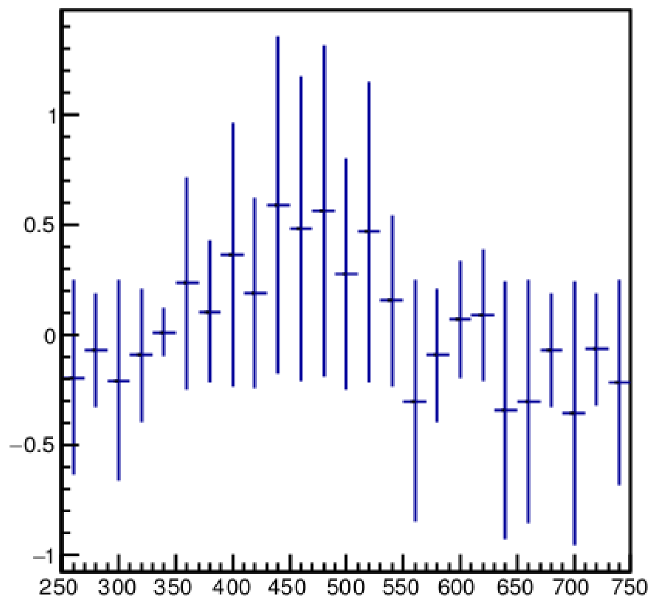
Fits in Carbon TOF (MC K+)

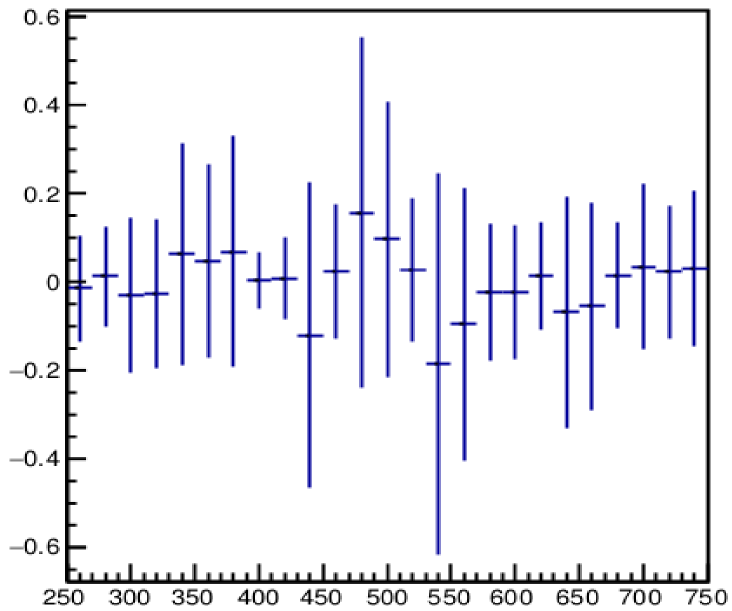


Fits in Carbon TOF (MC K+)

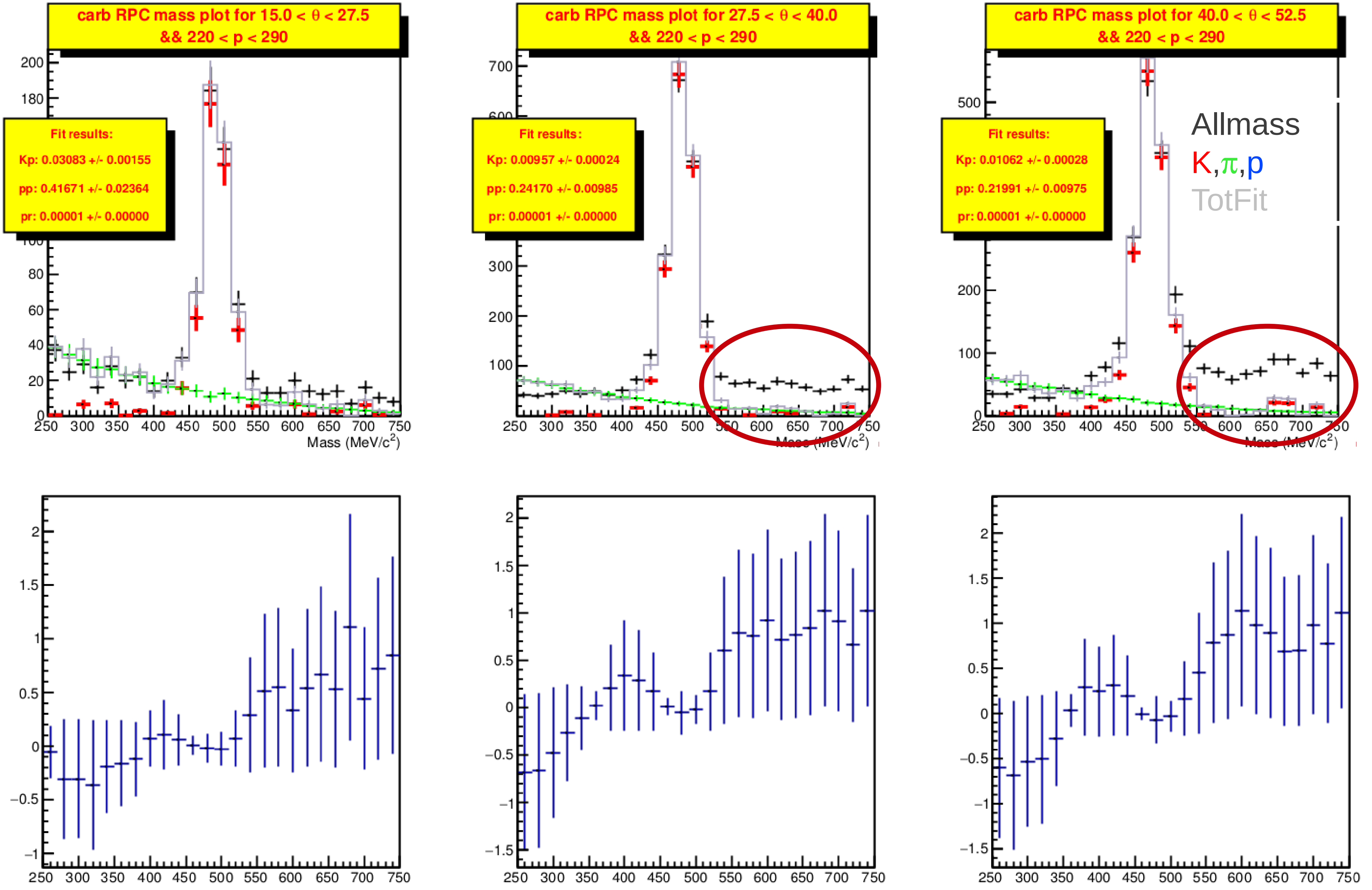




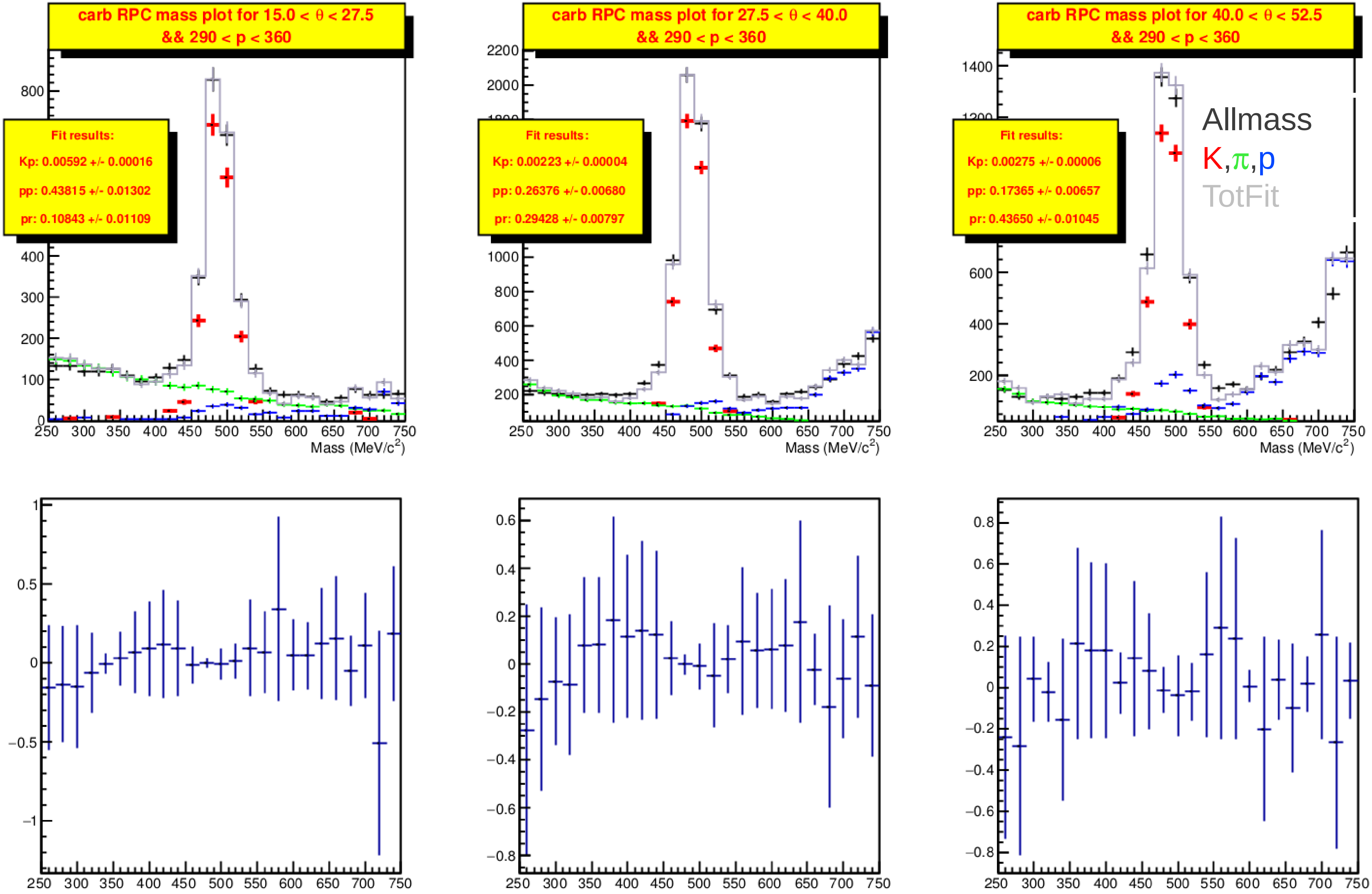




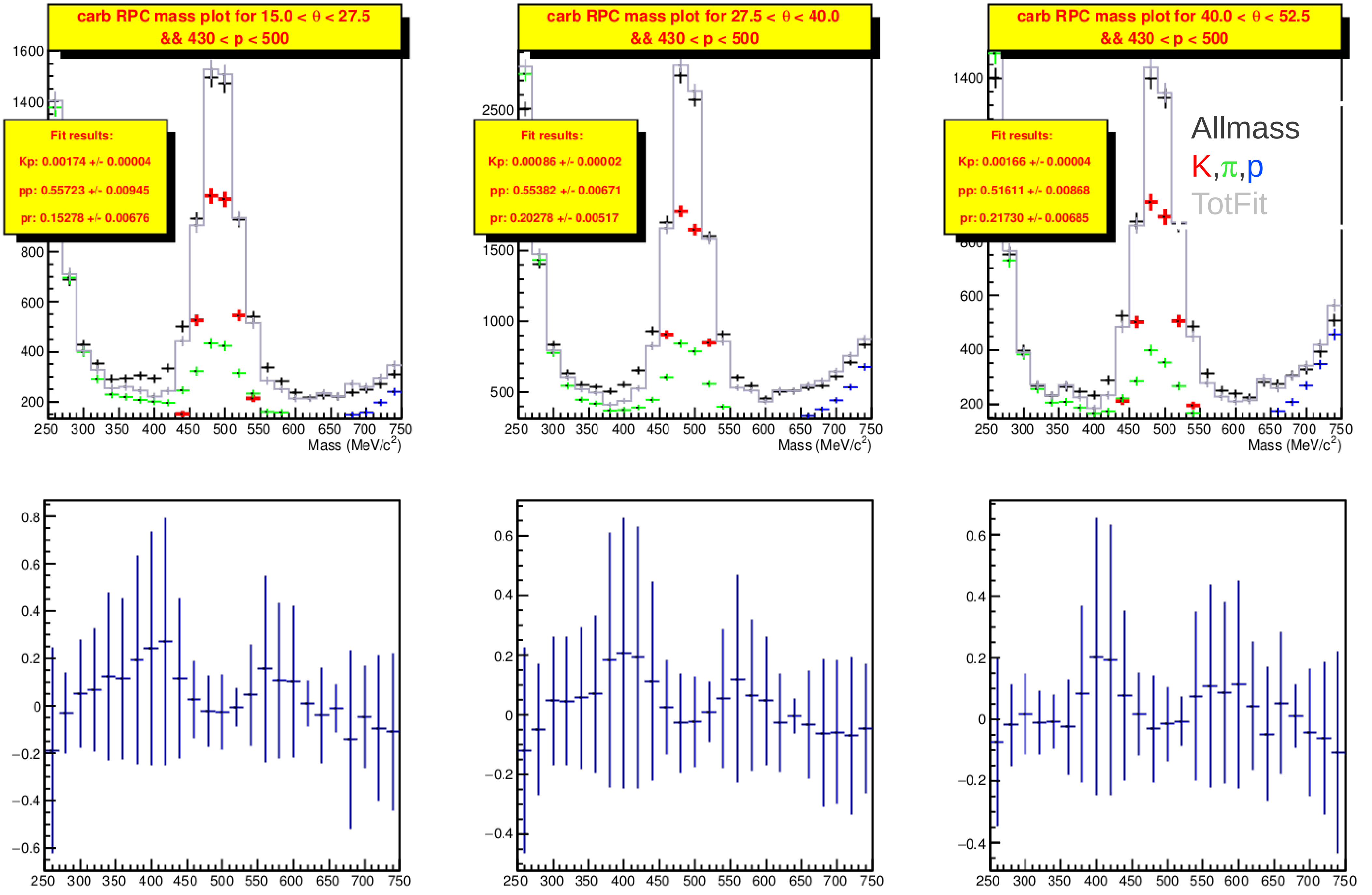
Fits in Carbon RPC (exp K+)



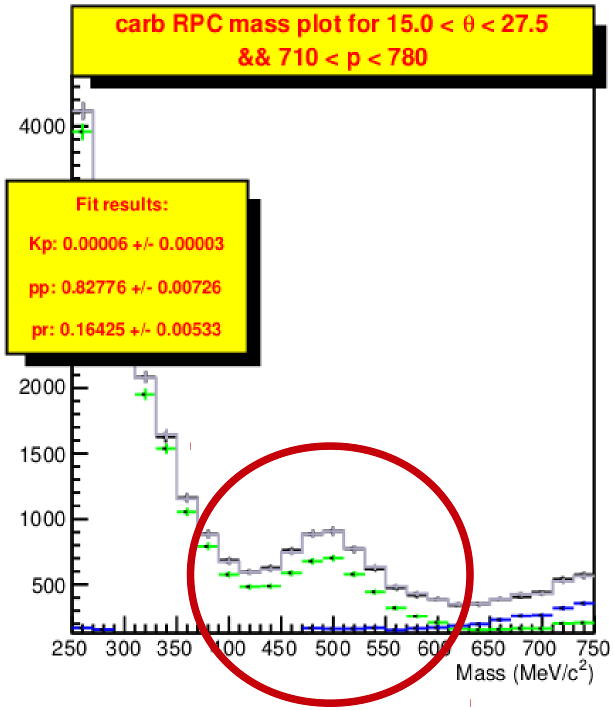
Fits in Carbon RPC (exp K+)

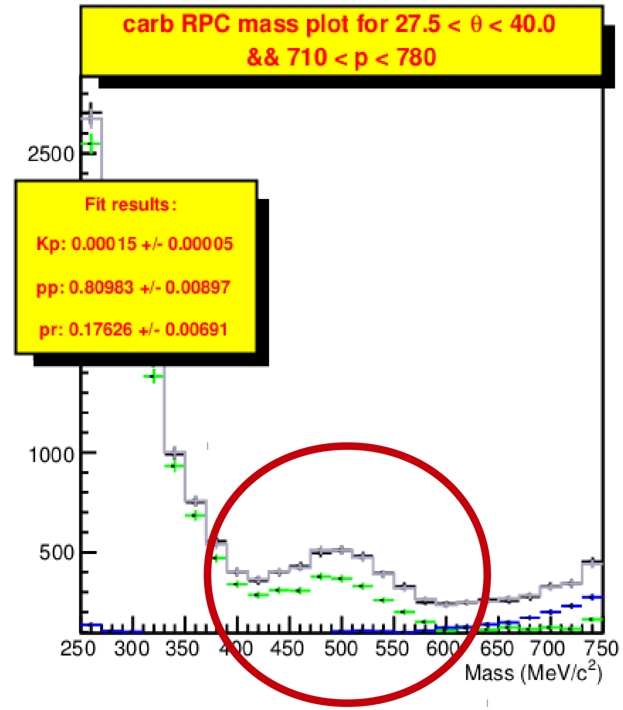


Fits in Carbon RPC (exp K+)

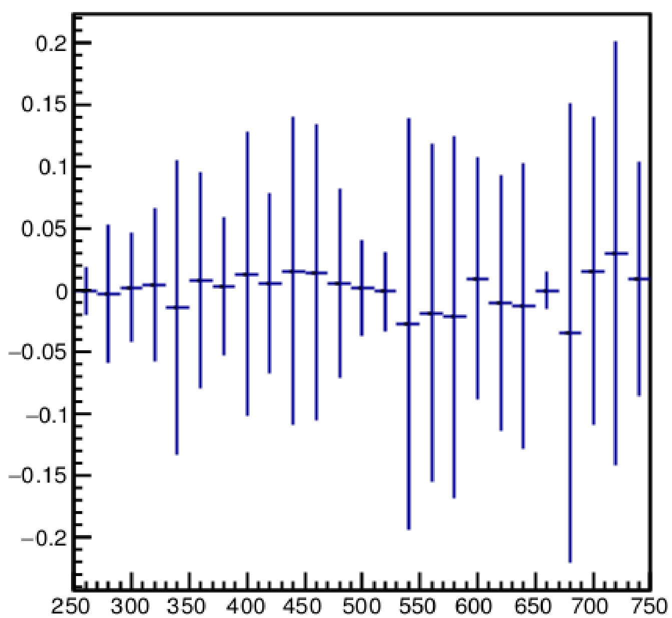


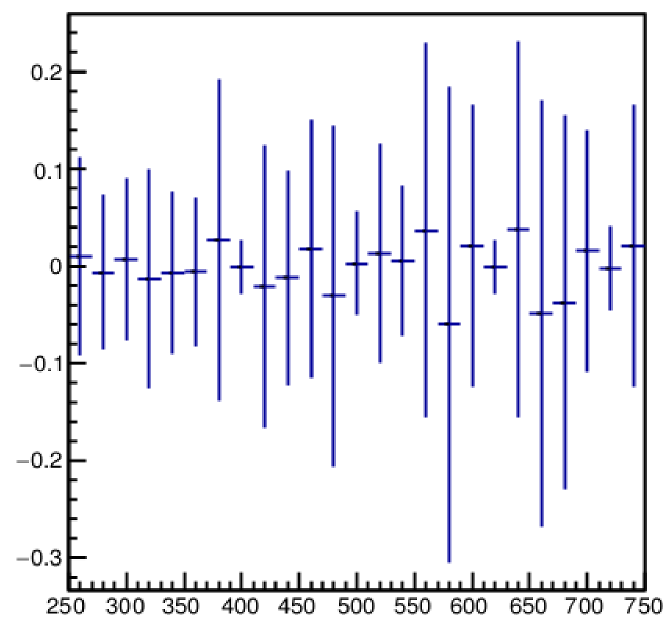
Fits in Carbon RPC (exp K+)



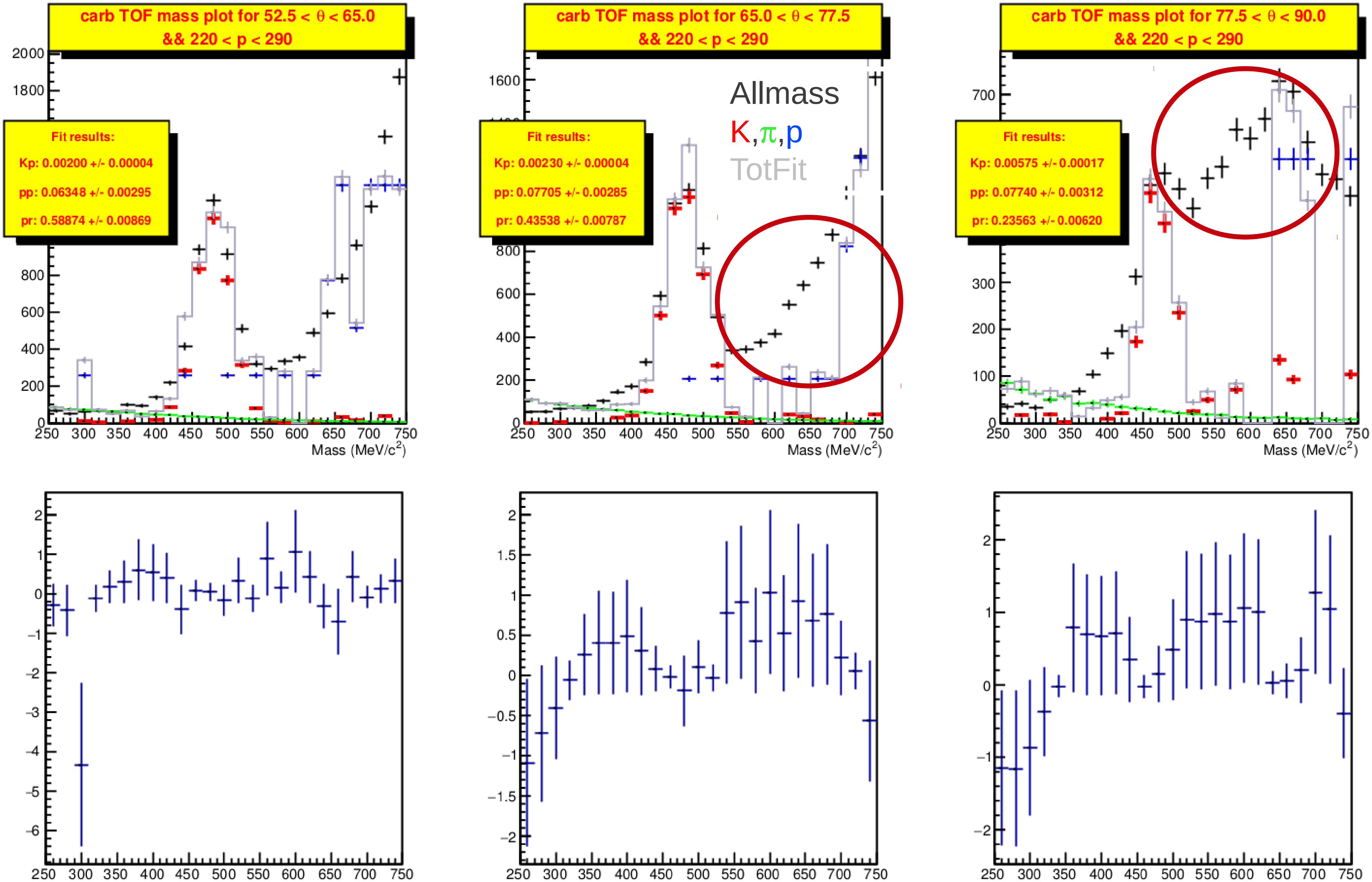


Allmass
K,π,p
TotFit

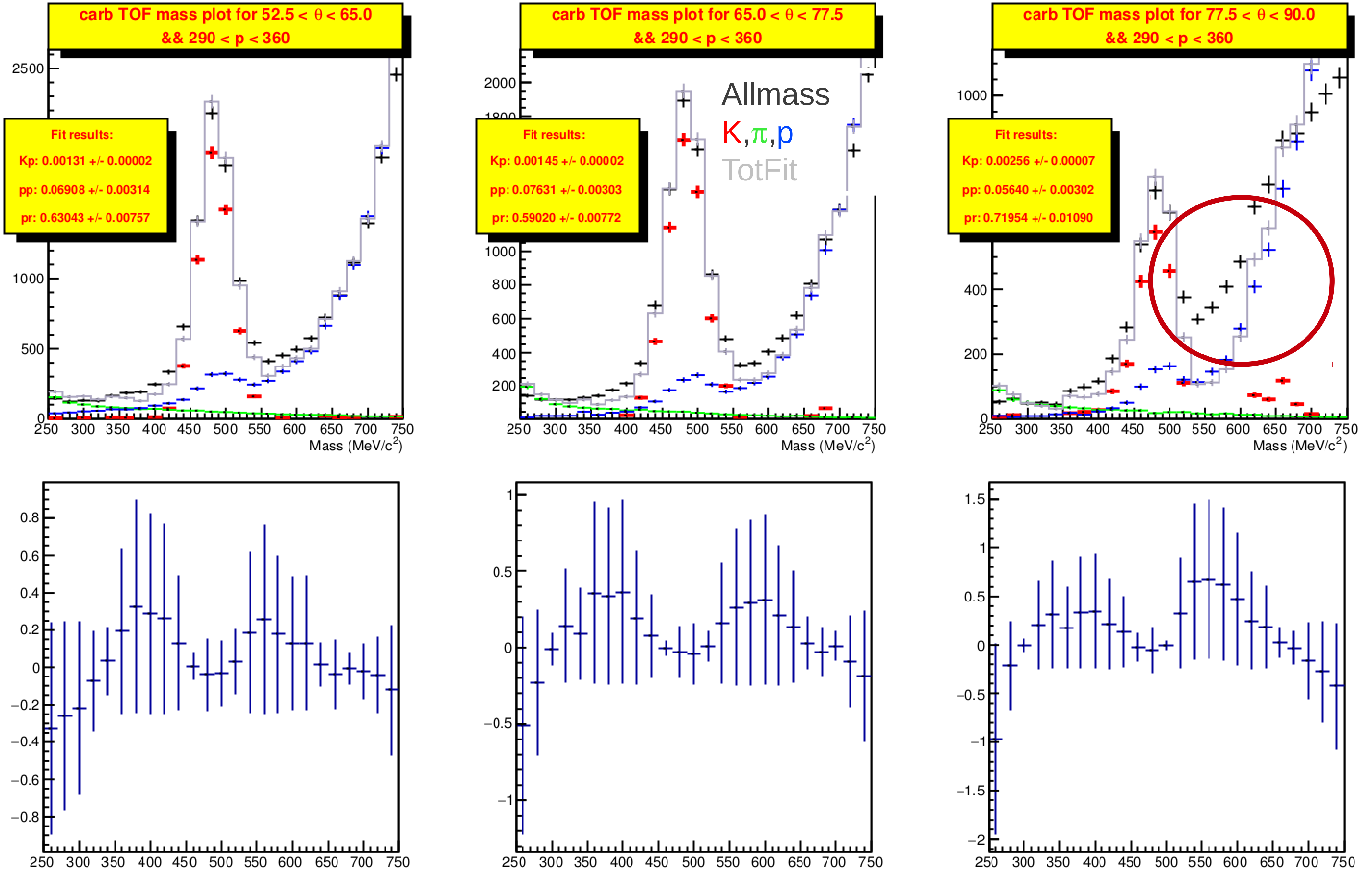




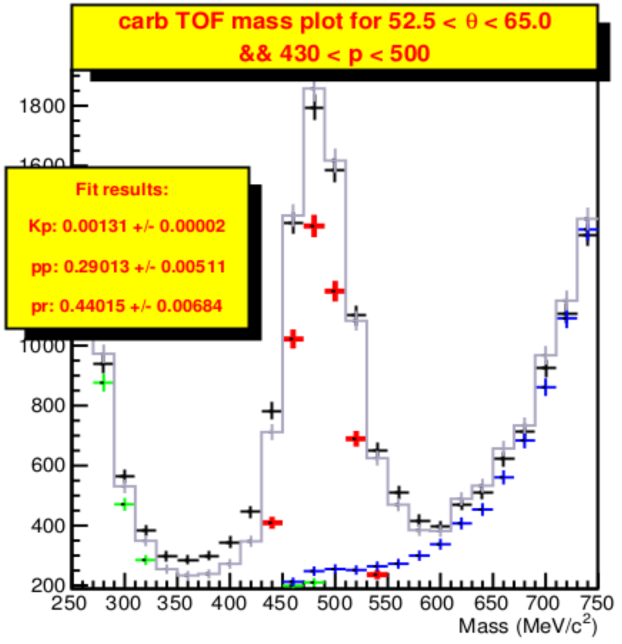
Fits in Carbon TOF (exp K+)

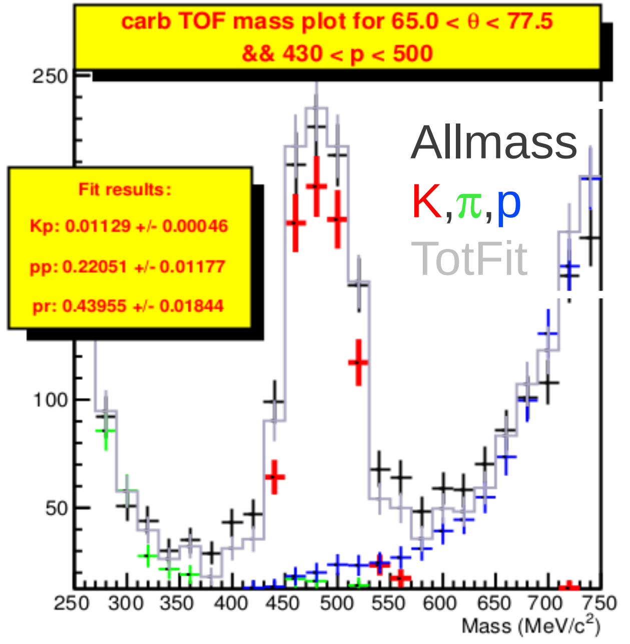


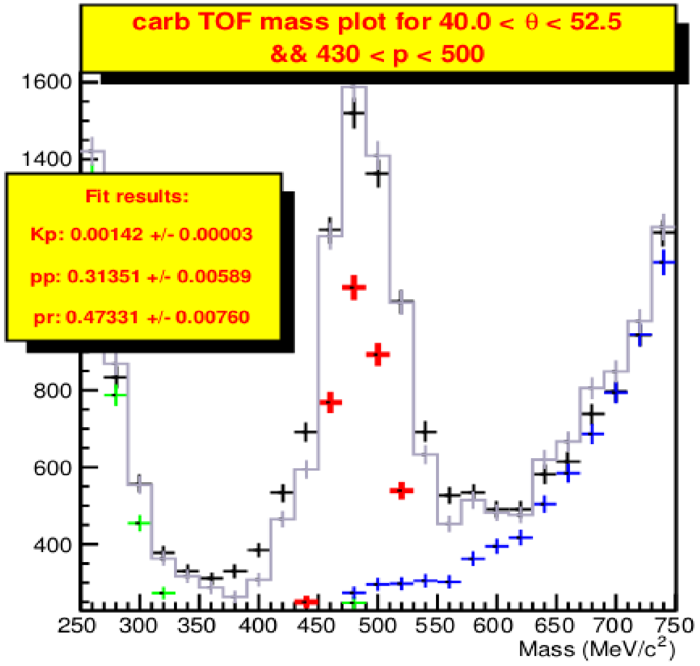
Fits in Carbon TOF (exp K+)

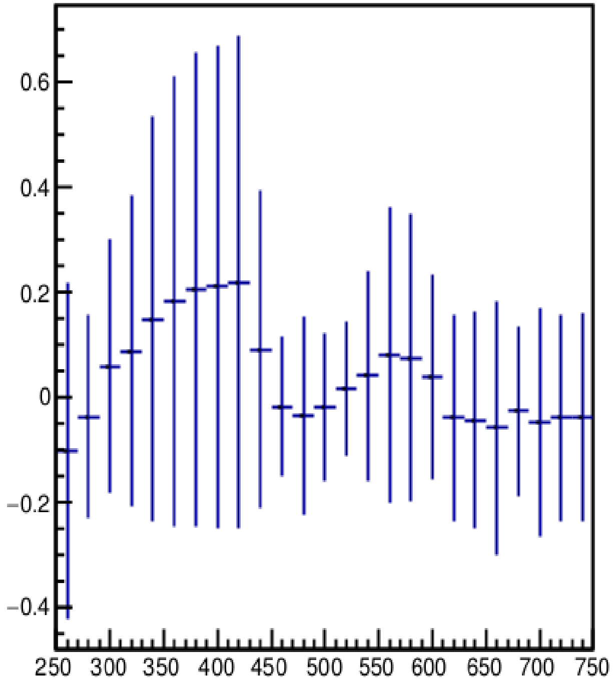


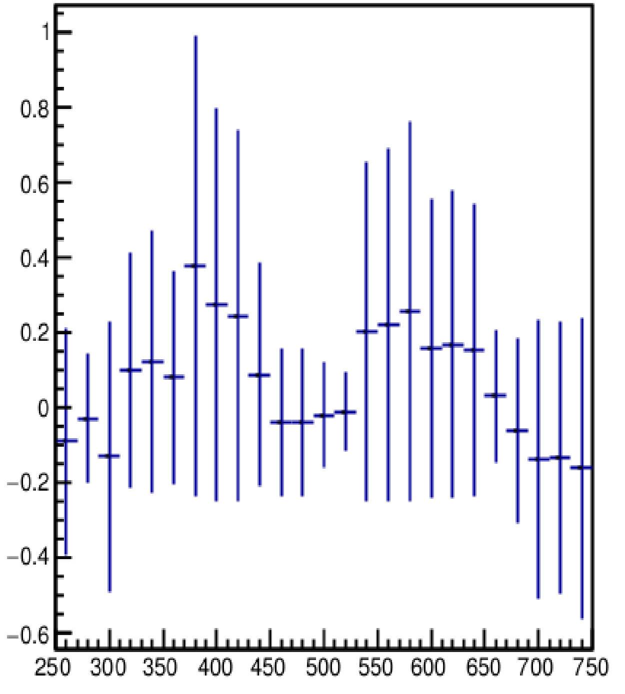
Fits in Carbon TOF (exp K+)

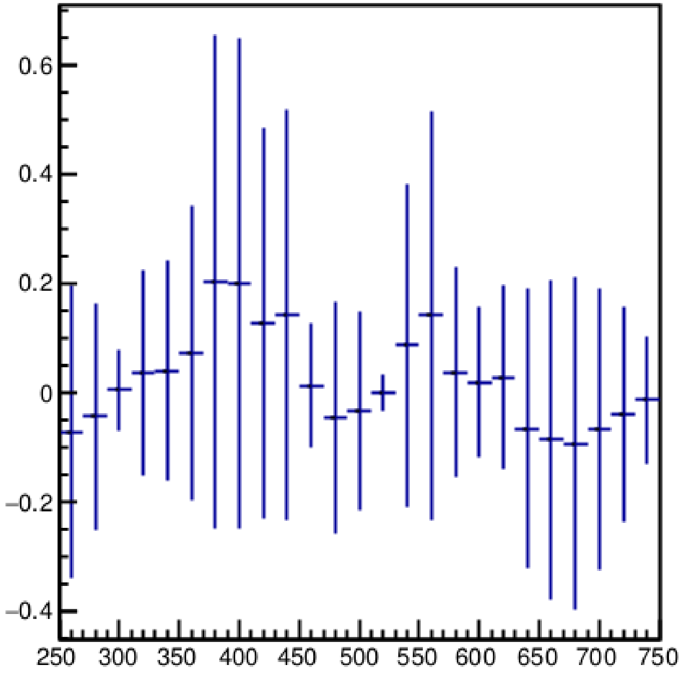




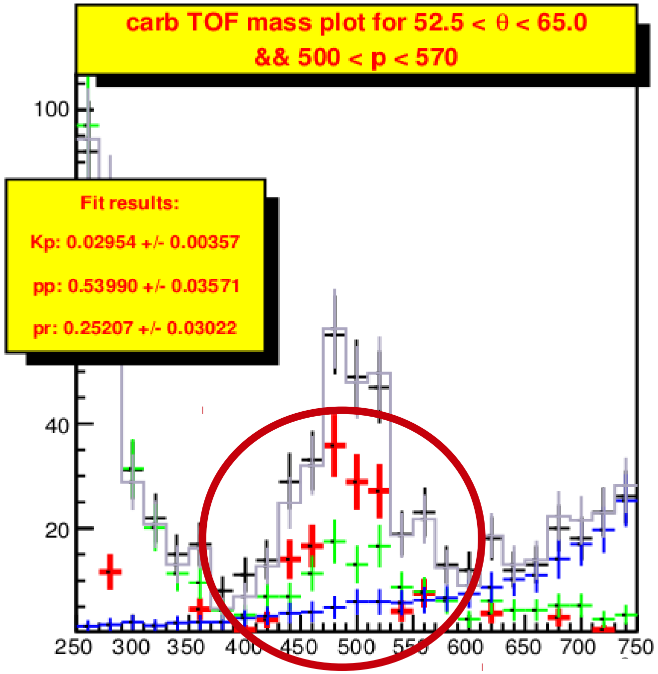




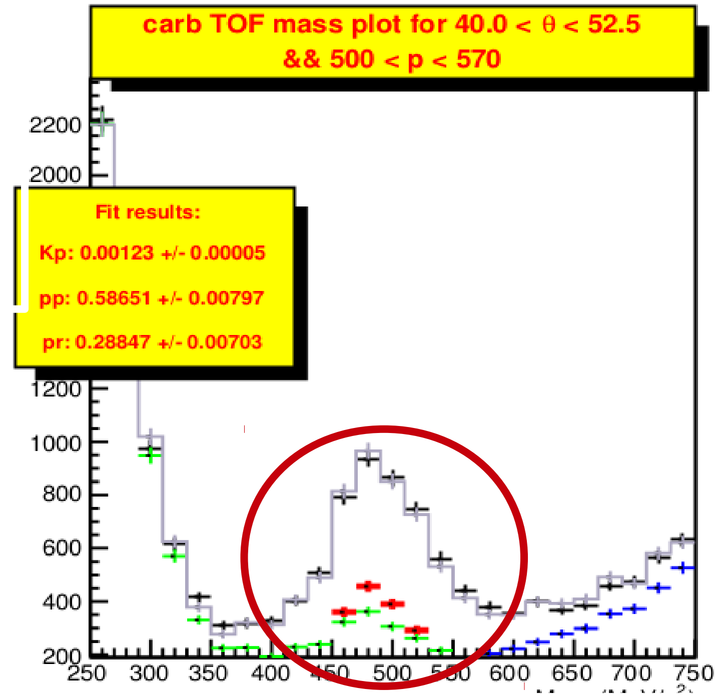


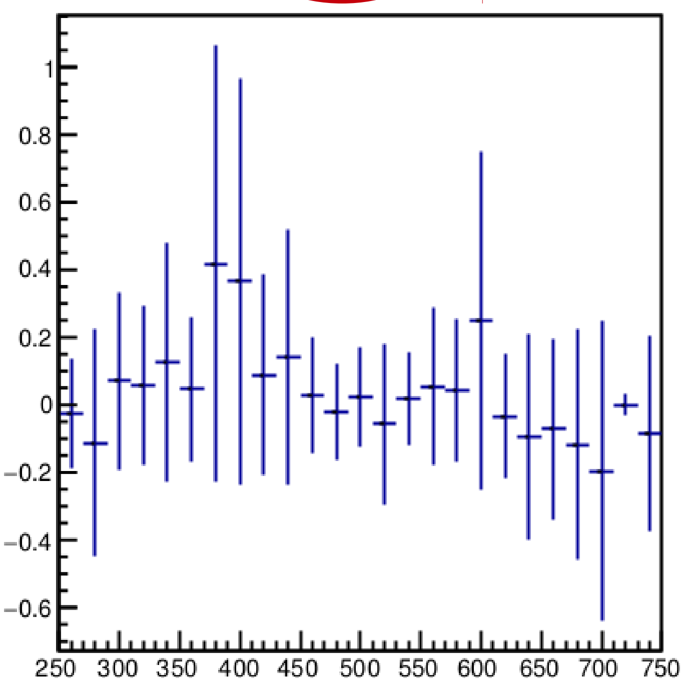


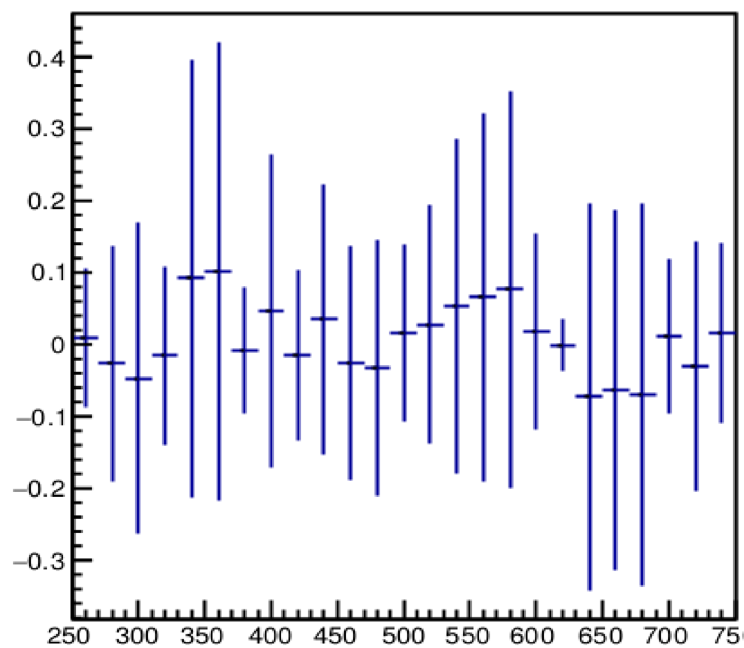
Fits in Carbon TOF (exp K+)



Allmass
K,π,p
TotFit







Conclusions

Eloss + B correction doesn' t affect the MvsP trend
(still present)

Some fits do not look very good due to strange background behaviour

Possible alternative:

- Build K mass histogram from fit (MC/exp)
- Use π,K,p histograms to fit (normalized) the mass
  Spectrum

Both methods are not still optimized due also to MC-Exp disagreement
Best possibility would be to use MC dist with K dEdX selection and K,π,p PID

Wich one to start K+/K- ratio?