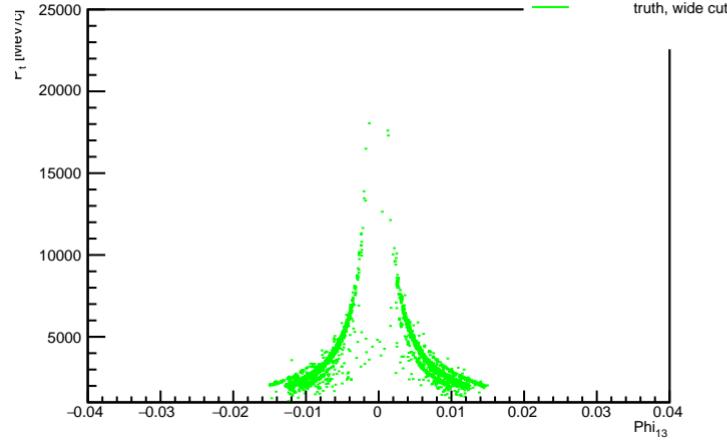
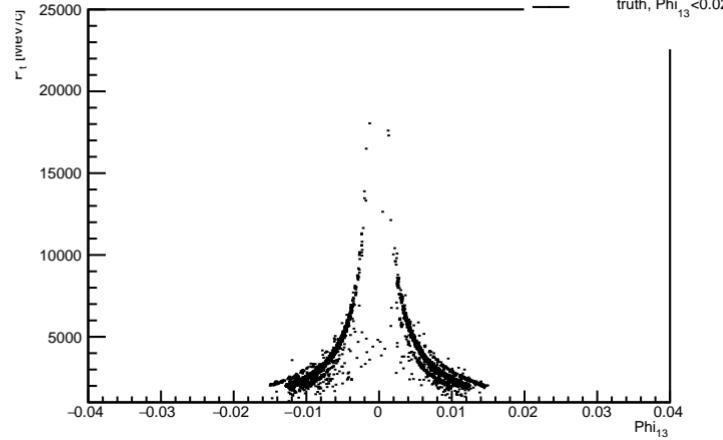


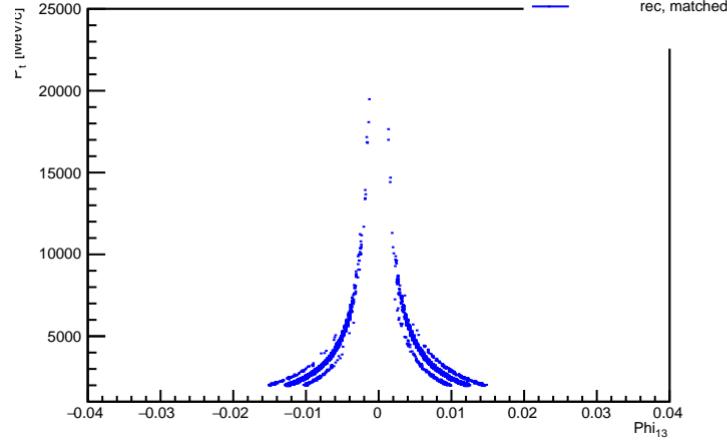
$P_t$  Vs  $\Phi_{13}$



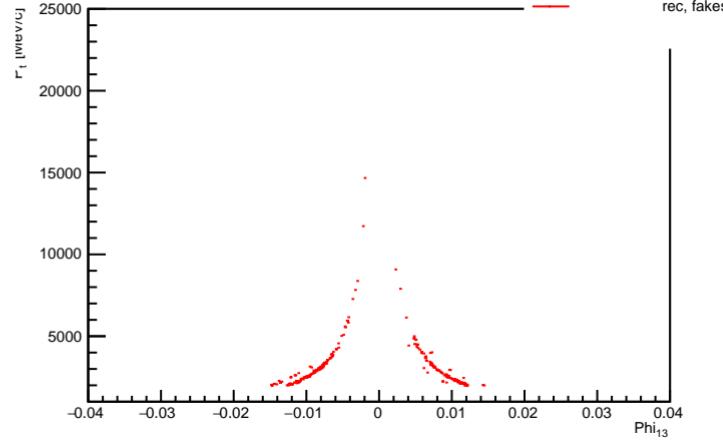
$P_t$  Vs  $\Phi_{13}$



$P_t$  Vs  $\Phi_{13}$



$P_t$  Vs  $\Phi_{13}$

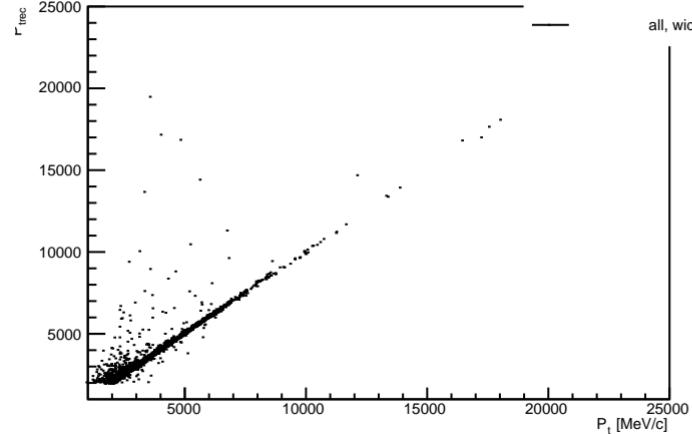


truth,  $\Phi_{13} < 0.02$

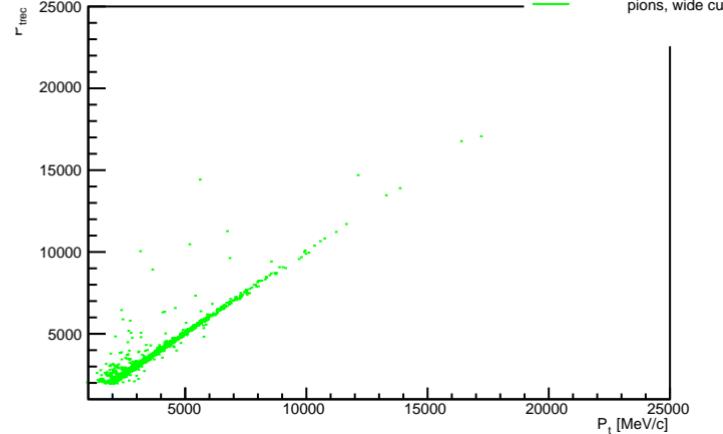
rec, matched

rec, fakes

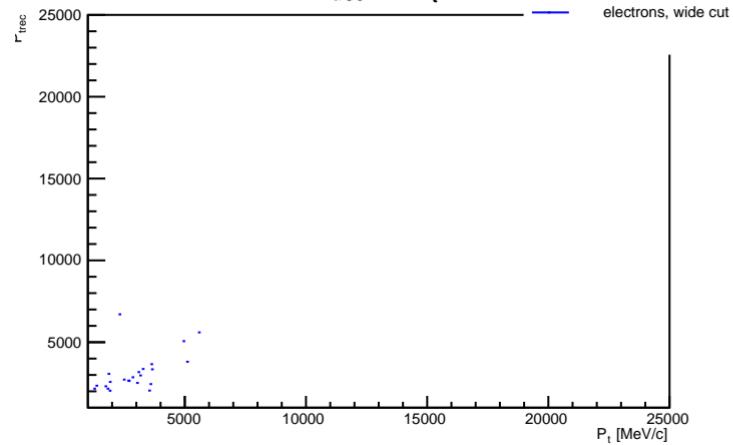
$P_{t\text{rec}}$  Vs  $P_t$



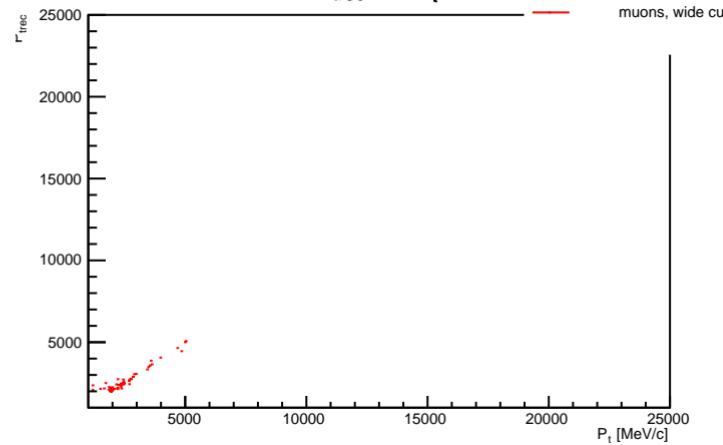
$P_{t\text{rec}}$  Vs  $P_t$



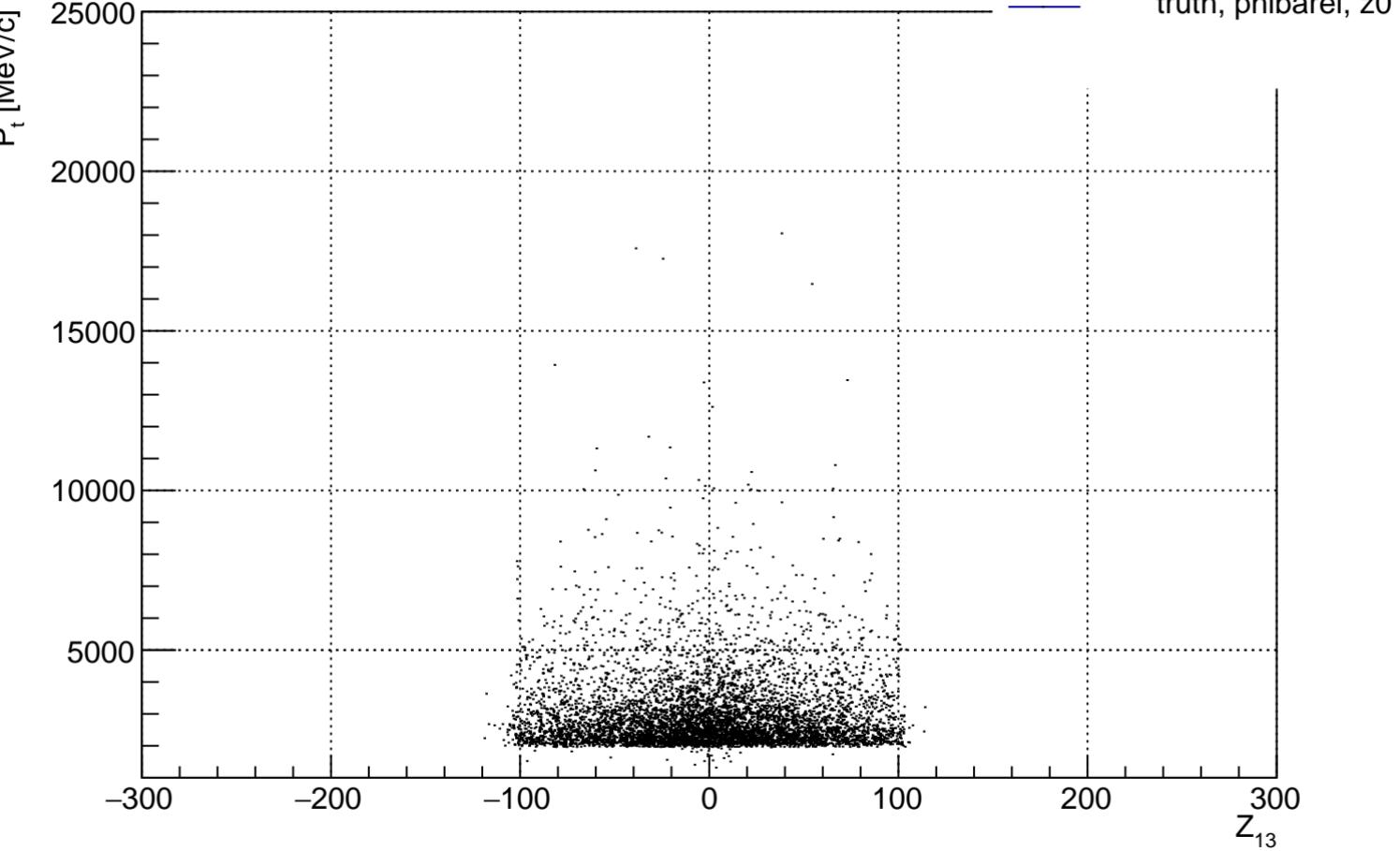
$P_{t\text{rec}}$  Vs  $P_t$

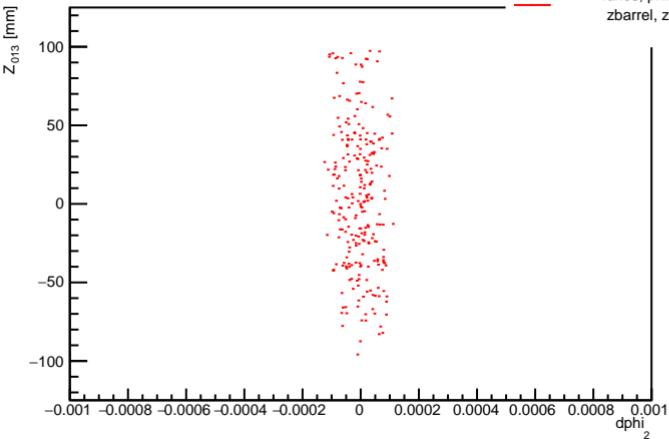
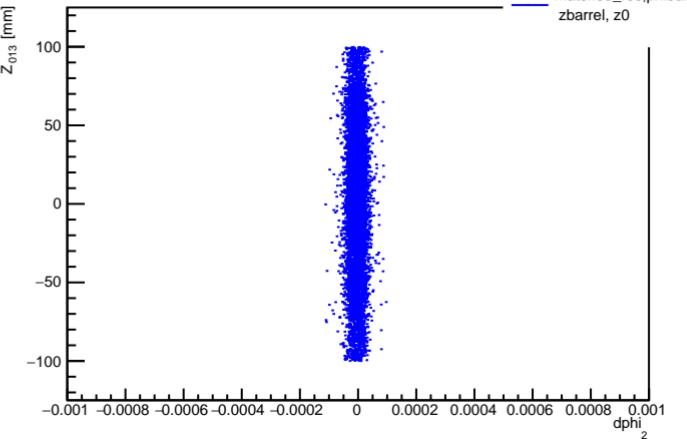
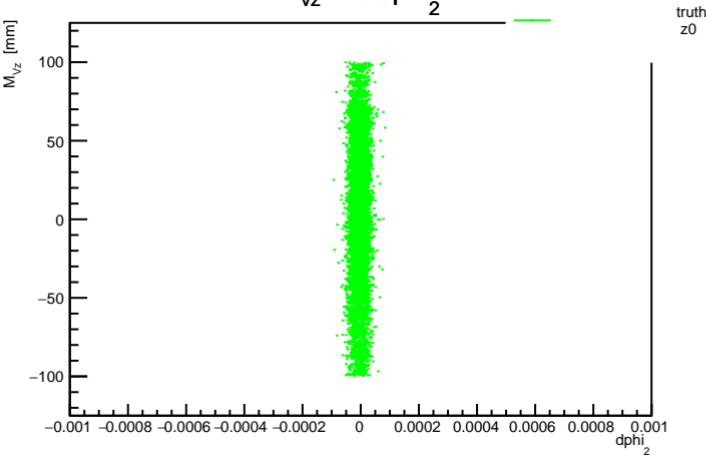
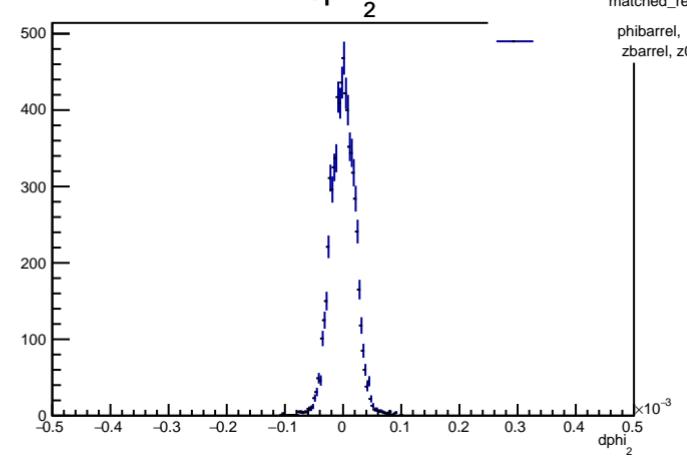


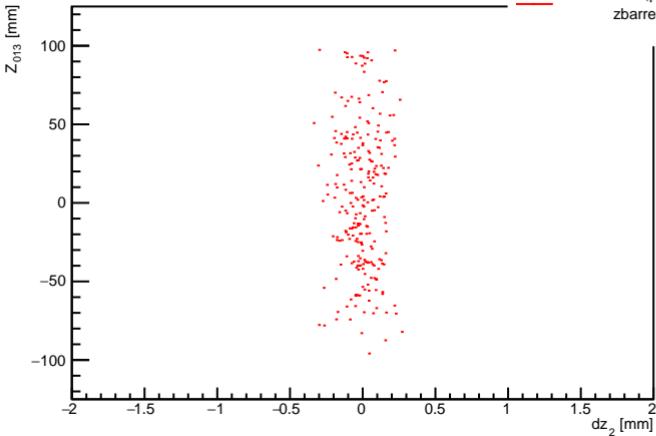
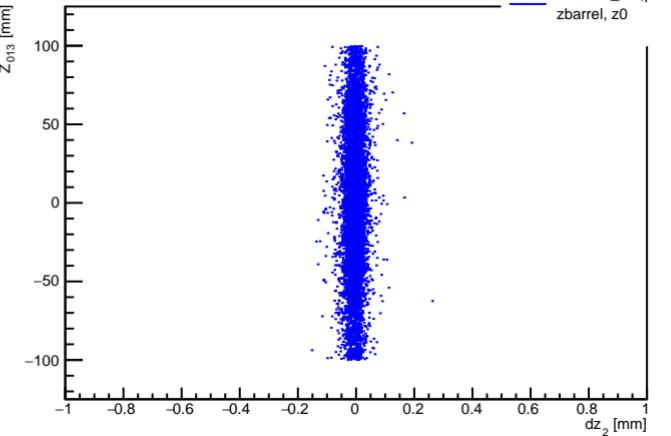
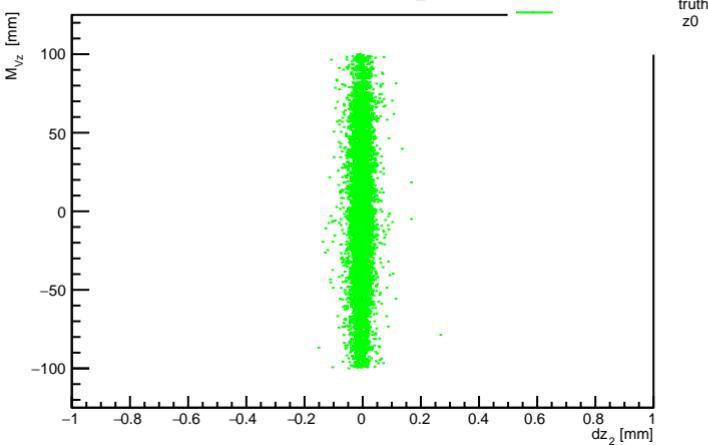
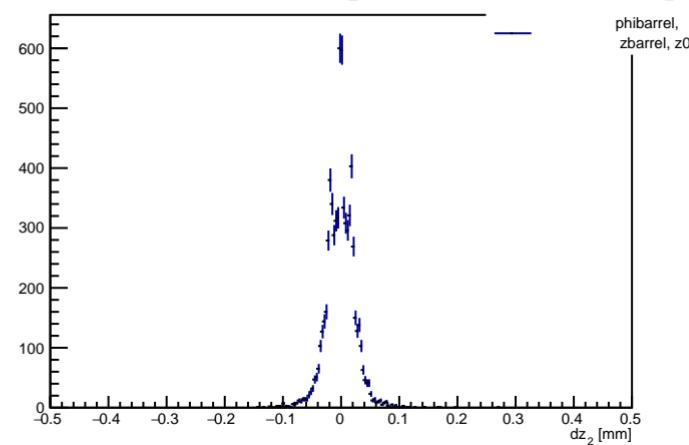
$P_{t\text{rec}}$  Vs  $P_t$



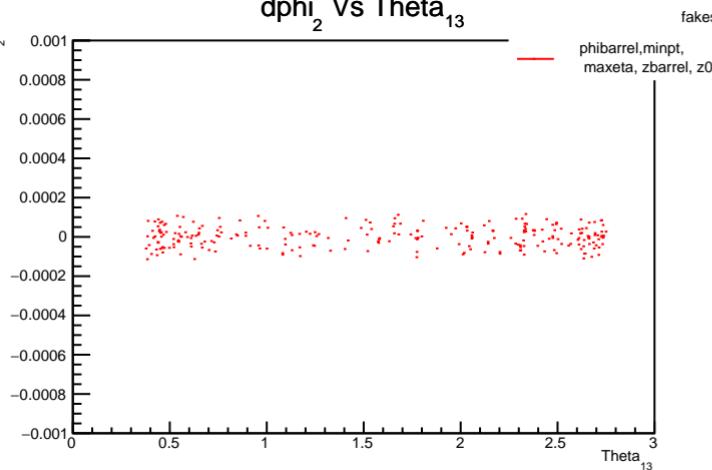
# $P_t$ Vs $Z_{13}$



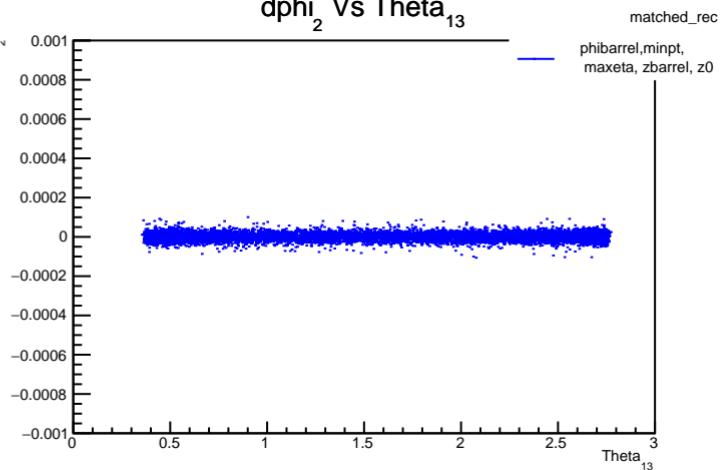
$Z_{013}$  Vs  $d\phi_2$  $Z_{013}$  Vs  $d\phi_2$  $M_{vz}$  Vs  $d\phi_2$  $d\phi_2$ 

$Z_{013}$  Vs  $dz_2$  $Z_{013}$  Vs  $dz_2$  $M_{vz}$  Vs  $dz_2$  $dz_2$ 

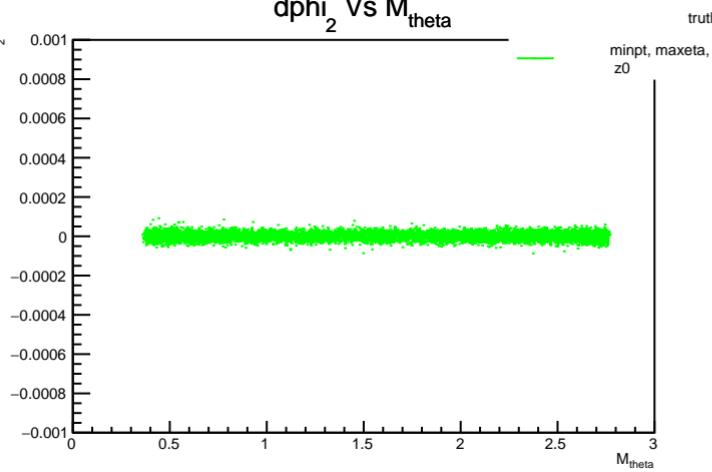
dphi<sub>2</sub> Vs Theta<sub>13</sub>



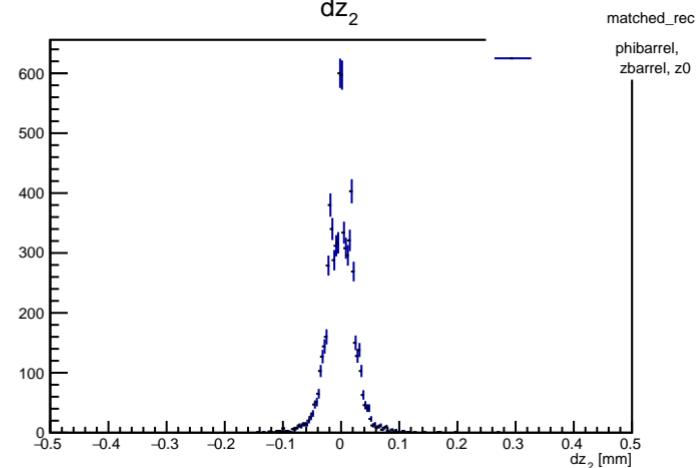
dphi<sub>2</sub> Vs Theta<sub>13</sub>



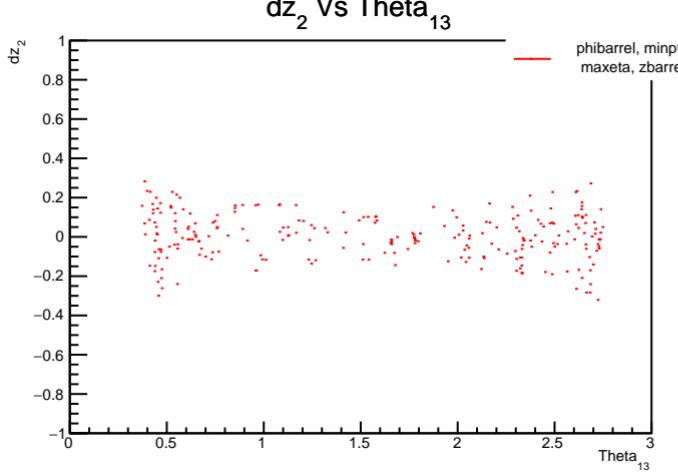
dphi<sub>2</sub> Vs M<sub>theta</sub>



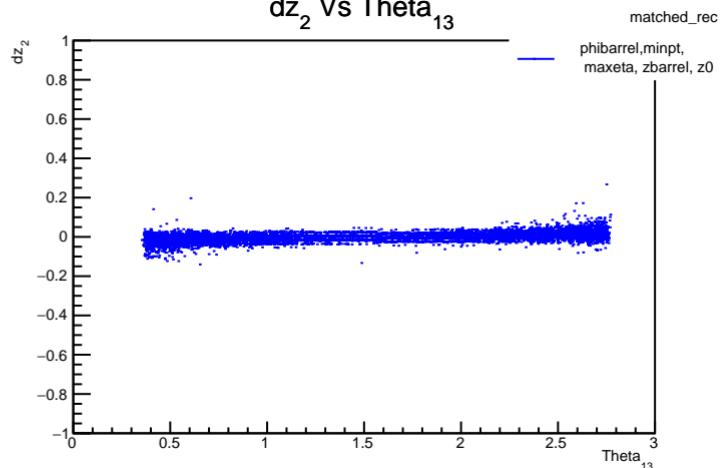
dz<sub>2</sub>



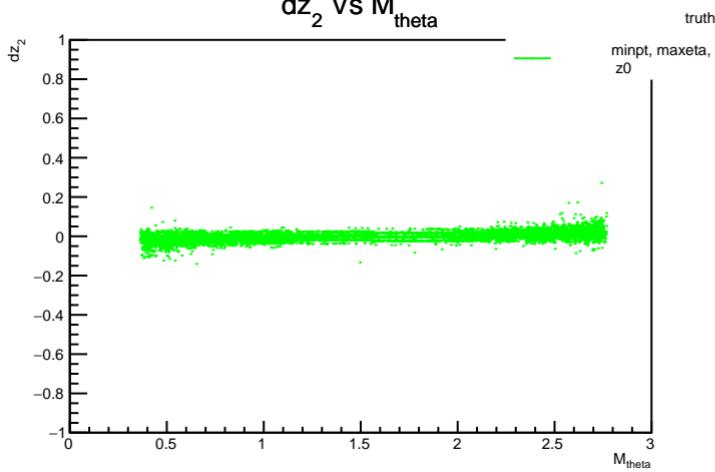
$dz_2$  Vs  $\Theta_{13}$



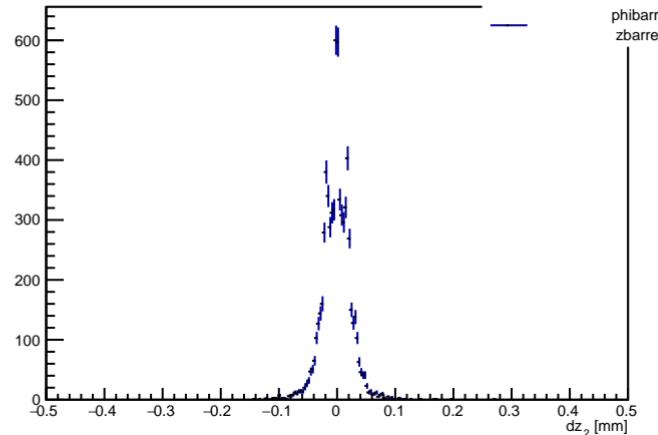
$dz_2$  Vs  $\Theta_{13}$



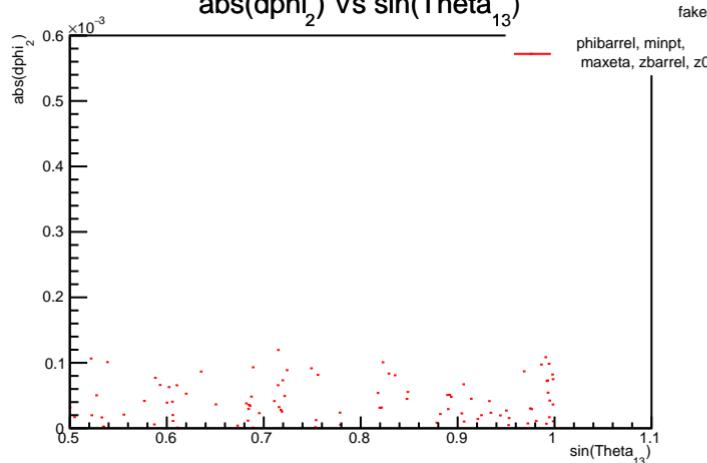
$dz_2$  Vs  $M_{\theta}$



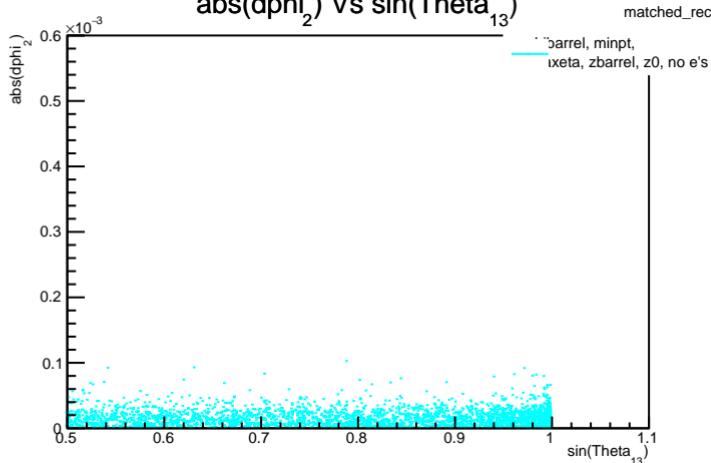
$dz_2$



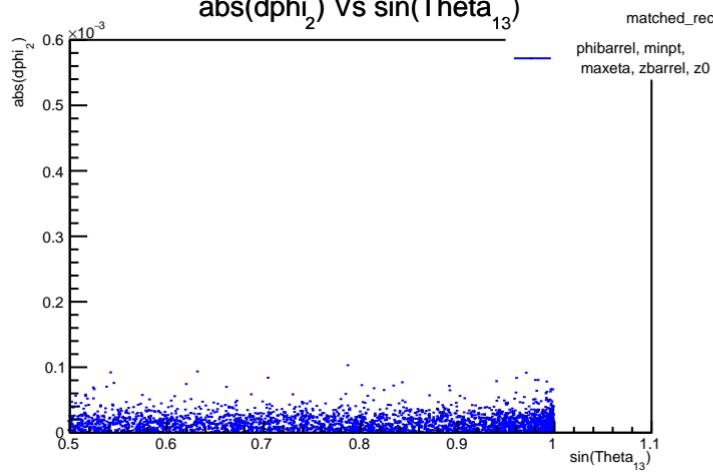
$\text{abs}(\text{dphi}_2)$  Vs  $\sin(\Theta_{13})$



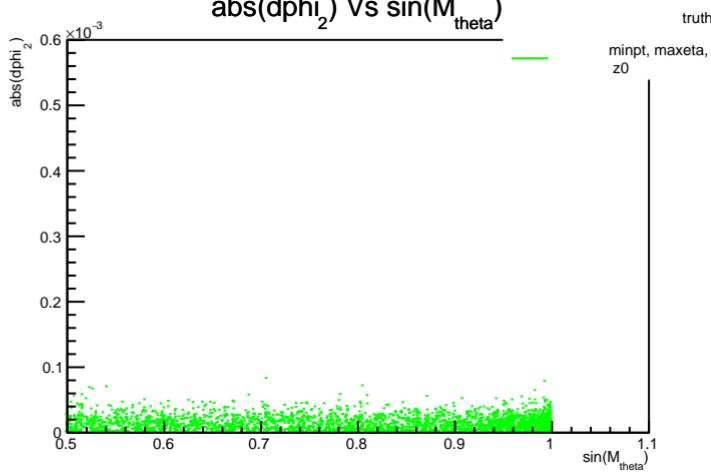
$\text{abs}(\text{dphi}_2)$  Vs  $\sin(\Theta_{13})$



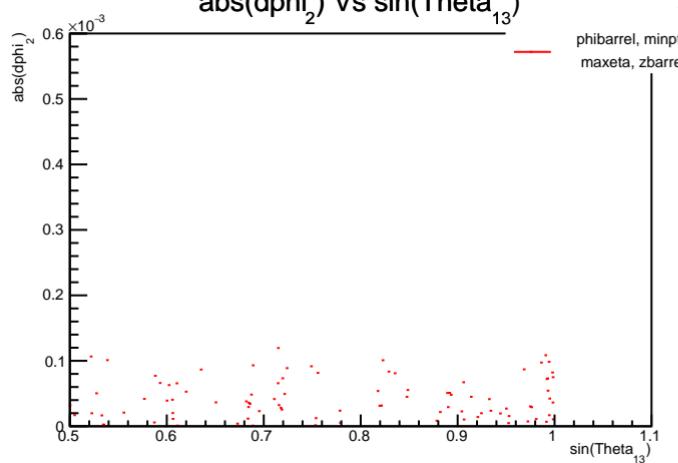
$\text{abs}(\text{dphi}_2)$  Vs  $\sin(\Theta_{13})$



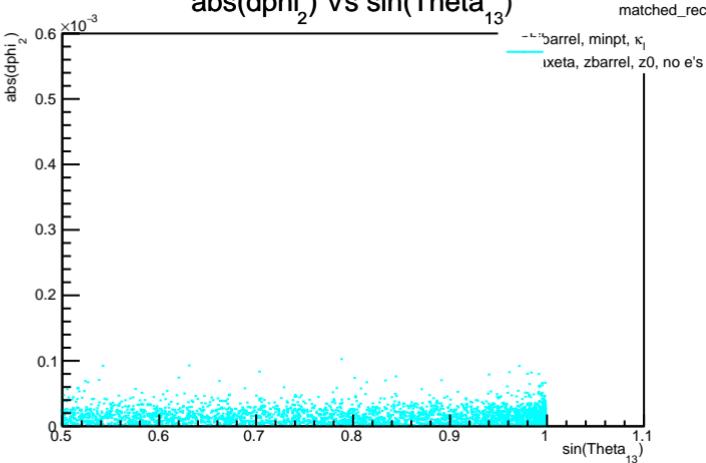
$\text{abs}(\text{dphi}_2)$  Vs  $\sin(M_{\theta})$



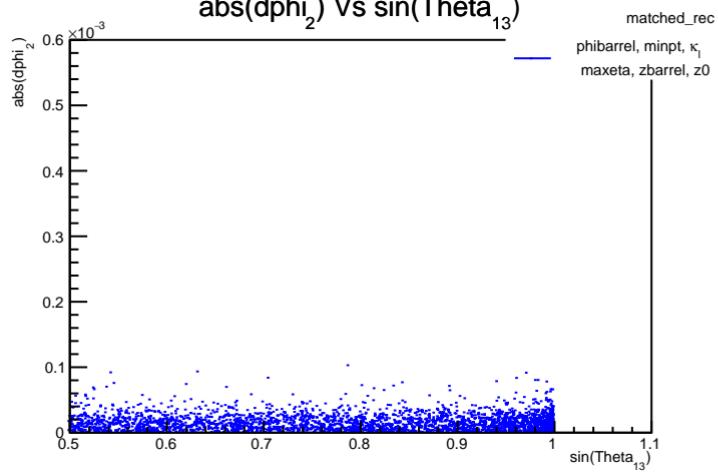
$\text{abs}(\text{dphi}_2)$  Vs  $\sin(\Theta_{13})$



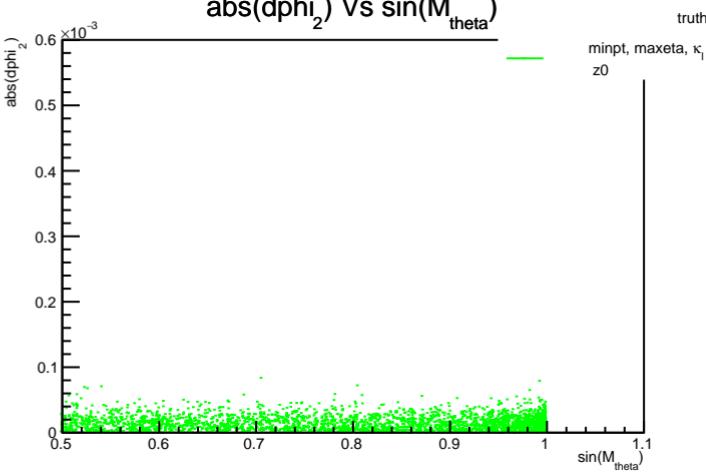
$\text{abs}(\text{dphi}_2)$  Vs  $\sin(\Theta_{13})$

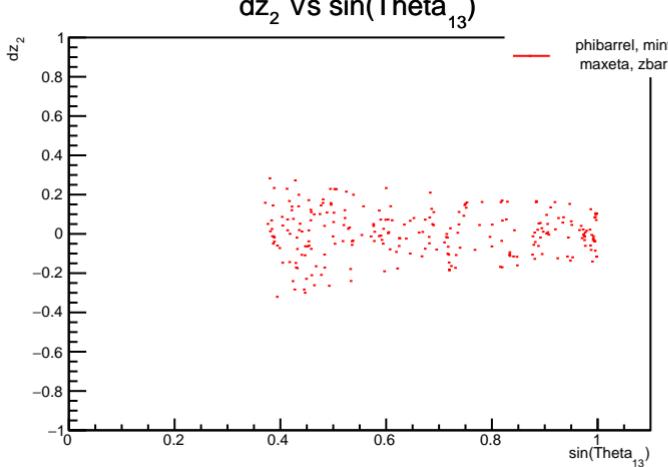
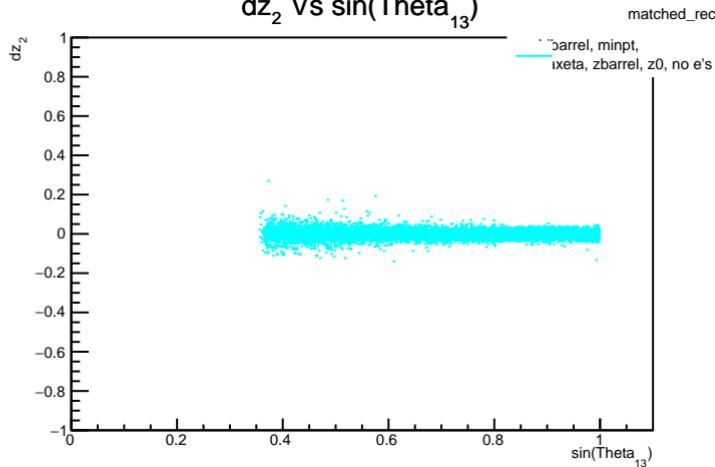
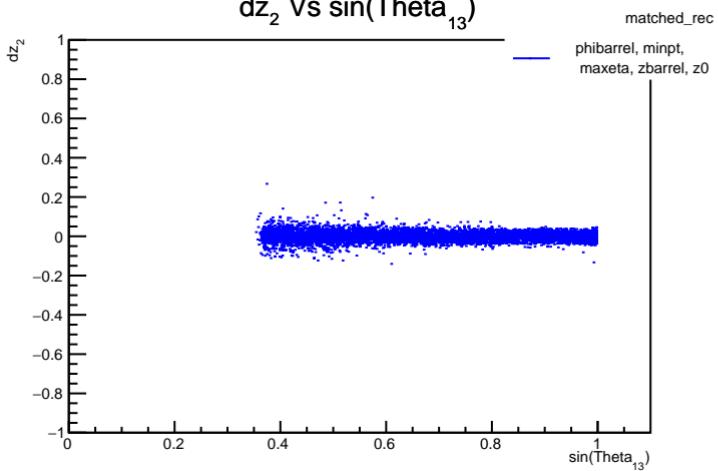
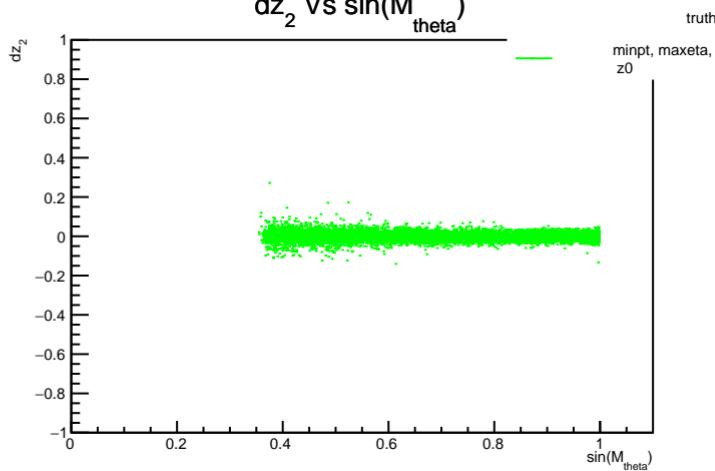


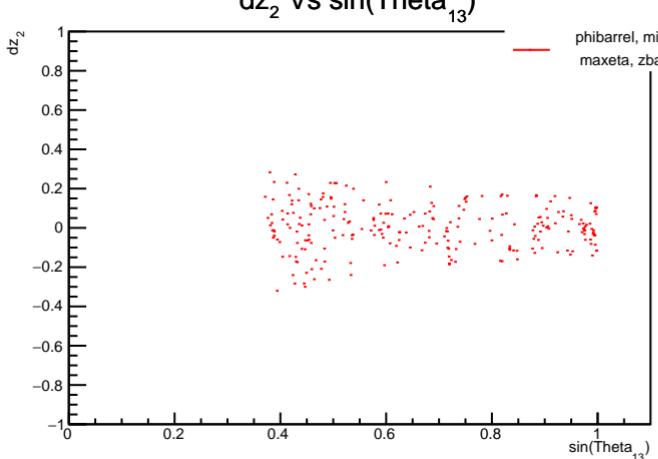
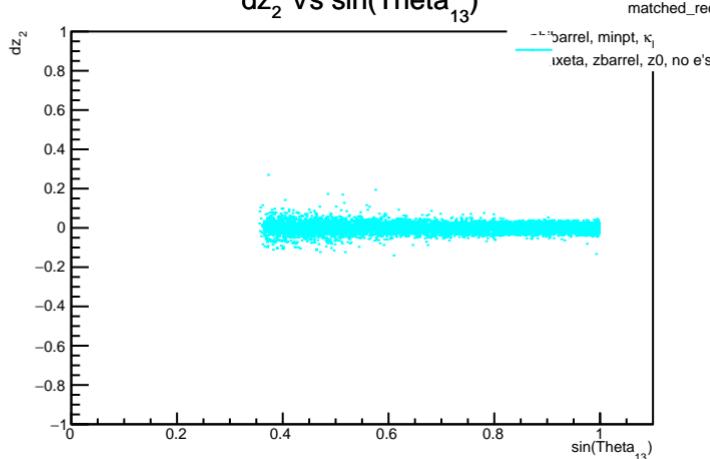
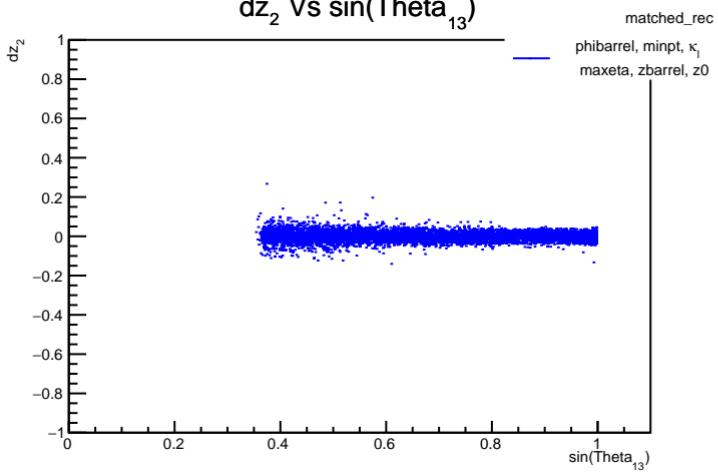
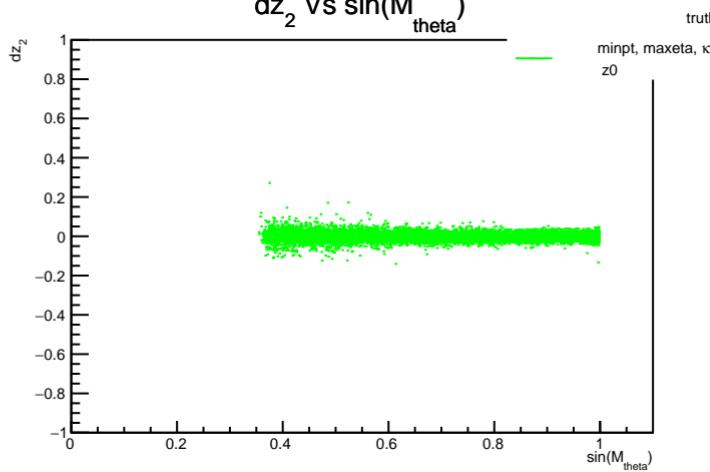
$\text{abs}(\text{dphi}_2)$  Vs  $\sin(\Theta_{13})$



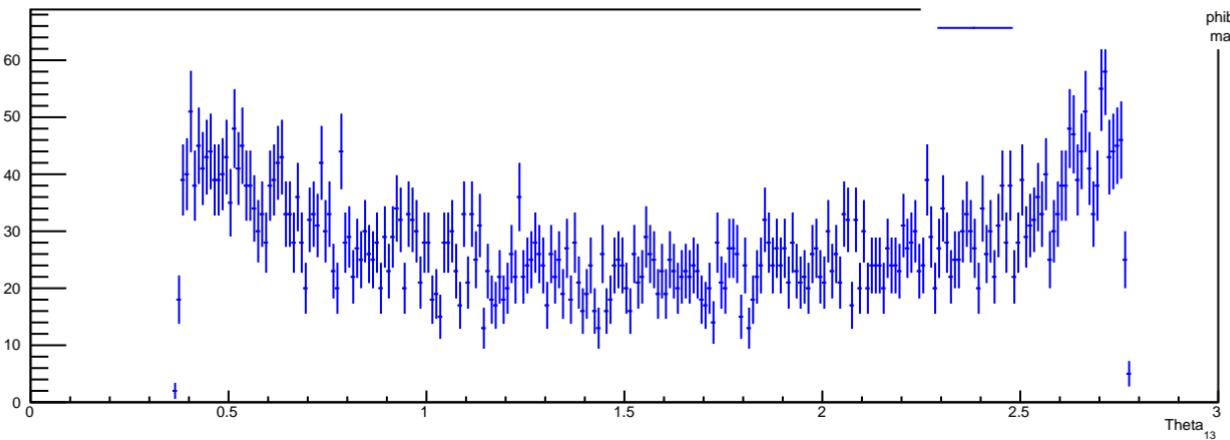
$\text{abs}(\text{dphi}_2)$  Vs  $\sin(M_{\theta})$



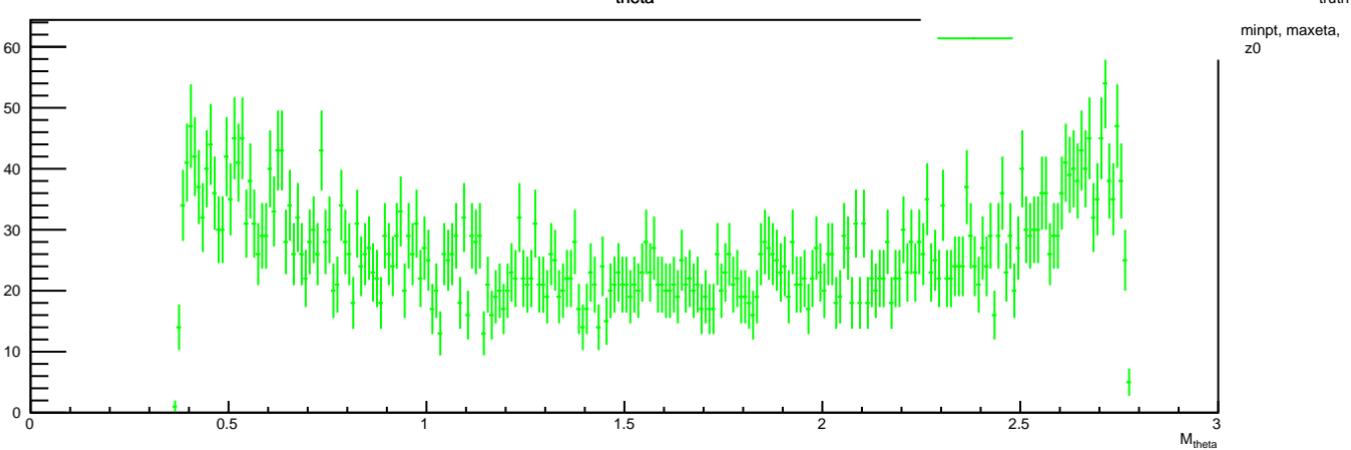
$dz_2$  Vs  $\sin(\Theta_{13})$  $dz_2$  Vs  $\sin(\Theta_{13})$  $dz_2$  Vs  $\sin(\Theta_{13})$  $dz_2$  Vs  $\sin(M_{\theta})$ 

$dz_2$  Vs  $\sin(\Theta_{13})$  $dz_2$  Vs  $\sin(\Theta_{13})$  $dz_2$  Vs  $\sin(\Theta_{13})$  $dz_2$  Vs  $\sin(M_{\theta})$ 

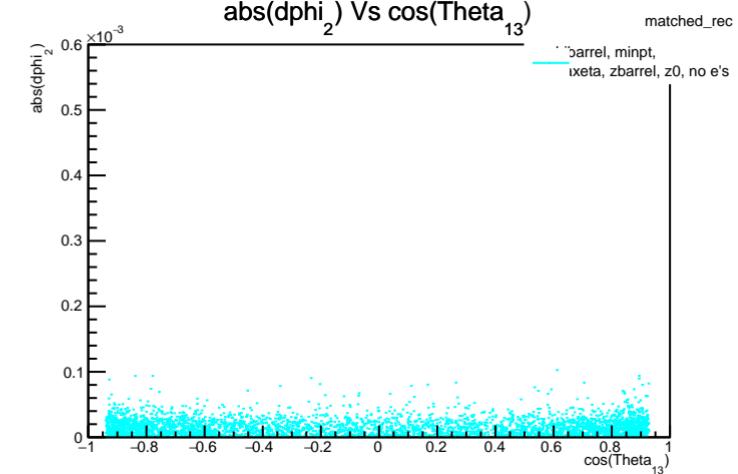
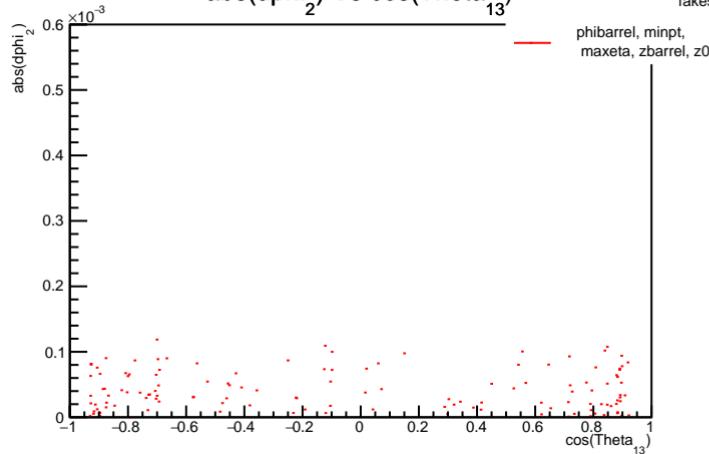
$\Theta_{13}$



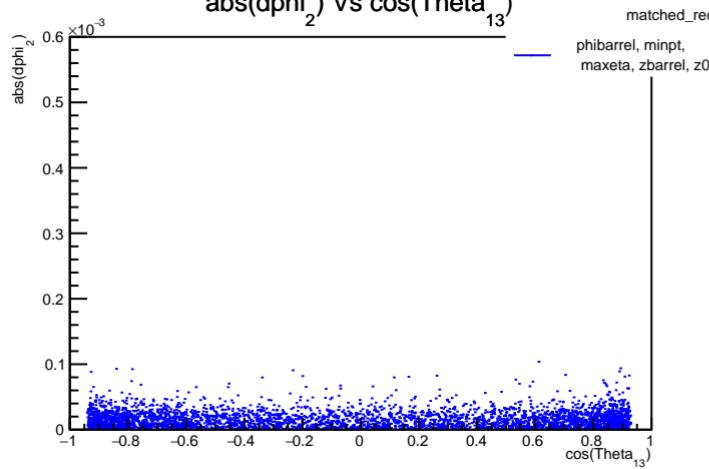
$M_{\theta}$



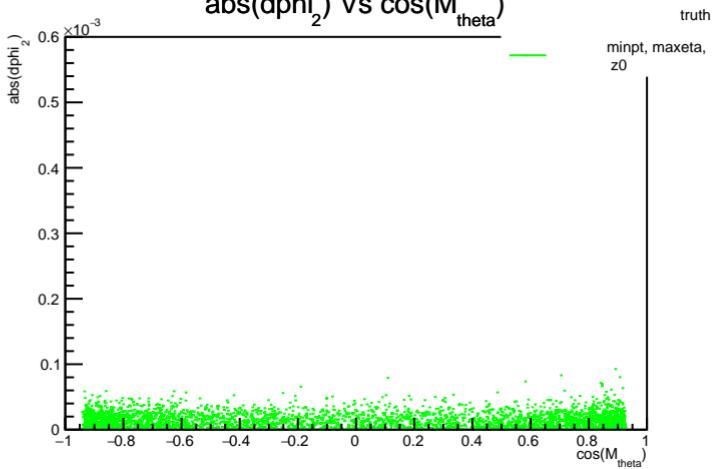
$\text{abs}(\text{dphi}_2)$  Vs  $\cos(\Theta_{13})$



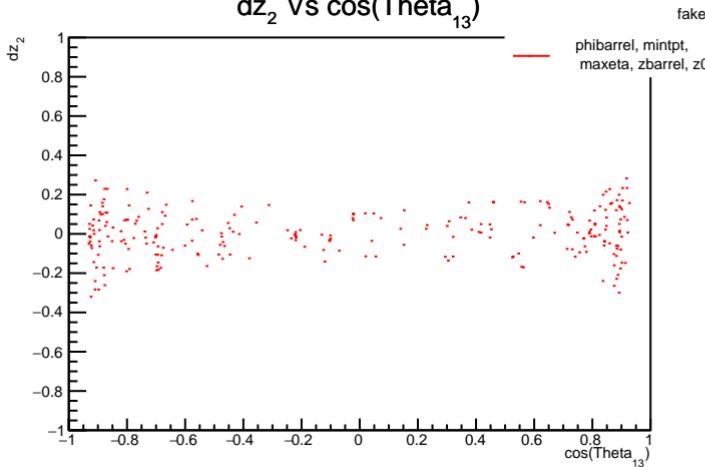
$\text{abs}(\text{dphi}_2)$  Vs  $\cos(\Theta_{13})$



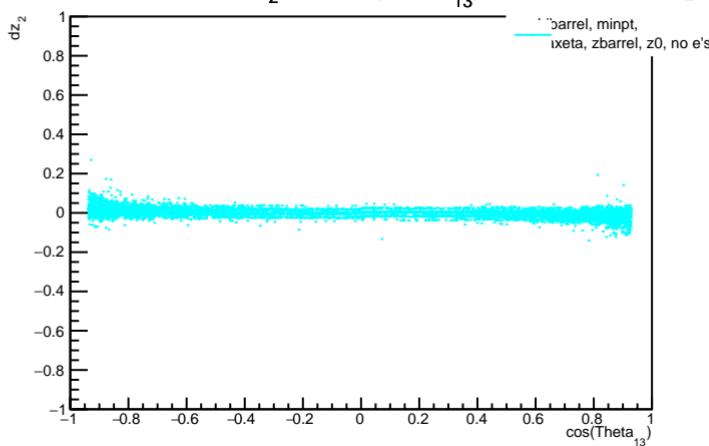
$\text{abs}(\text{dphi}_2)$  Vs  $\cos(M_{\theta})$



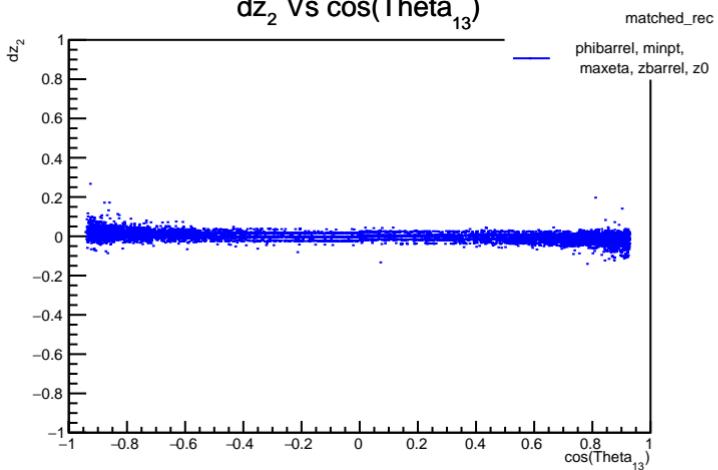
$dz_2$  Vs  $\cos(\Theta_{13})$



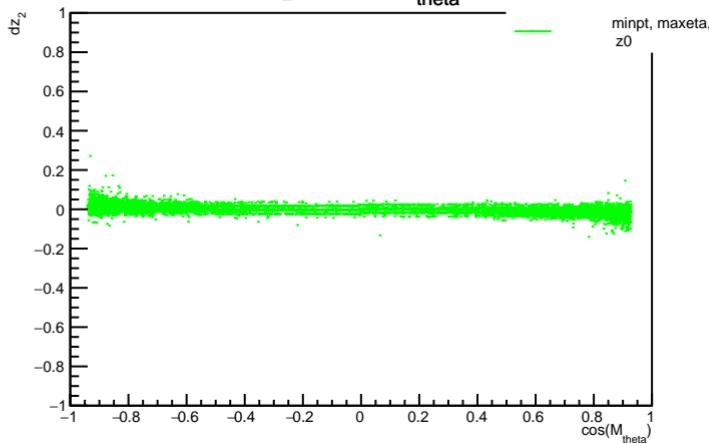
$dz_2$  Vs  $\cos(\Theta_{13})$

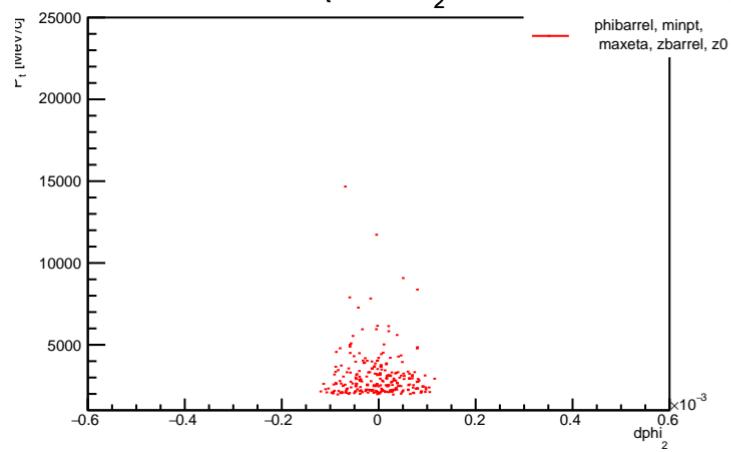
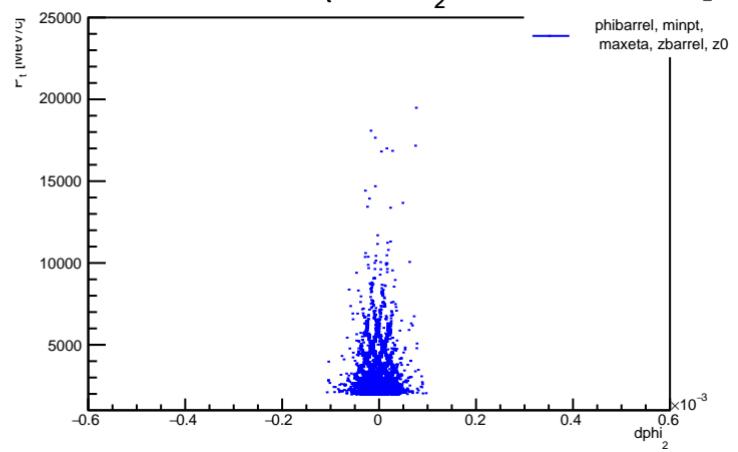
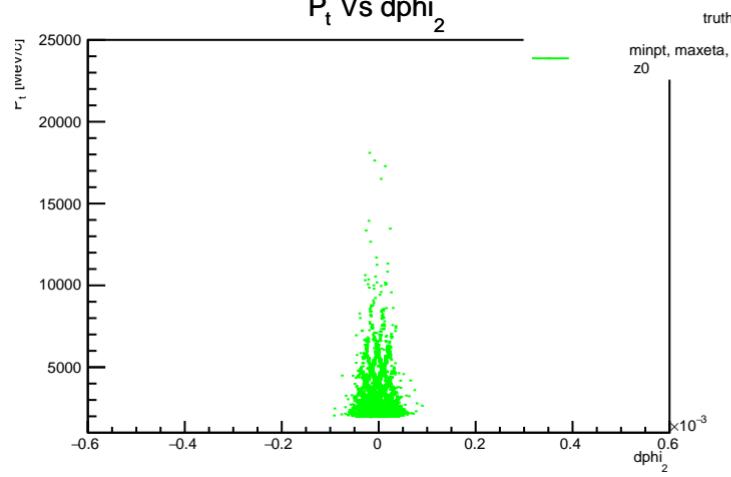
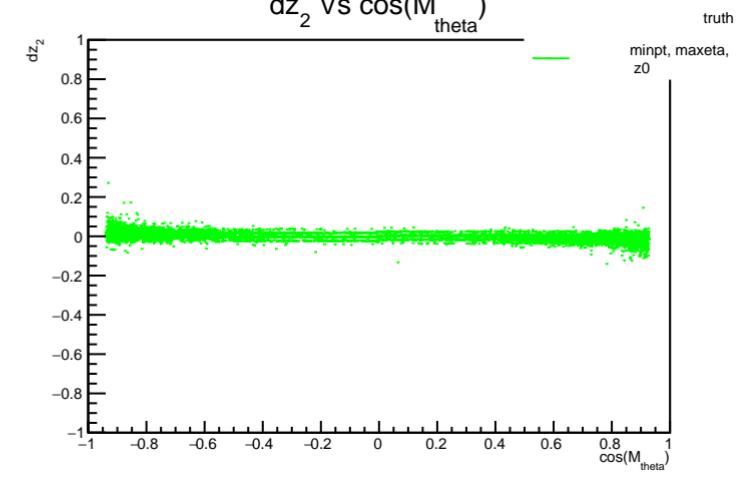


$dz_2$  Vs  $\cos(\Theta_{13})$



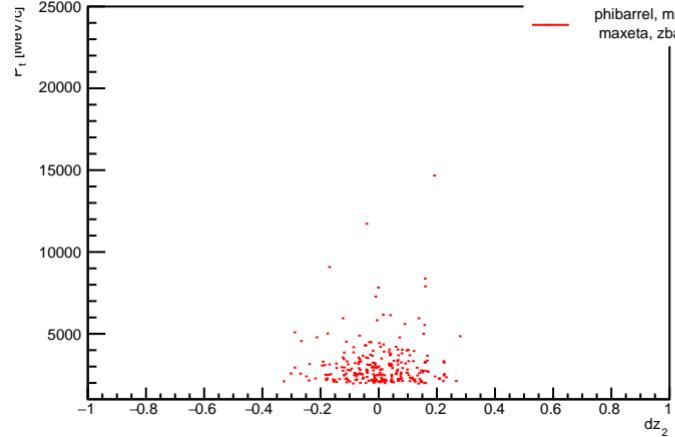
$dz_2$  Vs  $\cos(M_{\theta})$



$P_t$  Vs  $d\phi_{i_2}$  $P_t$  Vs  $d\phi_{i_2}$  $P_t$  Vs  $d\phi_{i_2}$  $dz_2$  Vs  $\cos(M_{\theta})$ 

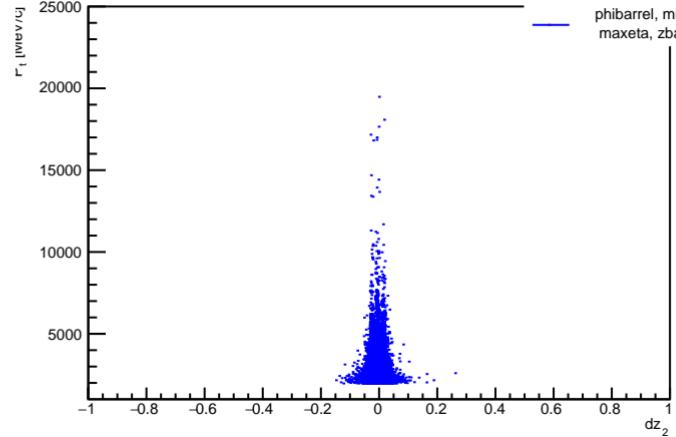
$P_t$  Vs  $dz_2$

fakes



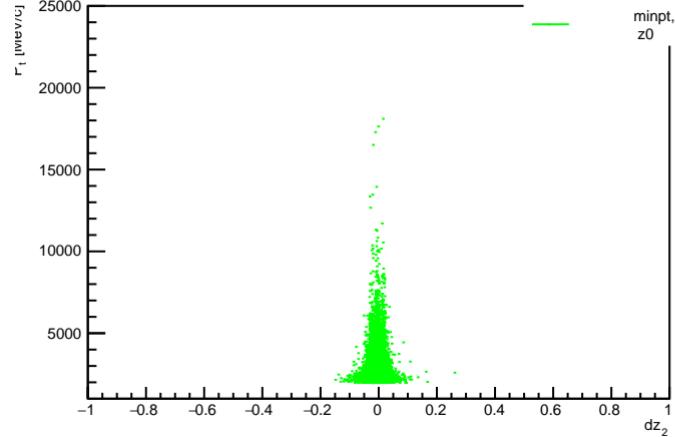
$P_t$  Vs  $dz_2$

matched\_rec



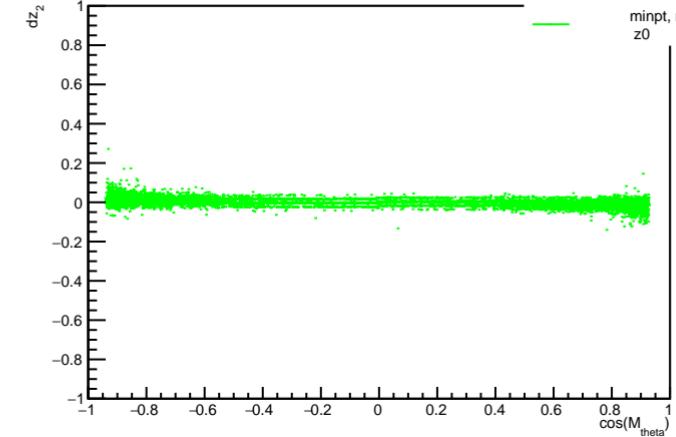
$P_t$  Vs  $dz_2$

truth

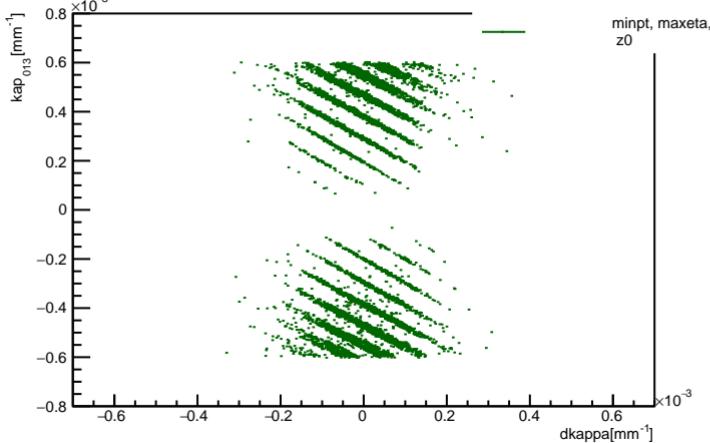


$dz_2$  Vs  $\cos(M_{\theta})$

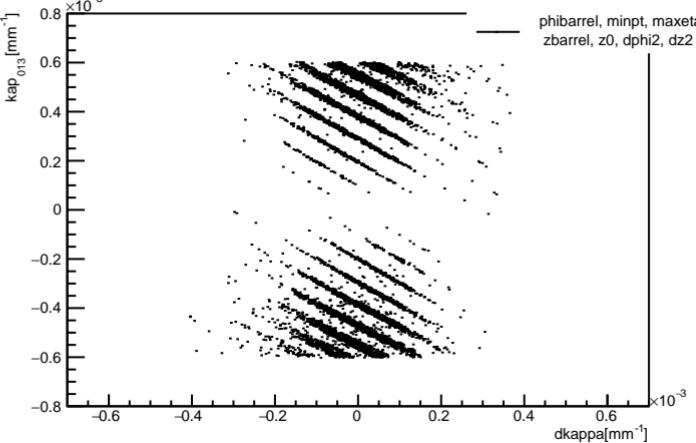
truth



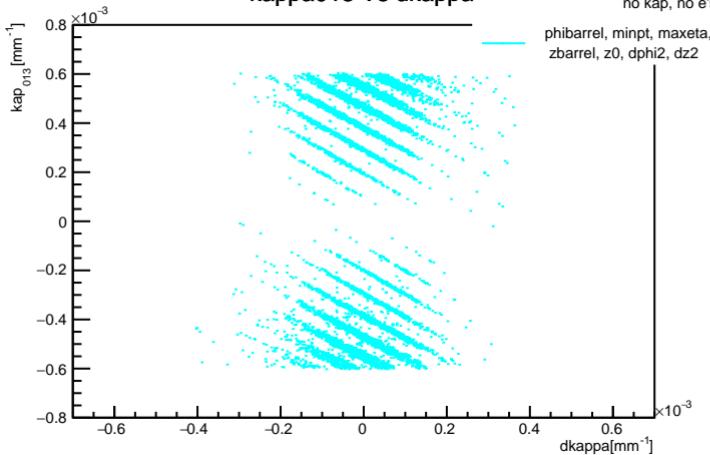
### kappa013 Vs dkappa



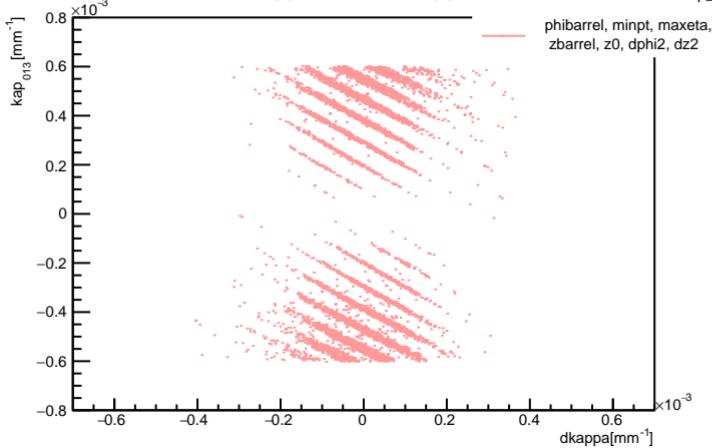
### kappa013 Vs dkappa



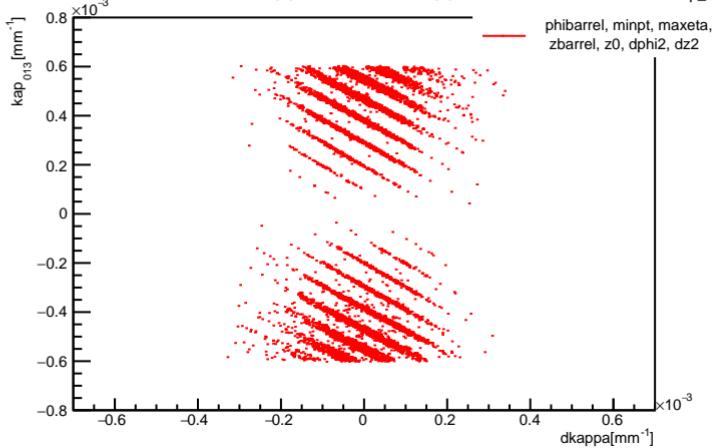
### kappa013 Vs dkappa



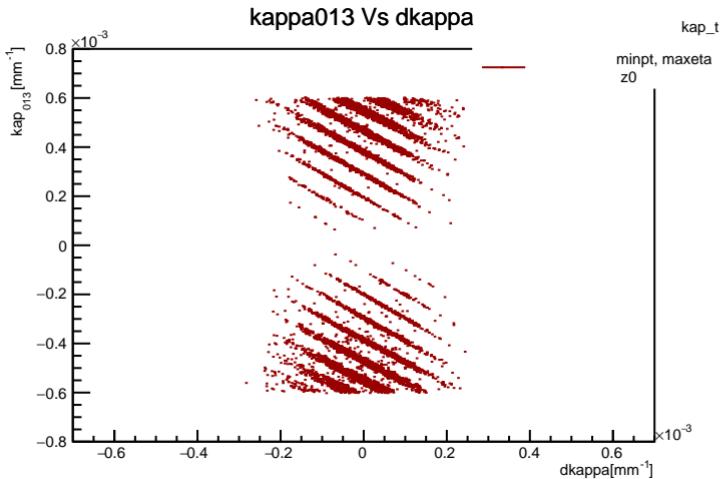
kappa013 Vs dkappa



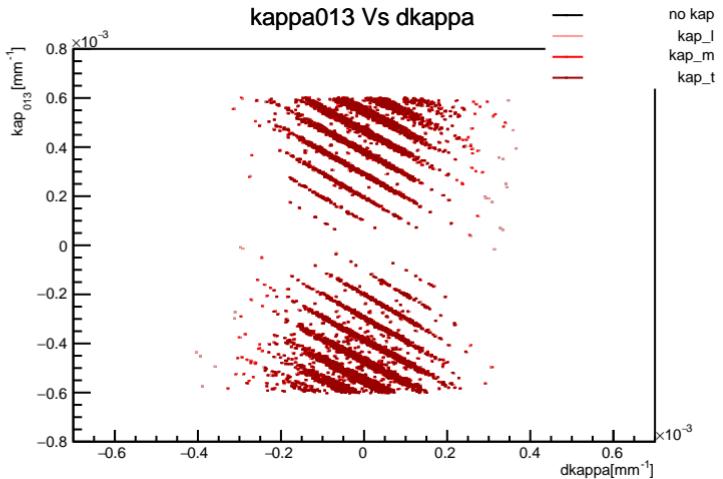
kappa013 Vs dkappa



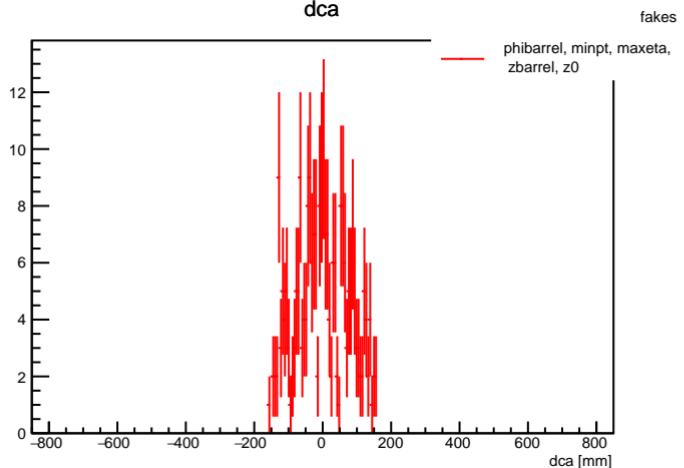
kappa013 Vs dkappa



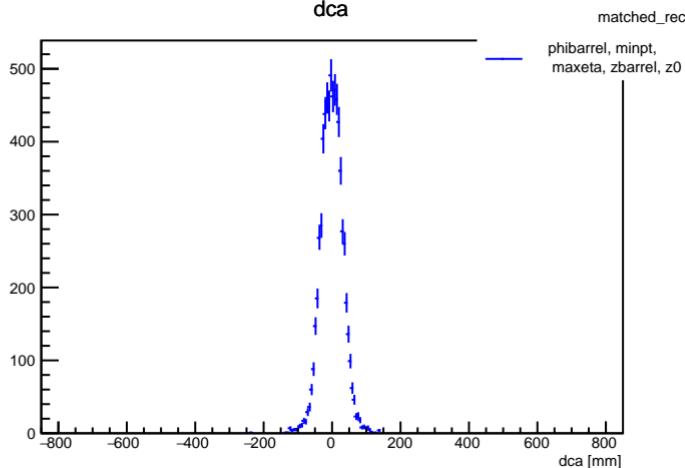
kappa013 Vs dkappa



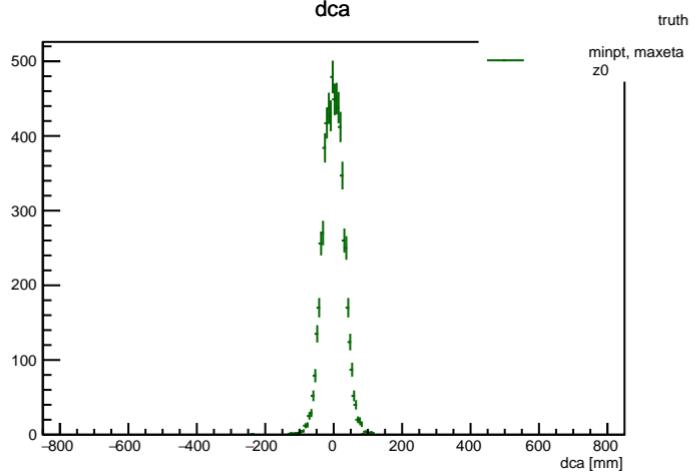
dca



dca



dca

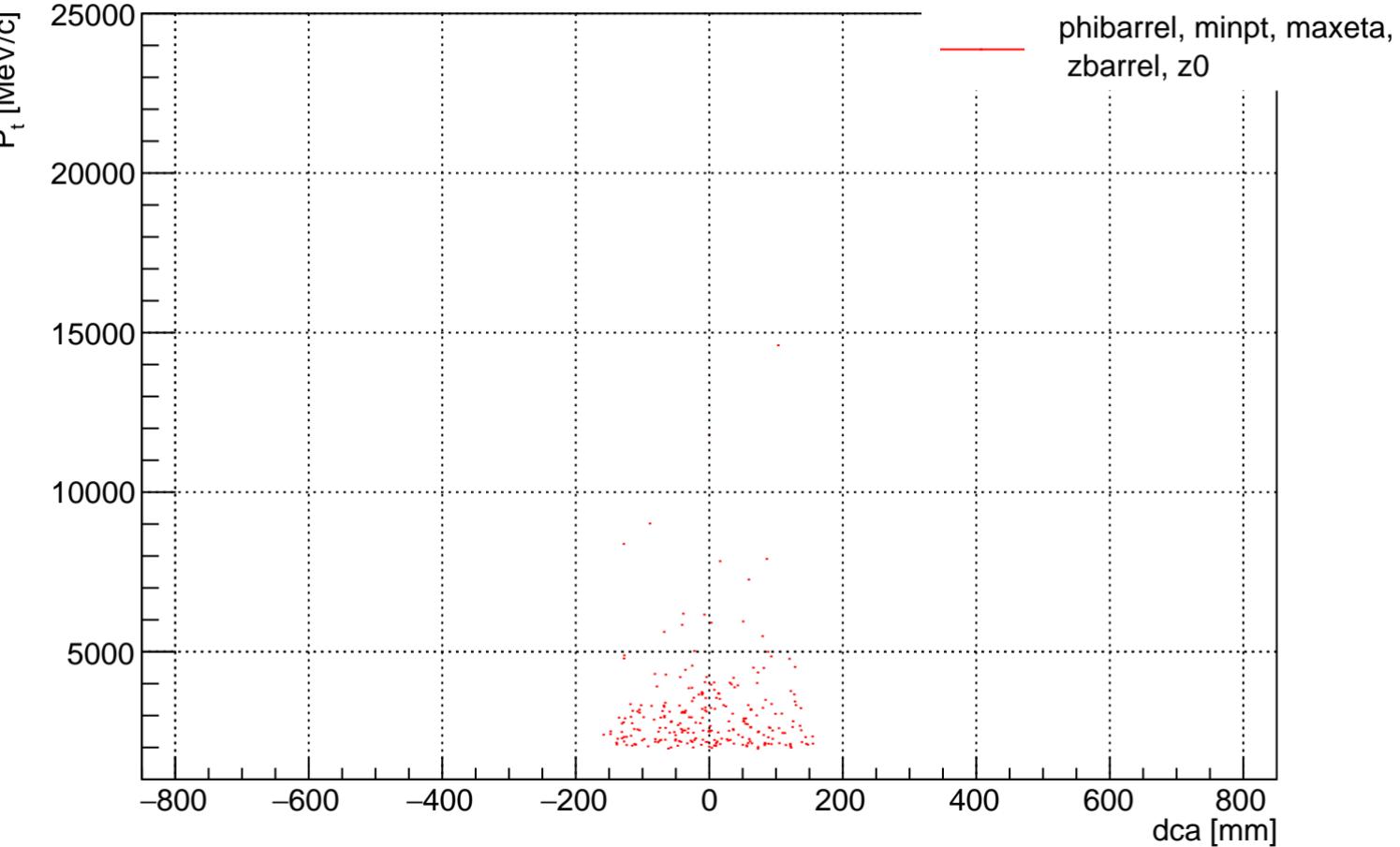


truth

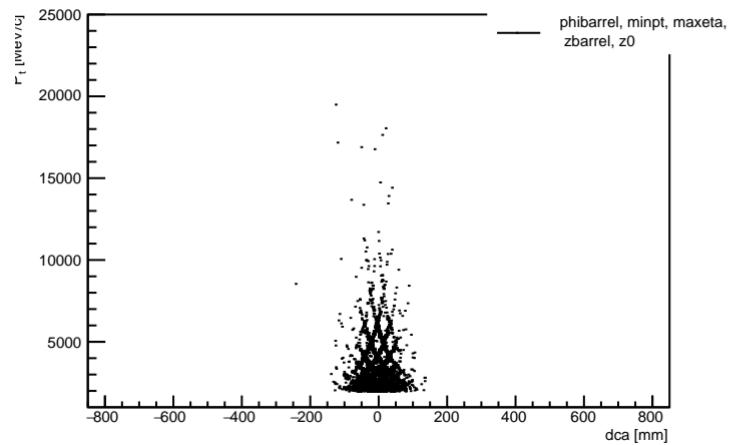
matched\_rec

# $P_t$ Vs dca

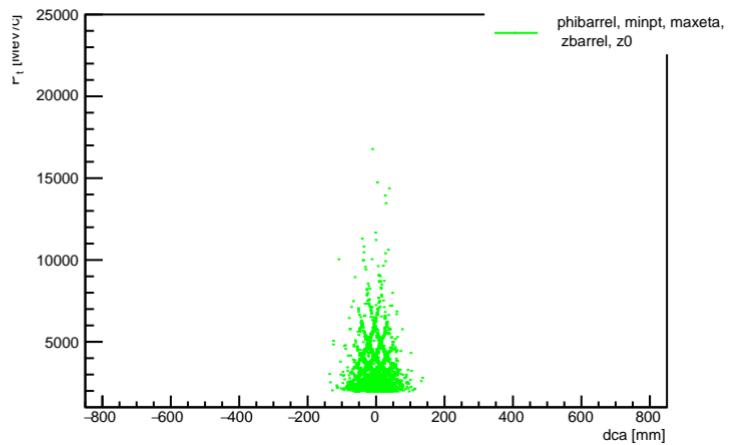
fakes



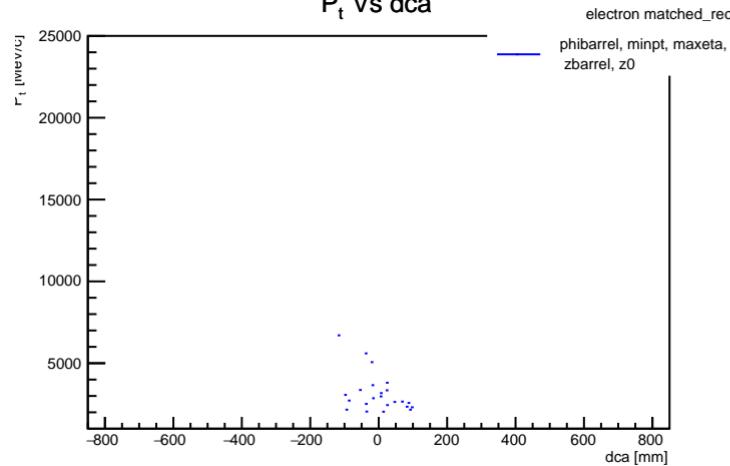
$P_t$  Vs dca



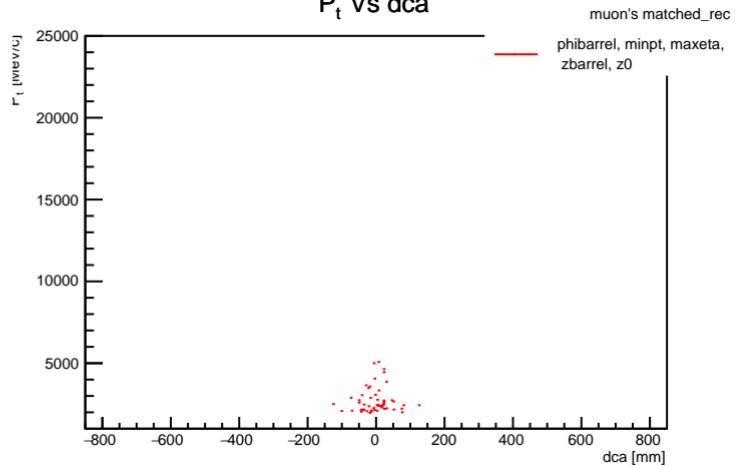
$P_t$  Vs dca



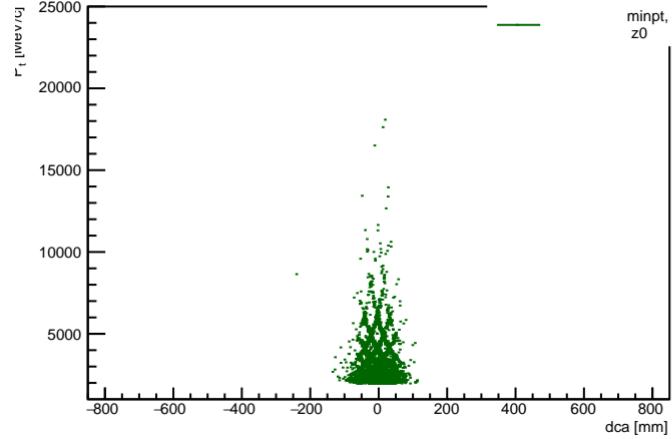
$P_t$  Vs dca



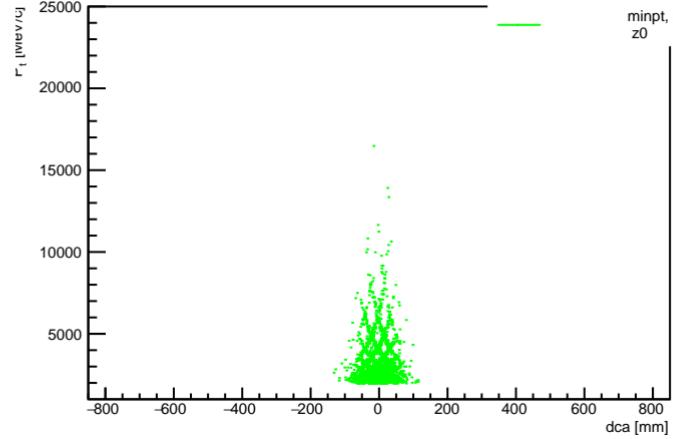
$P_t$  Vs dca



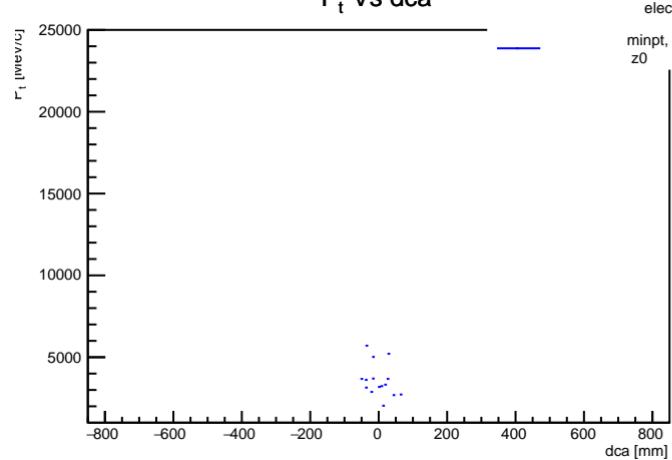
$P_t$  Vs dca



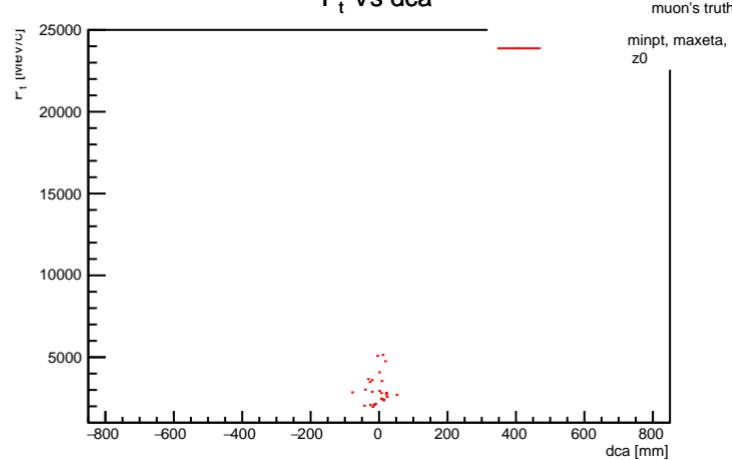
$P_t$  Vs dca



$P_t$  Vs dca

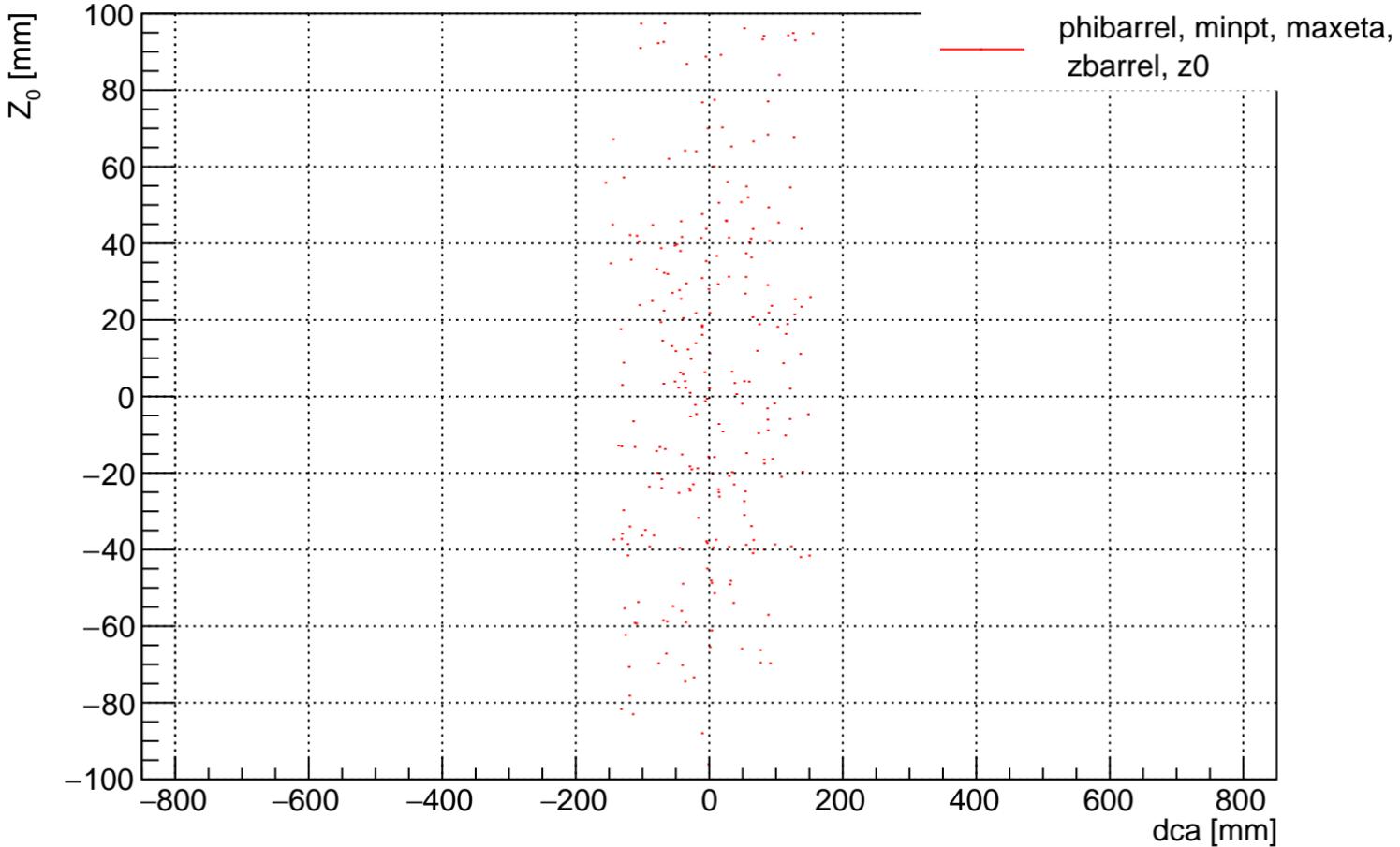


$P_t$  Vs dca

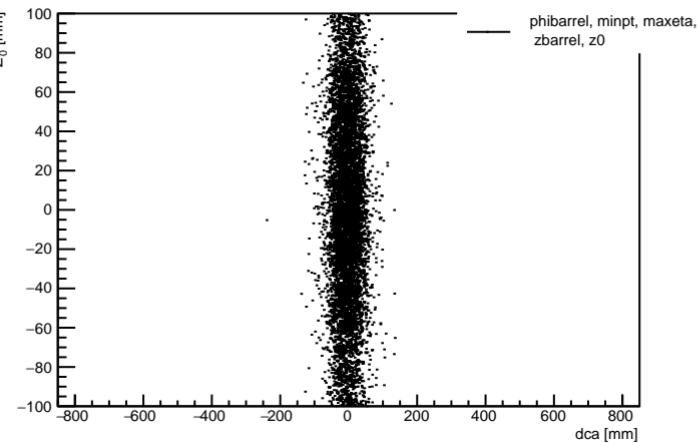


# $Z_0$ Vs dca

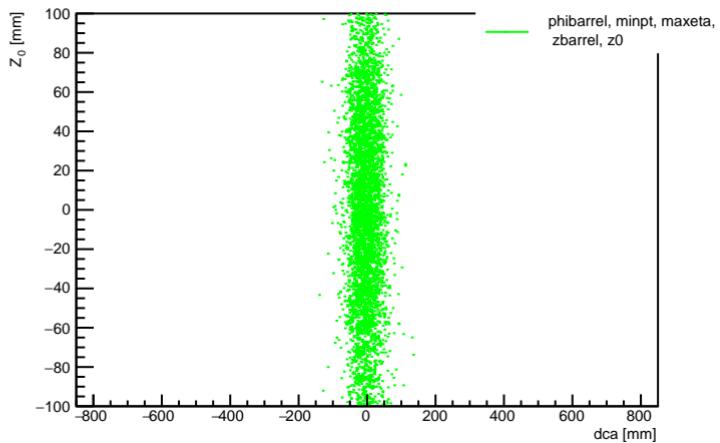
fakes



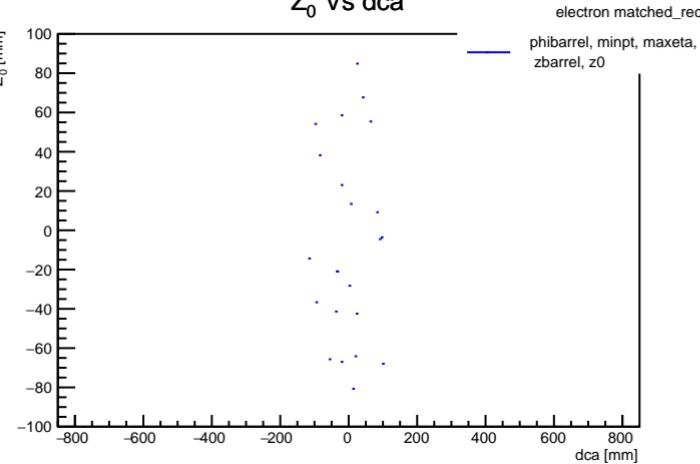
$Z_0$  Vs dca



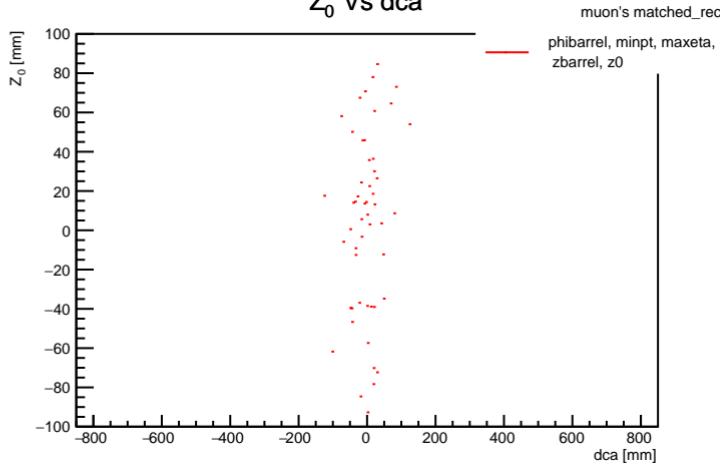
$Z_0$  Vs dca



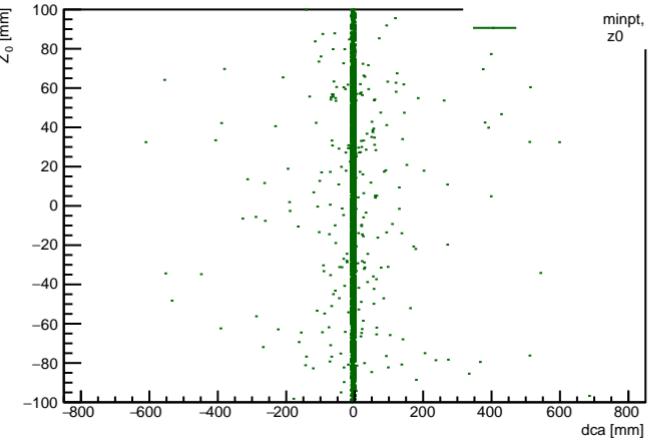
$Z_0$  Vs dca



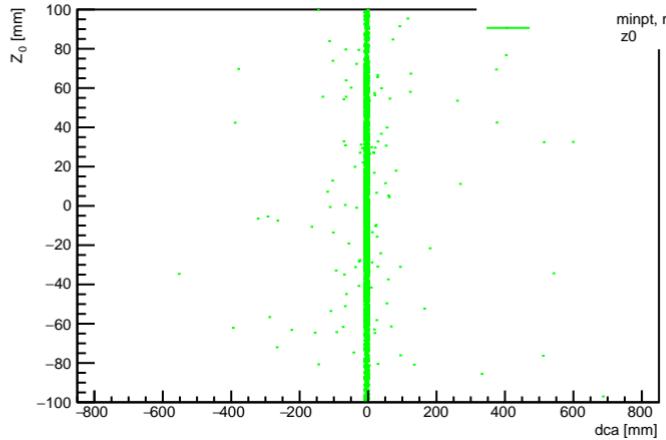
$Z_0$  Vs dca



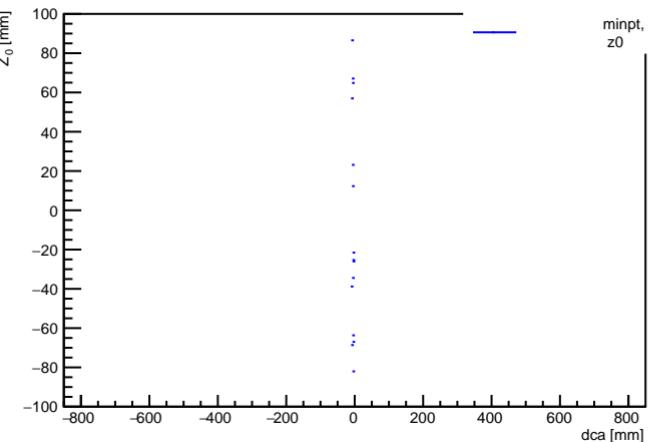
### $Z_0$ Vs dca



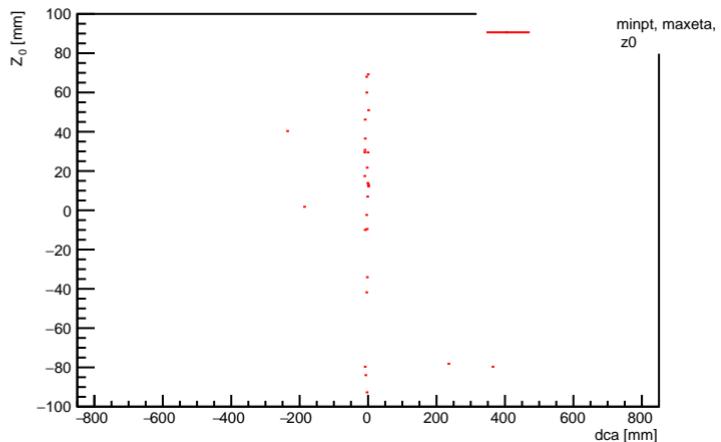
### $Z_0$ Vs dca



### $Z_0$ Vs dca

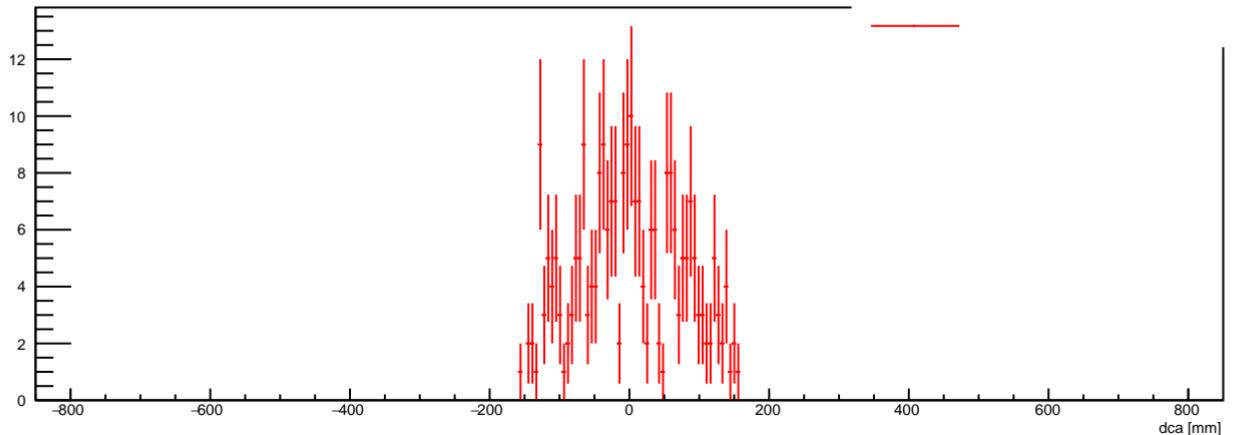


### $Z_0$ Vs dca



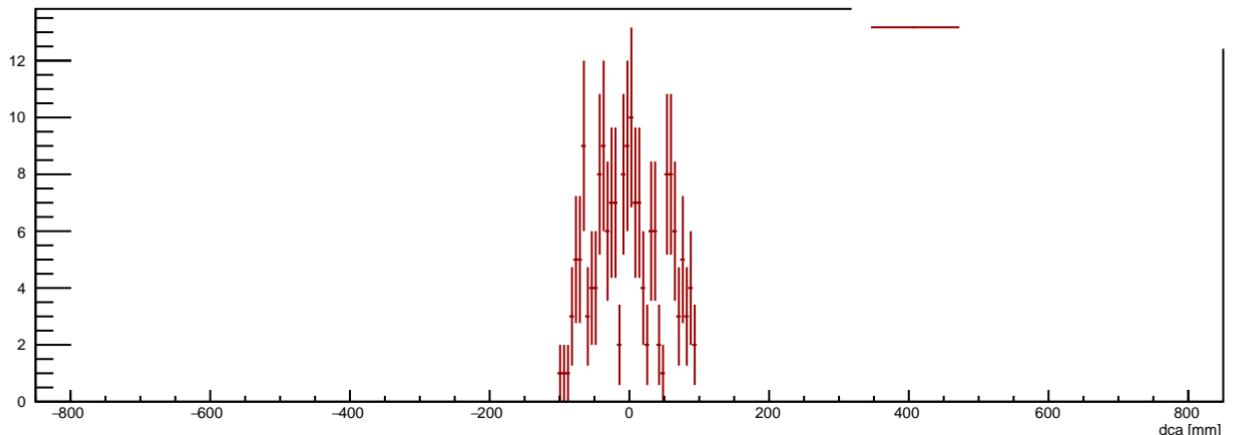
dca

fakes



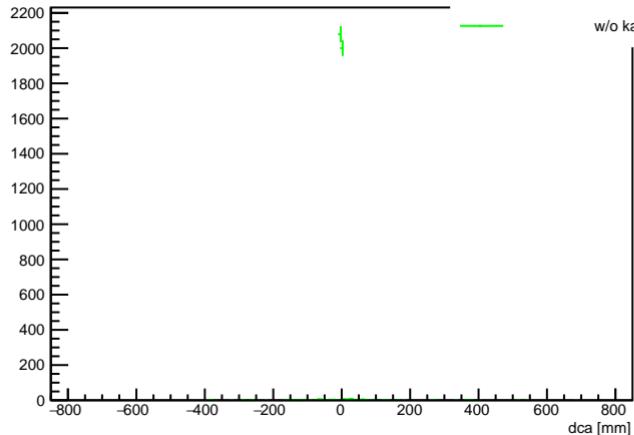
dca

fakes



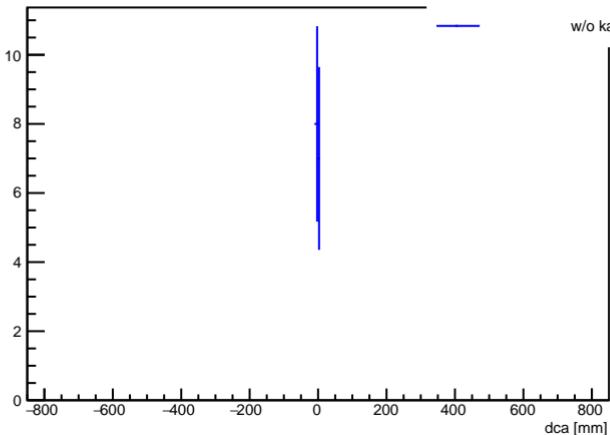
dca

pion truth



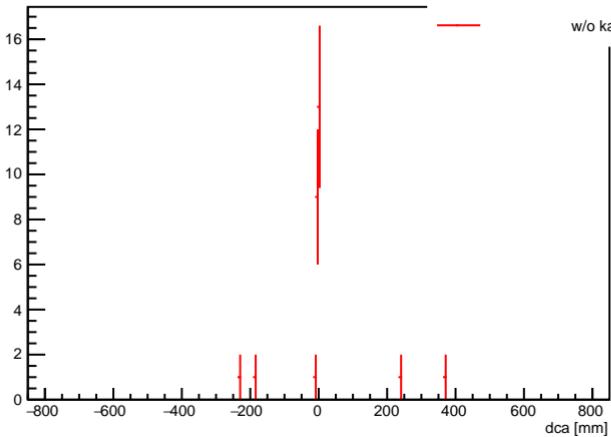
dca

electron truth

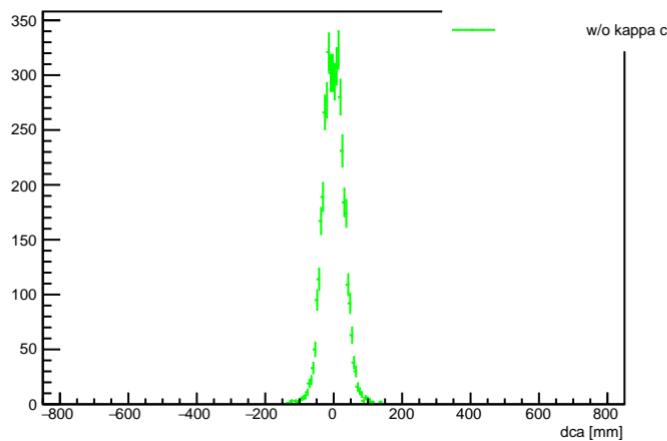


dca

muon truth



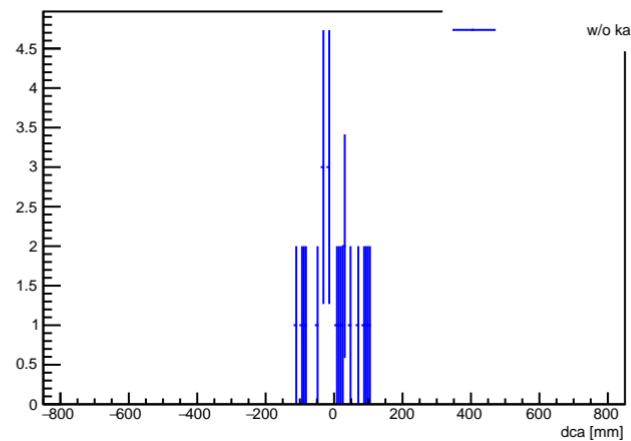
dca



pion matched\_rec

w/o kappa cut

dca



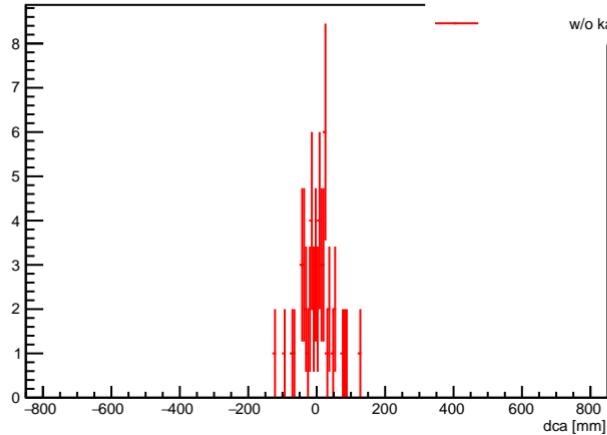
electron matched\_rec

w/o kappa cut

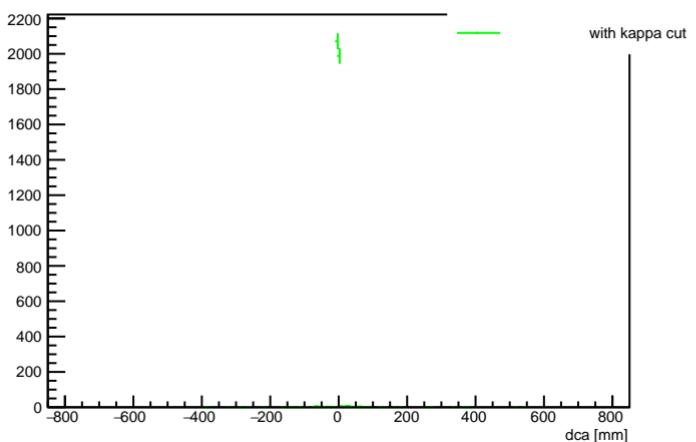
dca

muon matched\_rec

w/o kappa cut



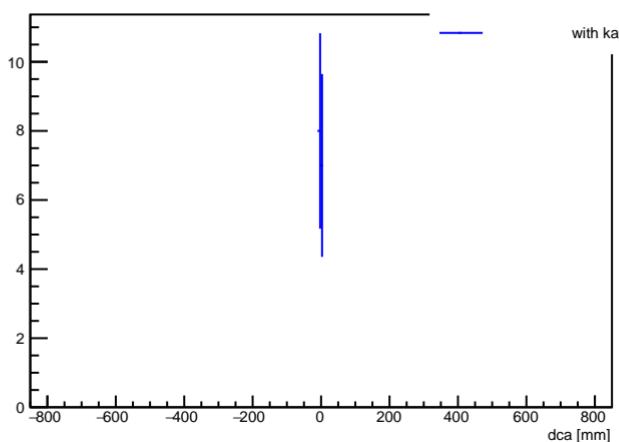
dca



pion truth

with kappa cut

dca



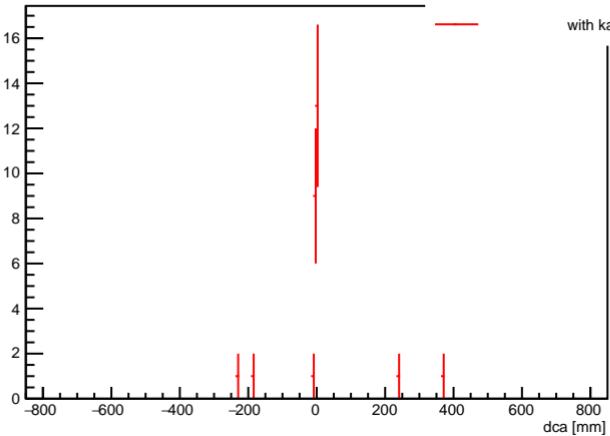
electron truth

with kappa cut

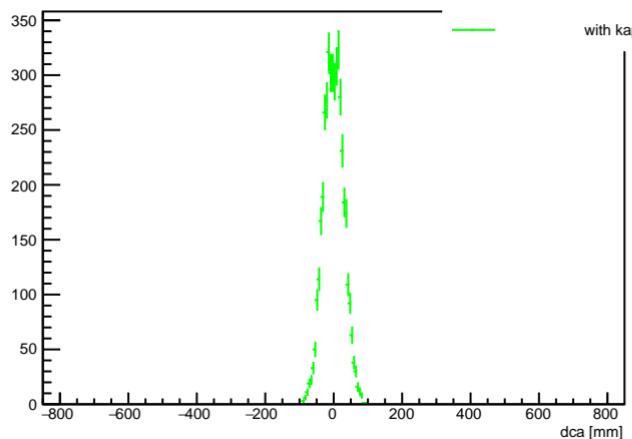
dca

muon truth

with kappa cut



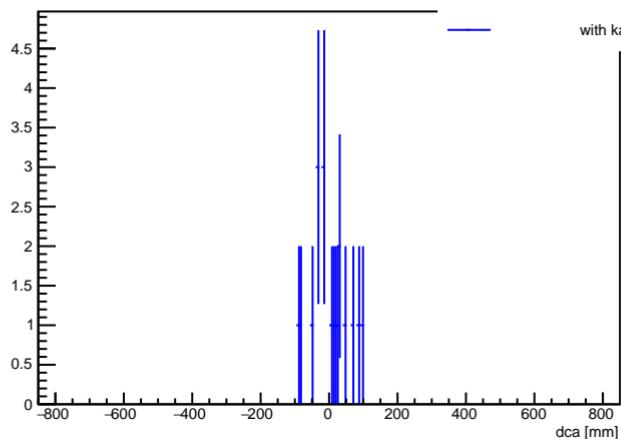
dca



pion matched\_rec

with kappa cut

dca



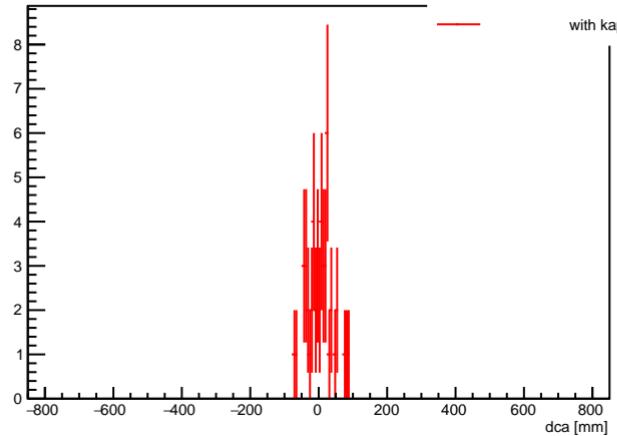
electron matched\_rec

with kappa cut

dca

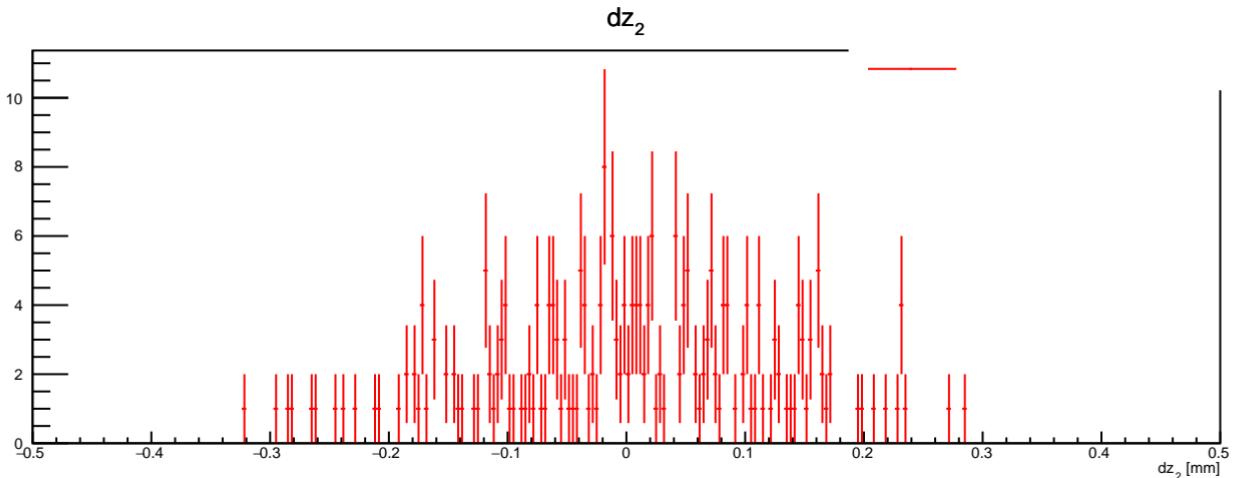
muon matched\_rec

with kappa cut



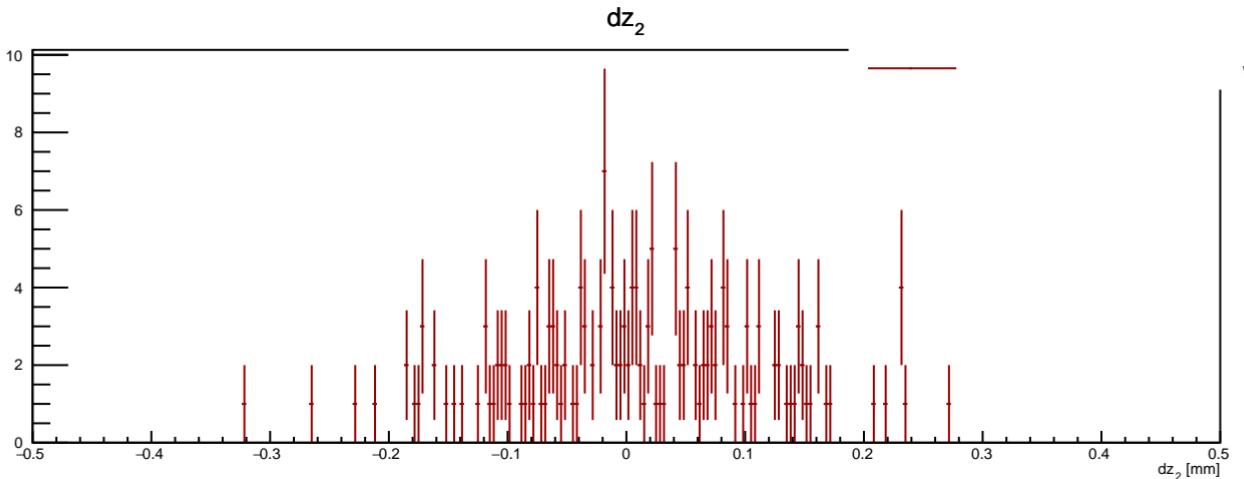
fakes

w/o kappa cut



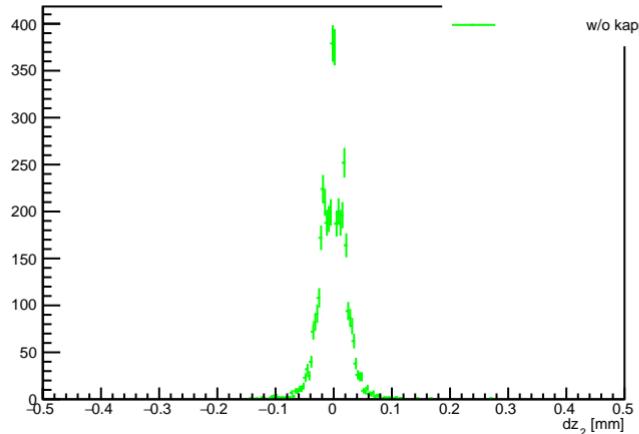
fakes

with kappa cut

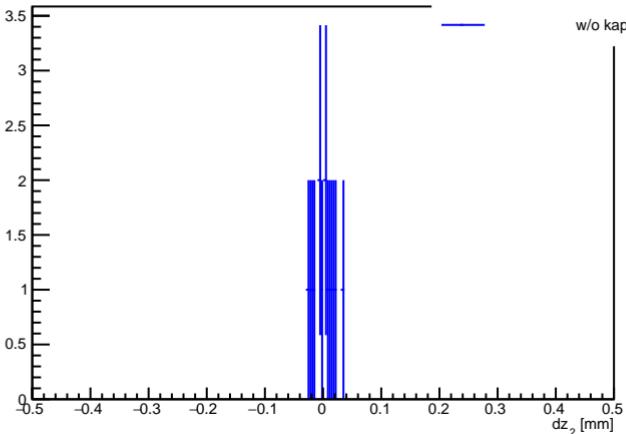


$dz_2$ 

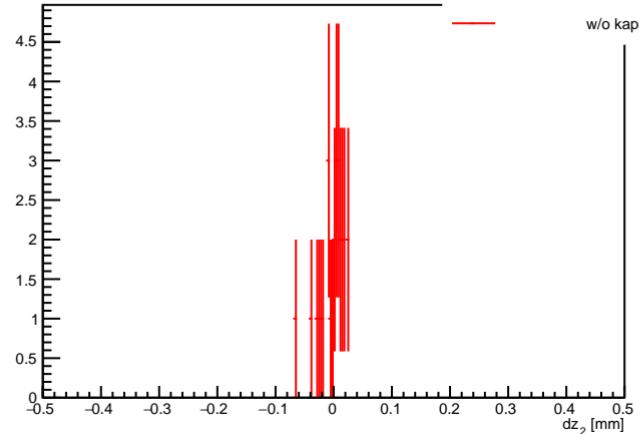
pion truth

 $dz_2$ 

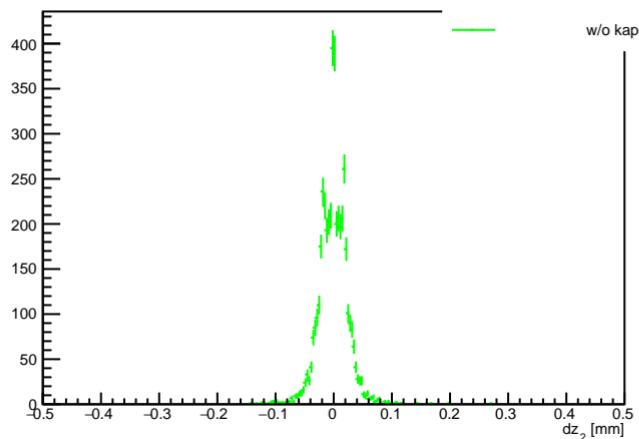
electron truth

 $dz_2$ 

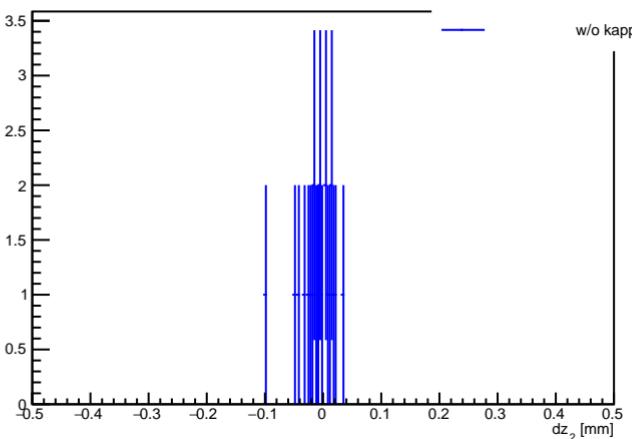
muon truth



$dz_2$

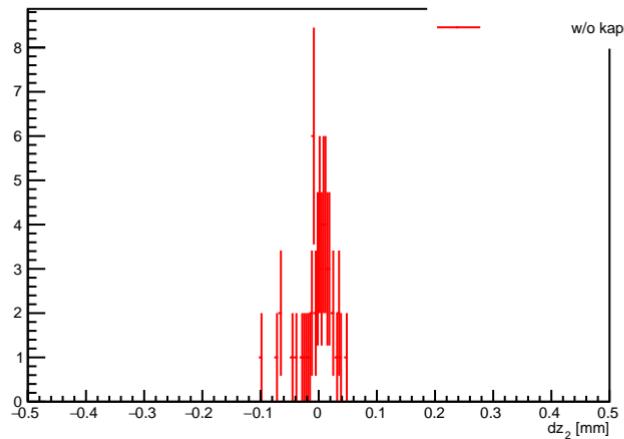


electron matched\_rec

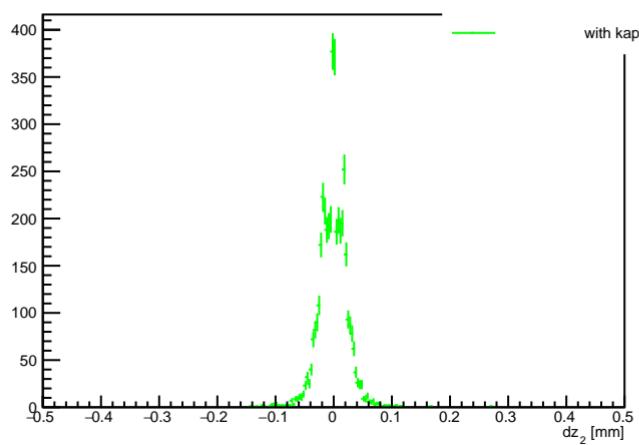


$dz_2$

muon matched\_rec



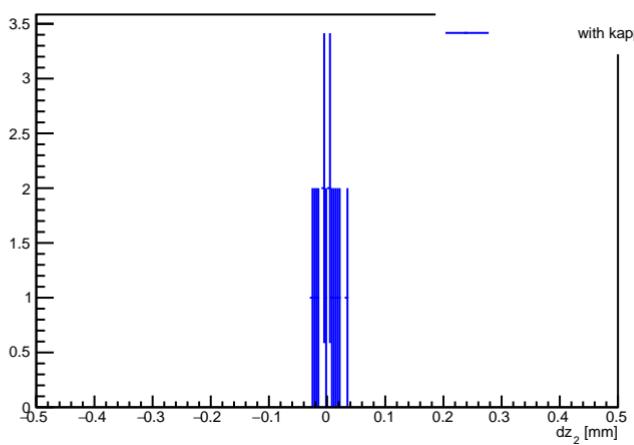
$dz_2$



pion truth

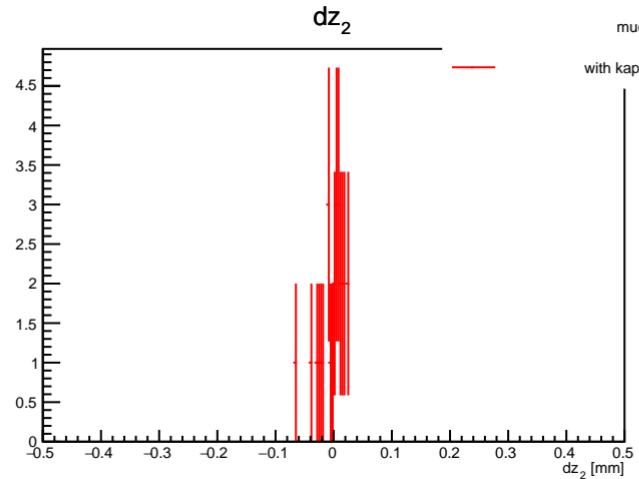
with kappa cut

$dz_2$



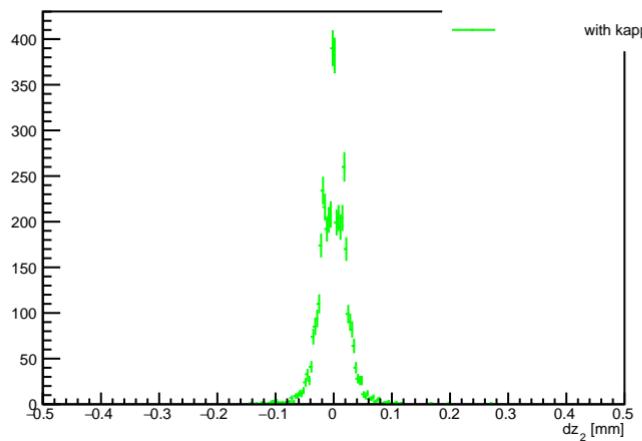
electron truth

muon truth



with kappa cut

$dz_2$



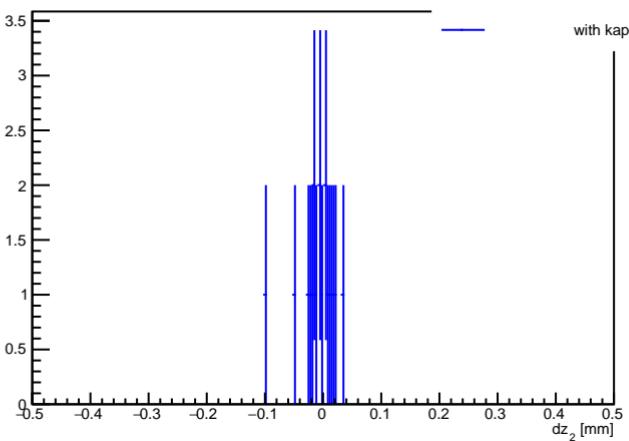
pion matched\_rec

with kappa cut

$dz_2$

electron matched\_rec

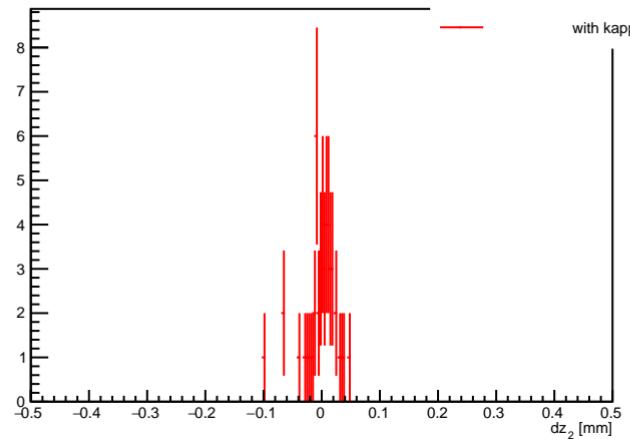
with kappa cut



$dz_2$

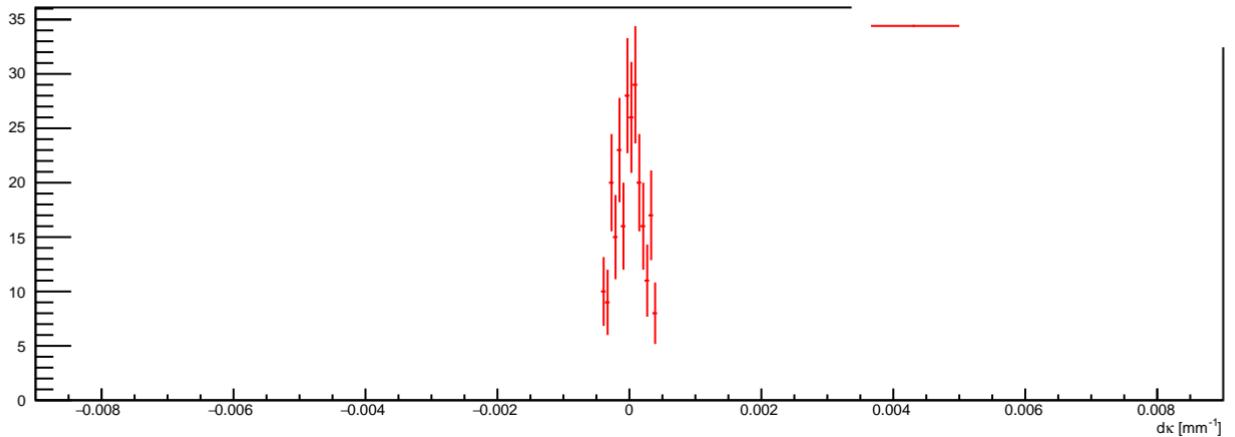
muon matched\_rec

with kappa cut



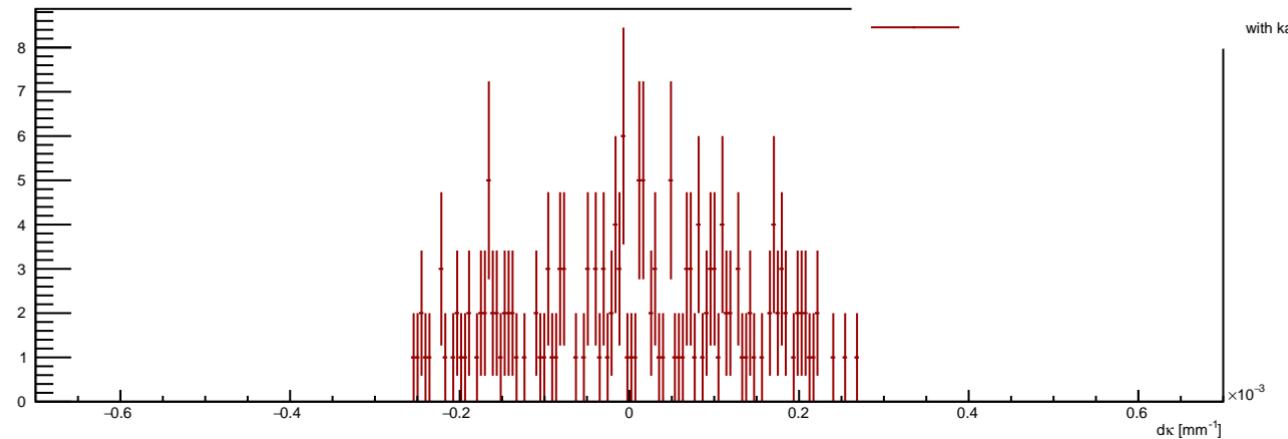
$d\kappa$

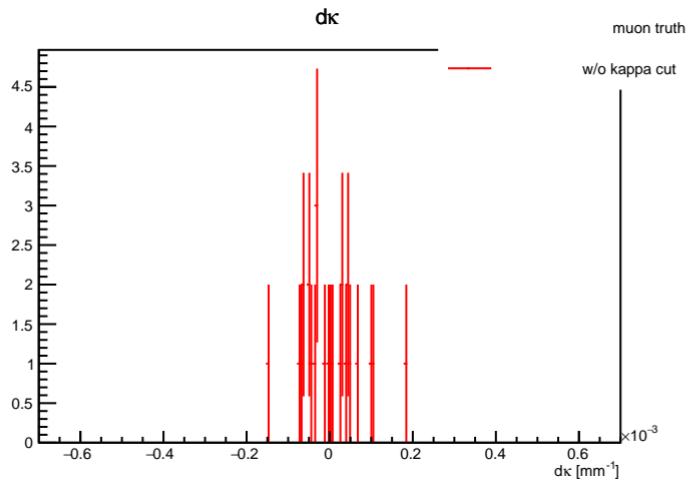
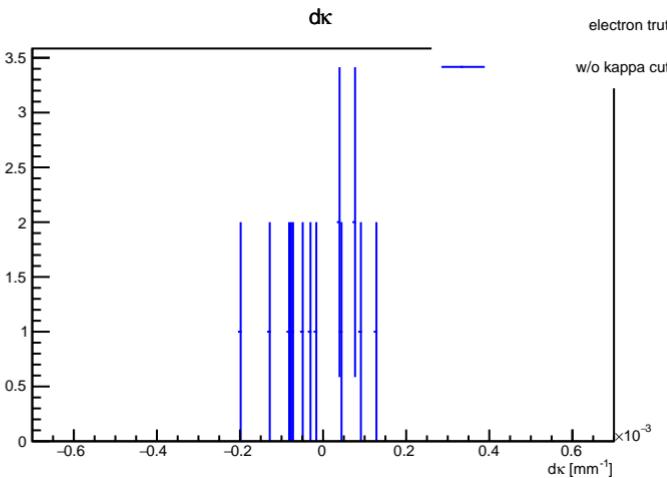
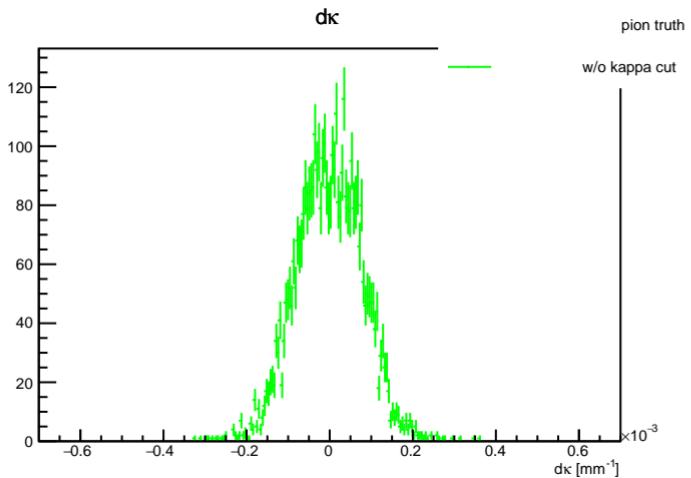
fakes



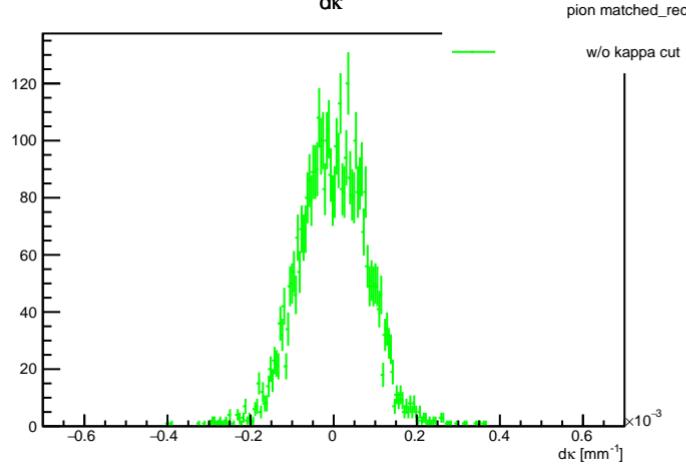
$d\kappa$

fakes





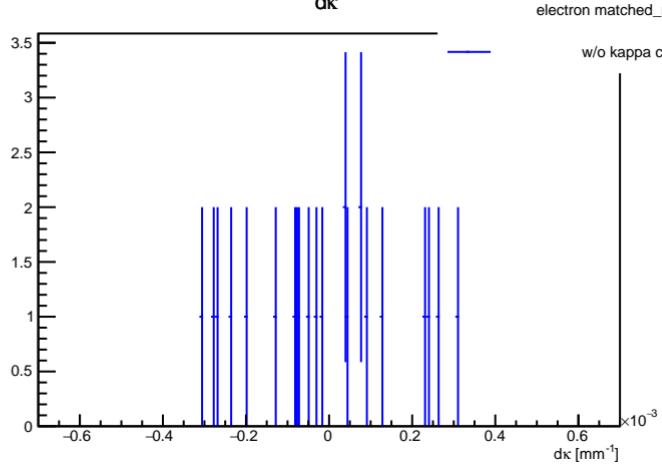
dk



pion matched\_rec

w/o kappa cut

dk



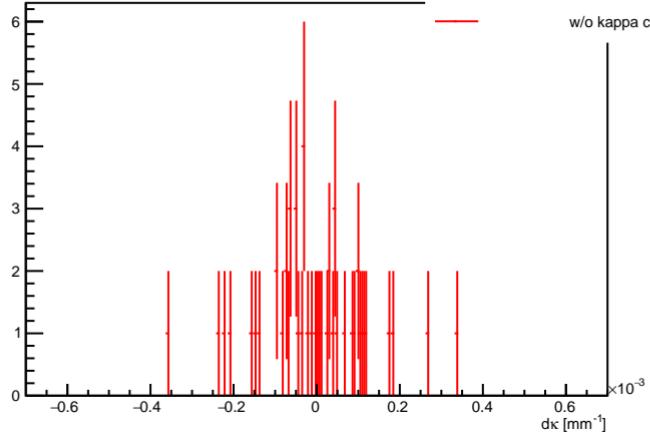
electron matched\_rec

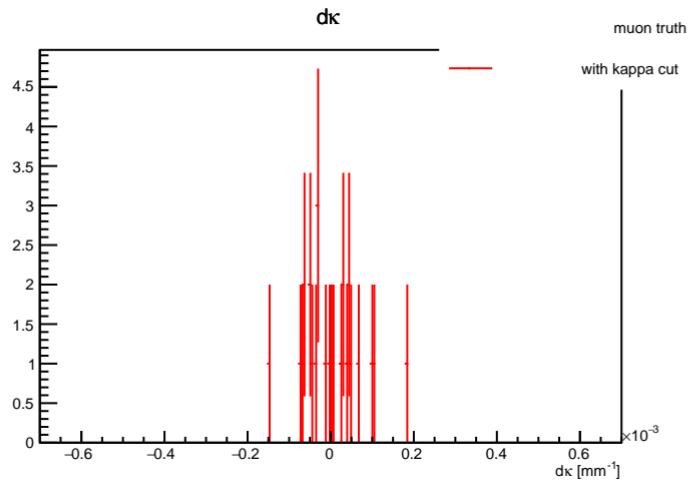
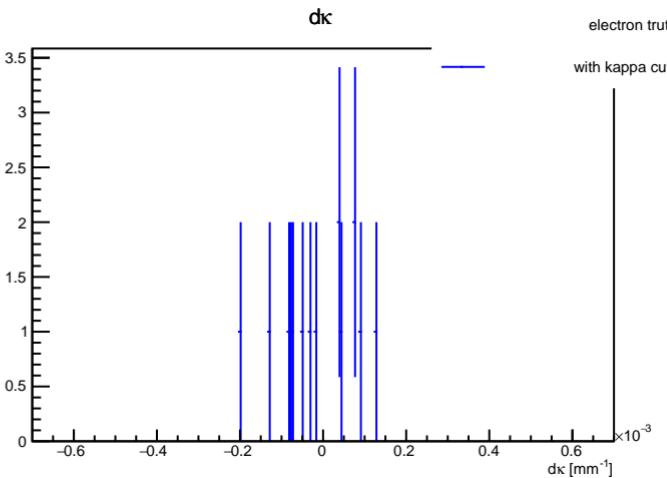
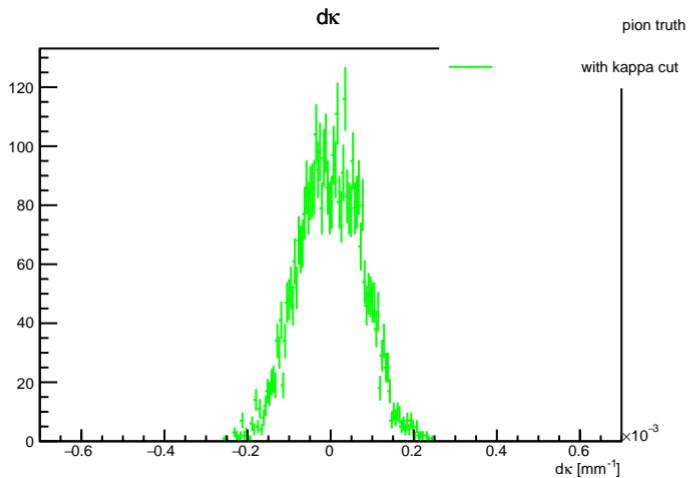
w/o kappa cut

dk

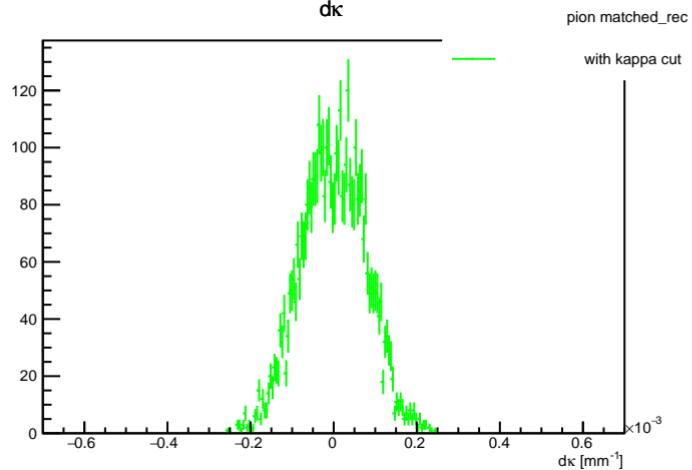
muon matched\_rec

w/o kappa cut





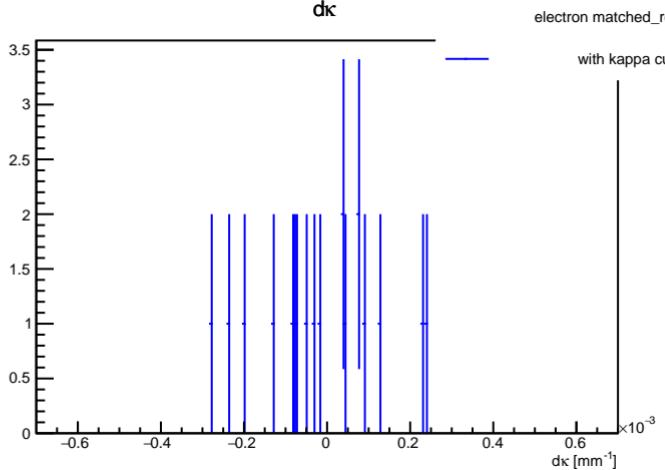
dk



pion matched\_rec

with kappa cut

dk



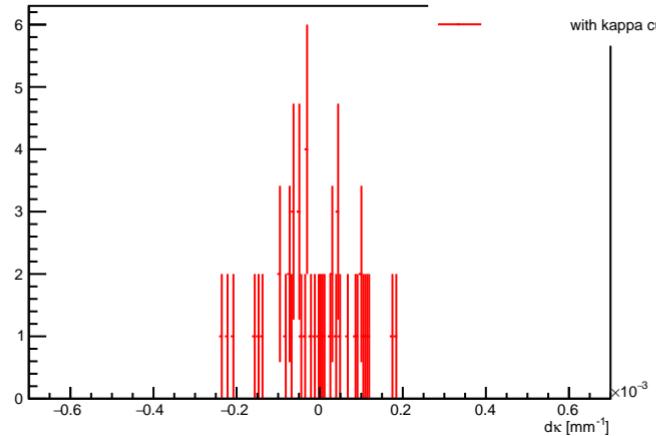
electron matched\_rec

with kappa cut

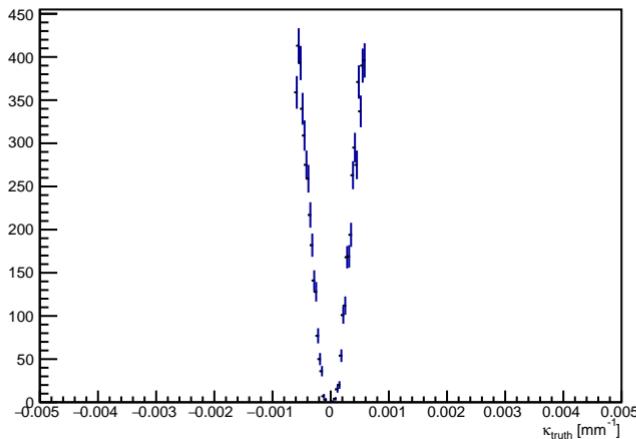
dk

muon matched\_rec

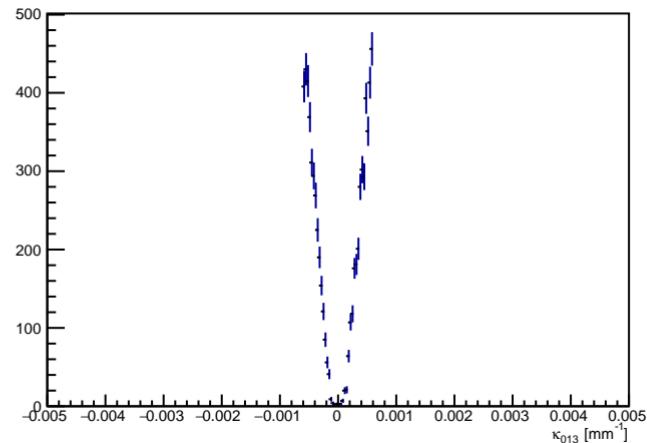
with kappa cut



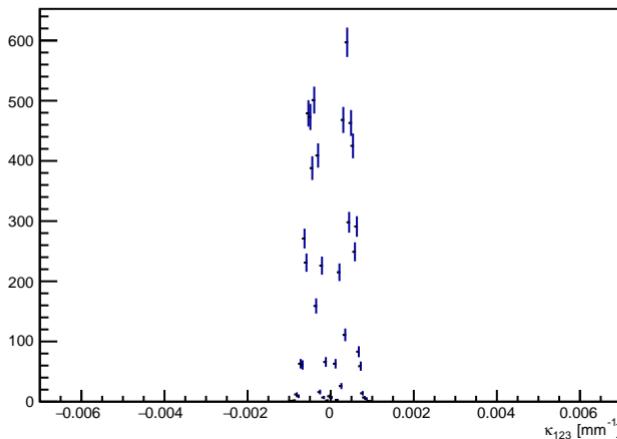
kappa truth



kappa rec with bml constraint

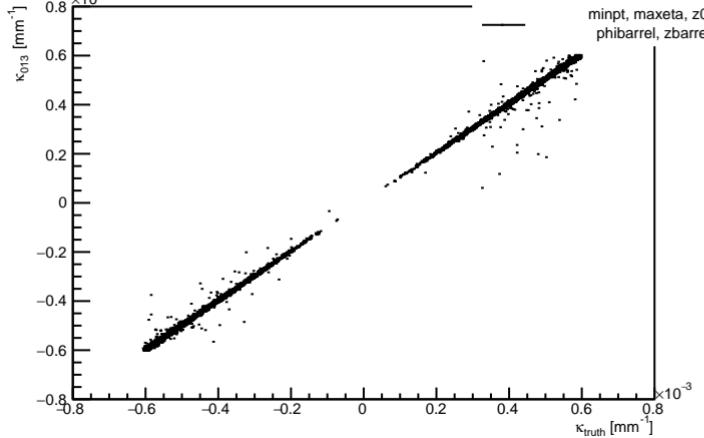


kappa rec w/o bml constraint

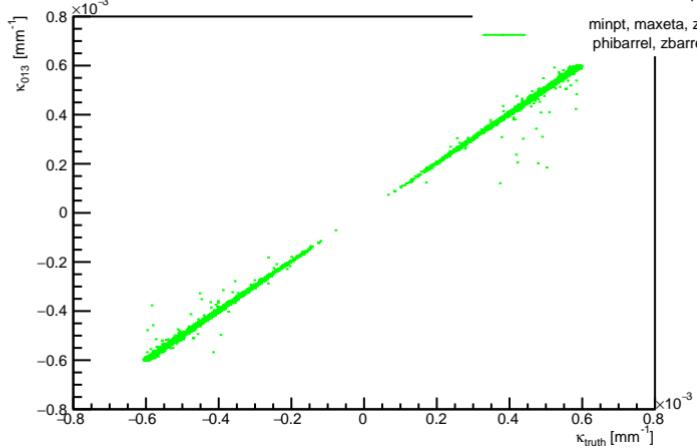


$\kappa_{013}$  Vs  $\kappa_{\text{truth}}$ 

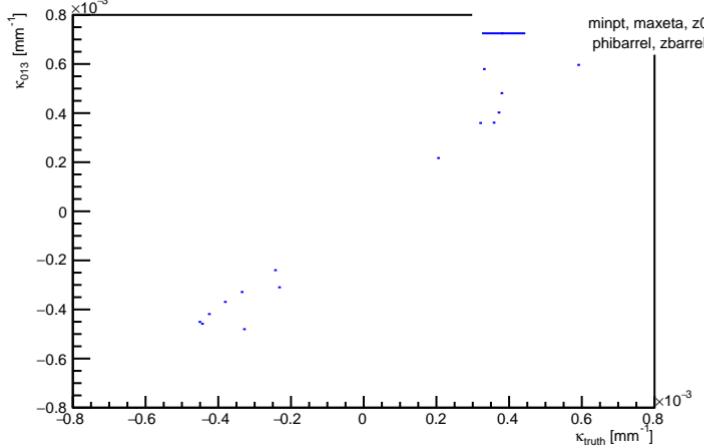
all

 $\kappa_{013}$  Vs  $\kappa_{\text{truth}}$ 

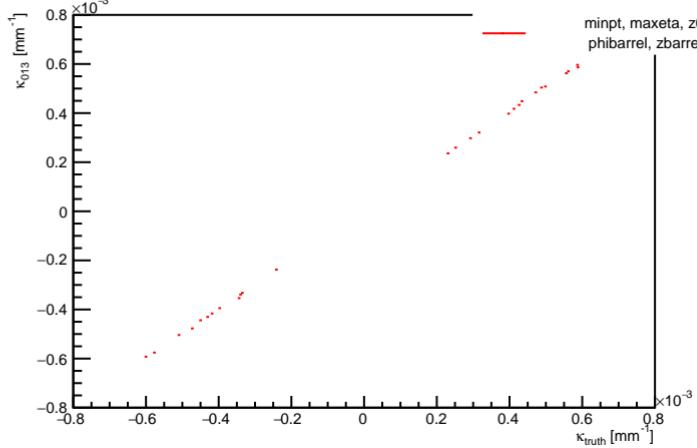
pion

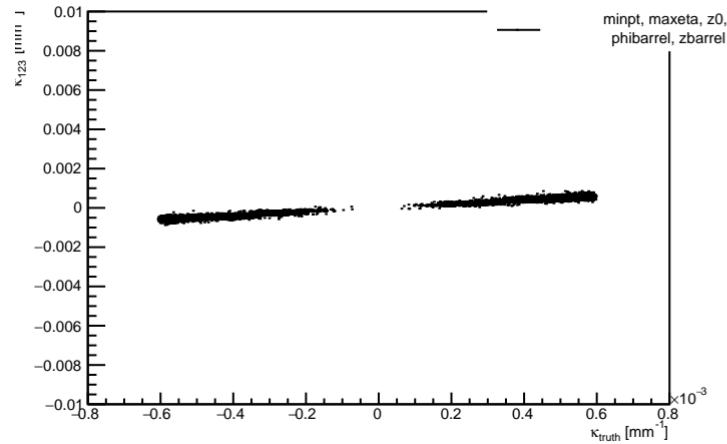
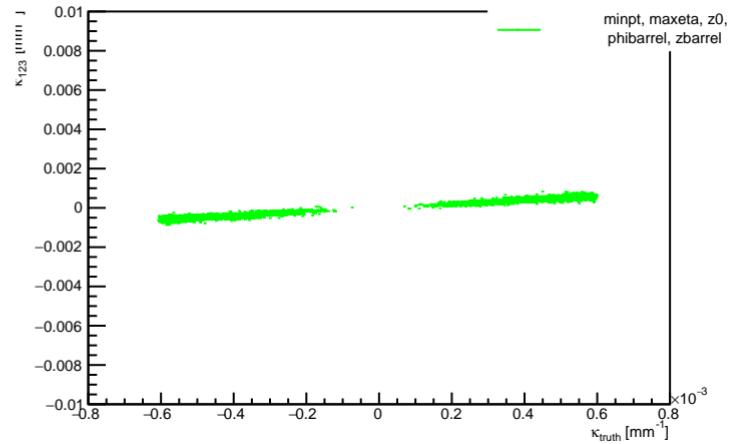
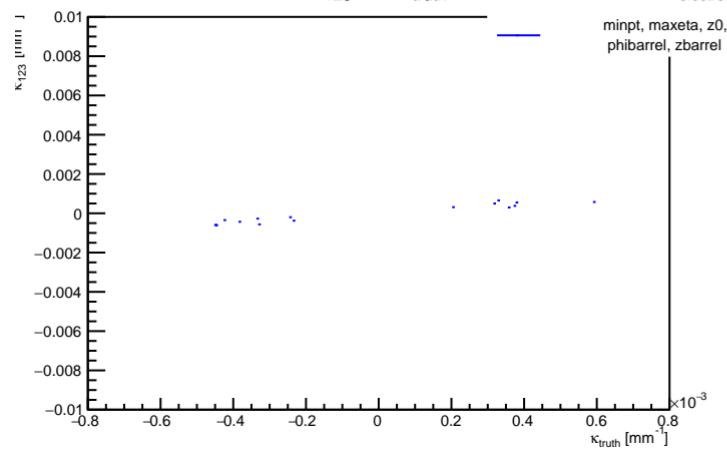
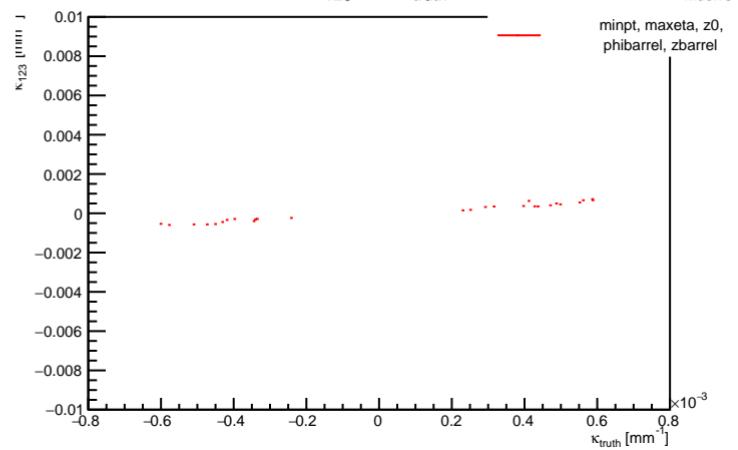
 $\kappa_{013}$  Vs  $\kappa_{\text{truth}}$ 

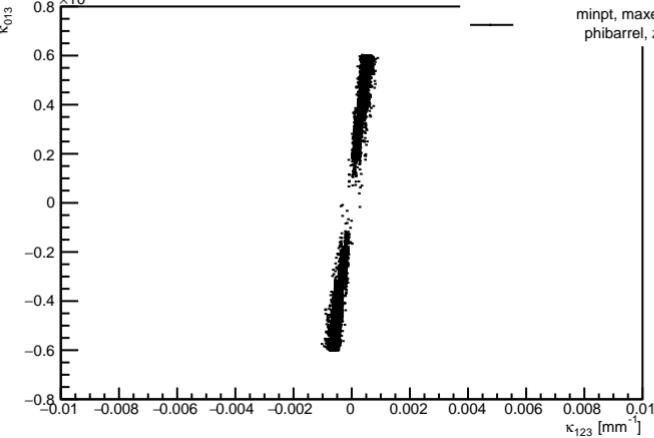
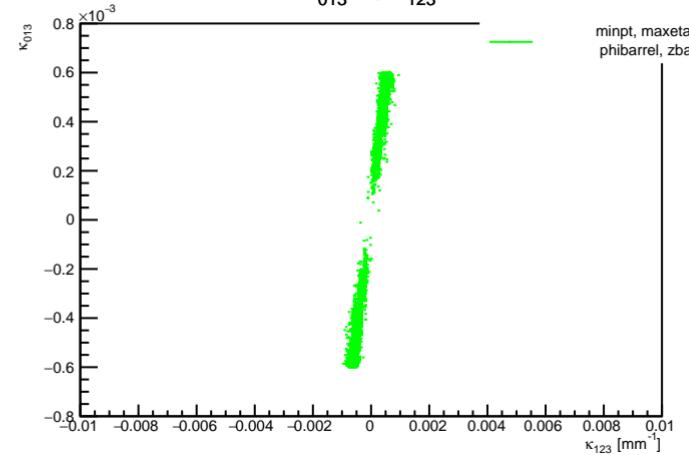
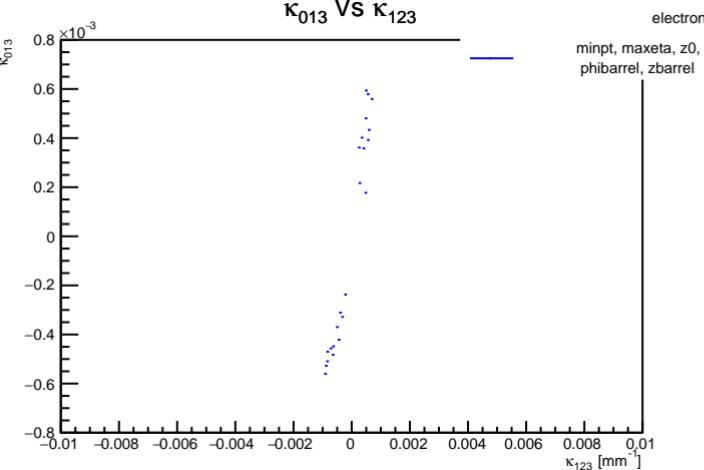
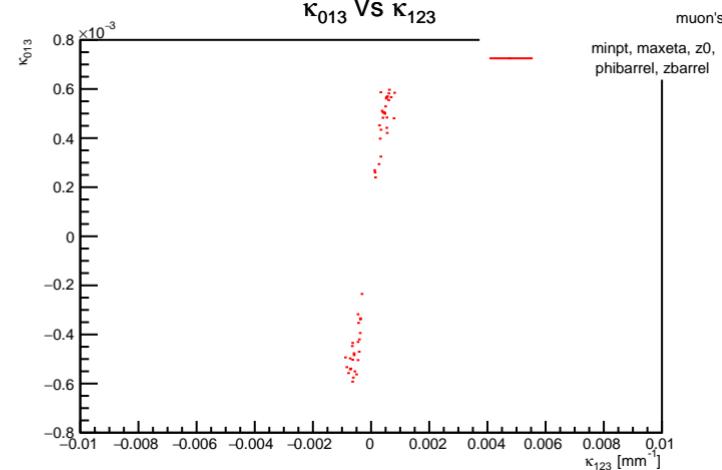
electron

 $\kappa_{013}$  Vs  $\kappa_{\text{truth}}$ 

muon's

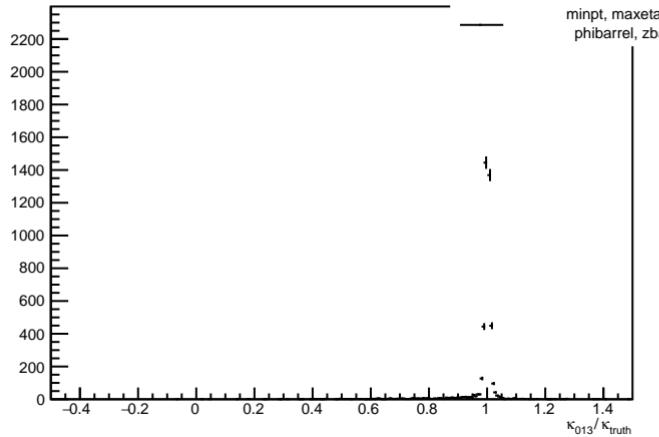


$\kappa_{123}$  Vs  $\kappa_{\text{truth}}$  $\kappa_{123}$  Vs  $\kappa_{\text{truth}}$  $\kappa_{123}$  Vs  $\kappa_{\text{truth}}$  $\kappa_{123}$  Vs  $\kappa_{\text{truth}}$ 

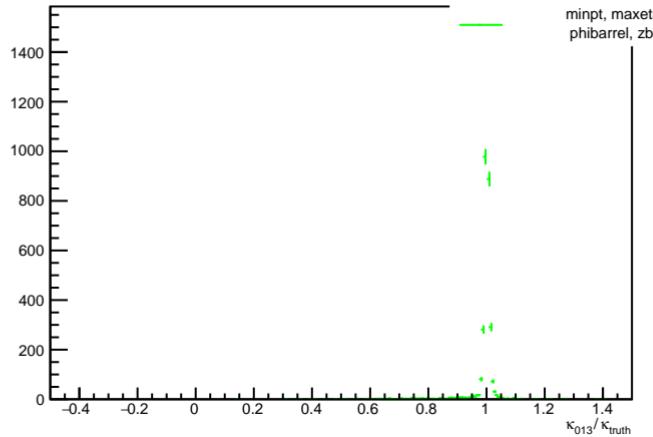
$\kappa_{013}$  Vs  $\kappa_{123}$  $\kappa_{013}$  Vs  $\kappa_{123}$  $\kappa_{013}$  Vs  $\kappa_{123}$  $\kappa_{013}$  Vs  $\kappa_{123}$ 

$\kappa_{013}/\kappa_{\text{truth}}$ 

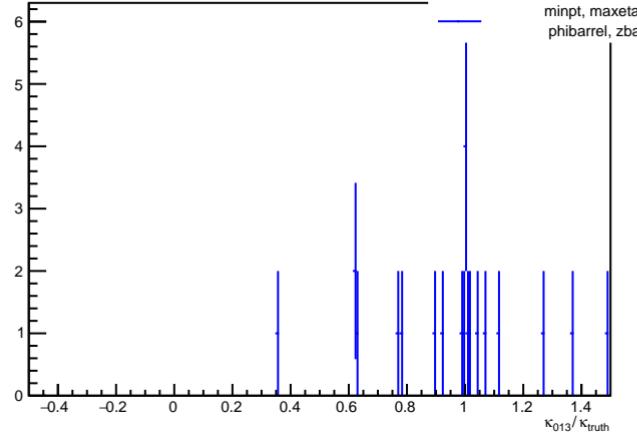
all

 $\kappa_{013}/\kappa_{\text{truth}}$ 

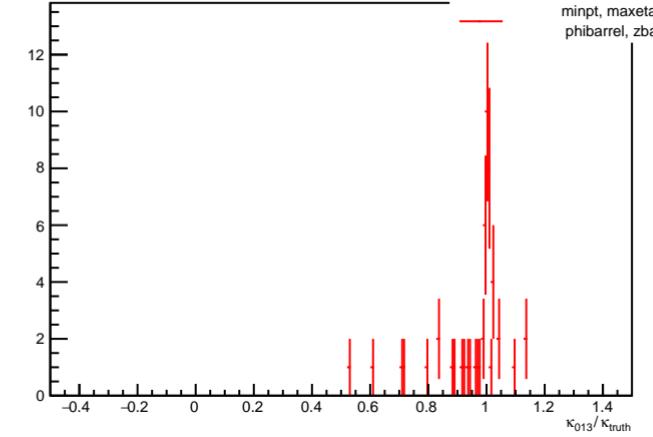
pion

 $\kappa_{013}/\kappa_{\text{truth}}$ 

electron

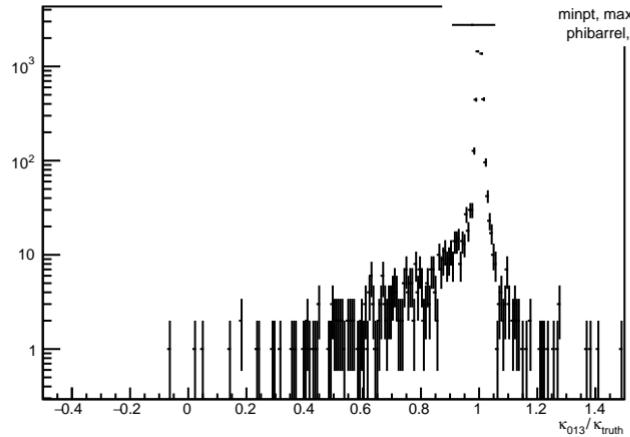
 $\kappa_{013}/\kappa_{\text{truth}}$ 

muon's

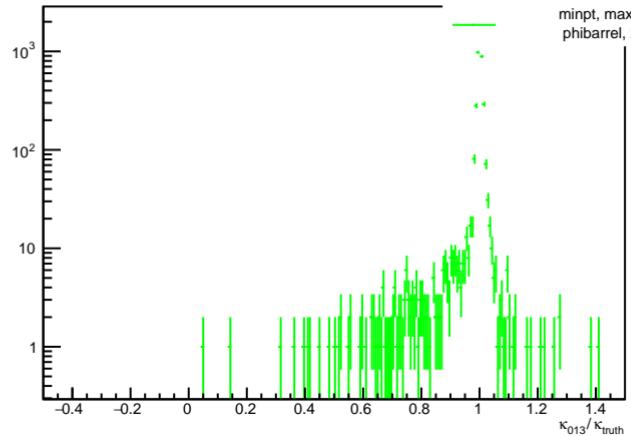


$\kappa_{013}/\kappa_{\text{truth}}$ 

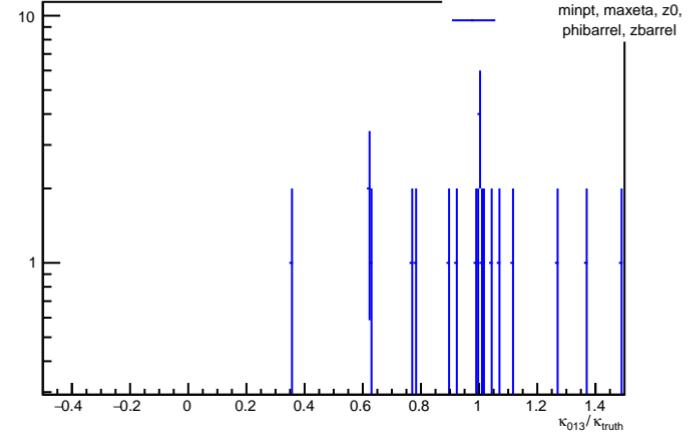
all

 $\kappa_{013}/\kappa_{\text{truth}}$ 

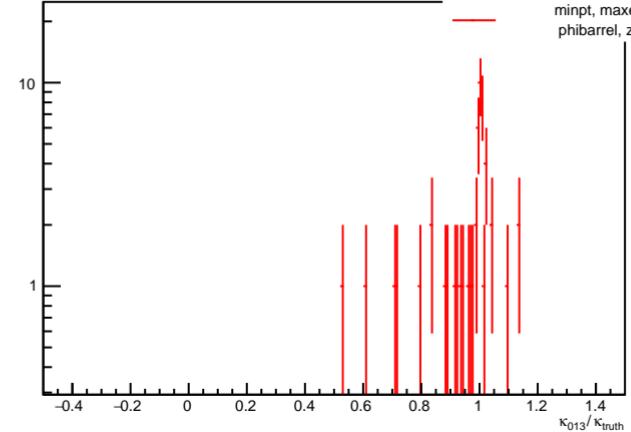
pion

 $\kappa_{013}/\kappa_{\text{truth}}$ 

electron

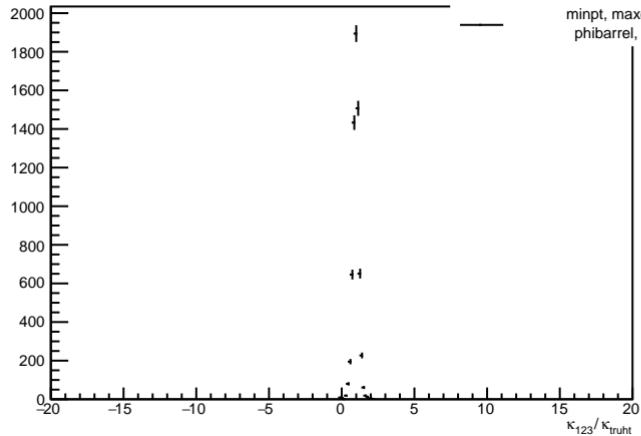
 $\kappa_{013}/\kappa_{\text{truth}}$ 

muon's

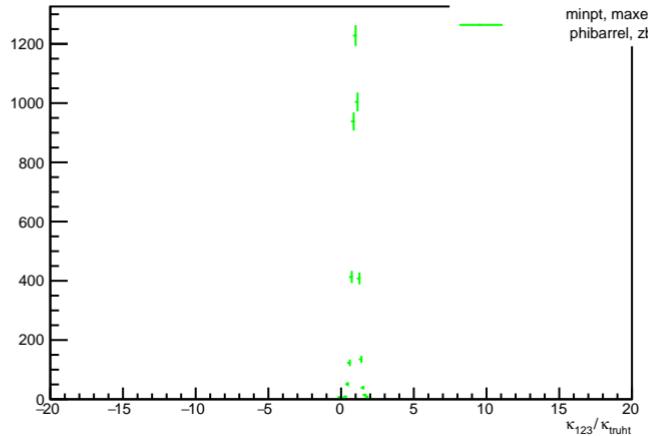


$\kappa_{123}/\kappa_{\text{truth}}$ 

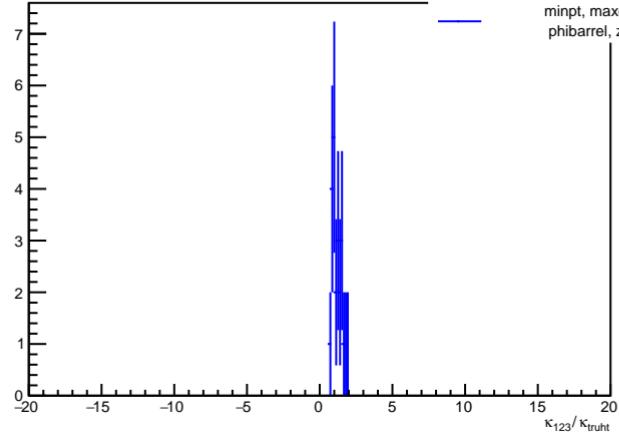
all

 $\kappa_{123}/\kappa_{\text{truth}}$ 

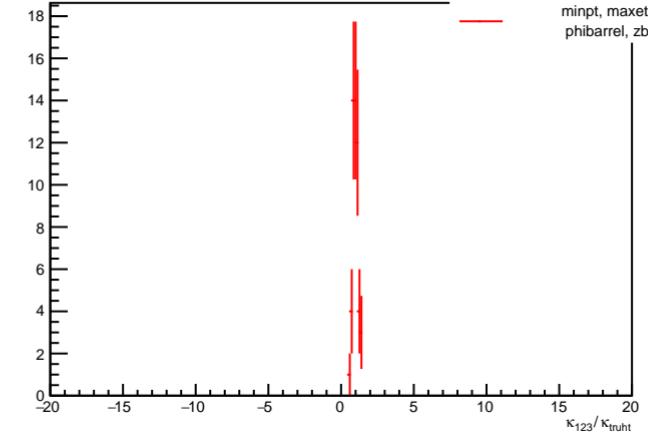
pion

 $\kappa_{123}/\kappa_{\text{truth}}$ 

electron

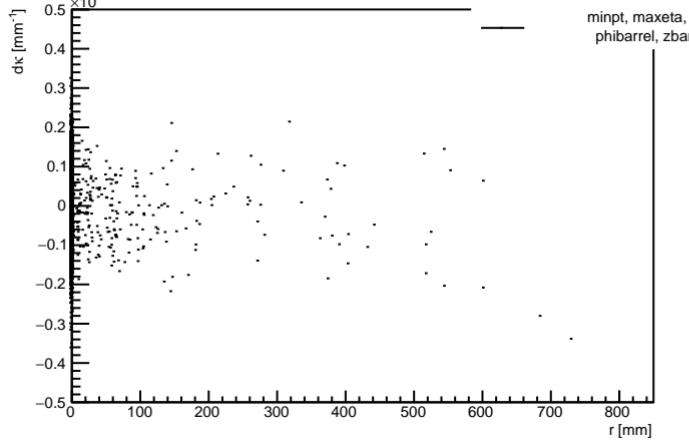
 $\kappa_{123}/\kappa_{\text{truth}}$ 

muon's



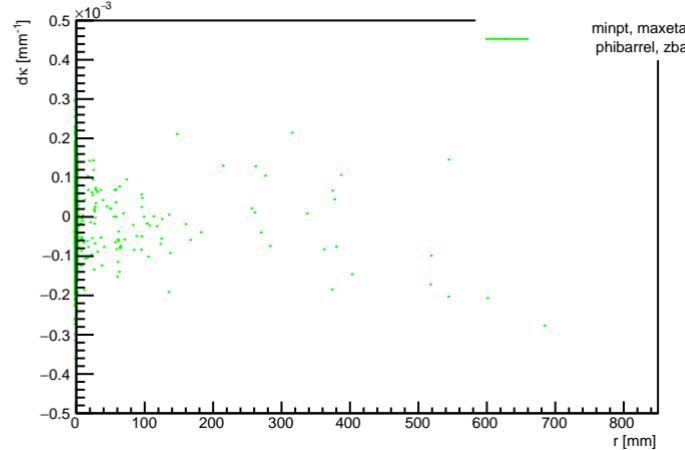
dk Vs r

all



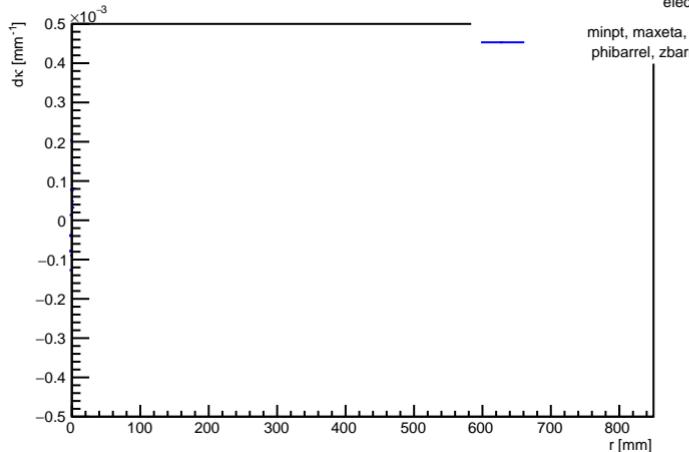
dk Vs r

pion



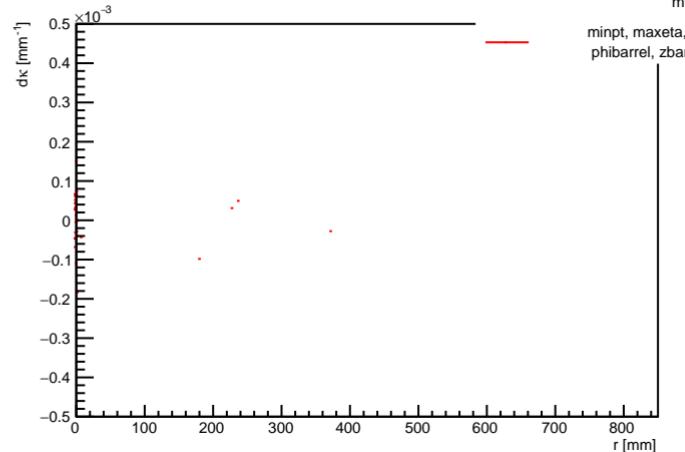
dk Vs r

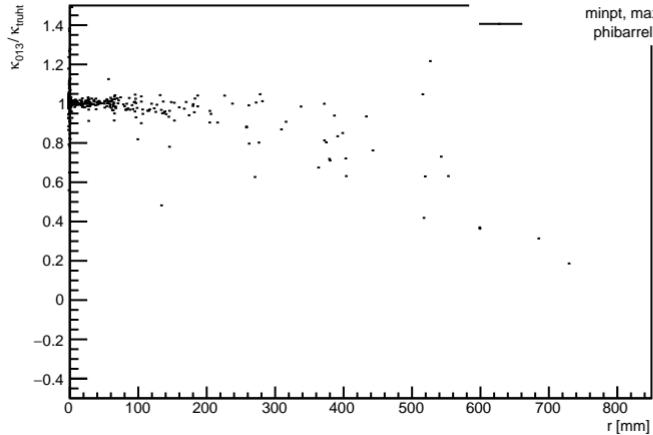
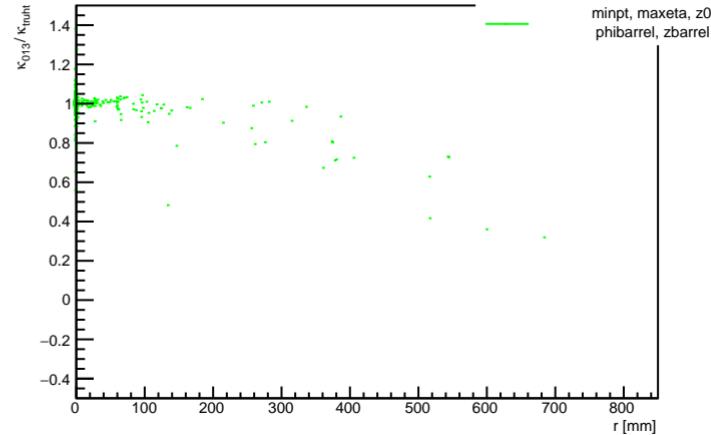
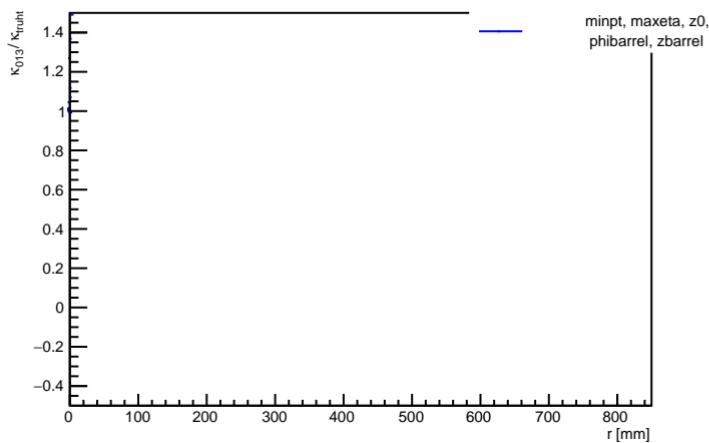
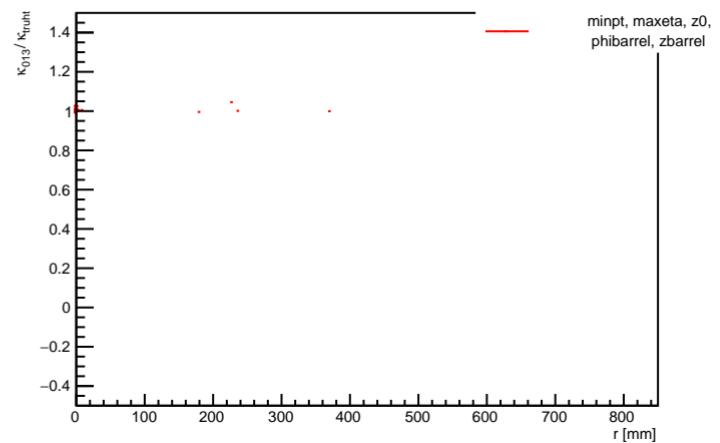
electron



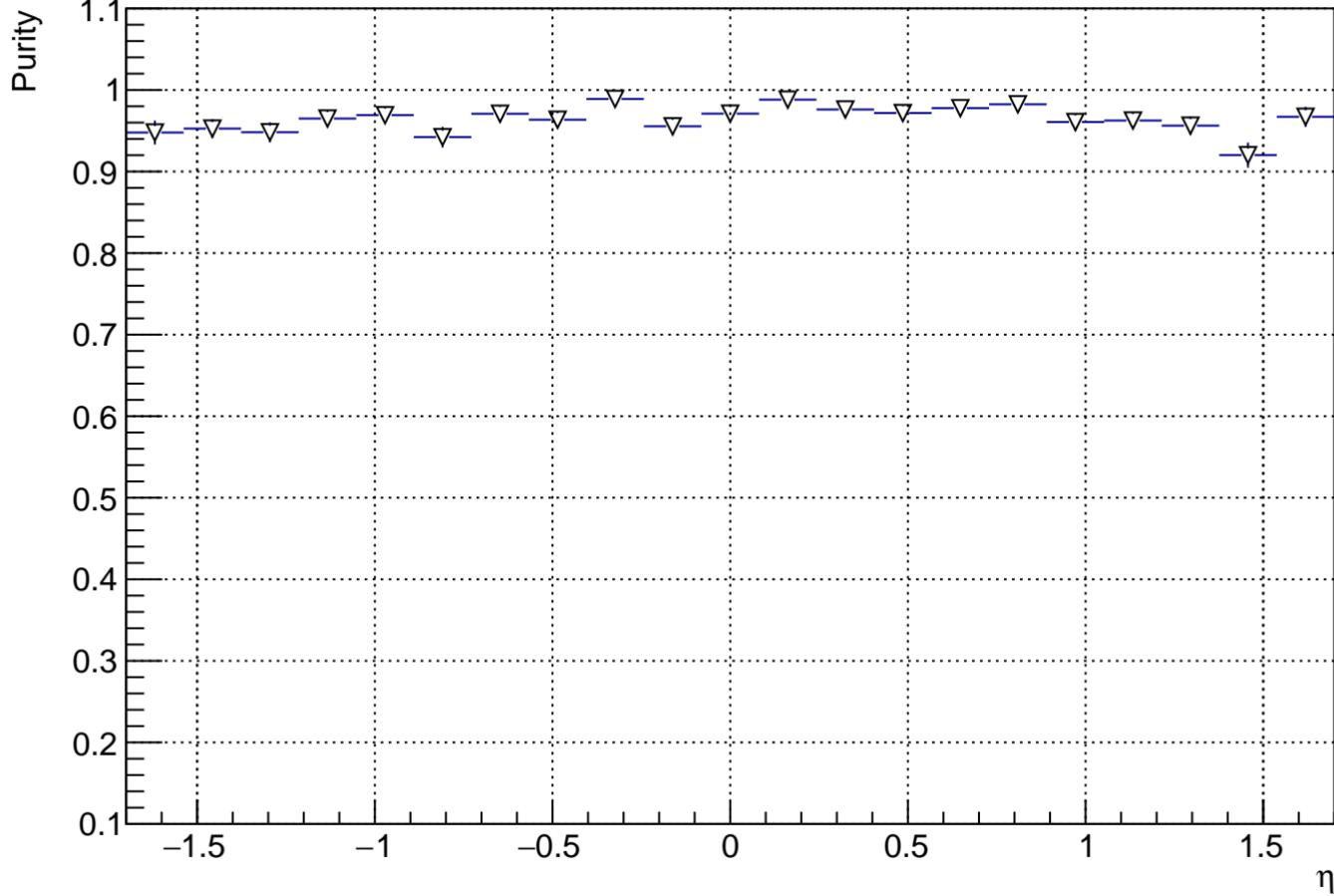
dk Vs r

muon's

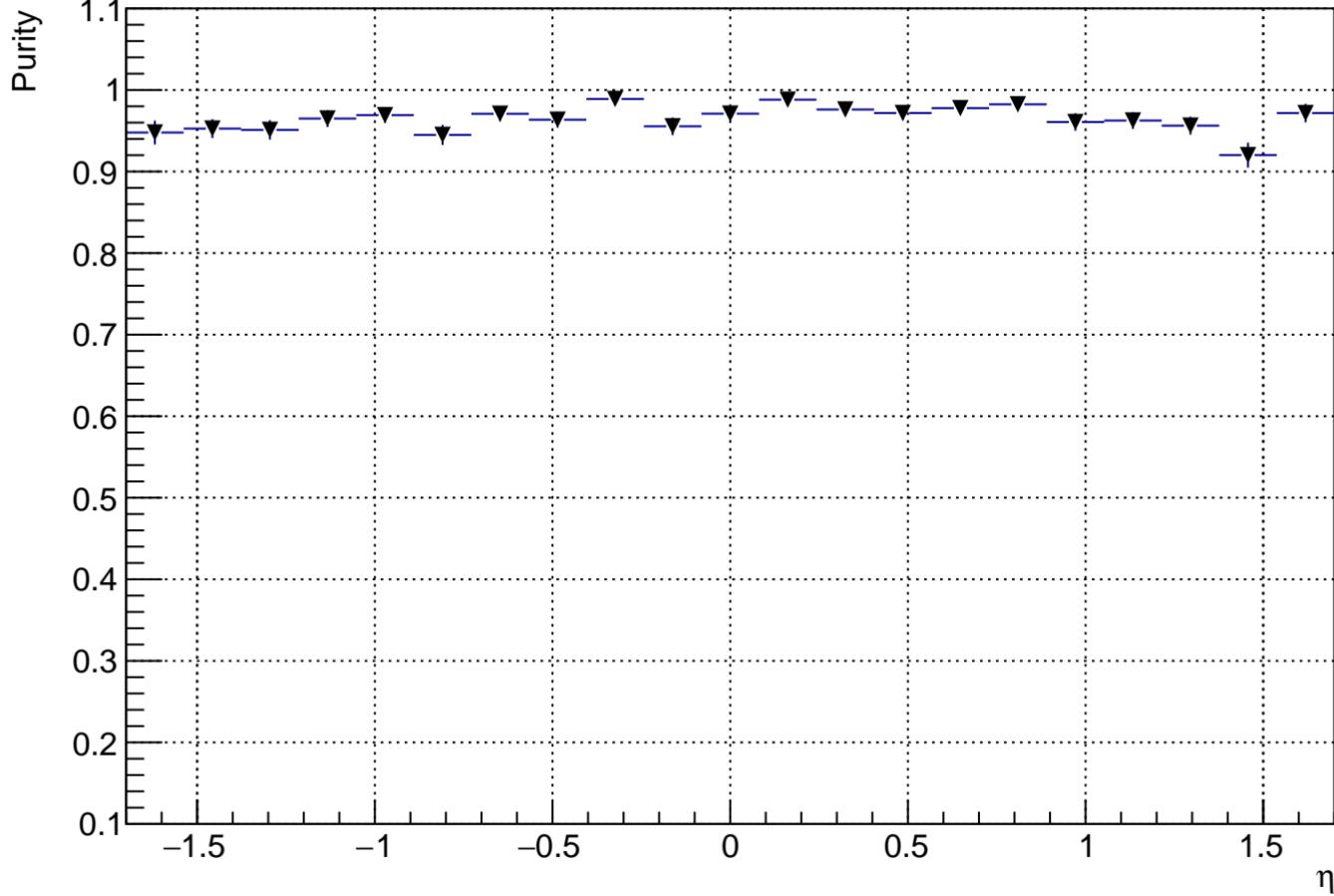


$\kappa_{013}/\kappa_{\text{truth}}$  Vs  $r$  $\kappa_{013}/\kappa_{\text{truth}}$  Vs  $r$  $\kappa_{013}/\kappa_{\text{truth}}$  Vs  $r$  $\kappa_{013}/\kappa_{\text{truth}}$  Vs  $r$ 

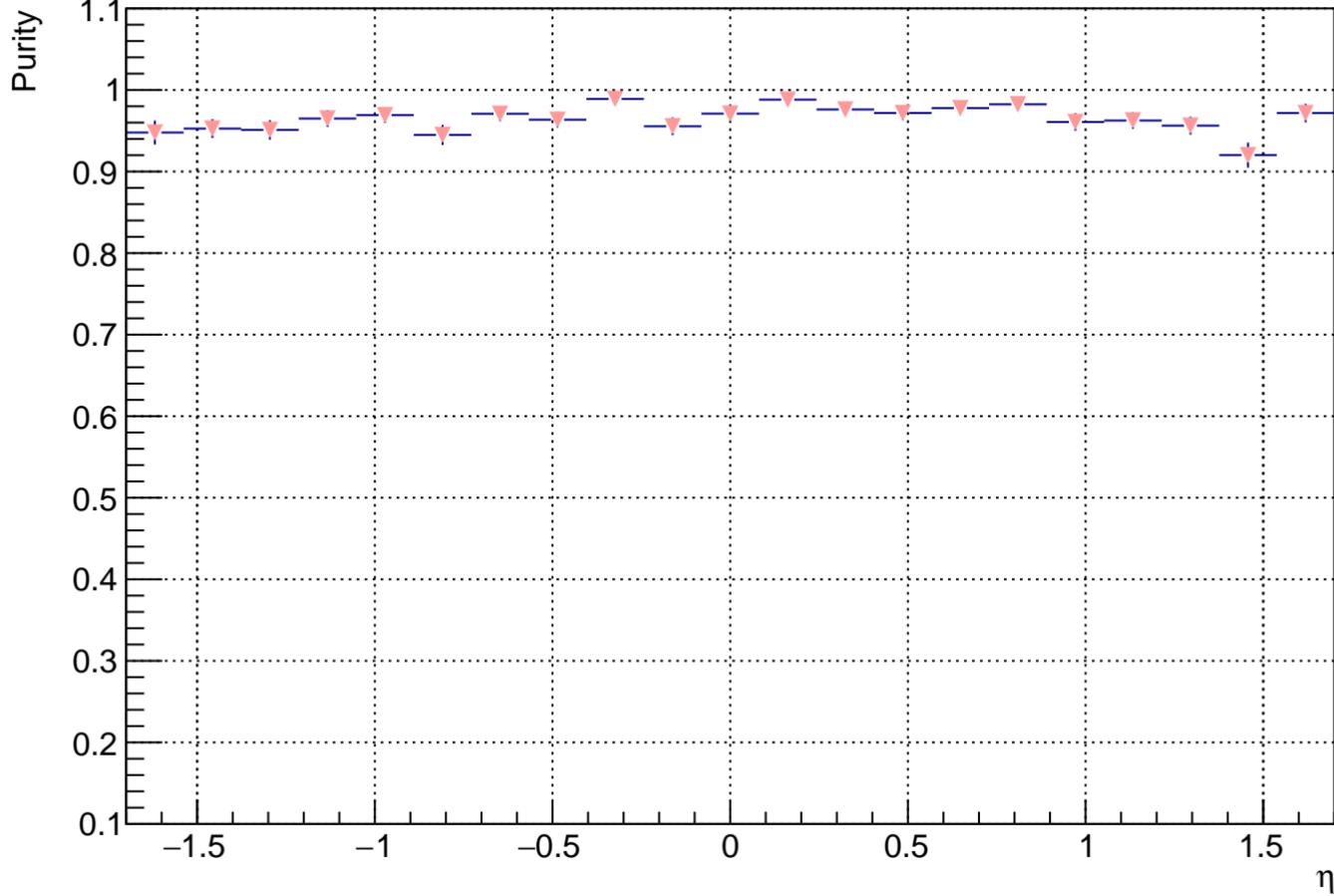
# Purity vs $\eta$



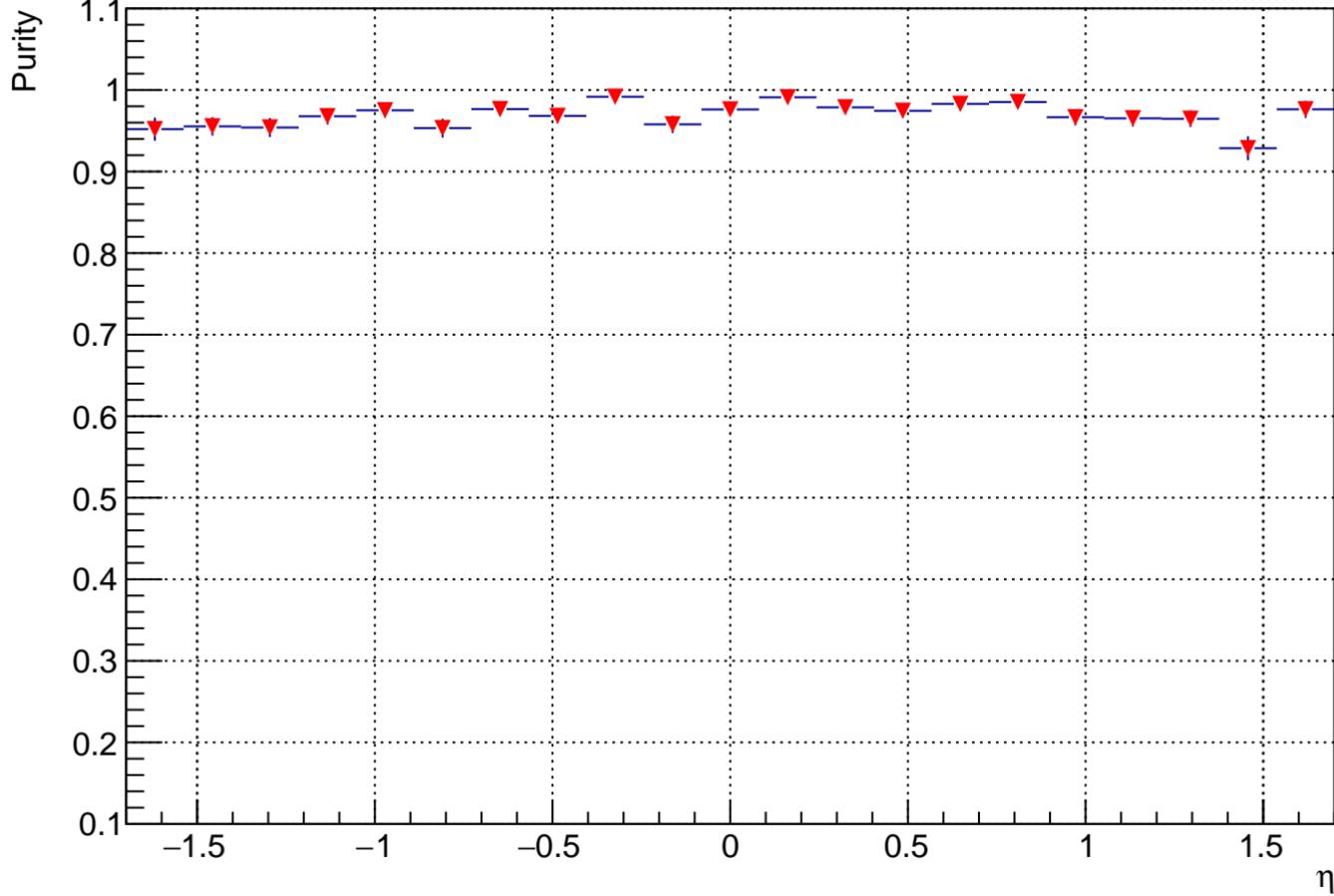
# Purity vs $\eta$



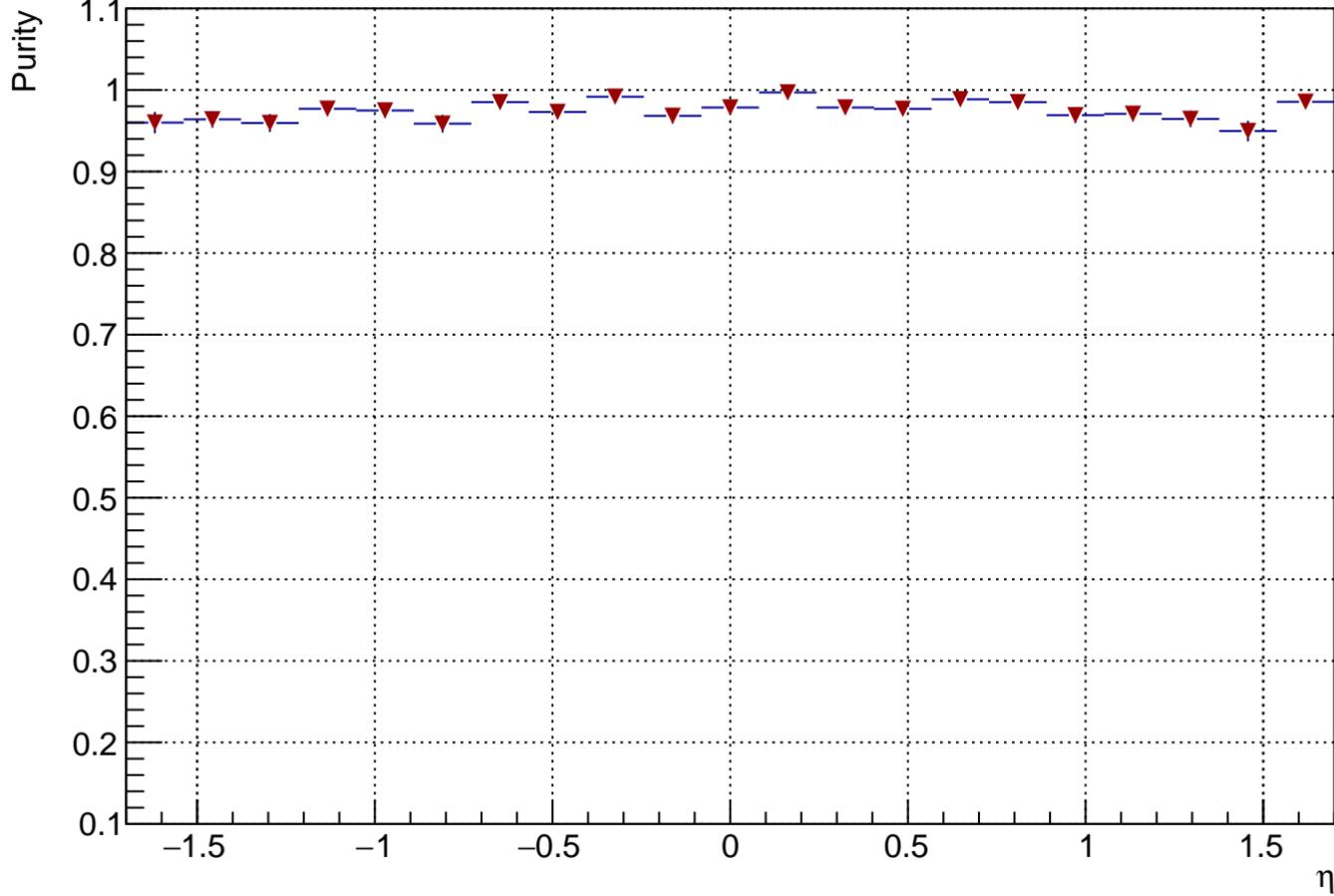
# Purity vs $\eta$



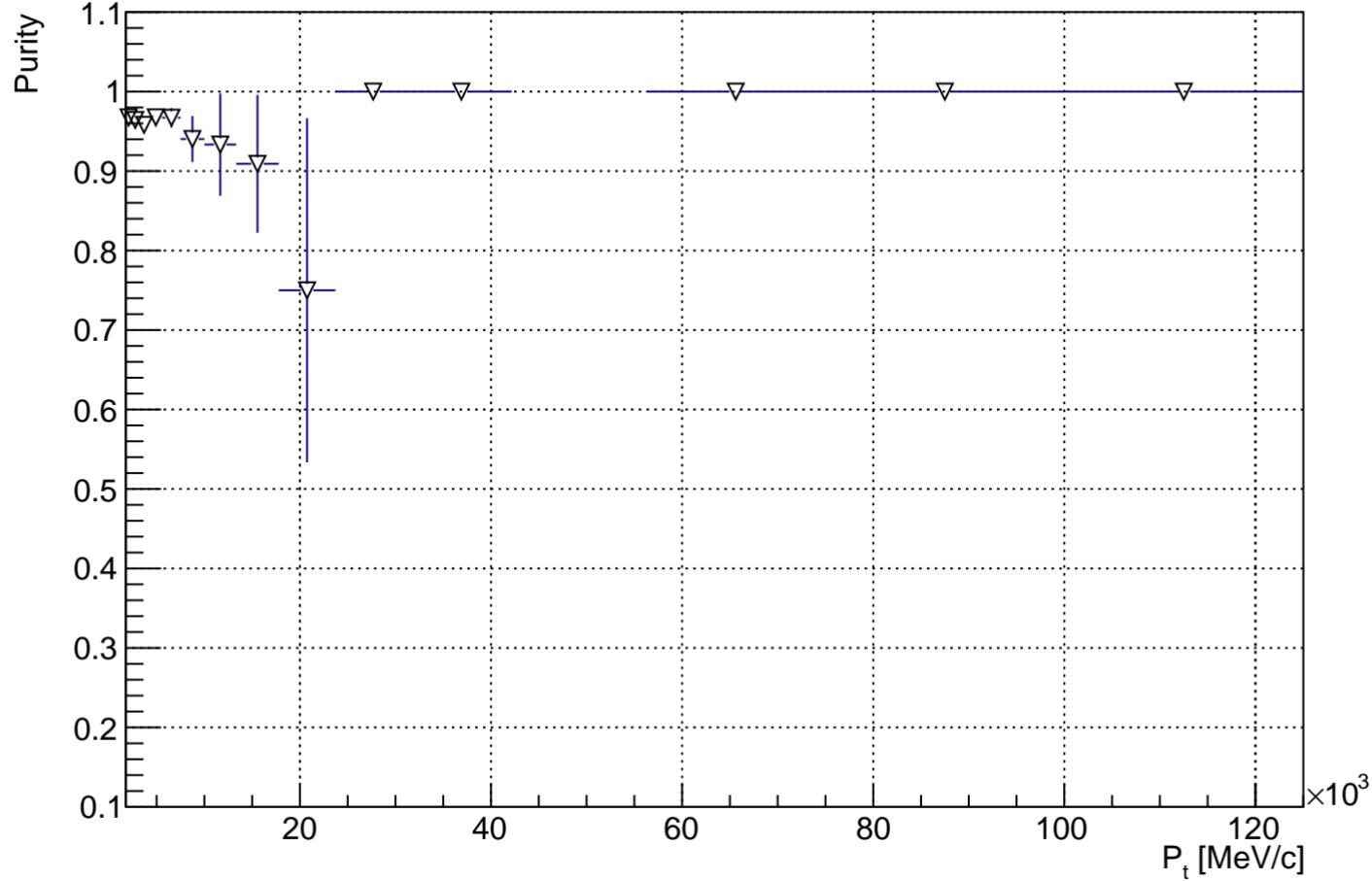
# Purity vs $\eta$



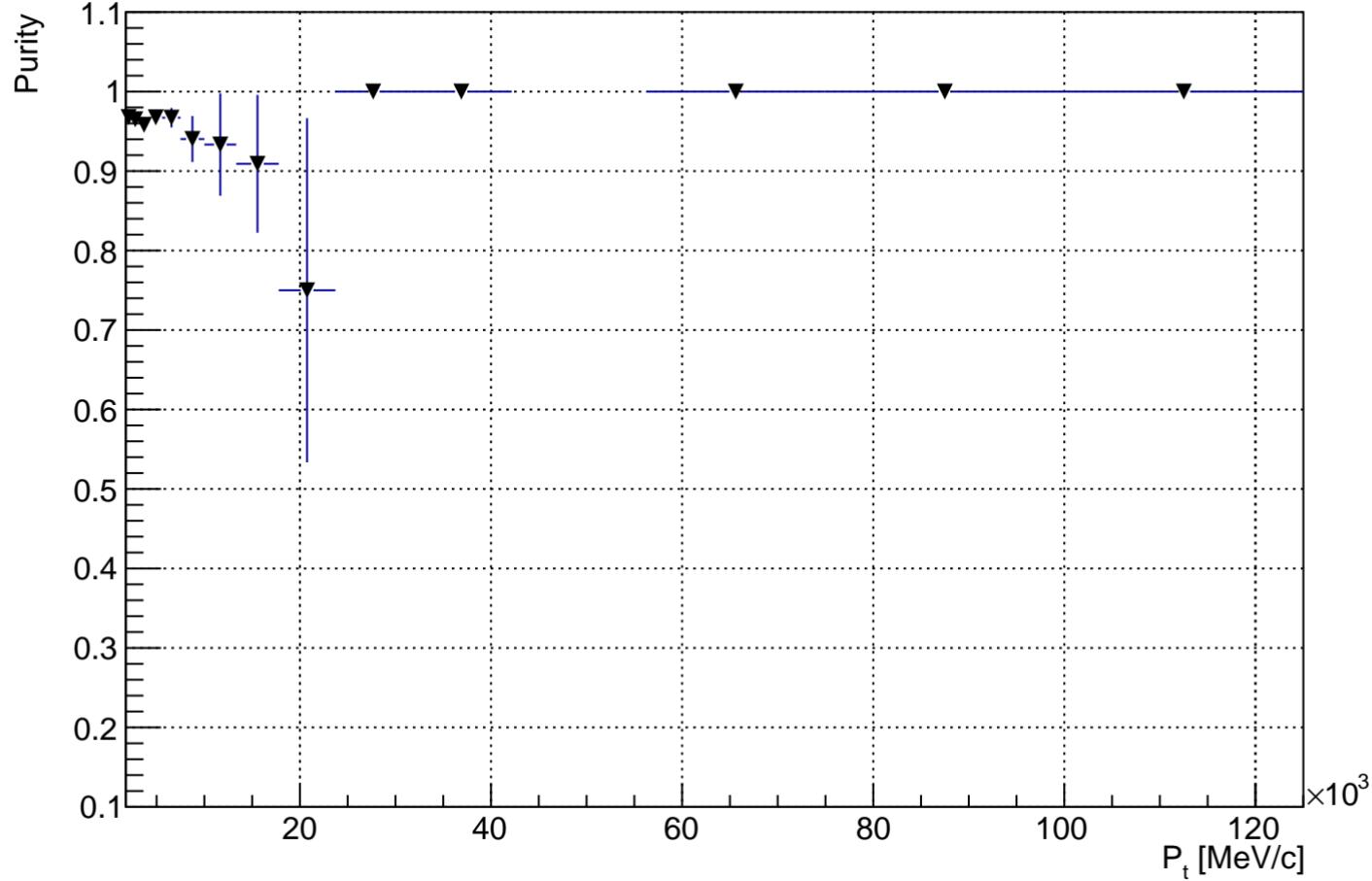
# Purity vs $\eta$



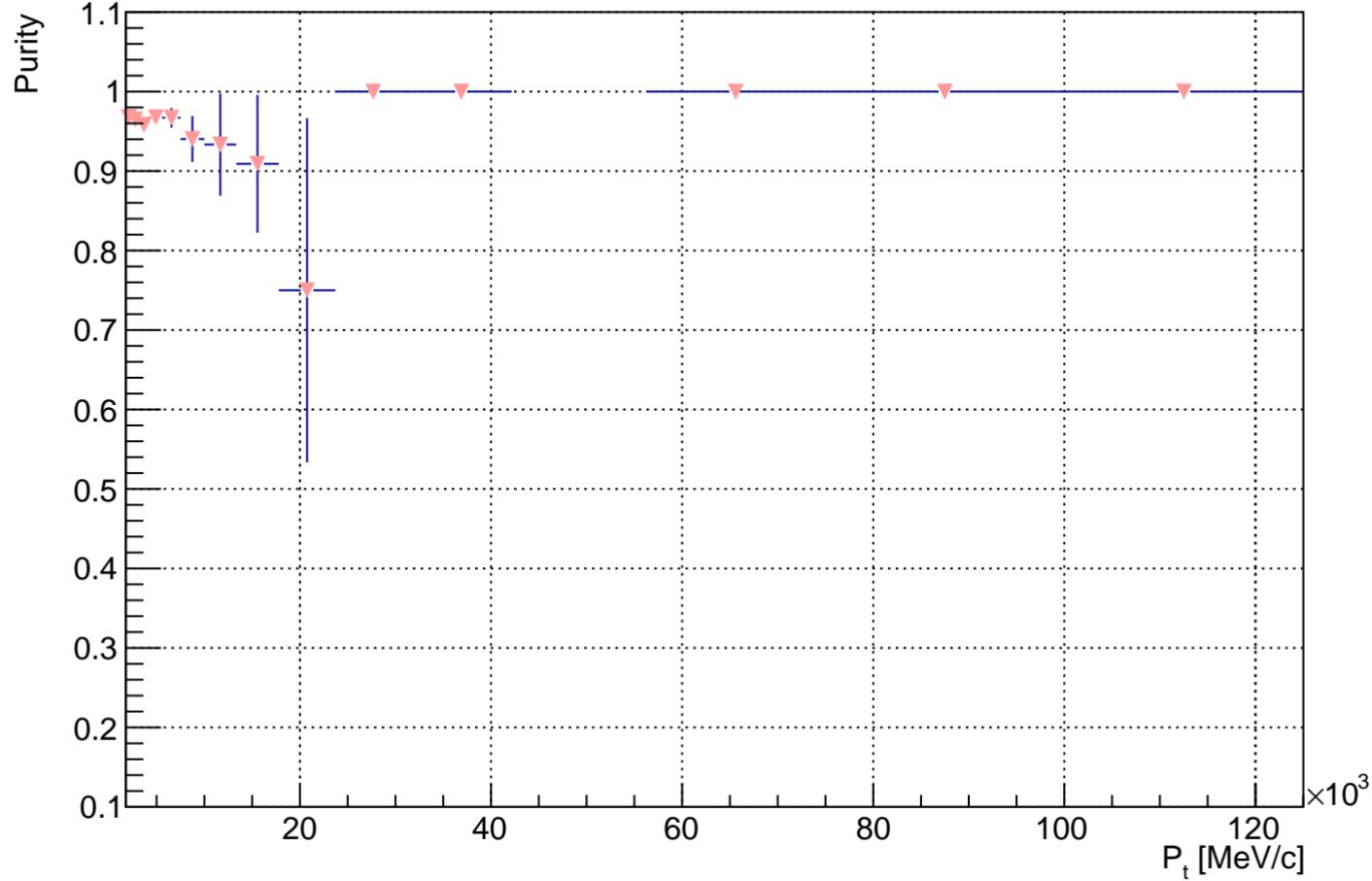
# Purity vs $P_t$



# Purity vs $P_t$

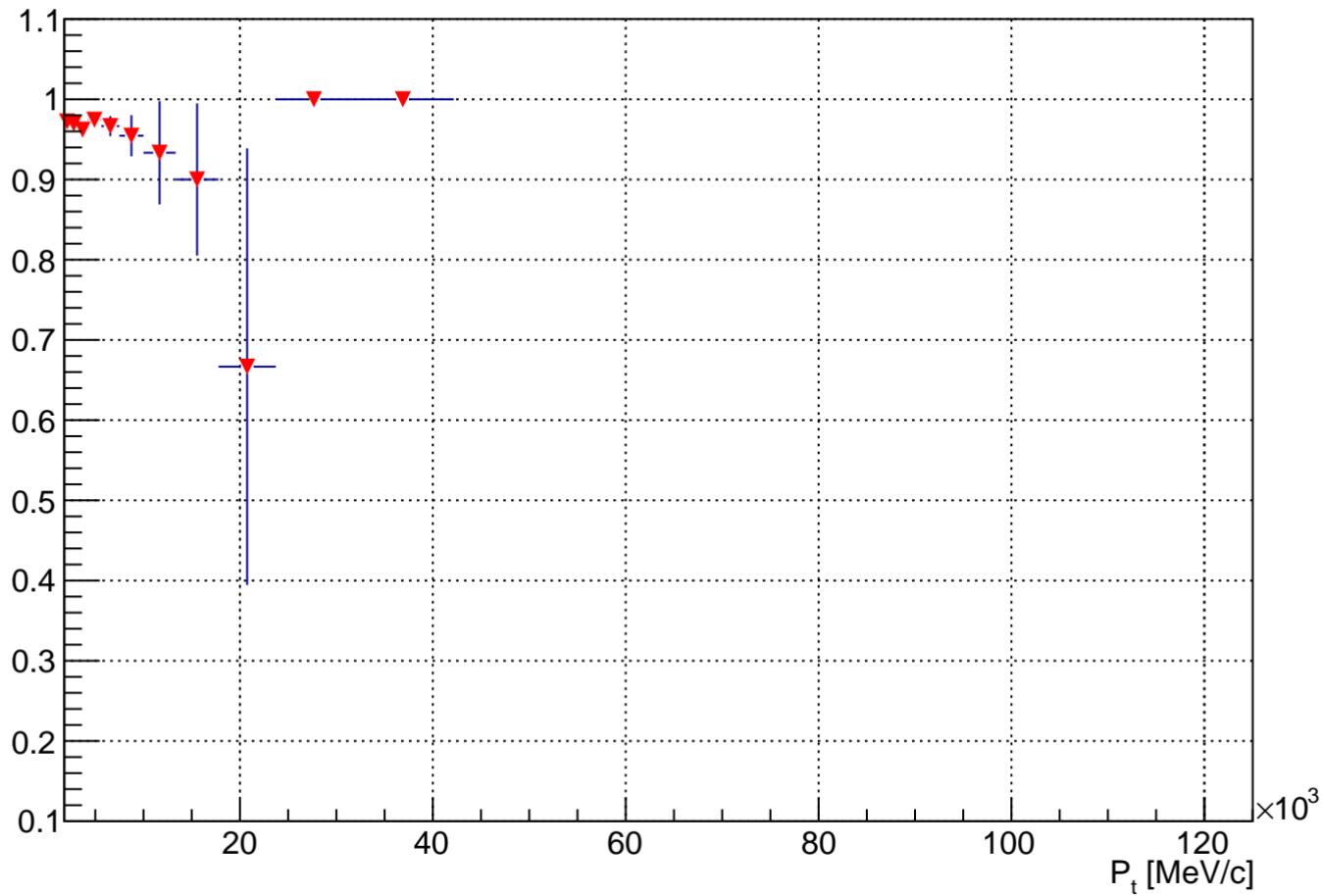


# Purity vs $P_t$



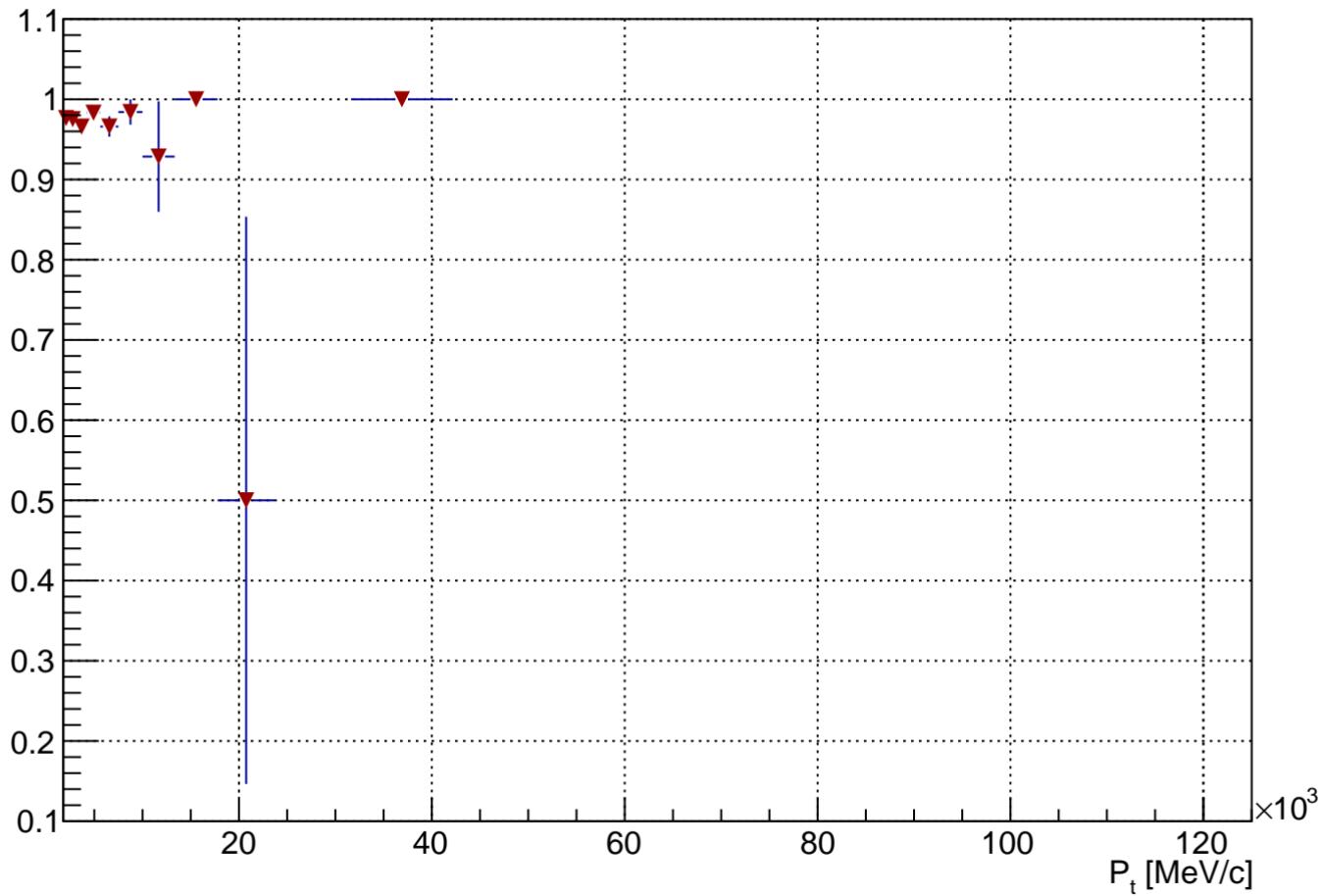
# Purity vs $P_t$

Purity



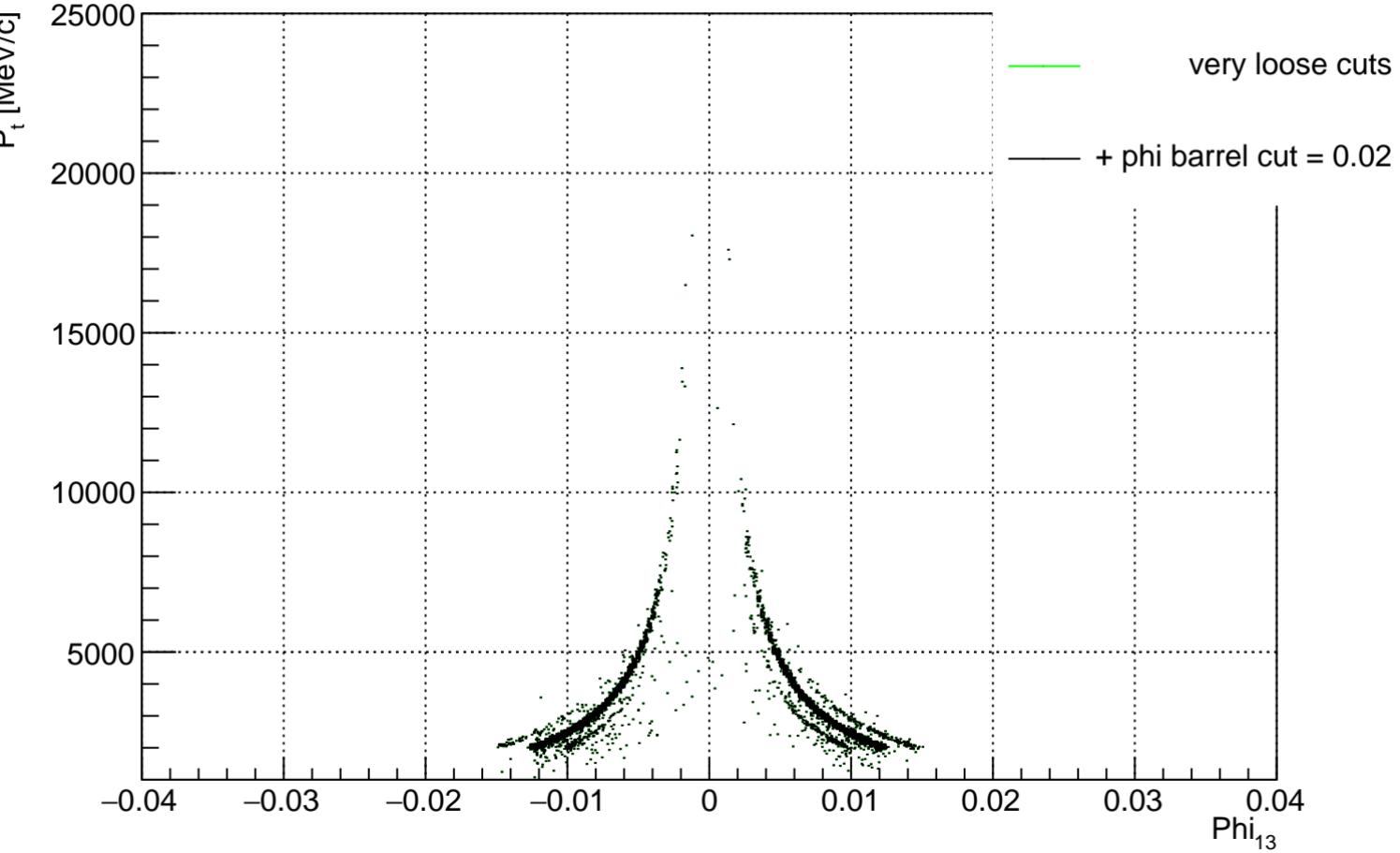
# Purity vs $P_t$

Purity

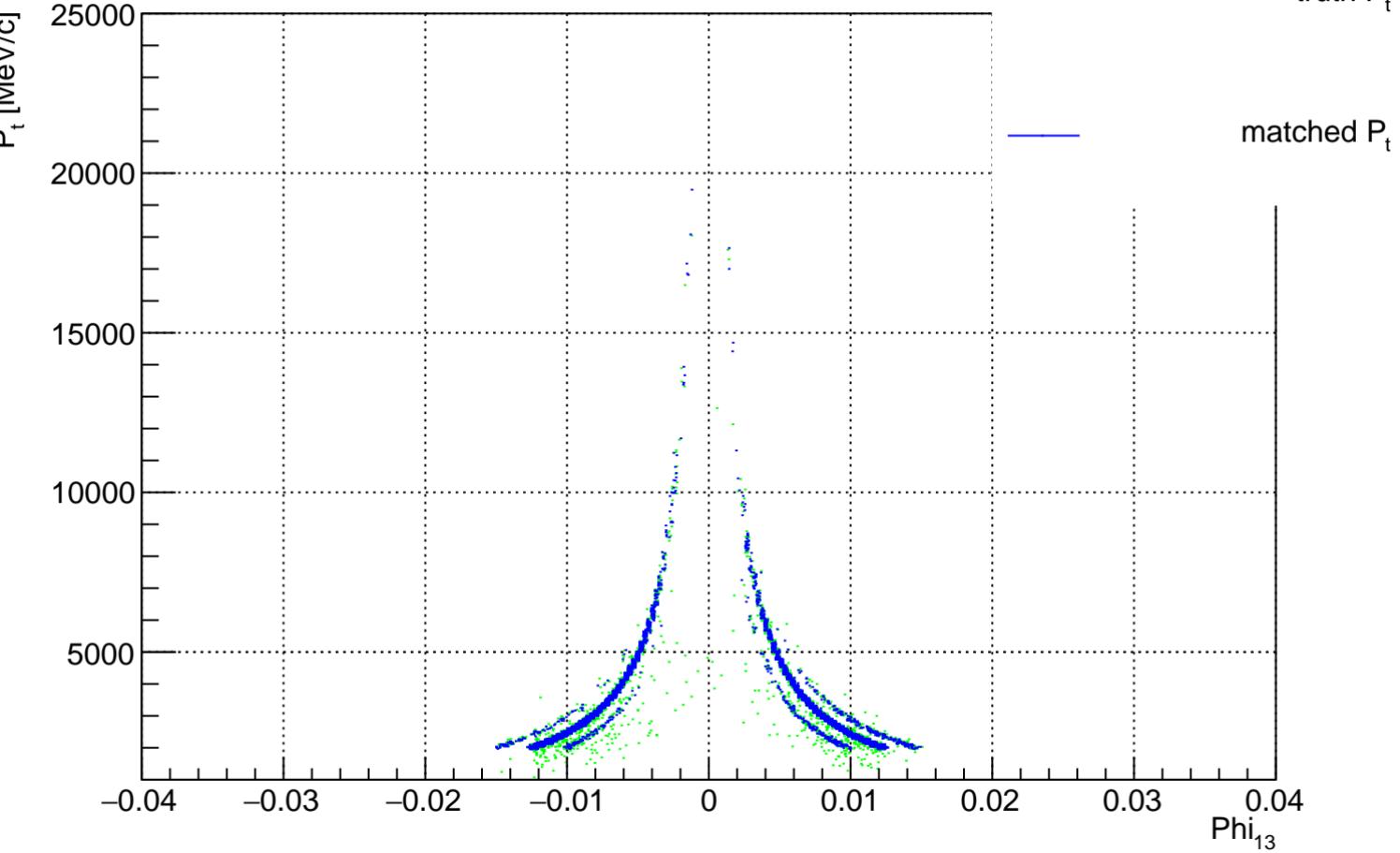


# $P_t$ Vs $\Phi_{13}$

truth  $P_t$

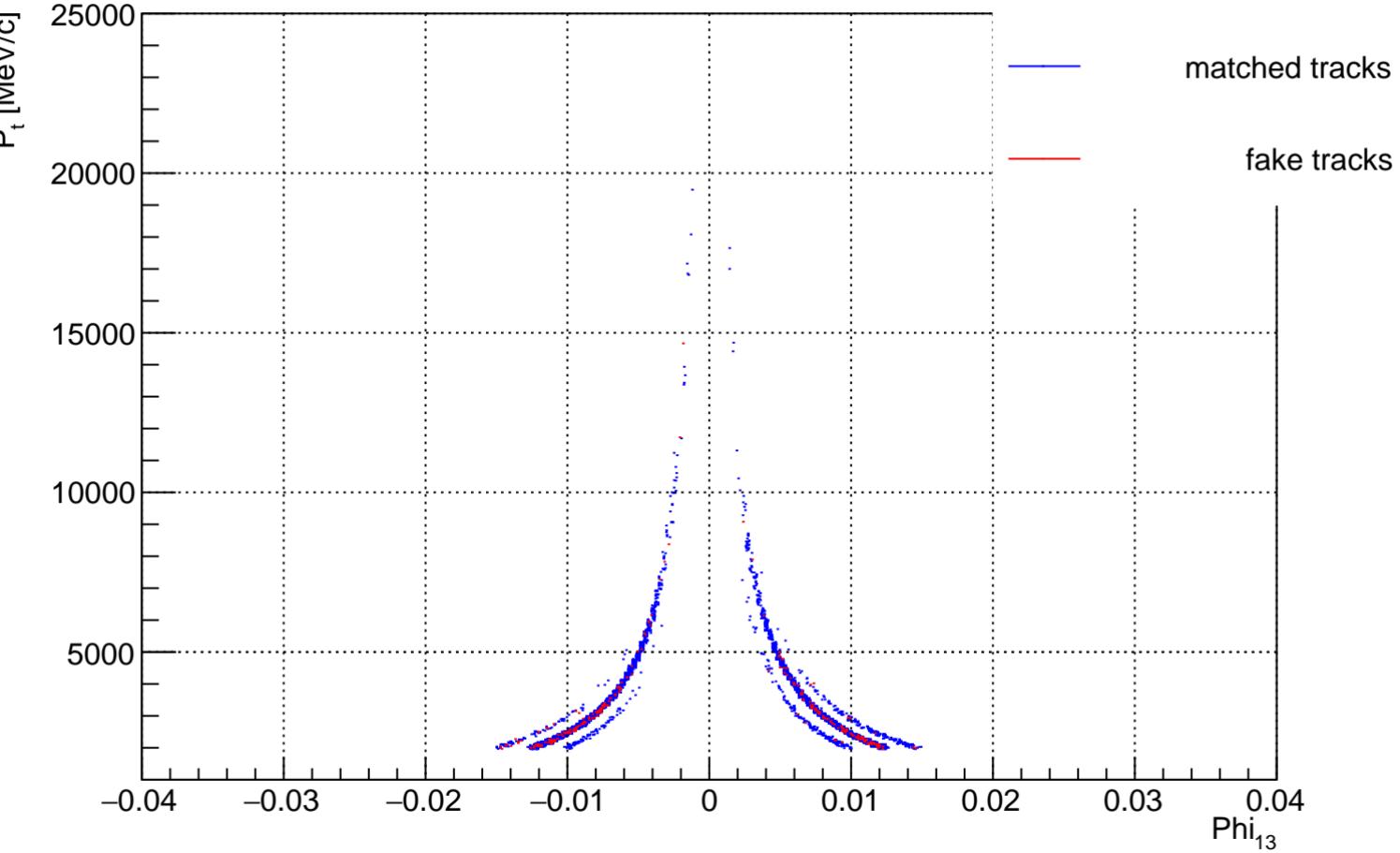


# $P_t$ Vs $\Phi_{13}$

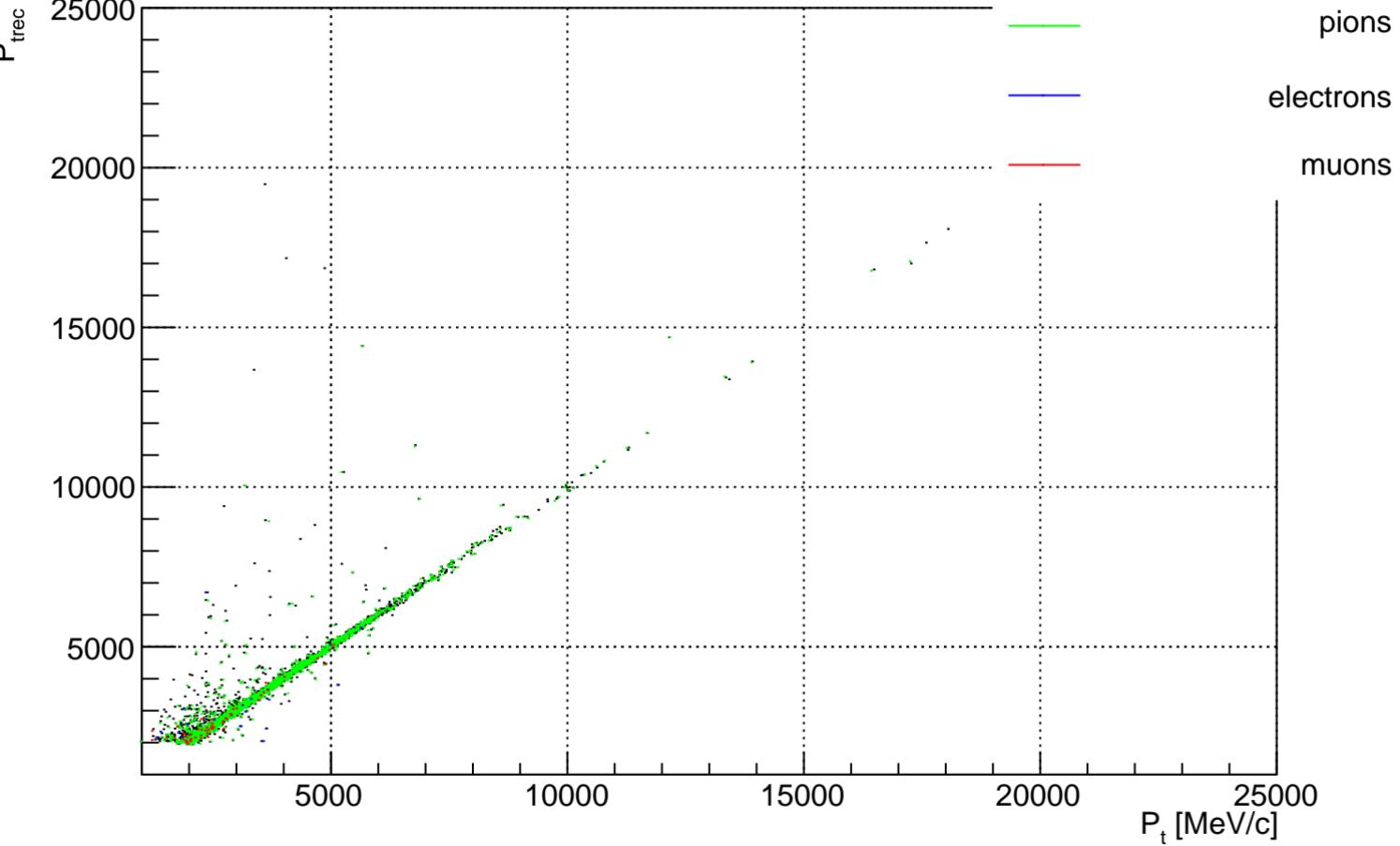


# $P_t$ Vs $\Phi_{13}$

rec  $P_t$

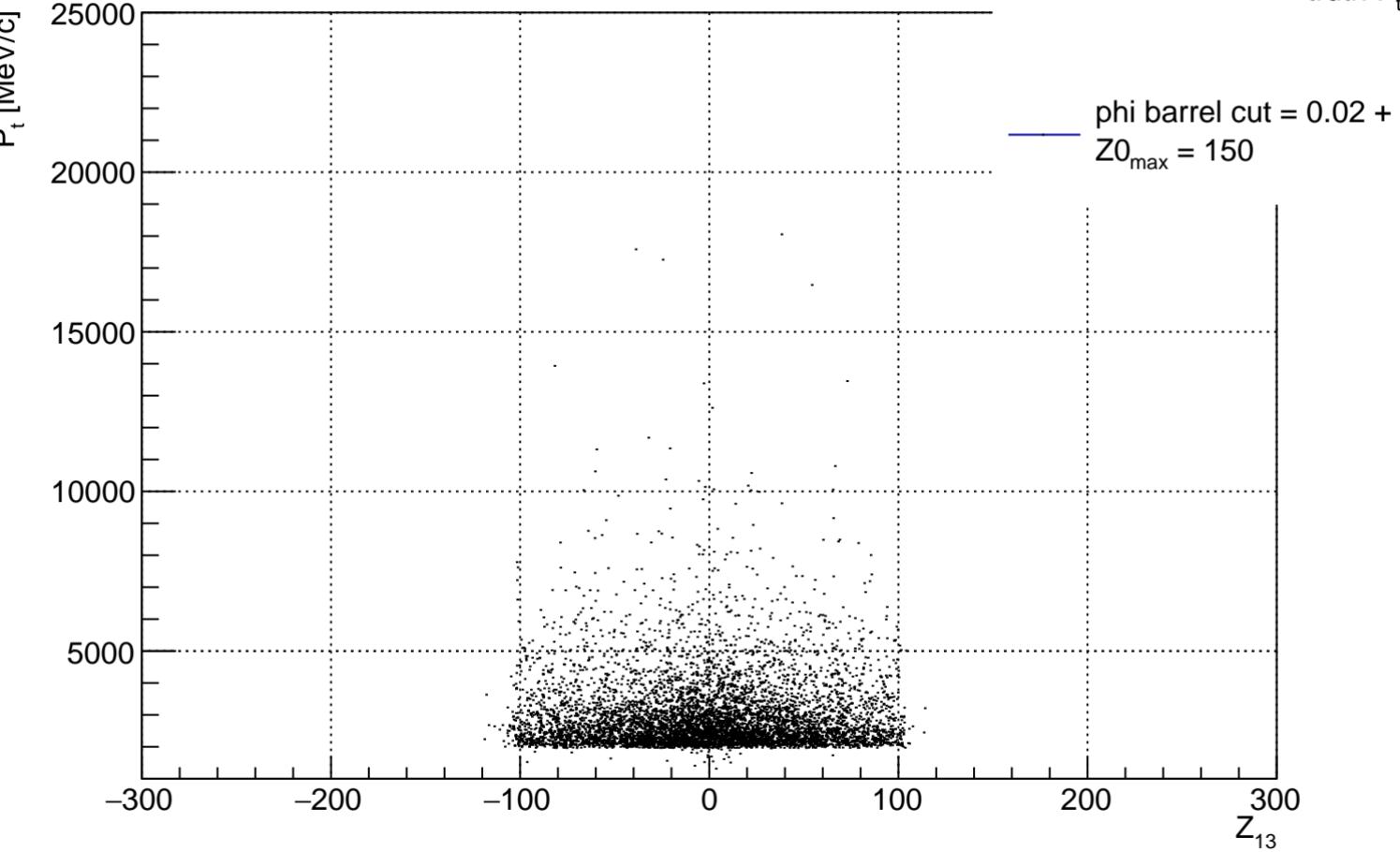


# $P_{\text{trec}}$ Vs $P_t$



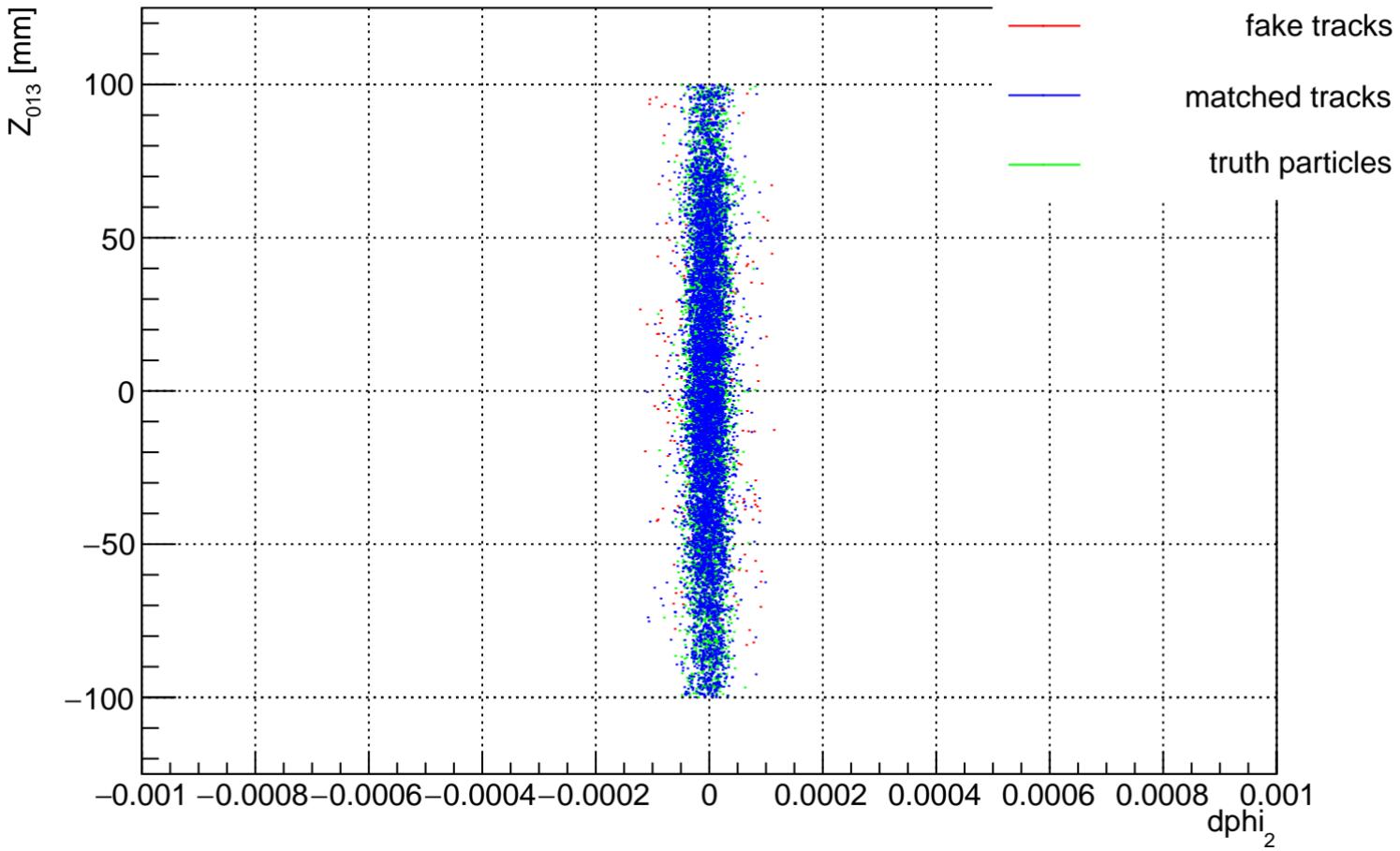
# $P_t$ Vs $Z_{13}$

truth  $P_t$



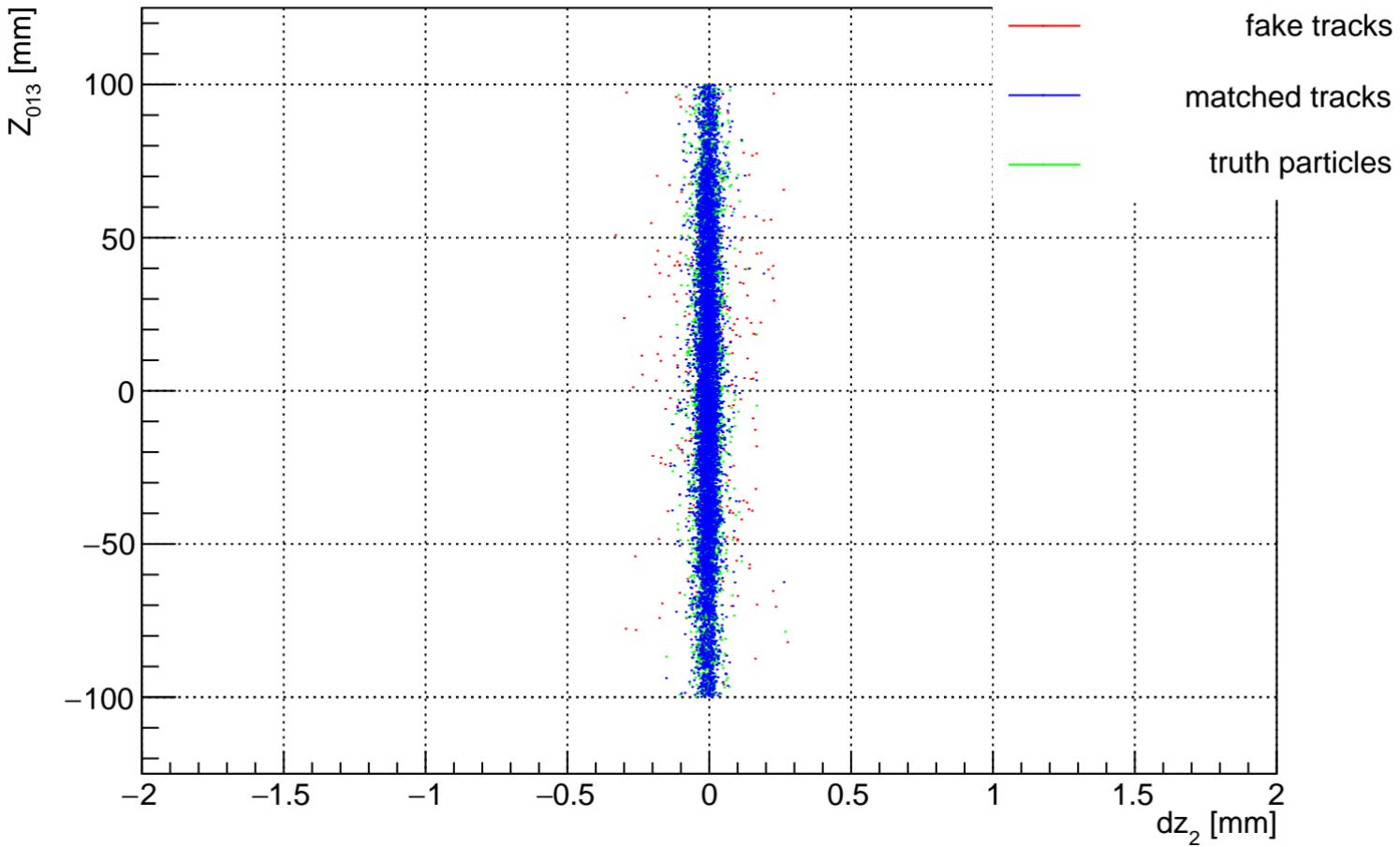
# $Z_{013}$ Vs $d\phi_i$

$\phi$  Barrel = 0.02 +  
 $Z_{\text{barrel}} = 160 + Z_{0\text{max}} = 150$



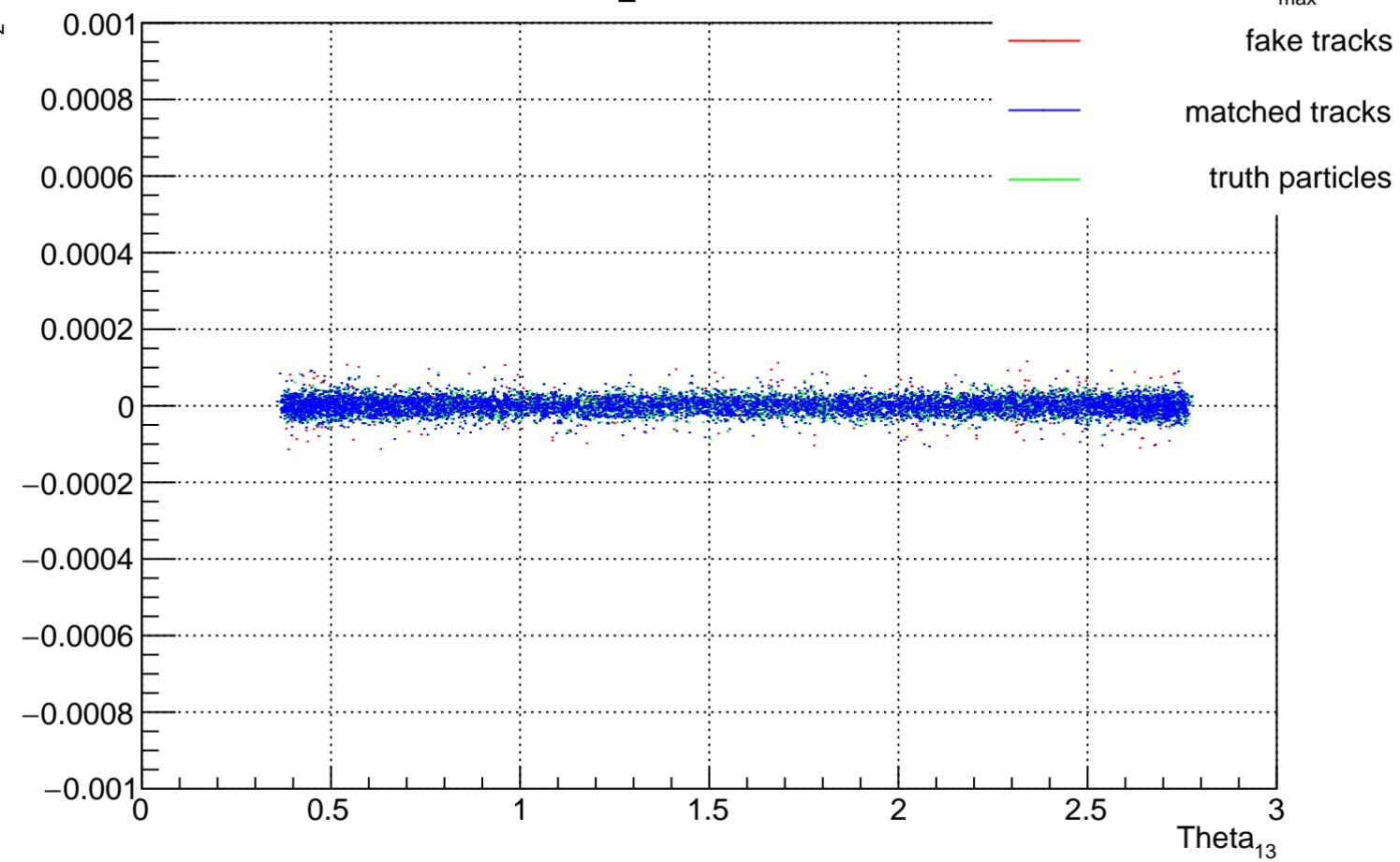
# $Z_{013}$ Vs $dz_2$

$\phi$  Barrel = 0.02 +  
 $Z_{\text{barrel}} = 160 + Z_{0_{\max}} = 150$



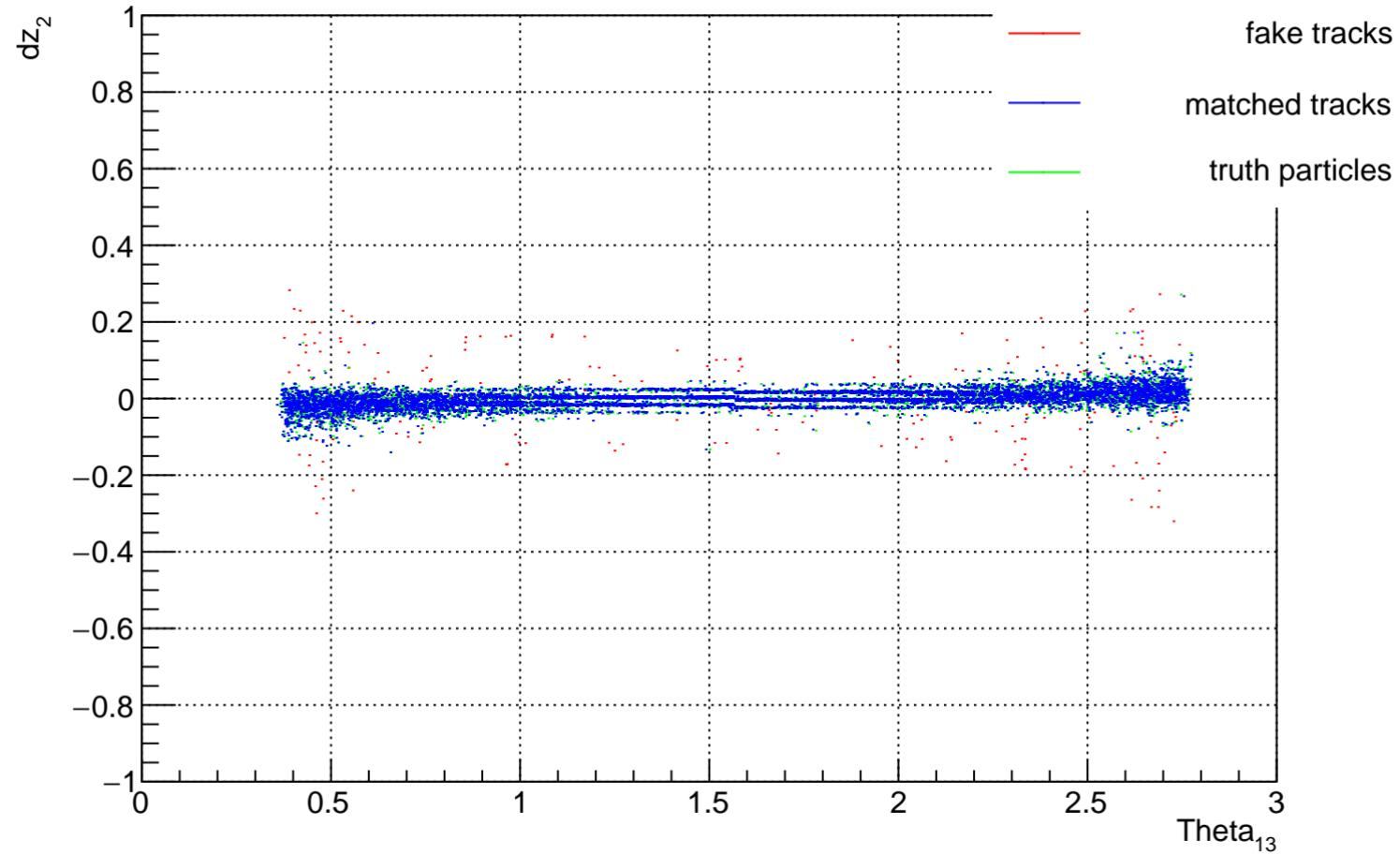
# $d\phi_{2}$ Vs $\Theta_{13}$

$\phi$  Barrel = 0.02 +  
 $Z_{\text{barrel}} = 160 + Z_{0_{\text{max}}} = 150$



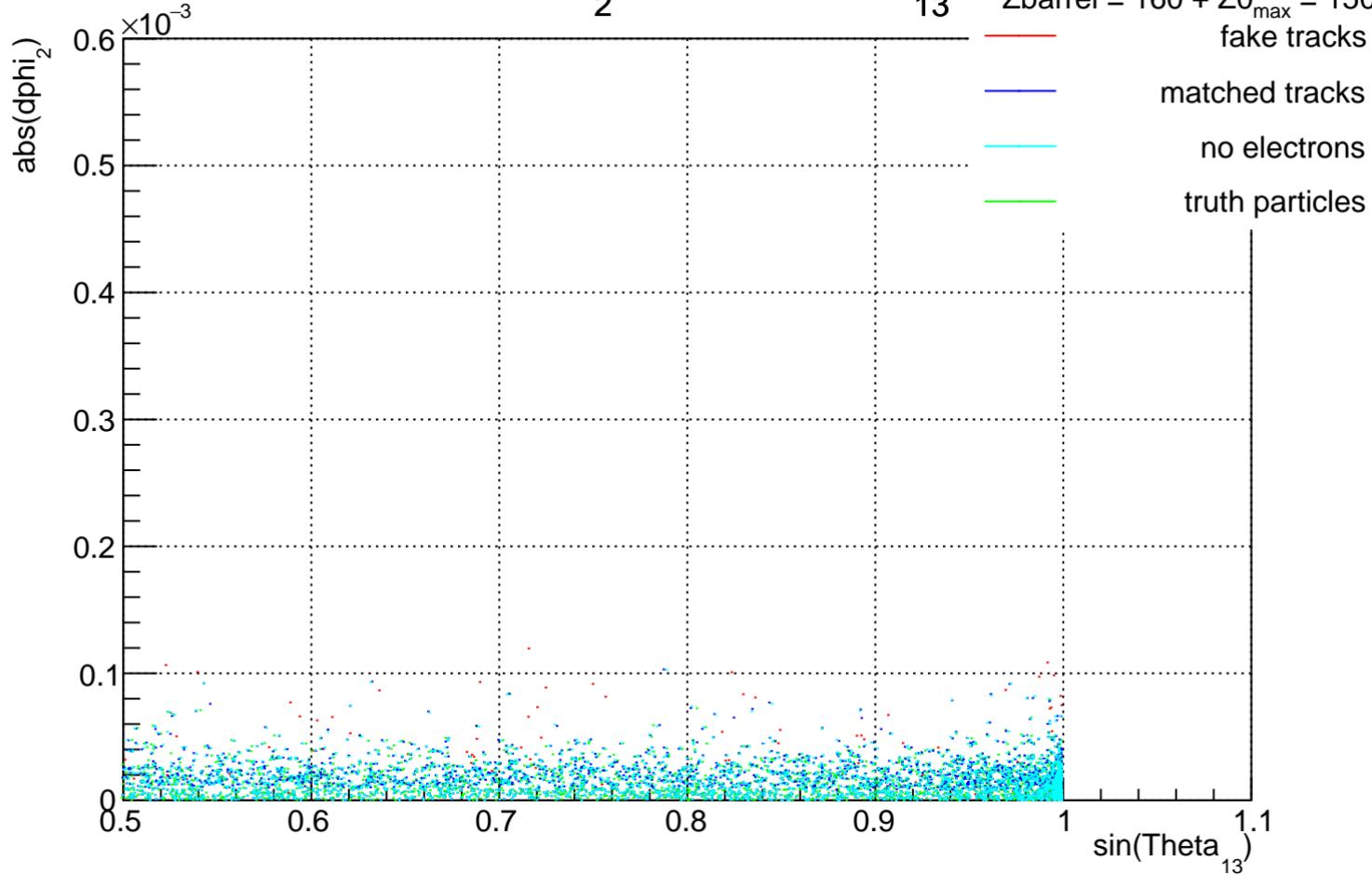
# $dz_2$ Vs $\Theta_{13}$

$\phi$  Barrel = 0.02 +  
 $Z_{\text{barrel}} = 160 + Z_{0_{\text{max}}} = 150$

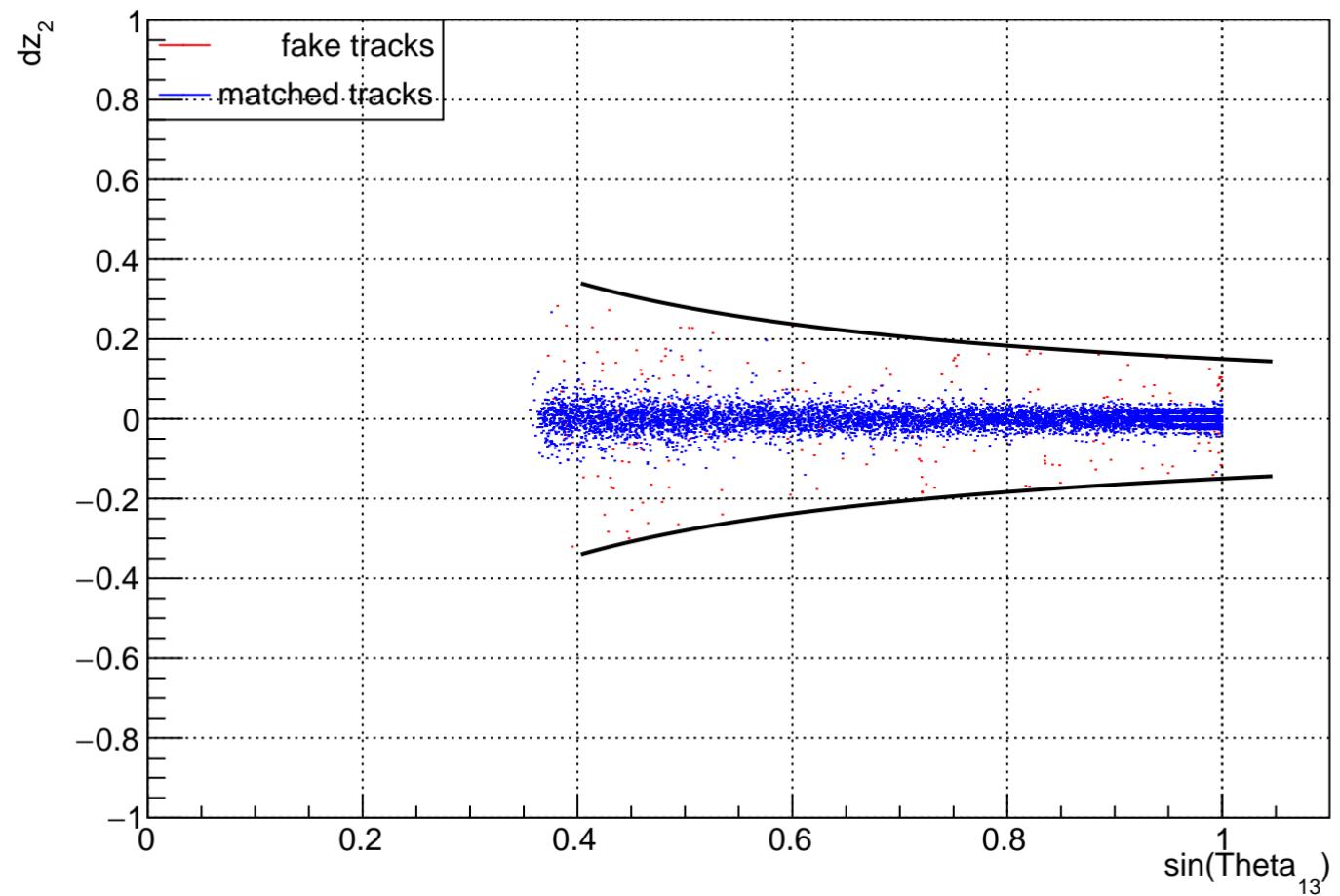


# $\text{abs}(\text{dphi}_2) \text{ Vs } \sin(\text{Theta}_{13})$

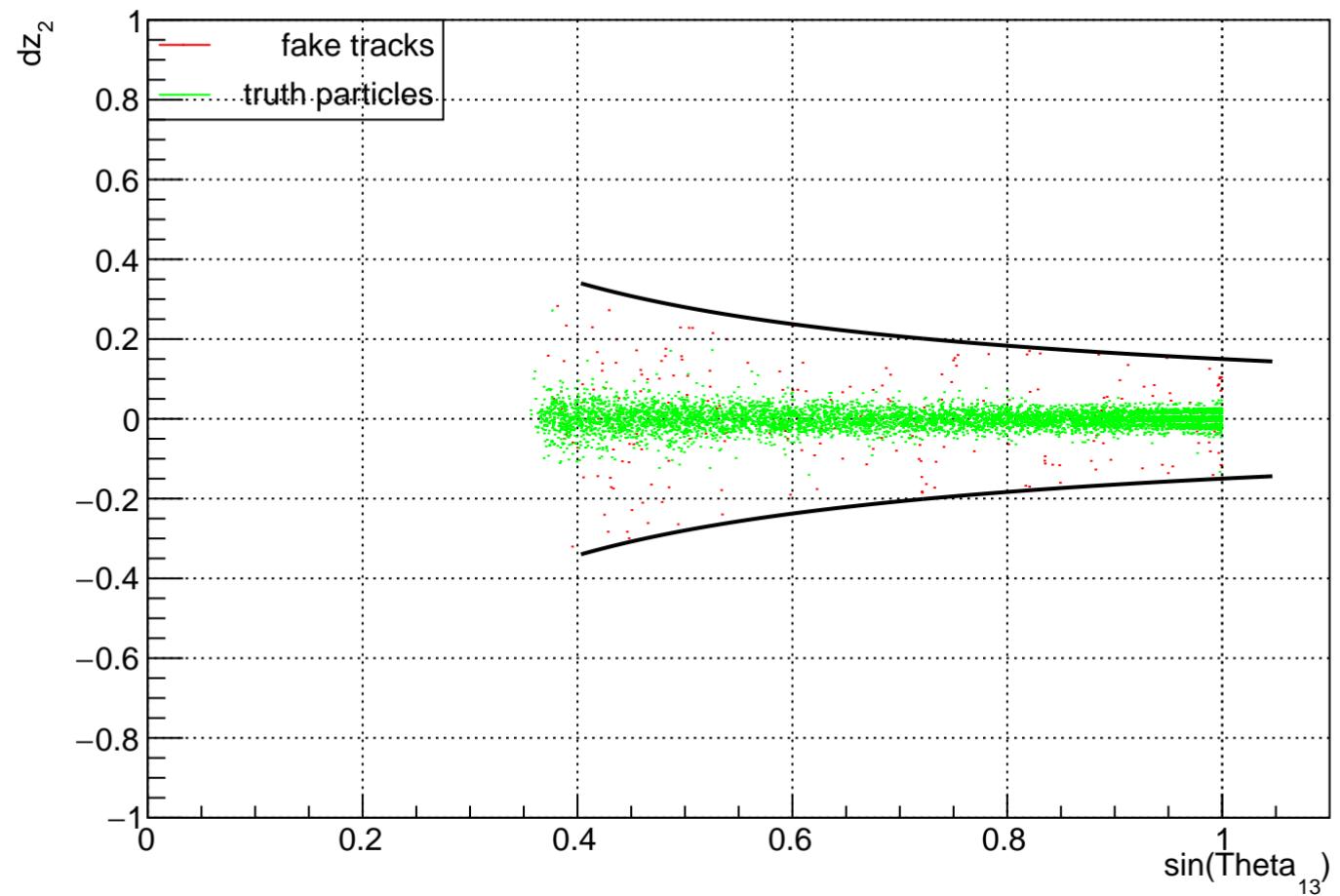
phi Barrel = 0.02 +  
Zbarrel = 160 + Z0<sub>max</sub> = 150  
fake tracks



# $dz_2$ Vs $\sin(\Theta_{13})$

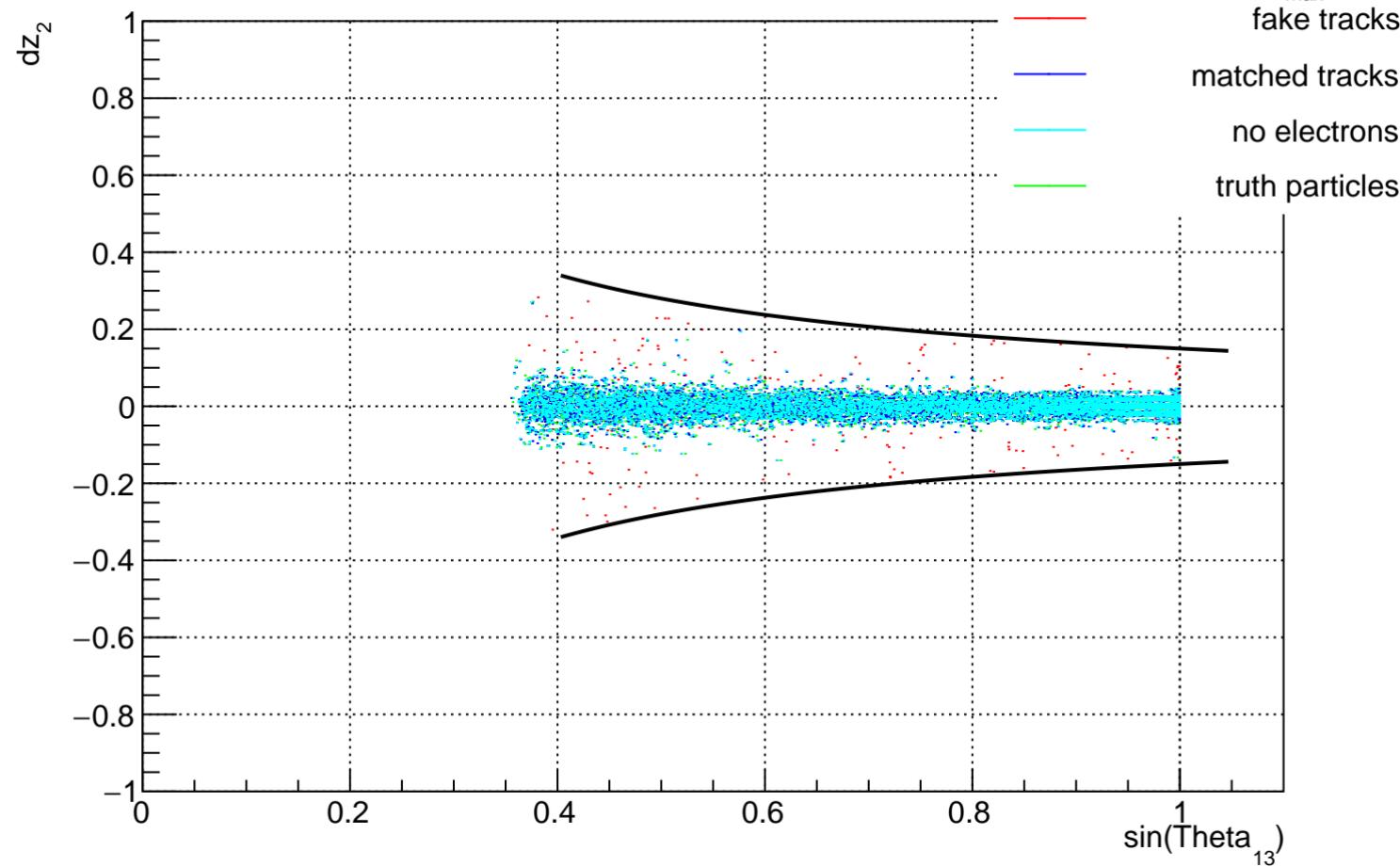


# $dz_2$ Vs $\sin(\Theta_{13})$



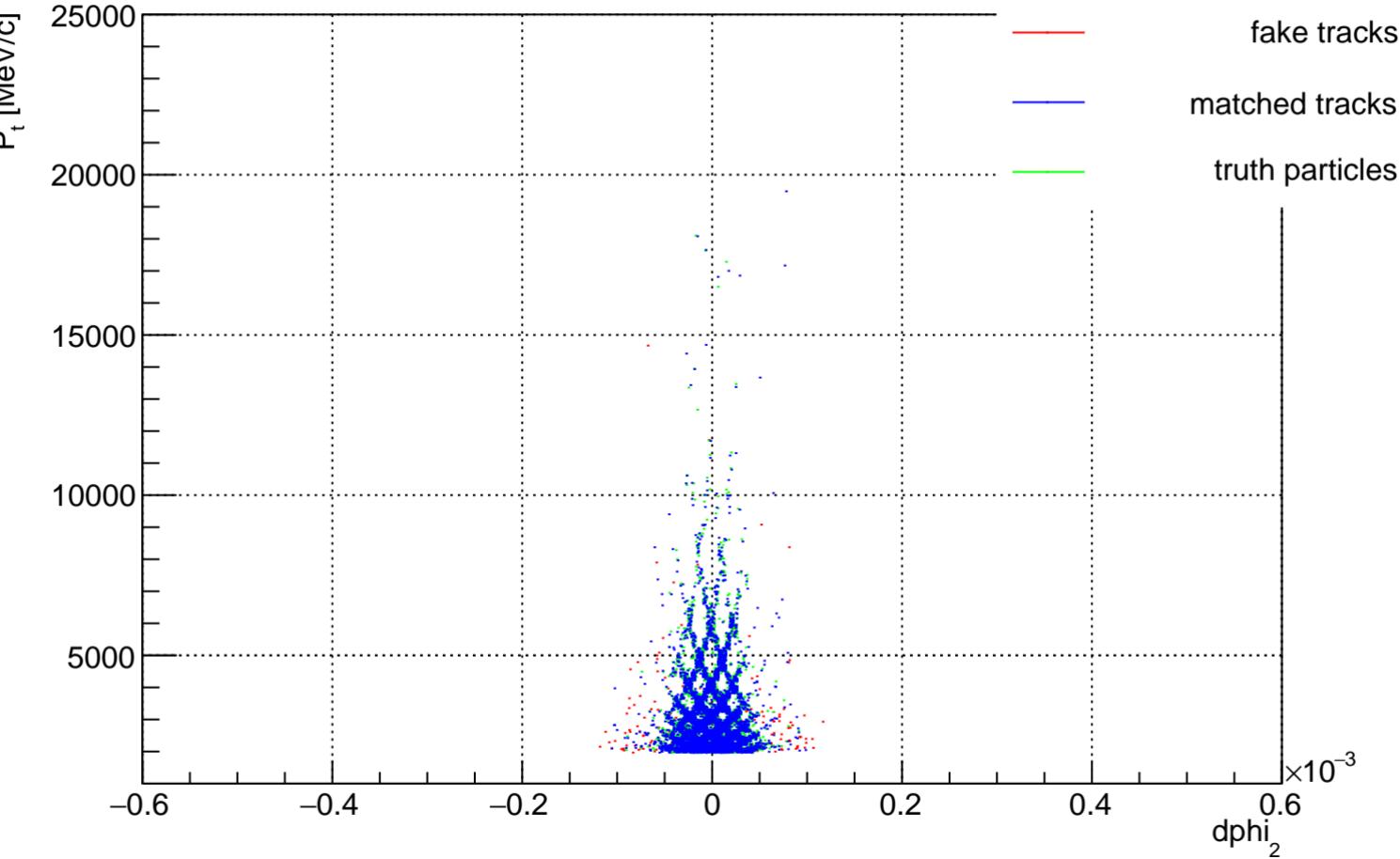
# $dz_2$ Vs $\sin(\Theta_{13})$

phi Barrel = 0.02 +  
Zbarrel = 160 +  $Z_0^{\max} = 150$   
fake tracks  
matched tracks  
no electrons  
truth particles



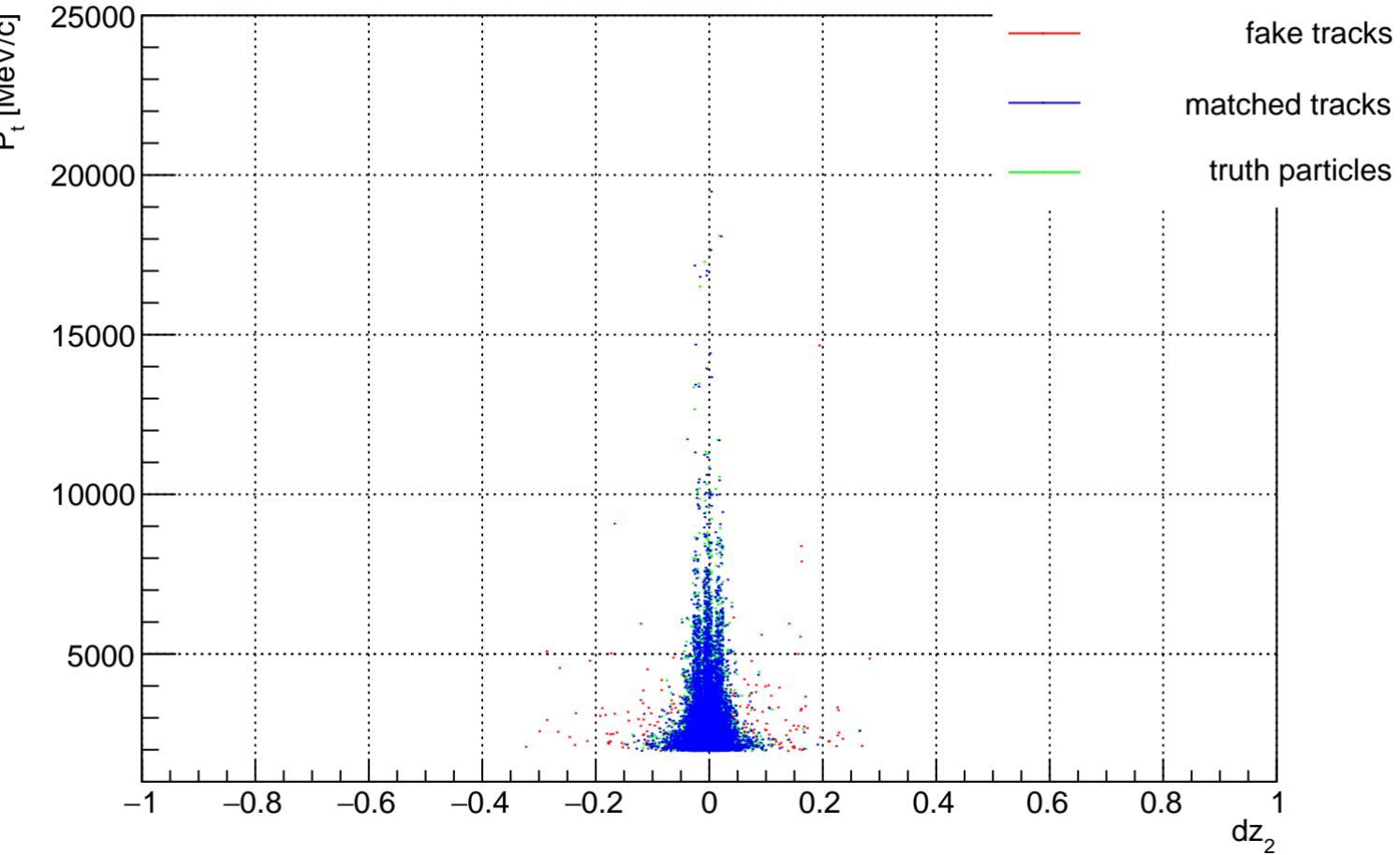
# $P_t$ Vs $d\phi_{2}$

phi Barrel = 0.02 +  
Zbarrel = 160 +  $Z_{max} = 150$



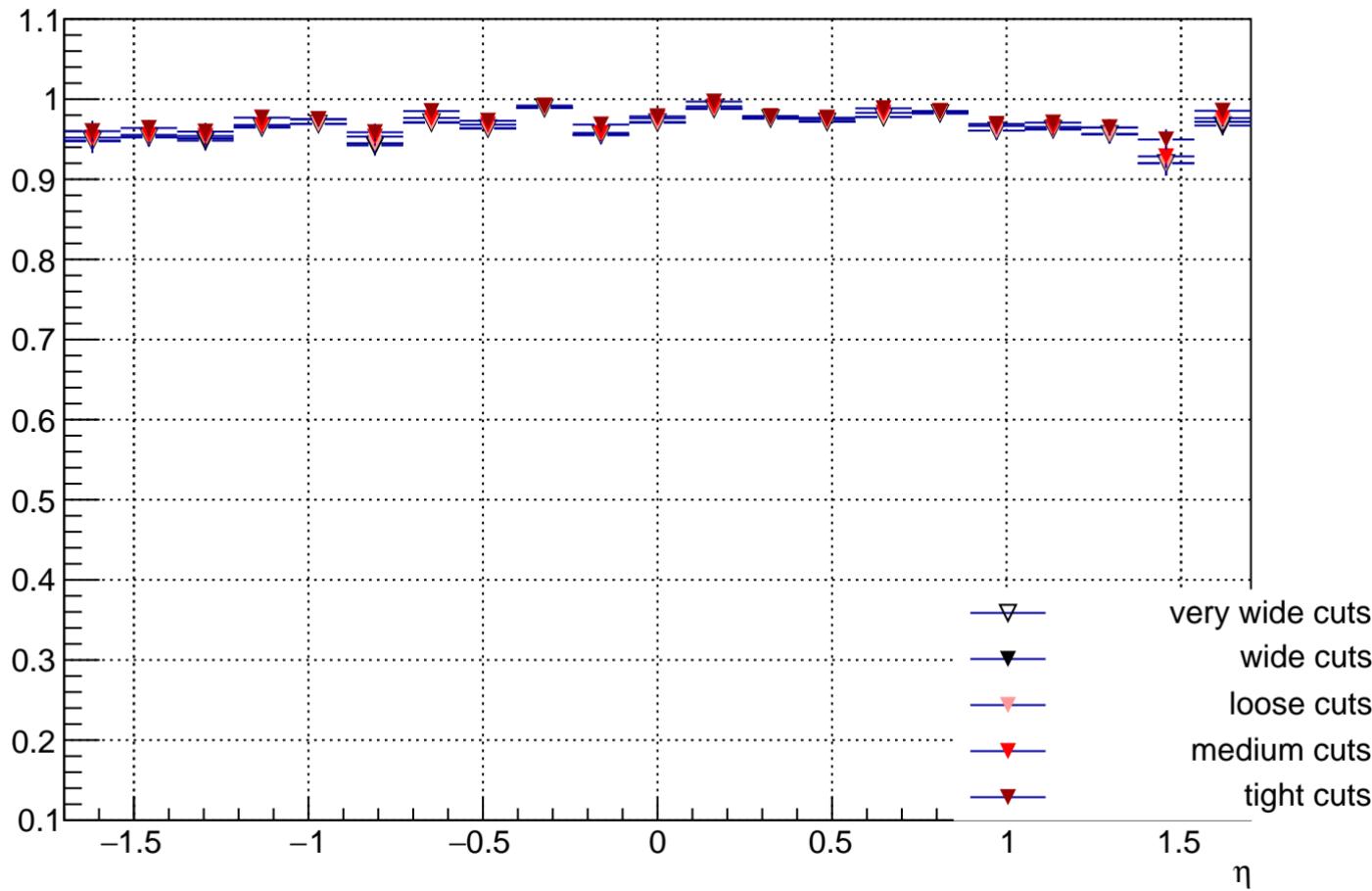
# $P_t$ Vs $dz_2$

phi Barrel = 0.02 +  
Zbarrel = 160 +  $Z_{\text{max}} = 150$

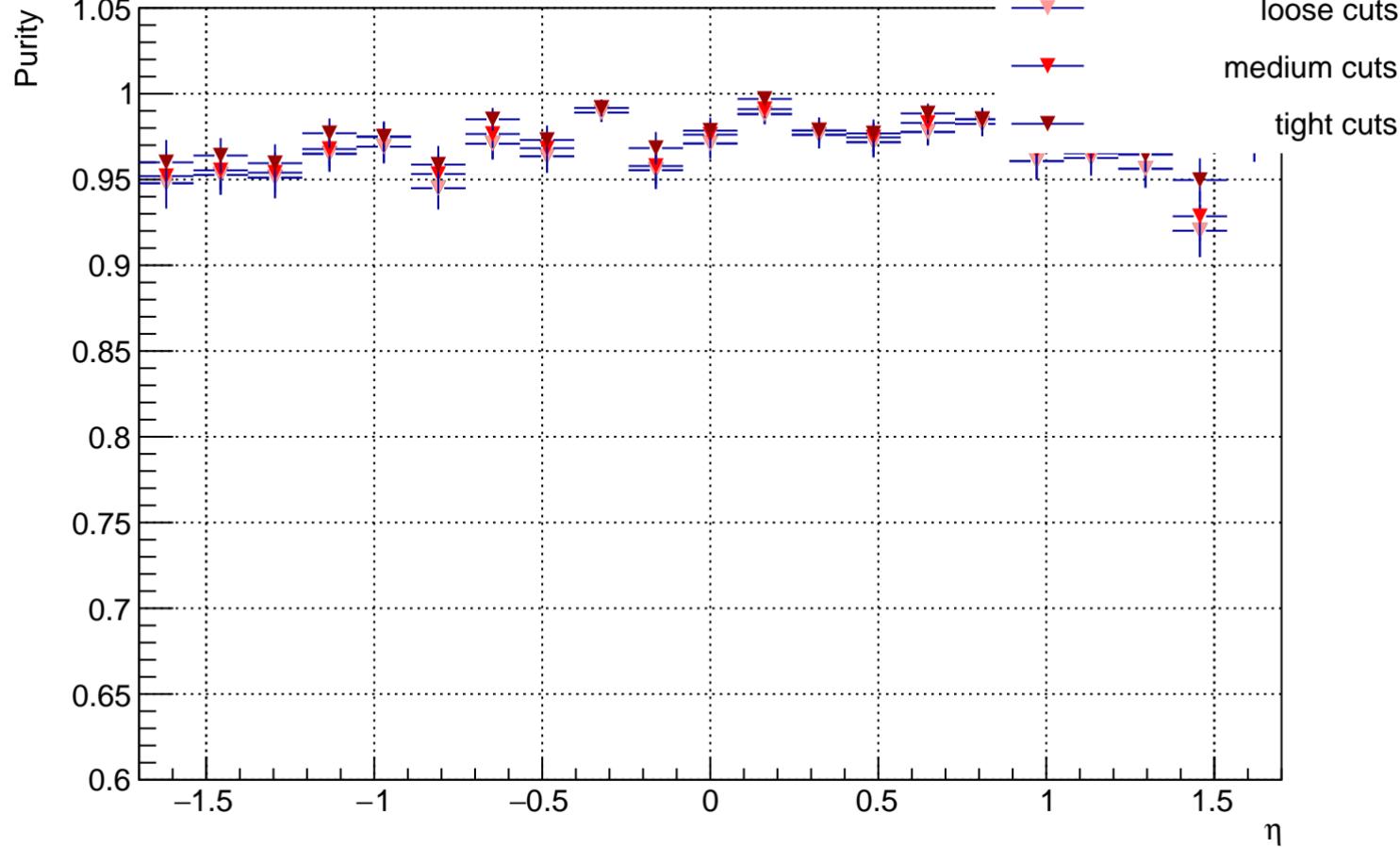


# Purity vs $\eta$

Purity

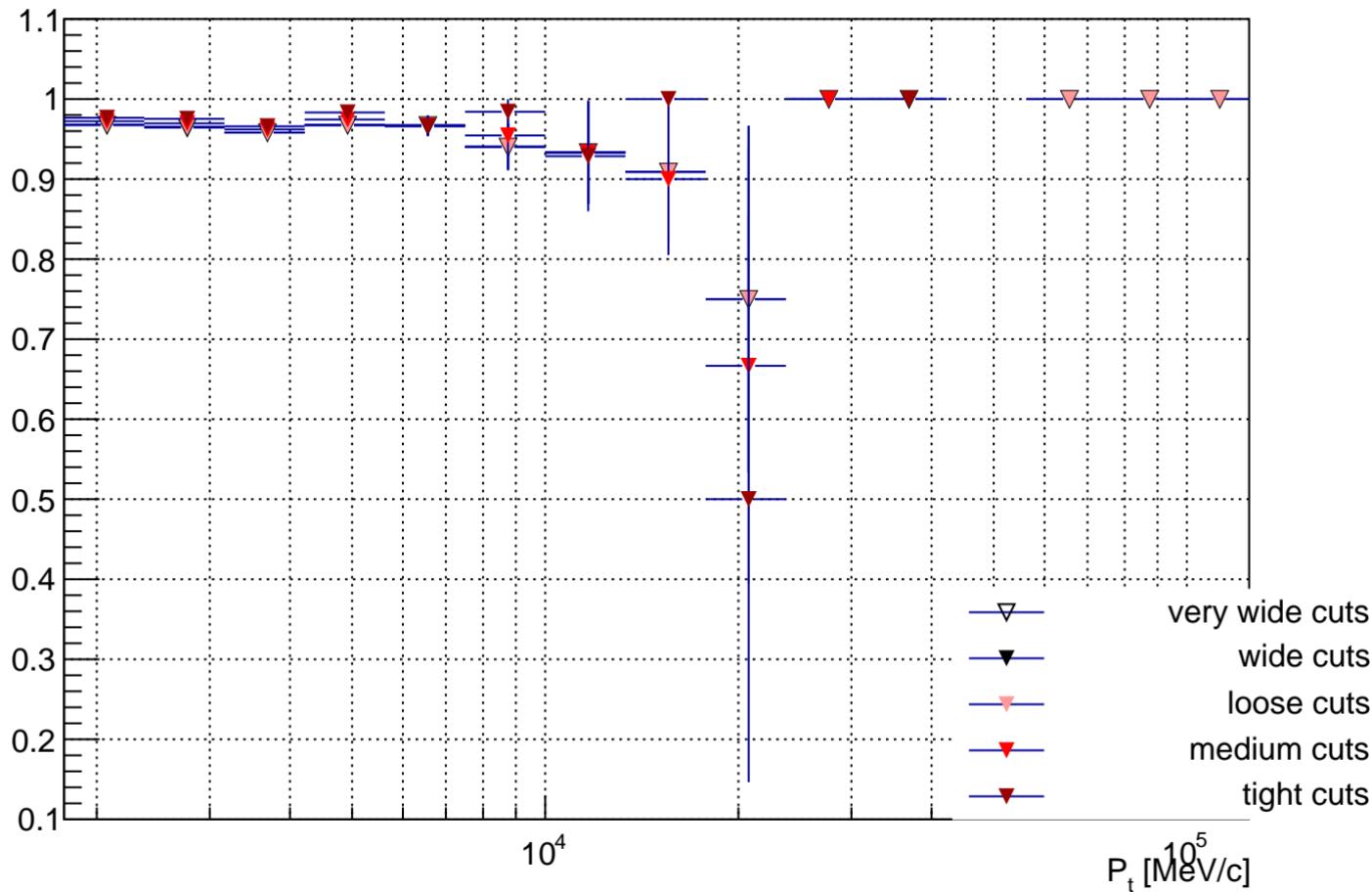


# Purity vs $\eta$



# Purity vs $P_t$

Purity



# Purity vs $P_t$

