Event shape variables: circularity, thrust + some new muons stuff

Last update...

Dominik Wrana

Data sample

All our data: runs
292319,294607,294630,294773,294775,294777

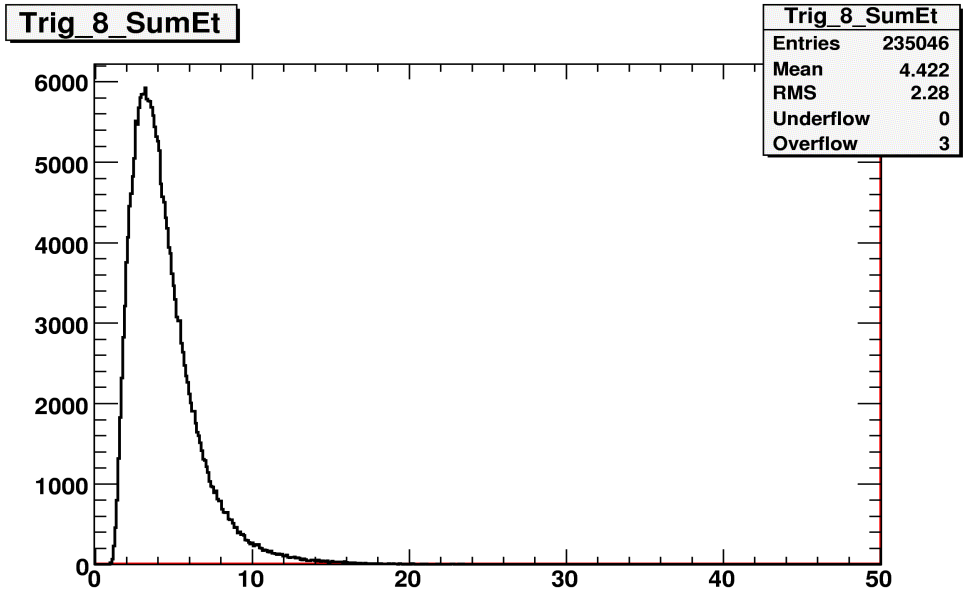
Gap data:
~ 2.5 M

Sum Et, Central Mass for different central triggers:

Trigger 8 :
L2_SUMET2_RL60HZ_L1_TWO_CEM0.5_&_CLC_BSC1_VETO [1]

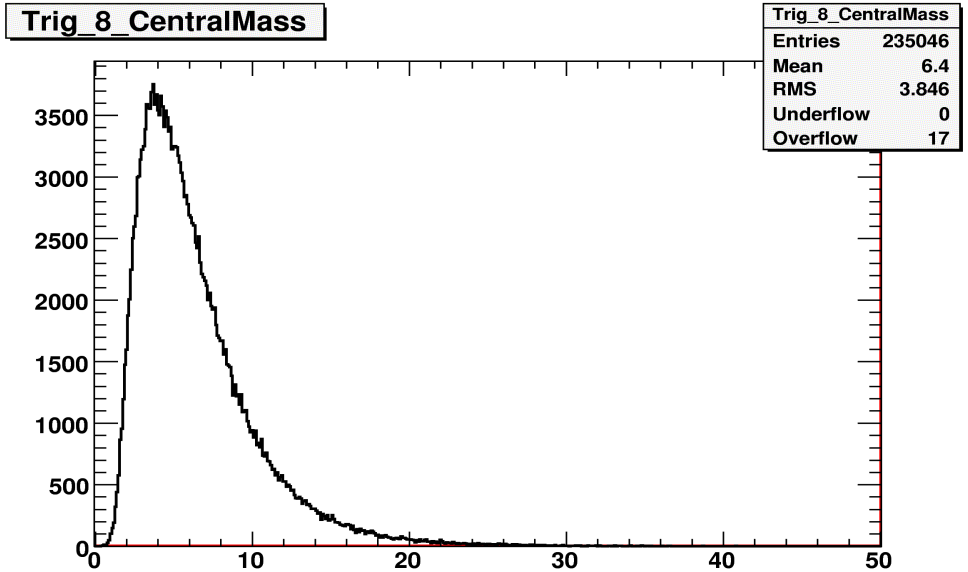
Trigger 9 :
L2_SUMET2_RL60HZ_L1_TWO_CJET0.5_&_CLC_BSC1_VETO [1]

Trigger 8



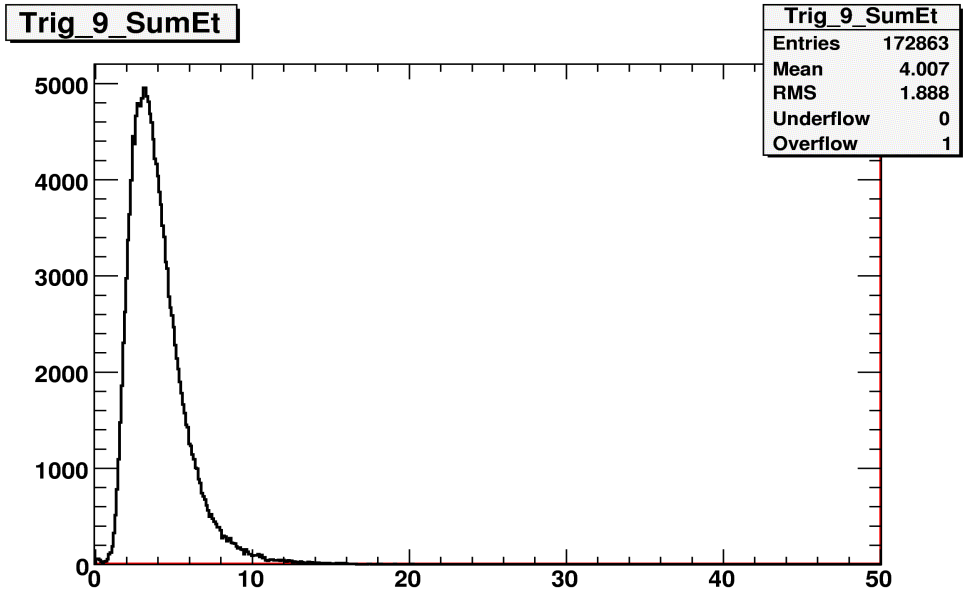
All plots after :
- gaps cuts
- crap cuts (neural net)
- $|\eta| < 2.1$

Sum Et

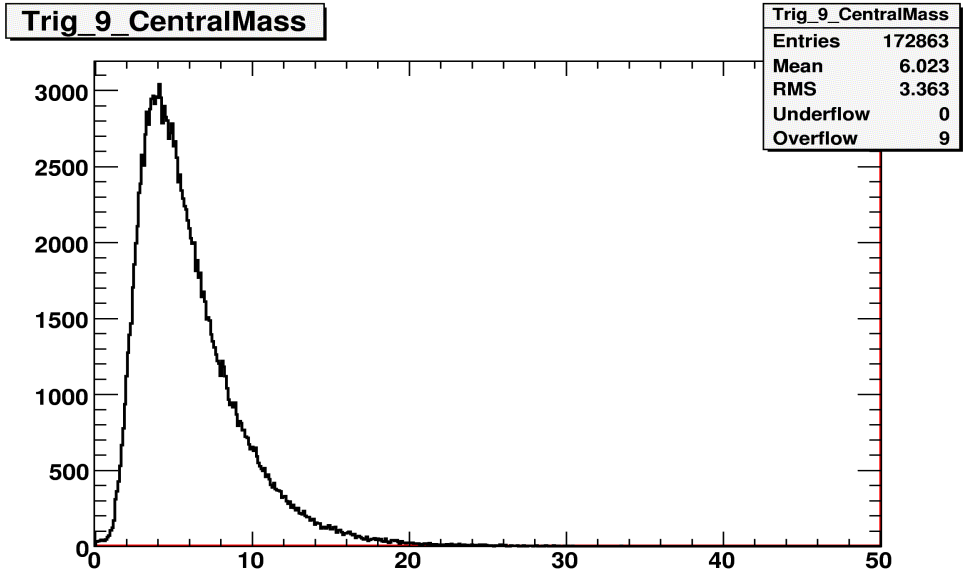


Central Mass

Trigger 9

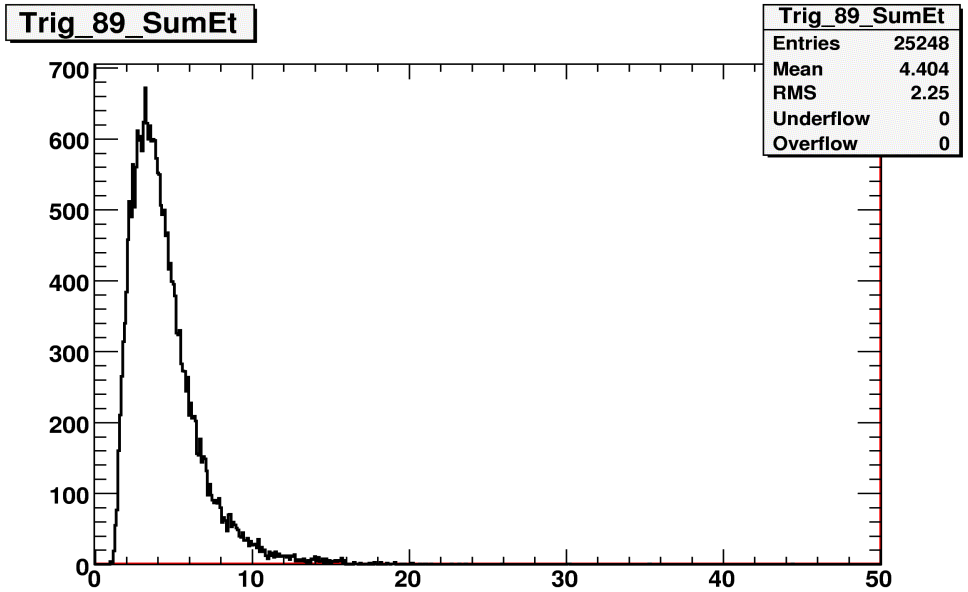


Sum Et

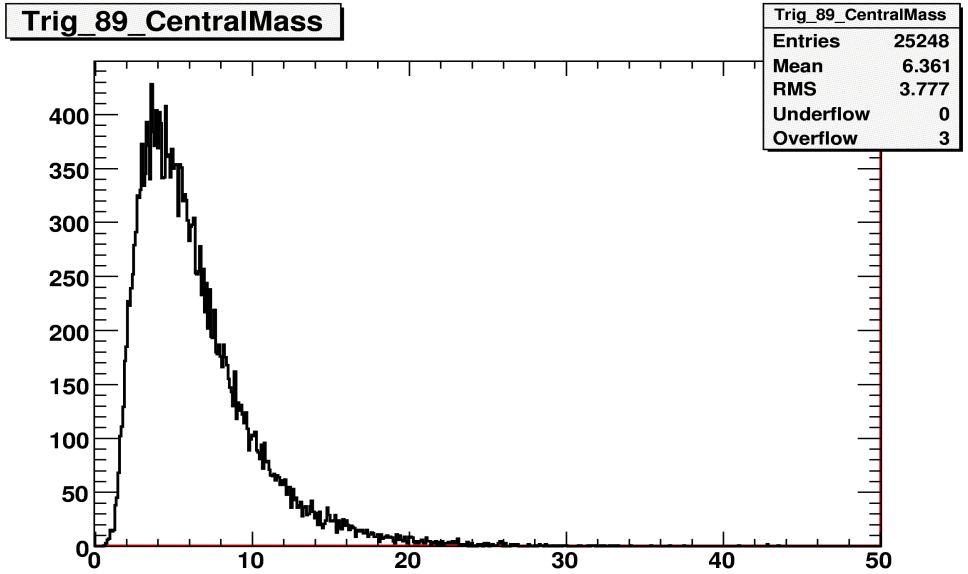


Central Mass

Trigger 8 & 9



Sum Et



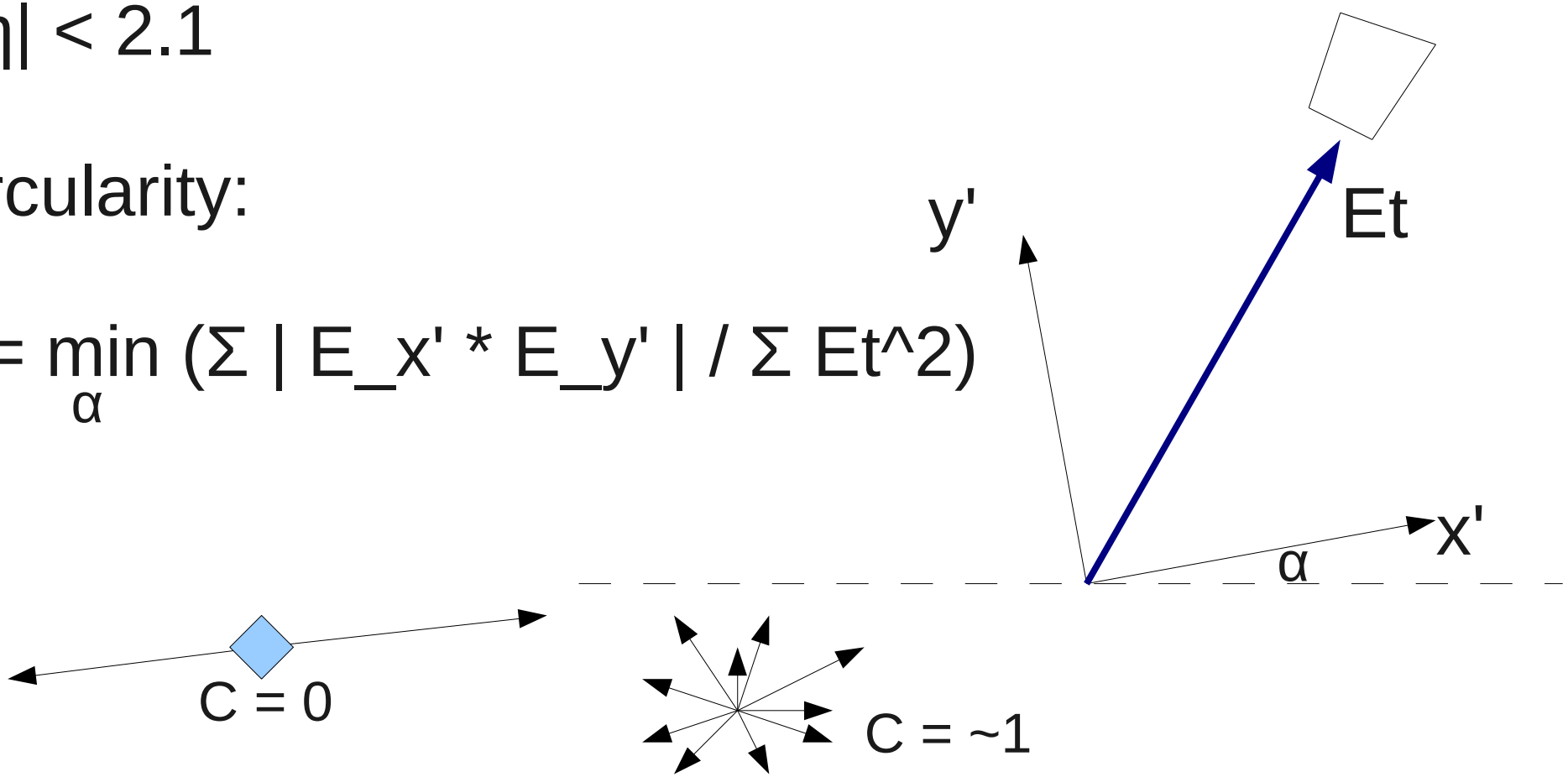
Central Mass

Circularity

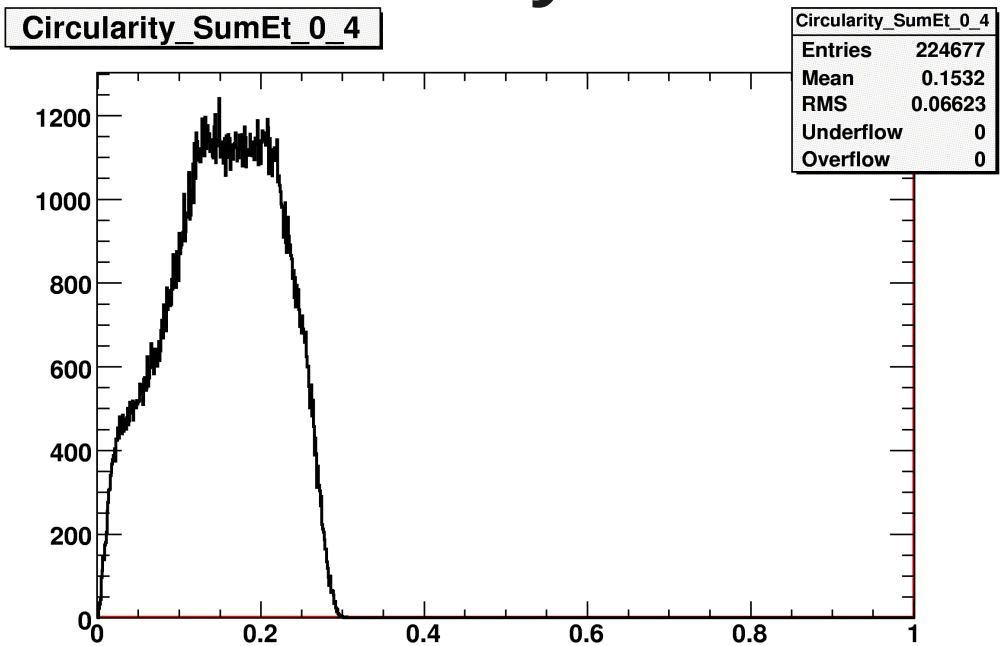
Conditions:
- forward gaps
- after crap cleanup
- $|\eta| < 2.1$

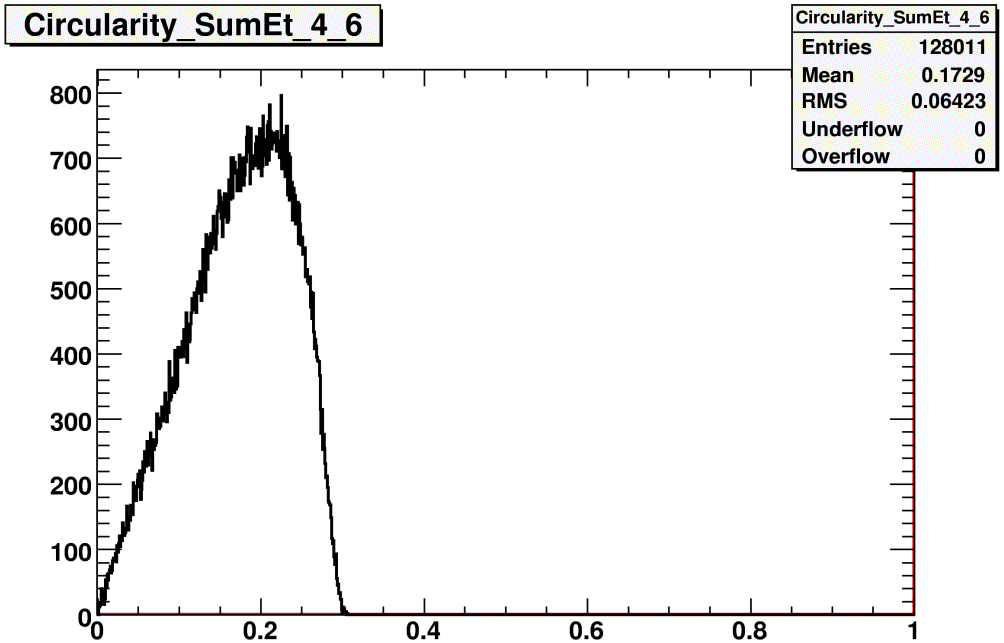
Circularity:

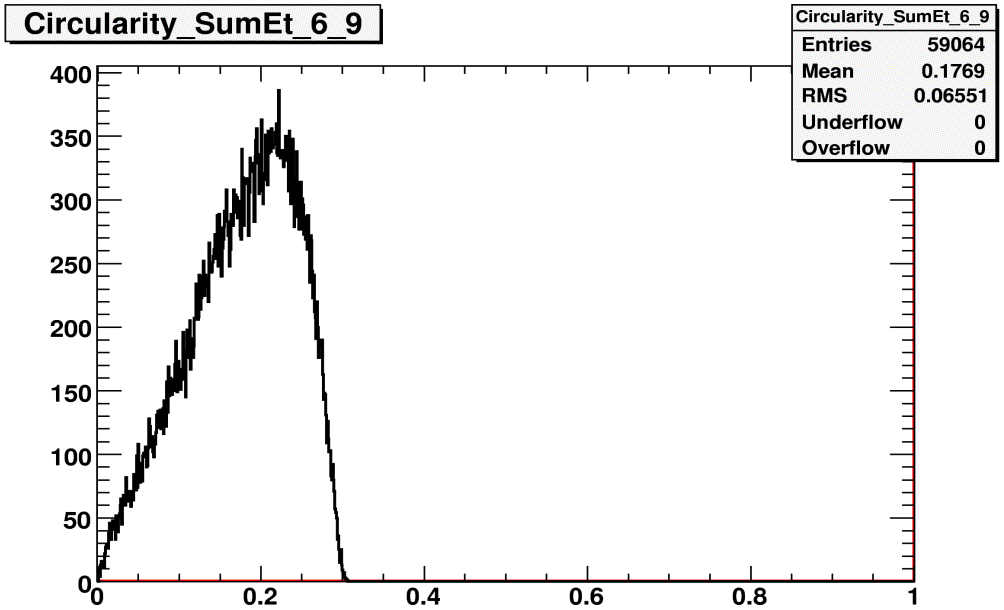
$$C = \min_{\alpha} (\Sigma \, | E_x' * E_y' | \, / \, \Sigma \, Et^2)$$

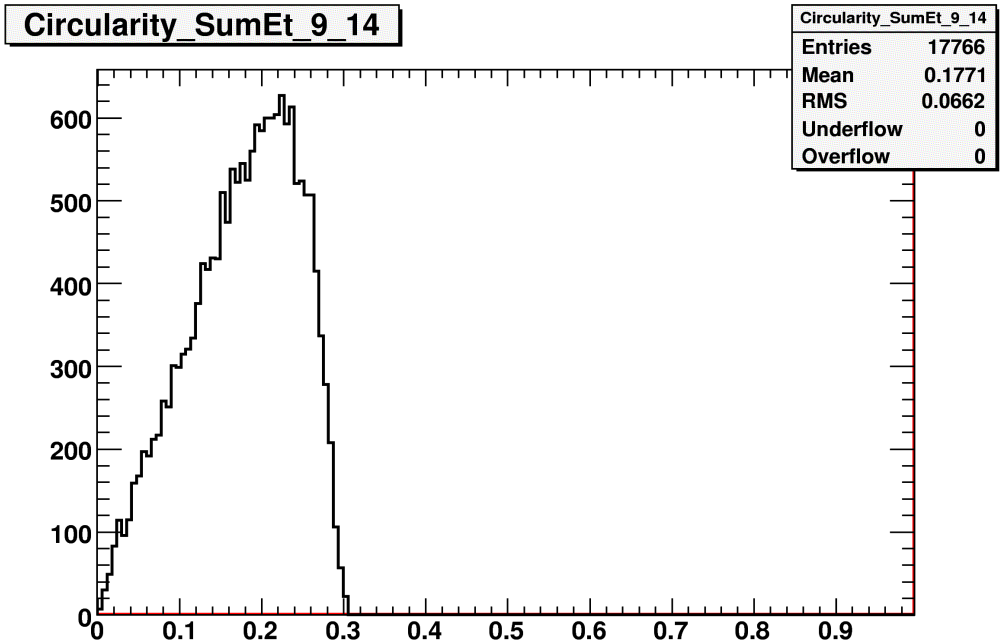


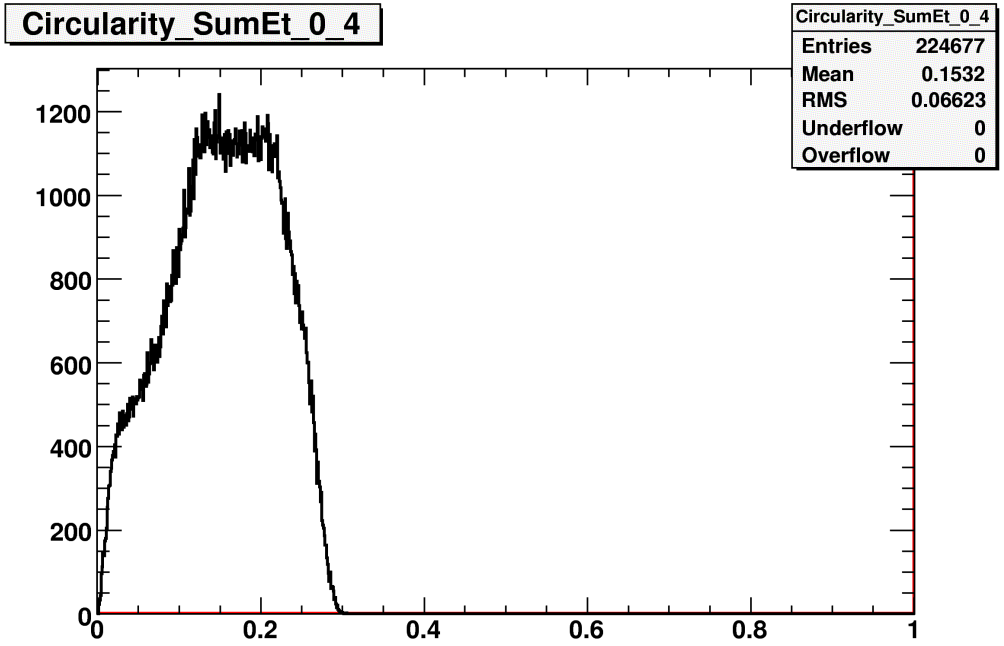
Circularity for different bands of SumEt

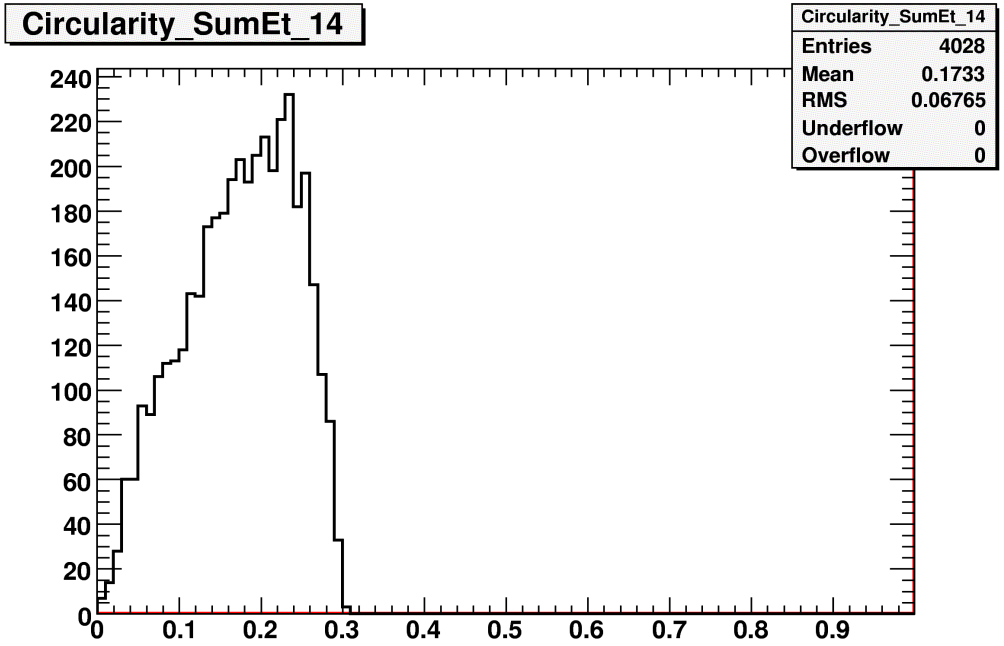








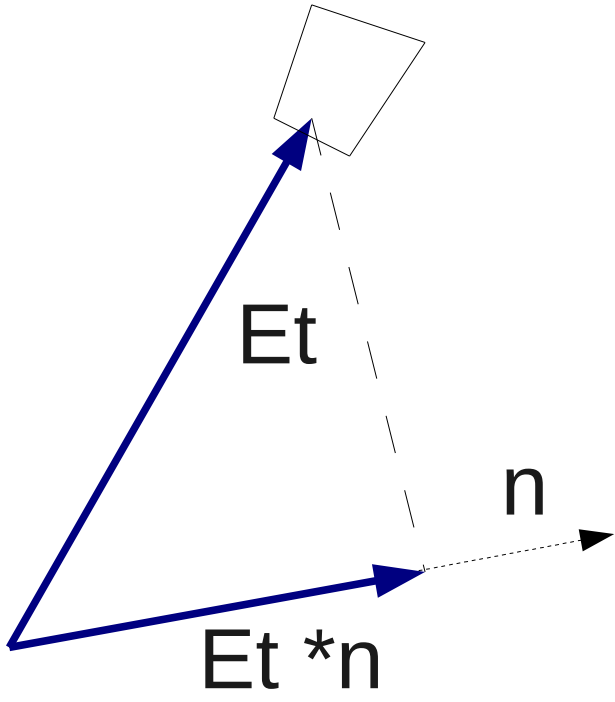




4 GeV > Sum Et > 0 GeV Sum Et > 14 GeV

Little difference – no jets appearing at large SumEt (why?)

Thrust

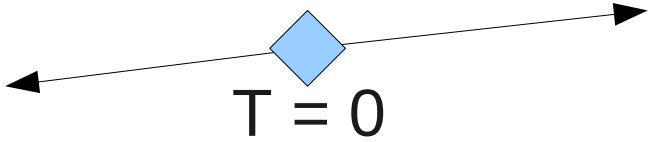


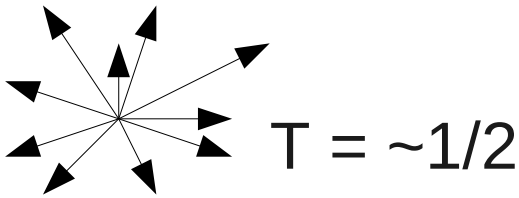
Conditions:
- forward gaps
- after crap cleanup
- $|\eta| < 2.1$

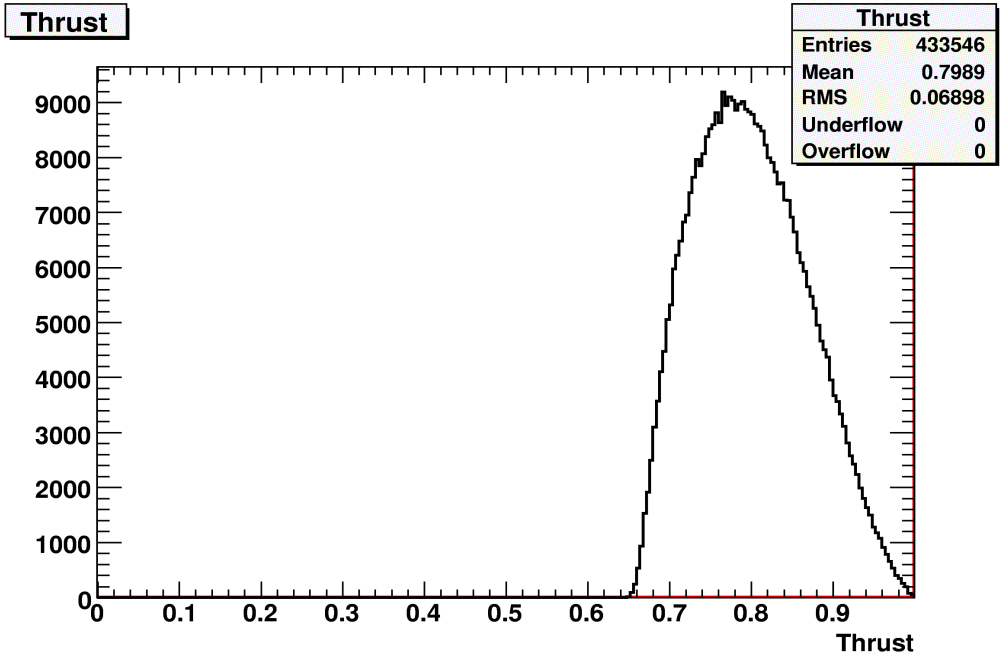
Thrust:

$$T = \max_{n} (\Sigma \mid n * E_t \mid / \Sigma Et)$$

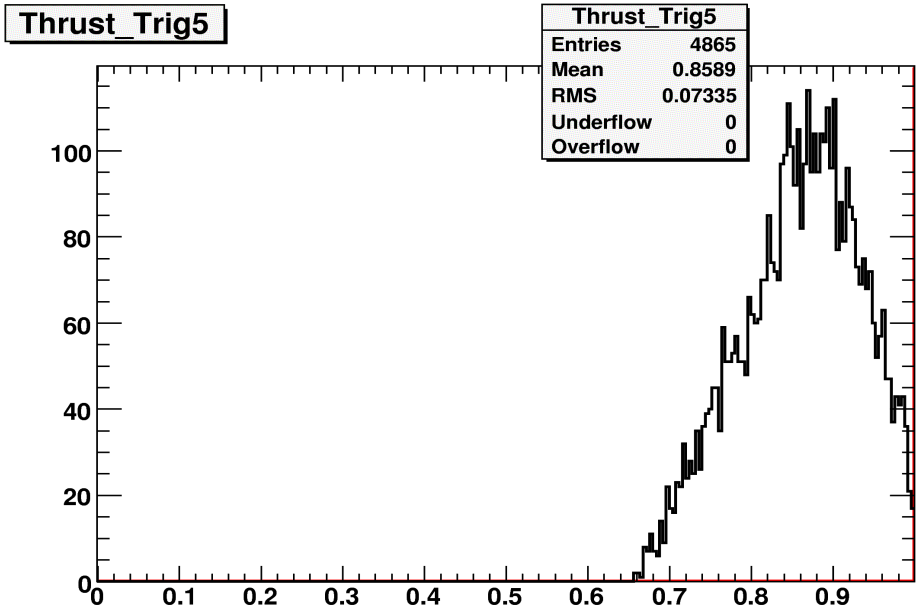
n – unit vector

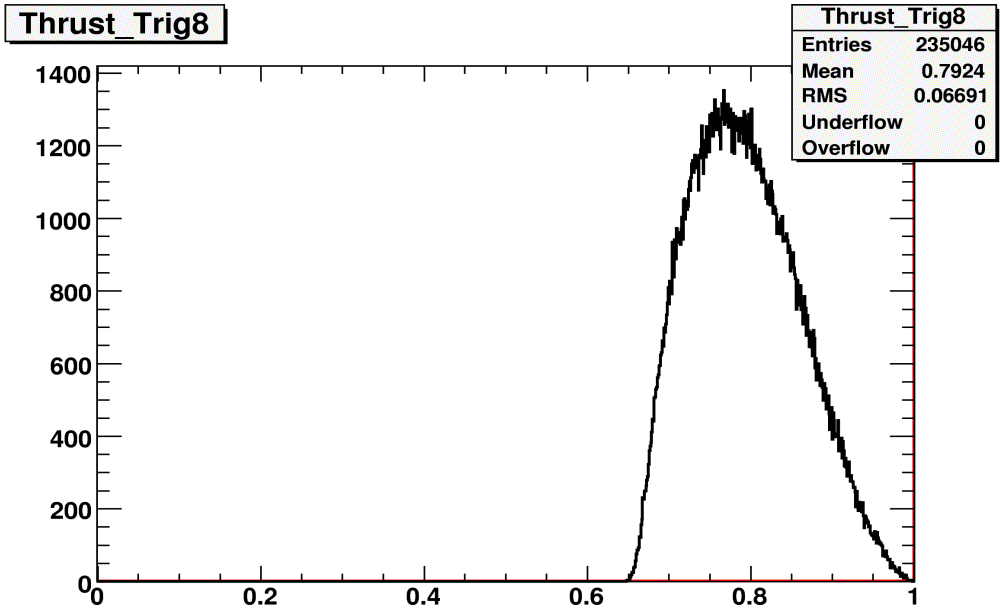


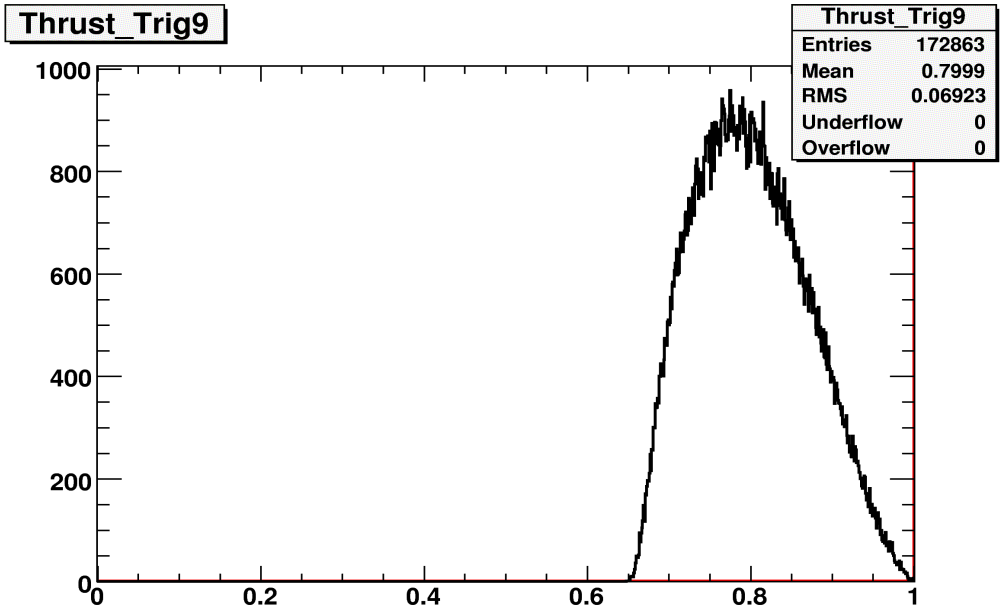




Thrust for all central triggers



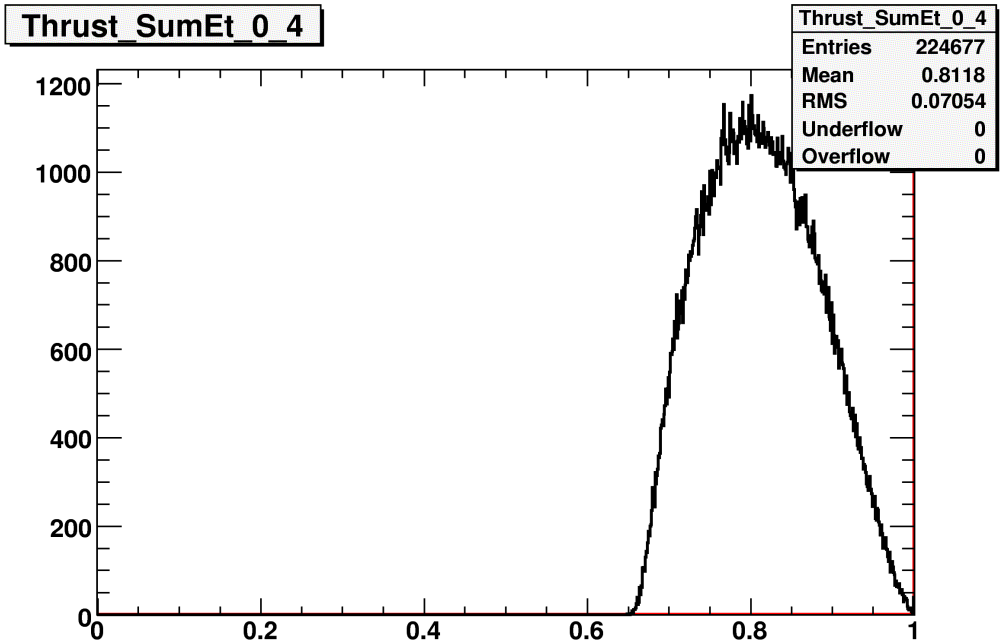


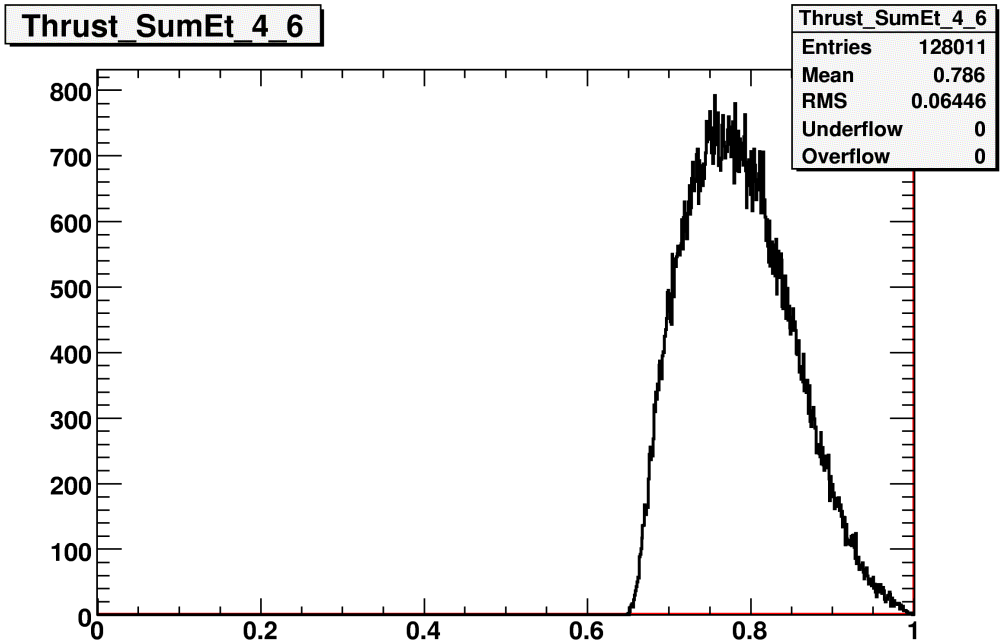


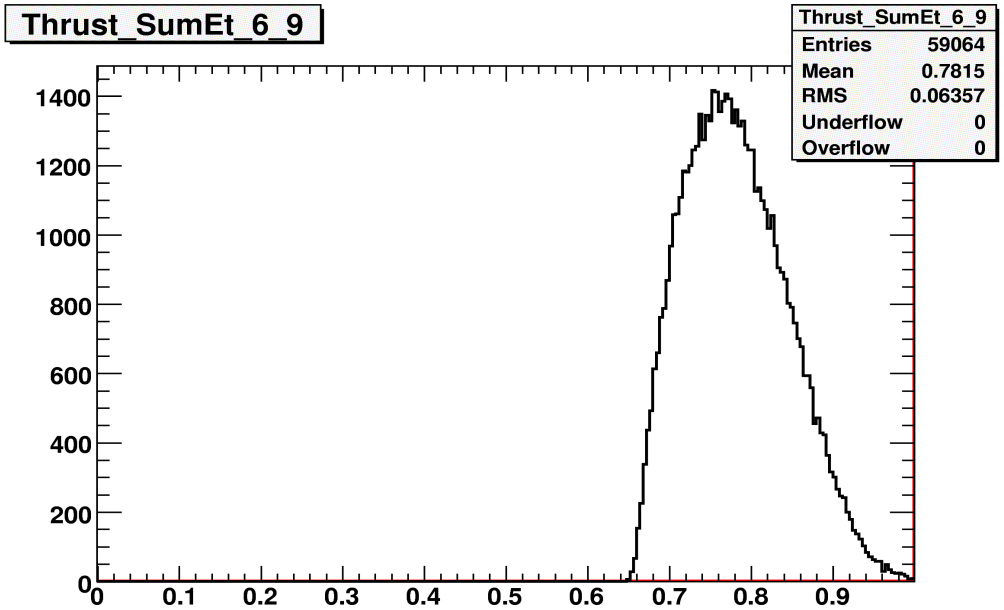
Thrust for different triggers:

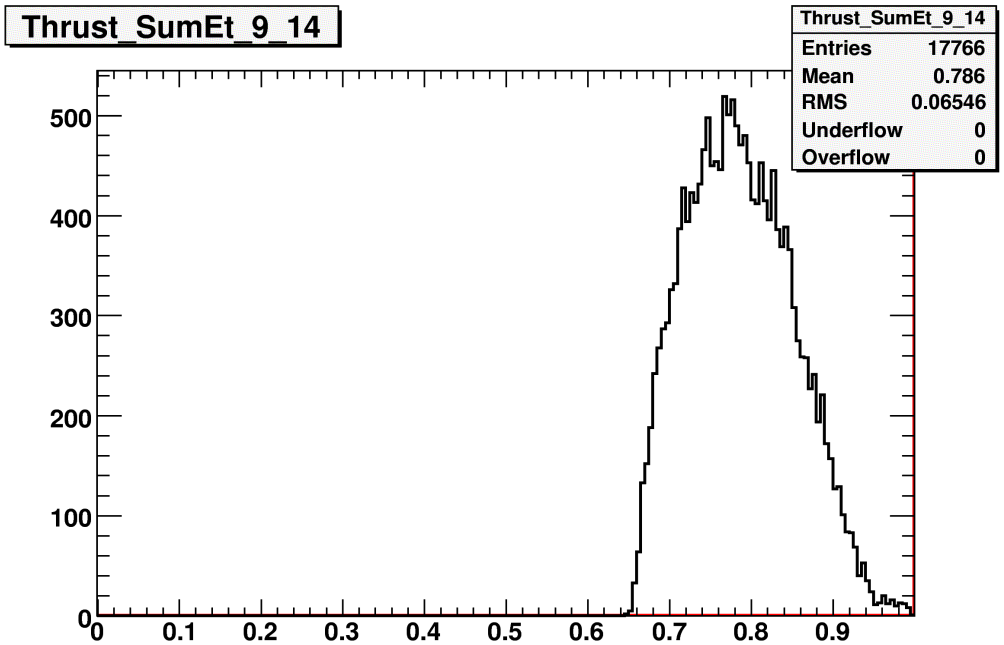
<^ 5
^> 8
< 9

Thrust for different bands of SumEt

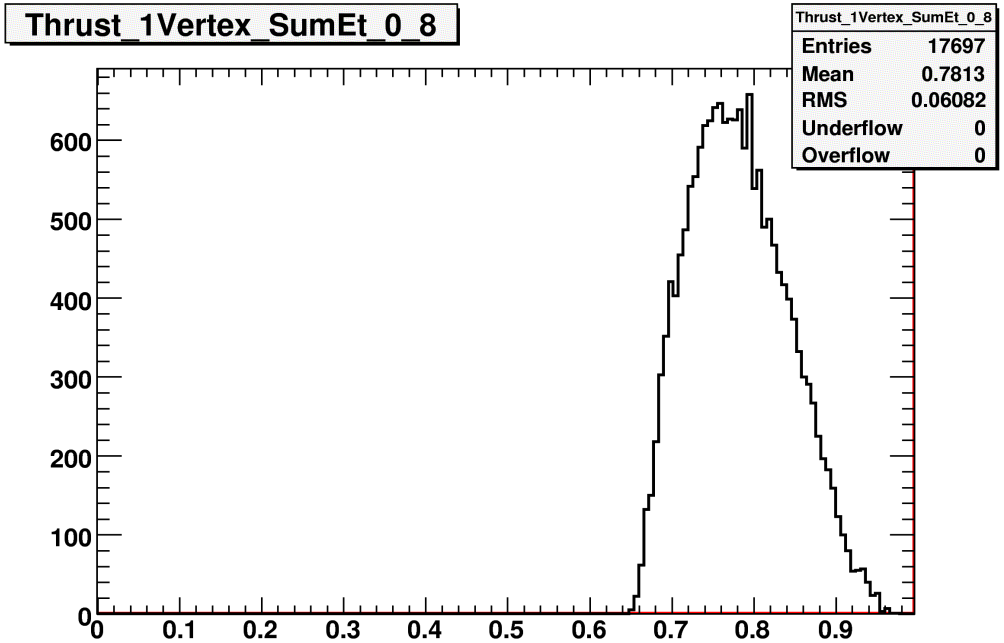


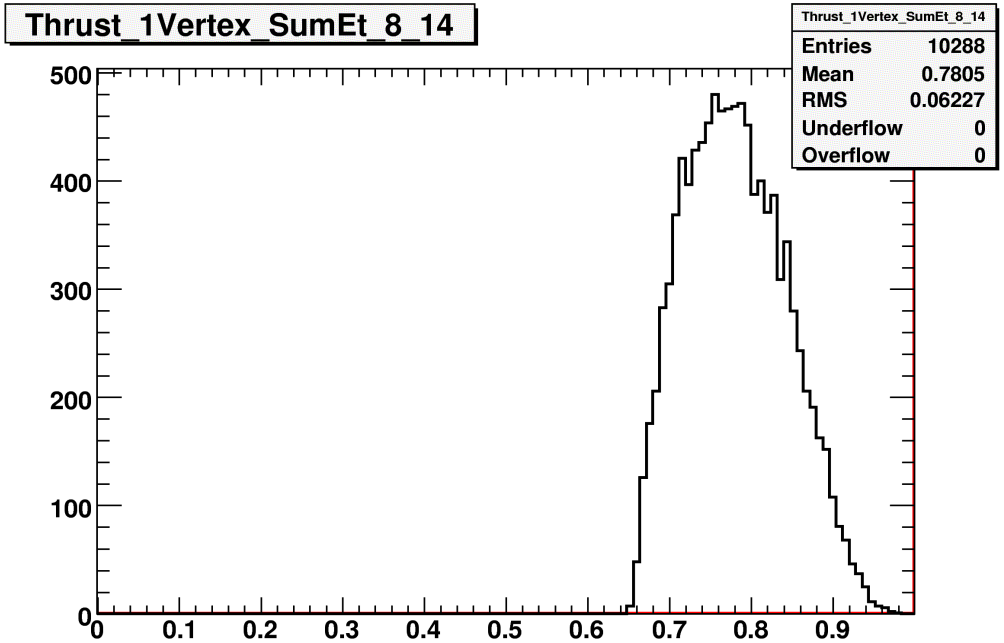


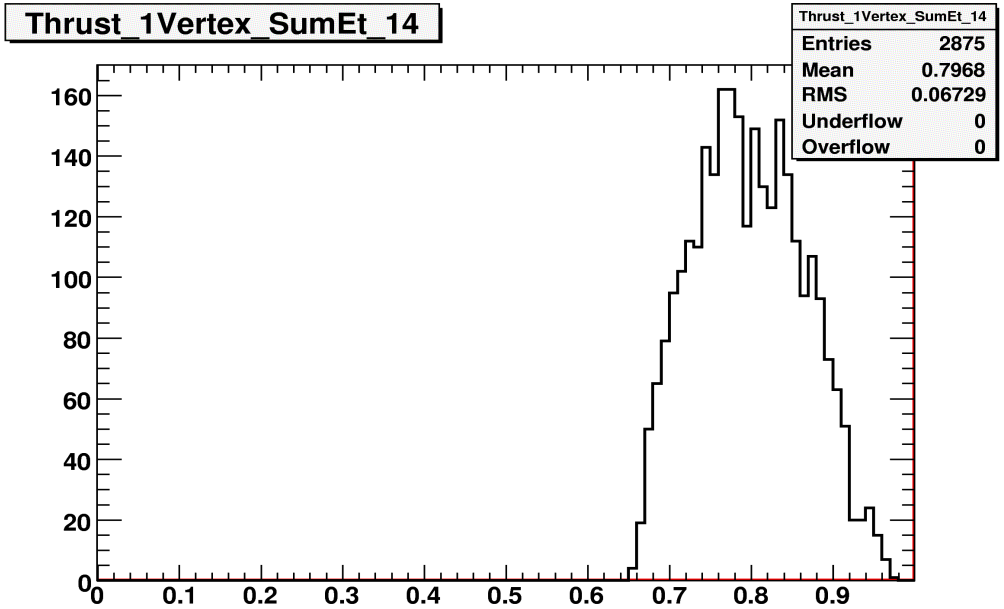




Thrust for different bands of SumEt (+ 1 vertex demand)

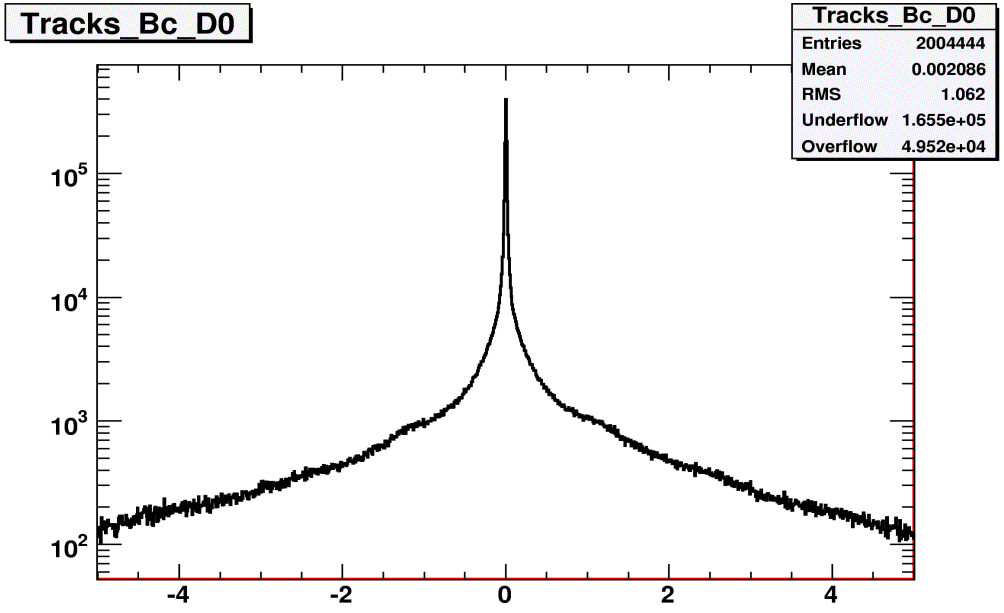


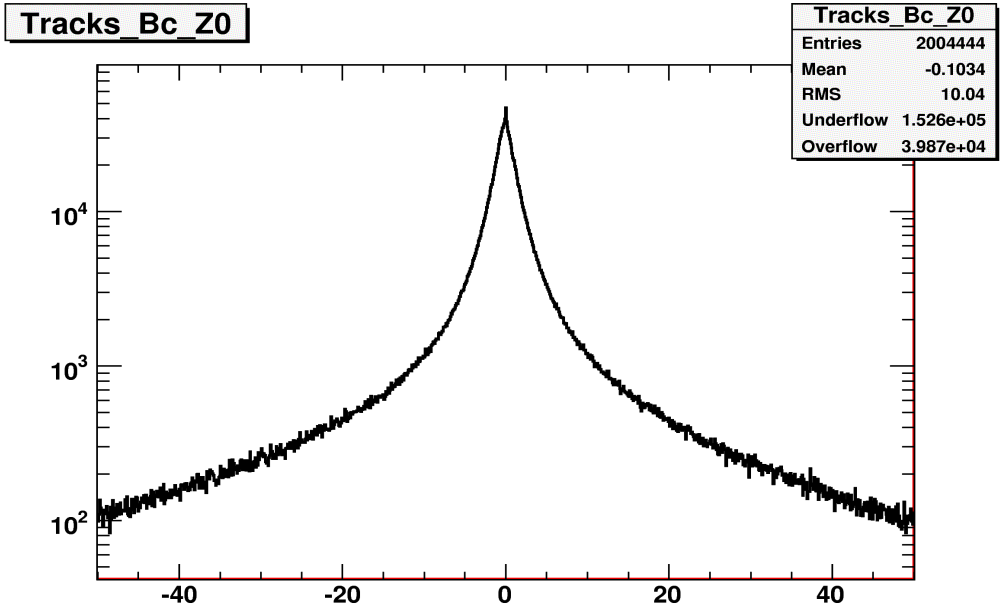




Beam constrained parameters (from stntuple)

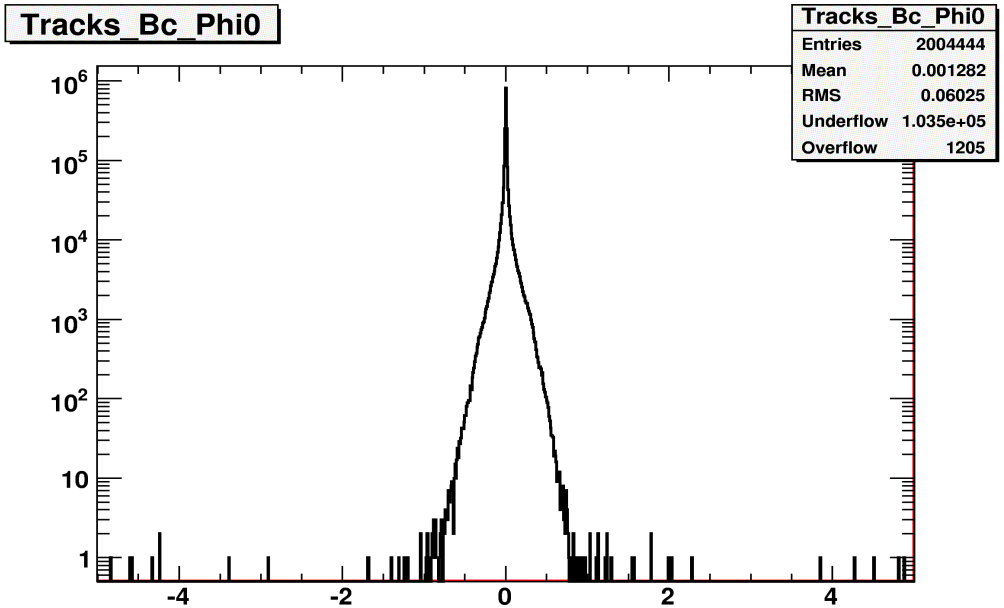
Difference between normal and beam constrained quantities

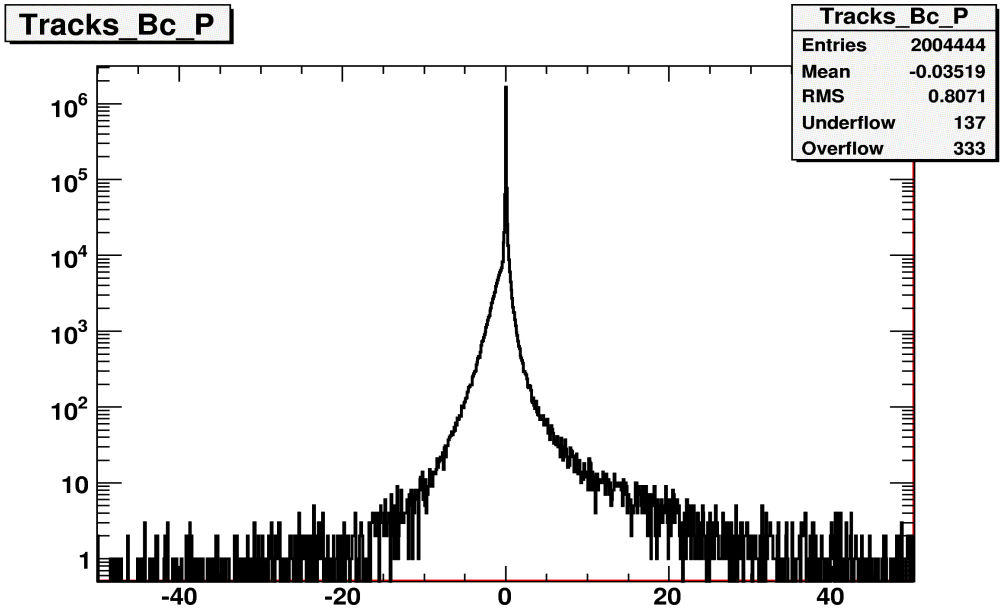


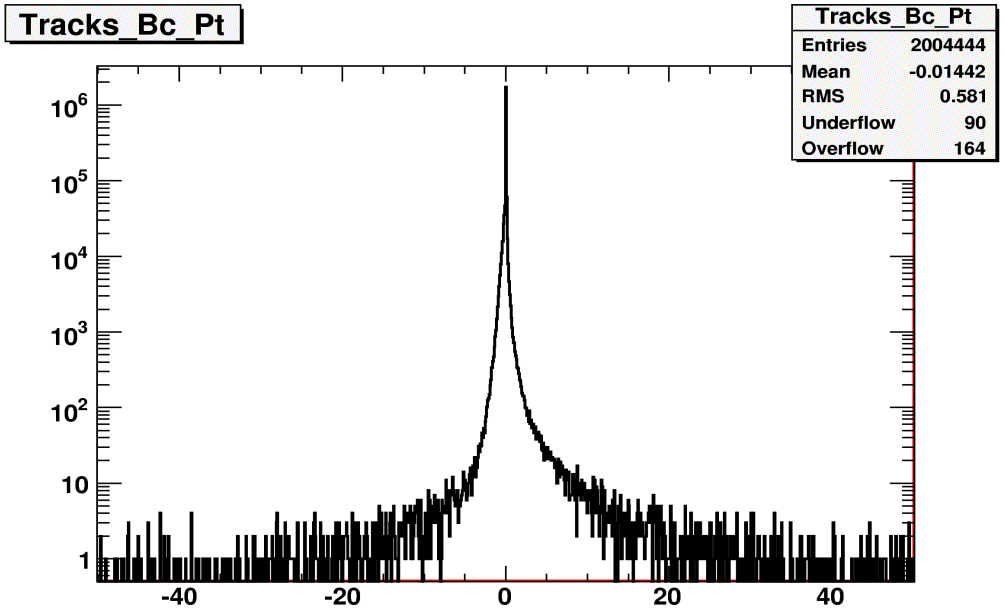


D0

Z0







Tracks quantities:

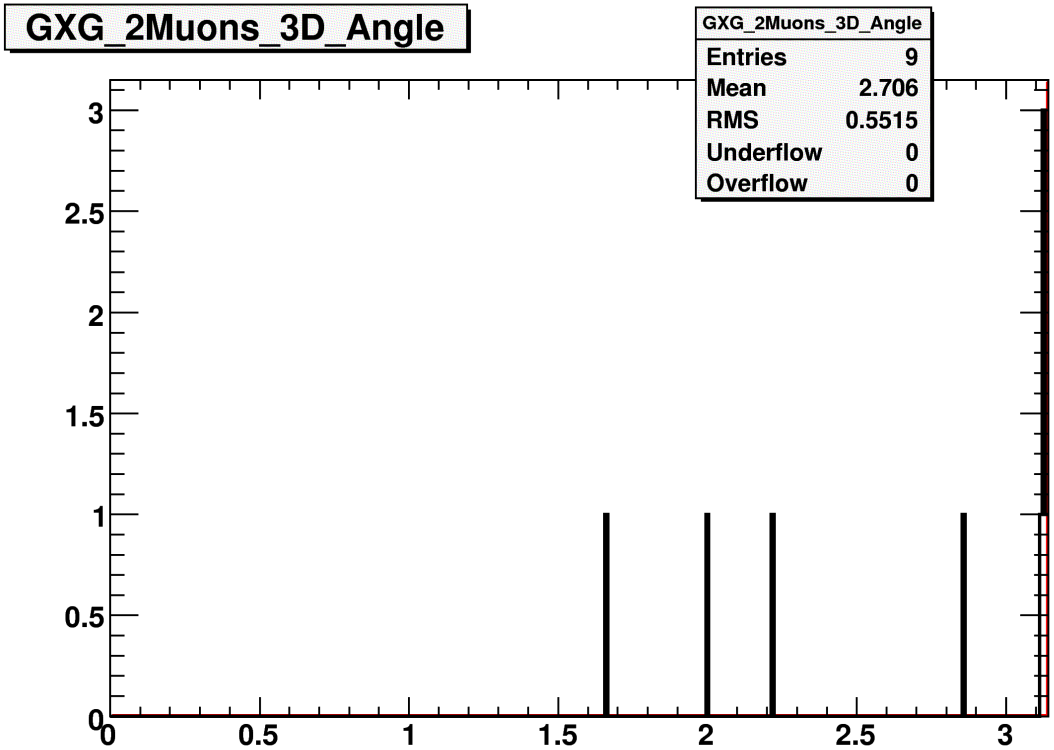
<^ Phi0

^> P

< Pt

Muons update

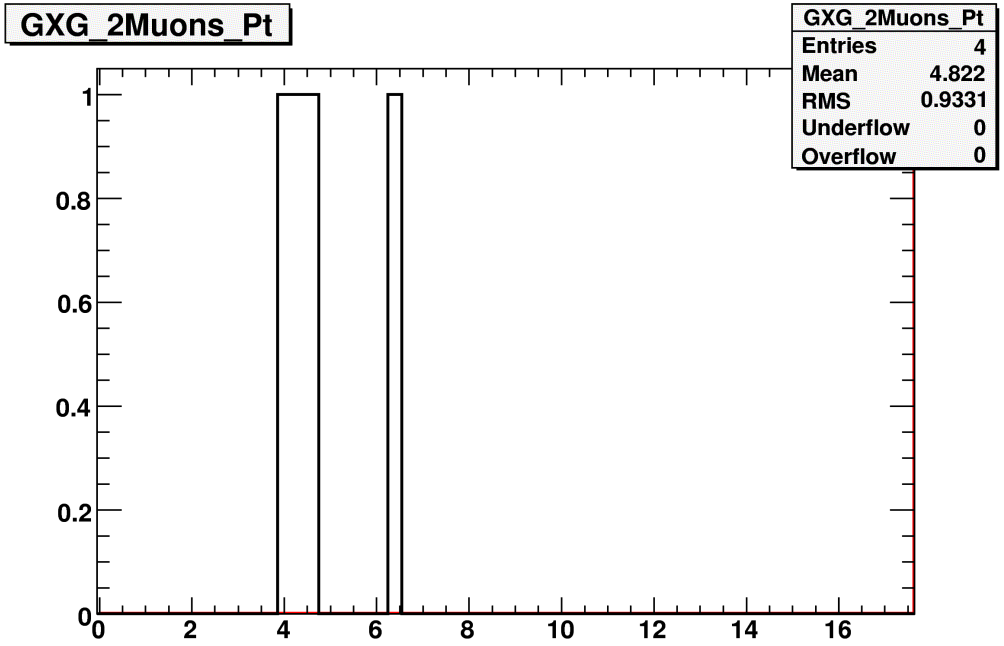
Conditions:
- gaps cuts
- crap cuts
- $|\eta| < 2.1$
- vertex cuts:
  - $|Z0 - Z0\ mean| < 3$
  - $|R_2D – R_2D\ mean| < 0.6$
- $Pt > 0.3$ GeV/c
- 3 superlayers of St and Ax separately with at least 8 hits (Jonathan's suggestion)
- All parameters are beam constrained !!

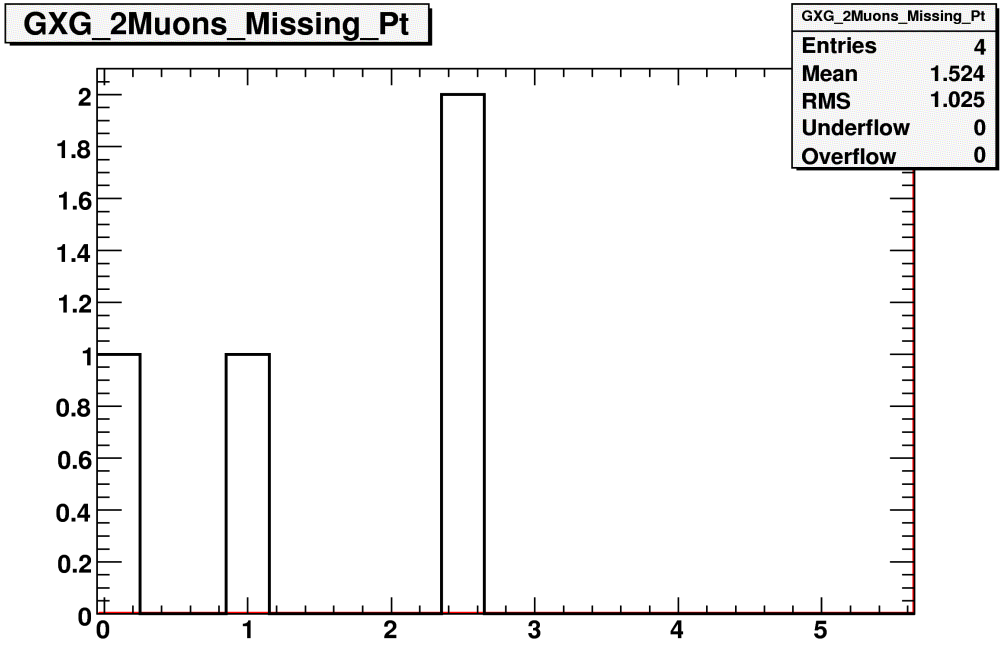


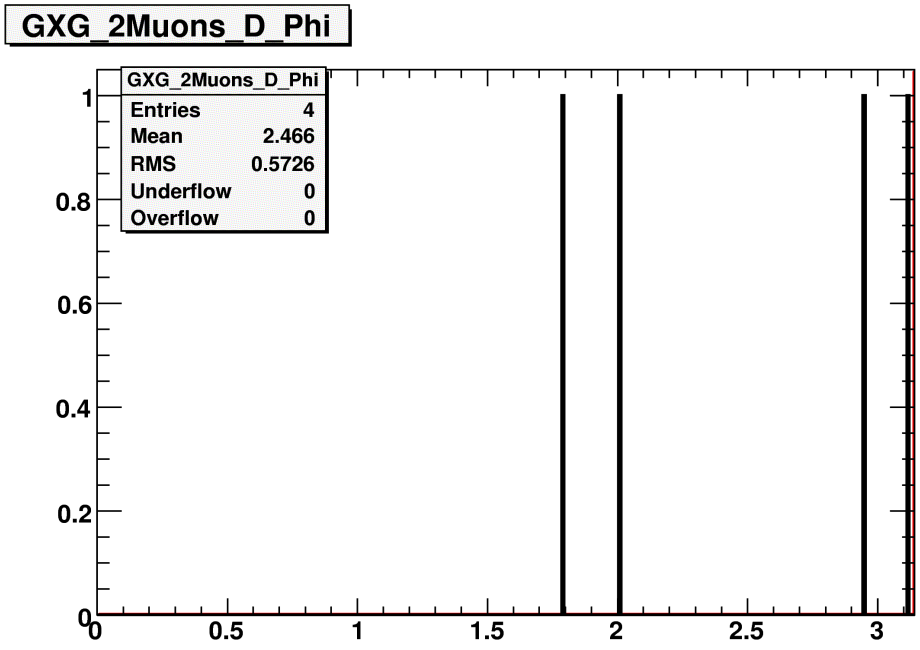
3D angle

Cosmics cut:
3D angle > 3.05 (events rejected)

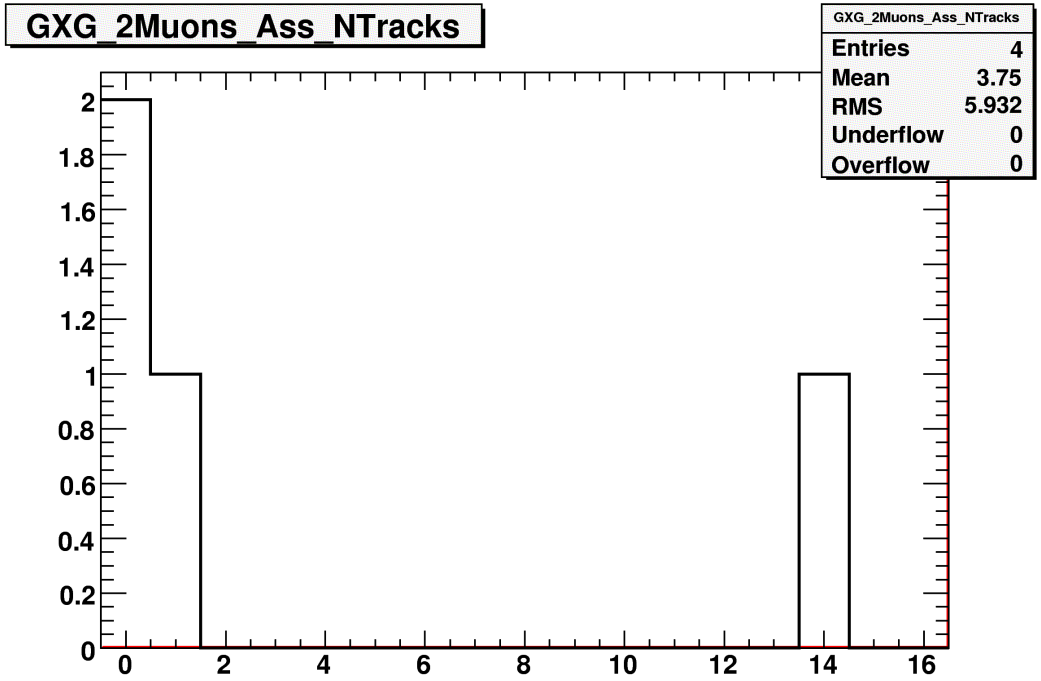
Muon split into 2 tracks (or inverse situation) cut
3D angle < 0.05 (events rejected)



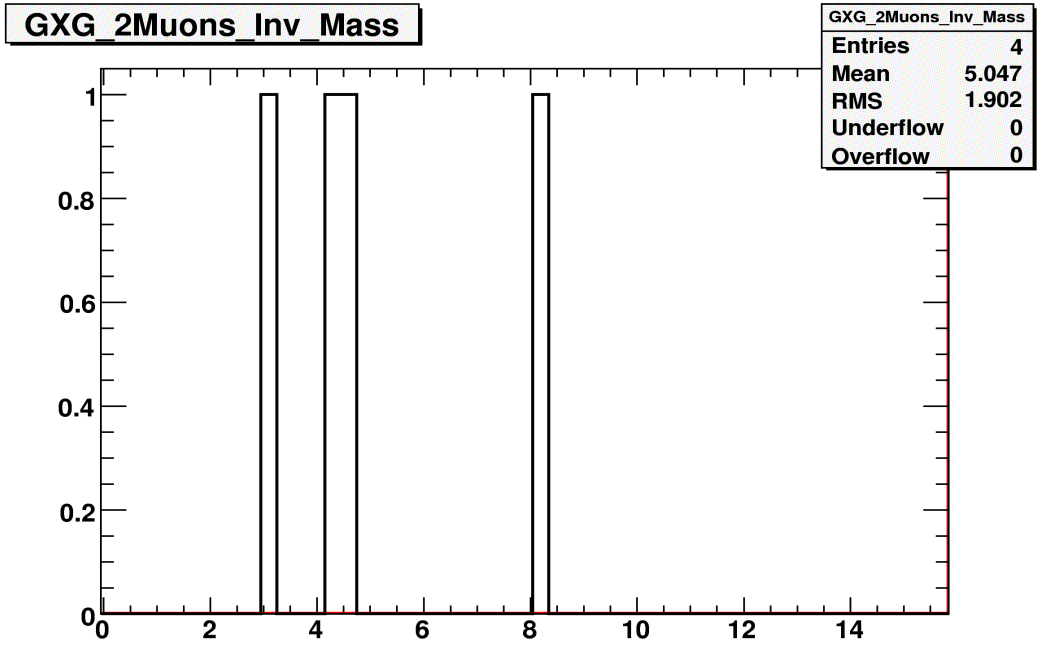




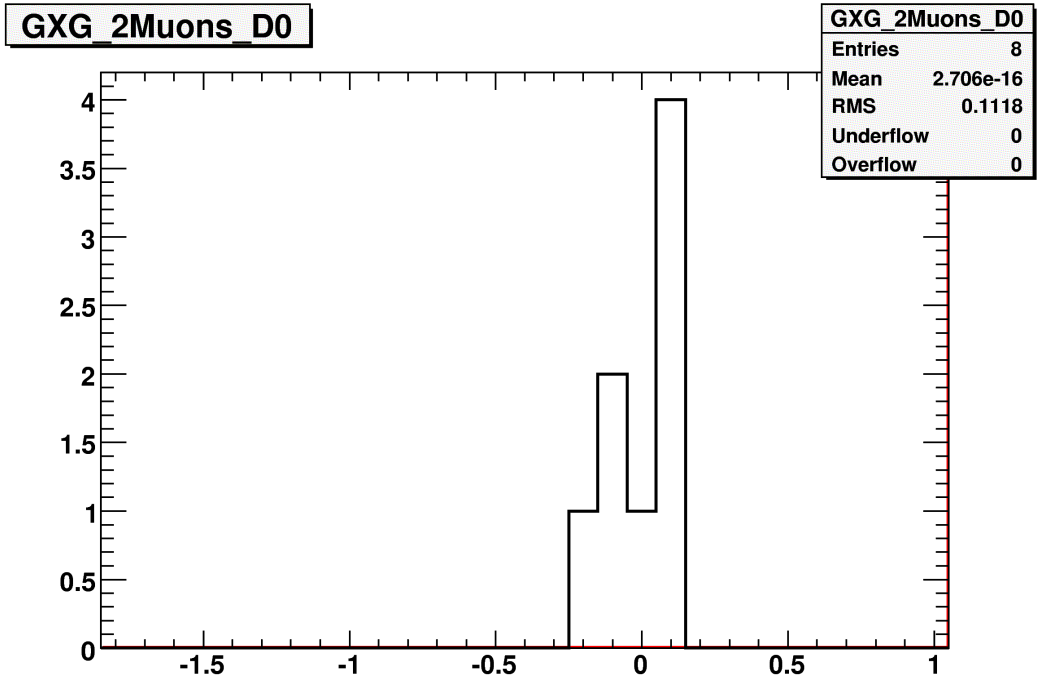
<^ Pt (scalar sum)
^> Missing Pt (vector sum)
<< Delta Phi



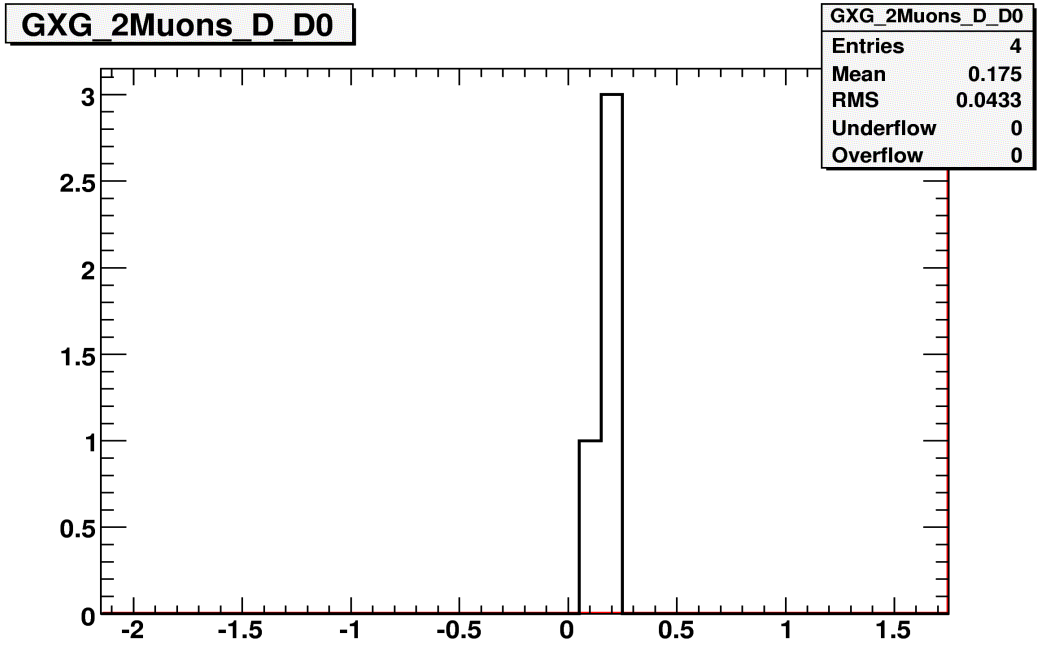
Number of other tracks in event



Invariant mass of μμ pair



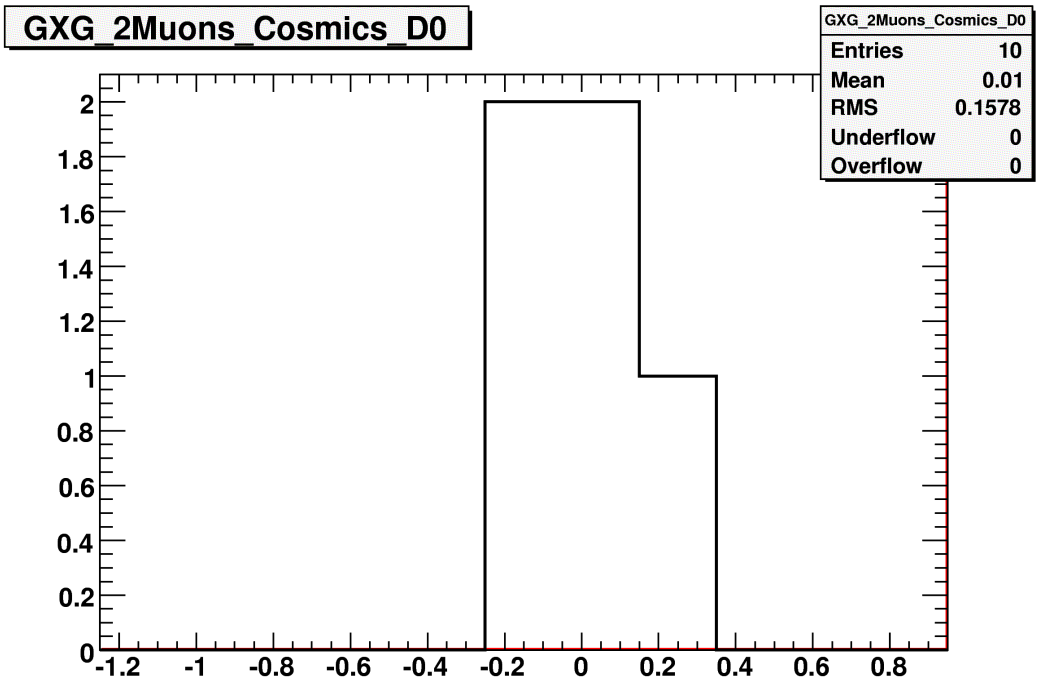
D0 of each track



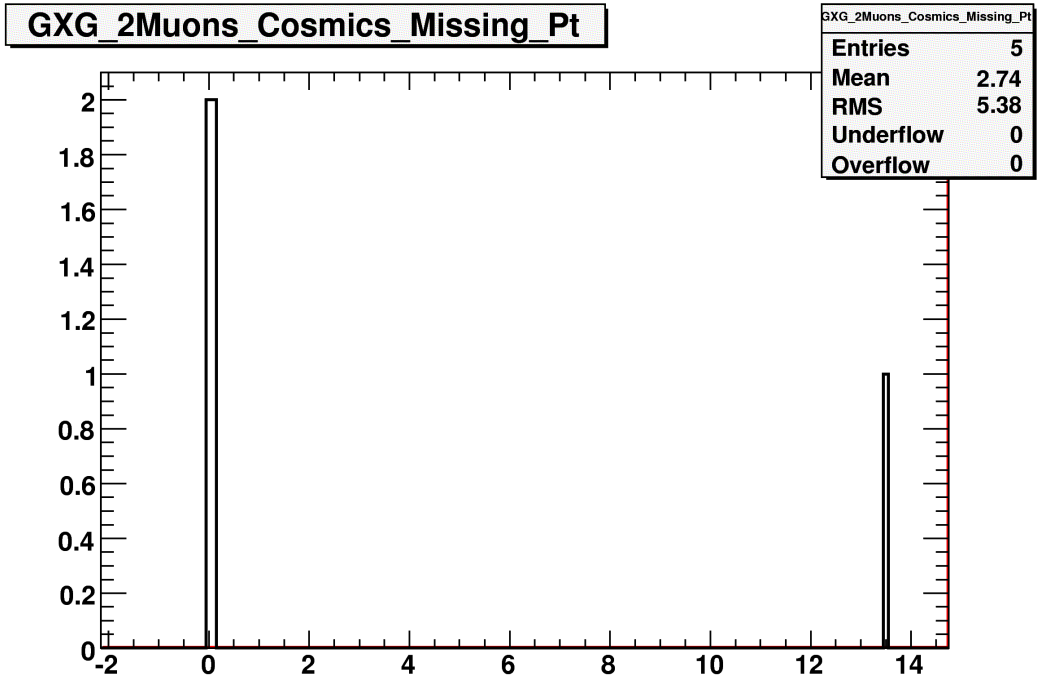
Difference in D0 in μμ pair

Some plots of events with 3D angle > 3.05 (cosmics probably) (dimuons)

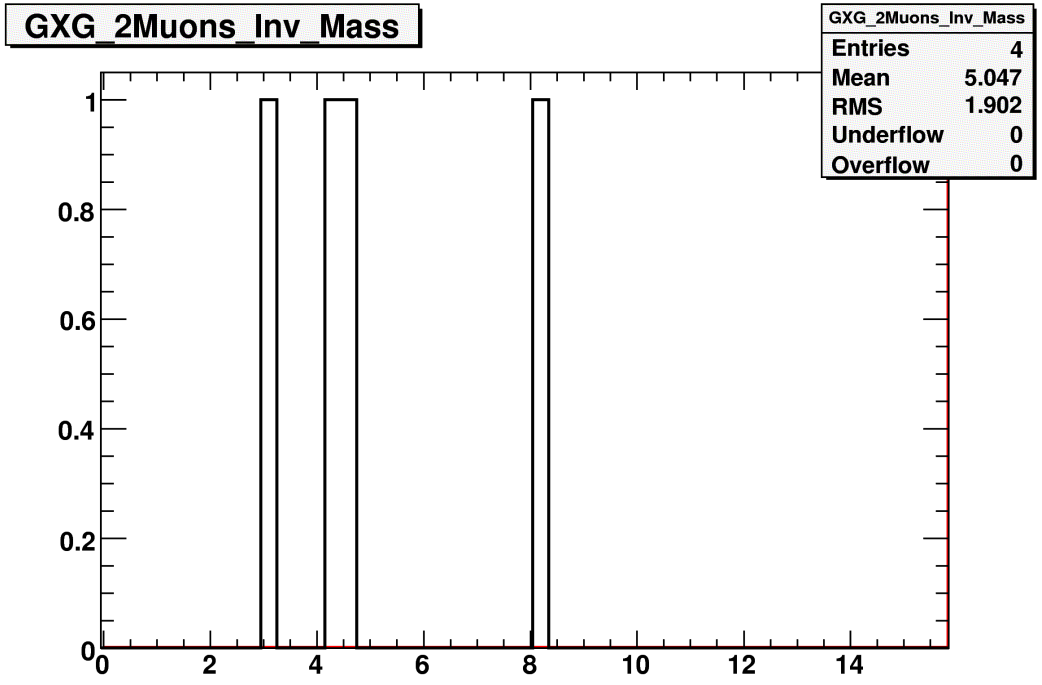
The same conditions as in muons analysis



D0



Missing Pt of a μμ pair



Invariant mass