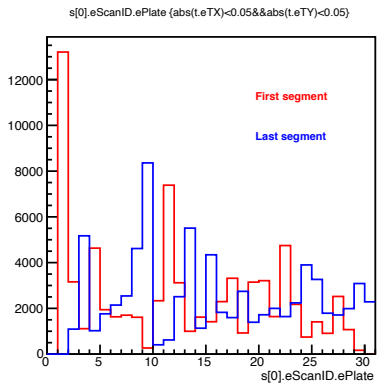
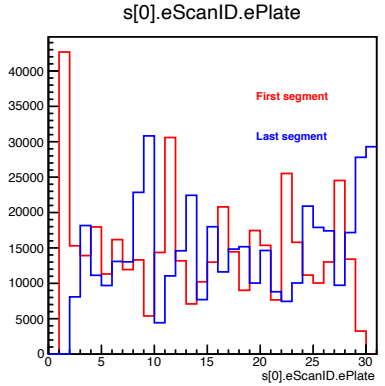
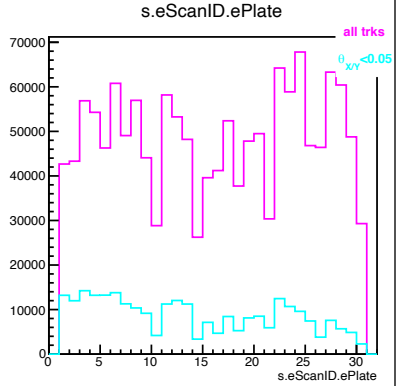
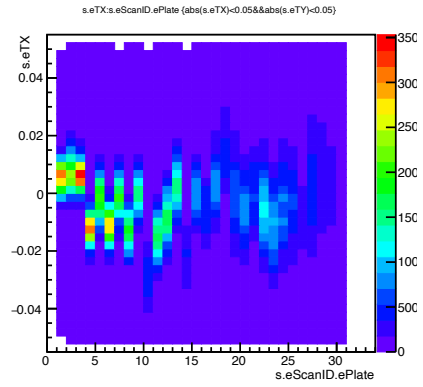
Update on the Analysis of GSI1 ^{16}O (200 MeV on C and C_2H_4)

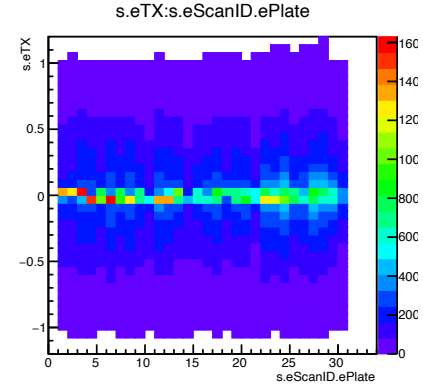
GSI 1 - S1 / BEFORE vs AFTER

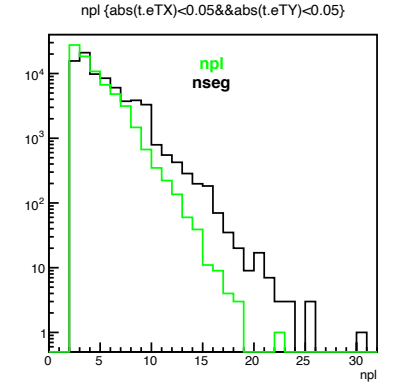


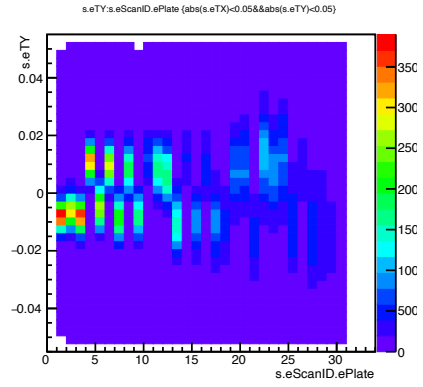


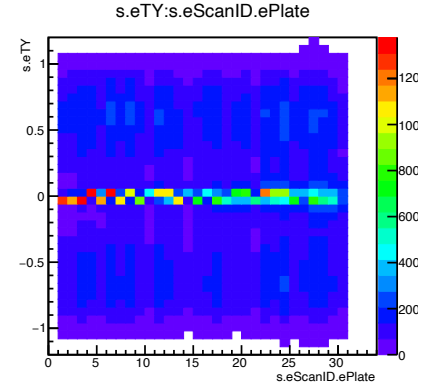


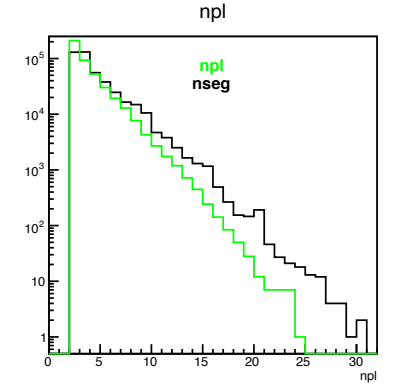


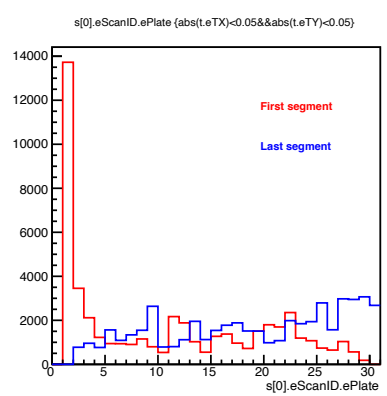


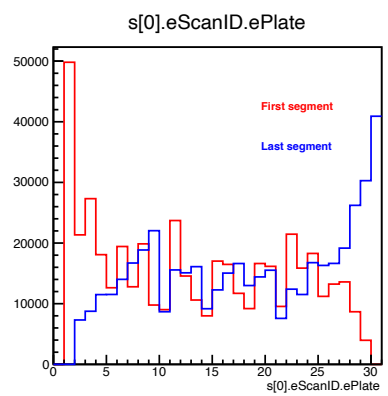


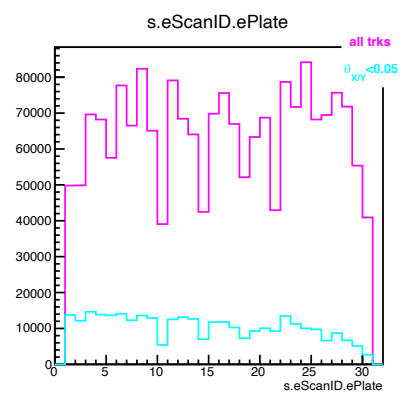


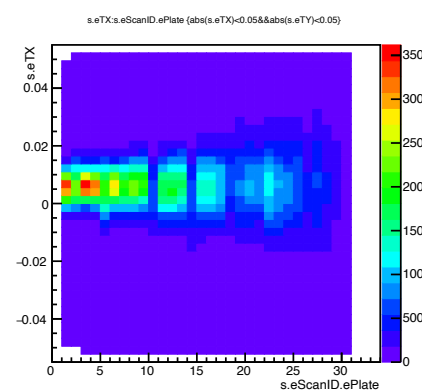


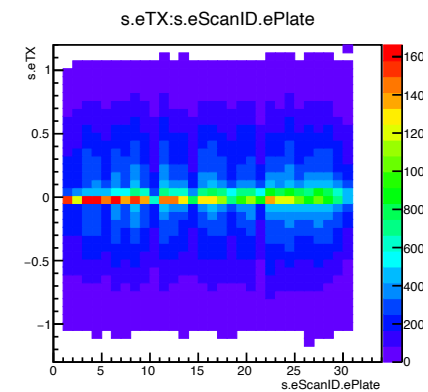


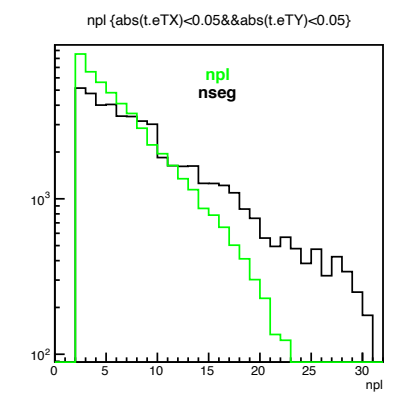


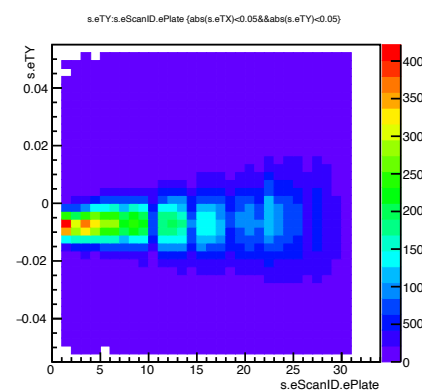


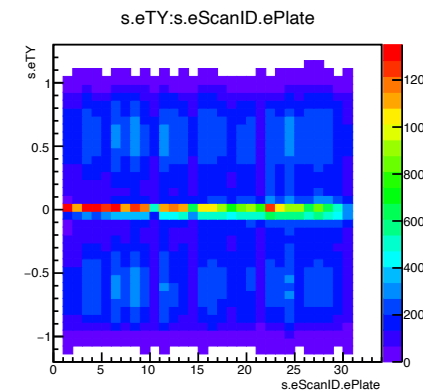


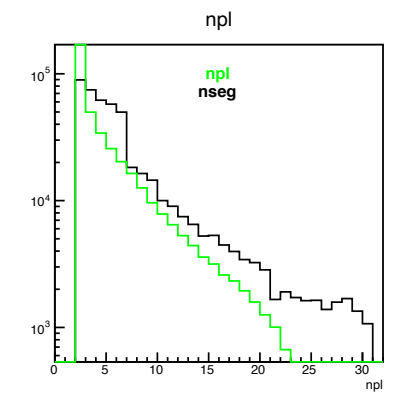




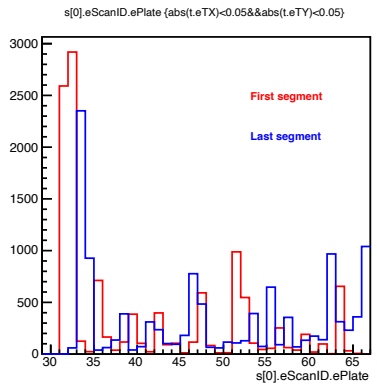


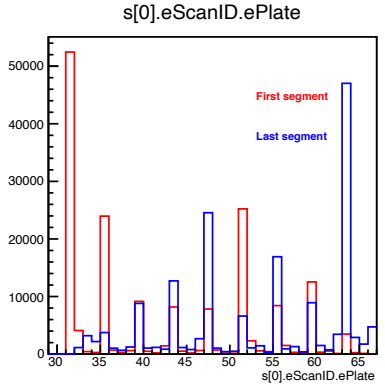


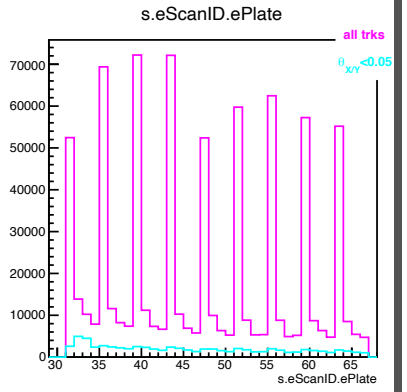


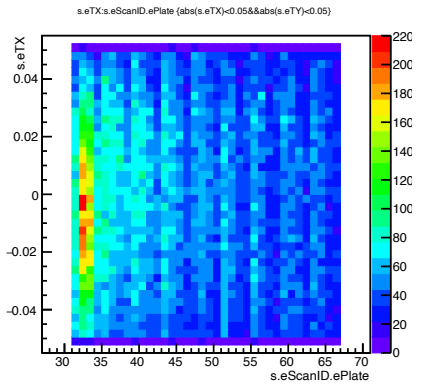


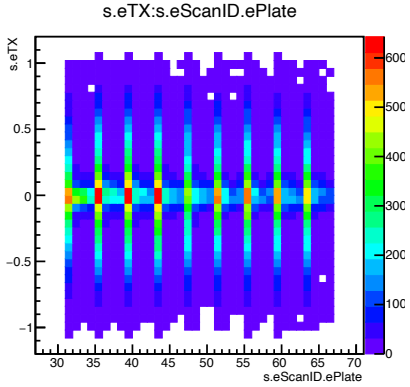
GSI 1 - S2 / BEFORE vs AFTER

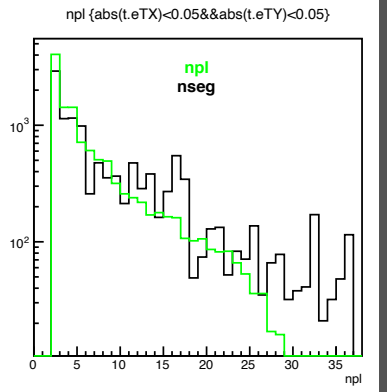


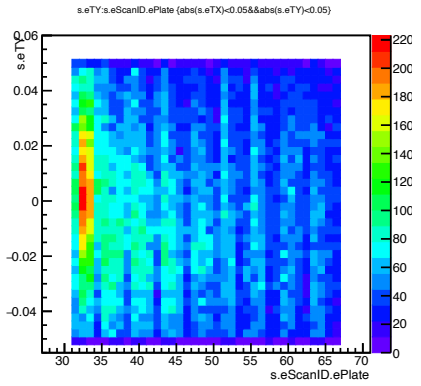


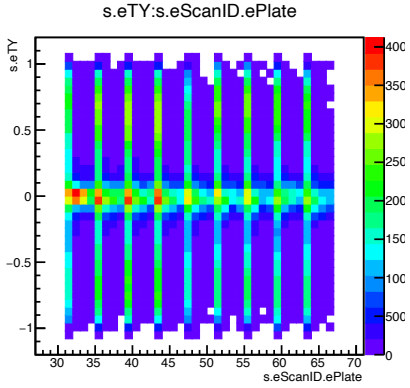


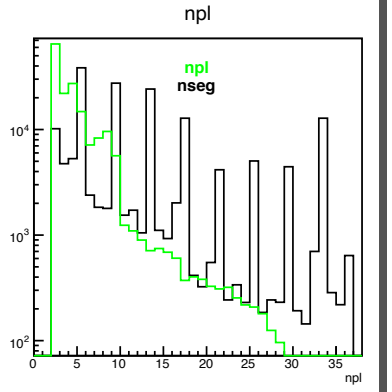


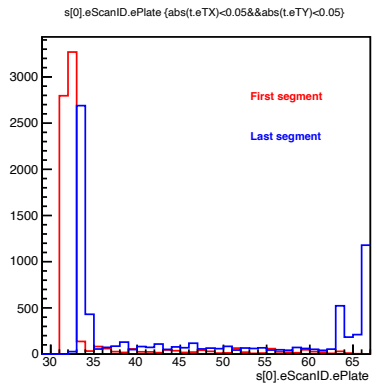


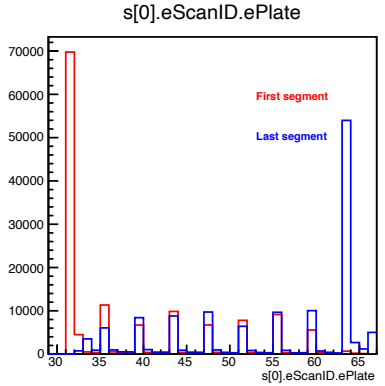


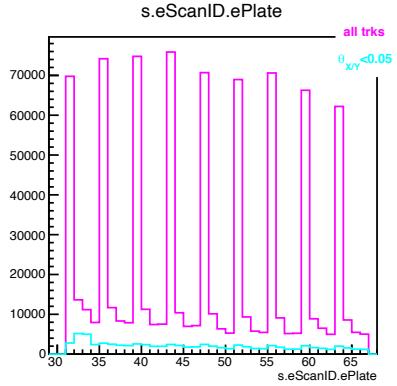


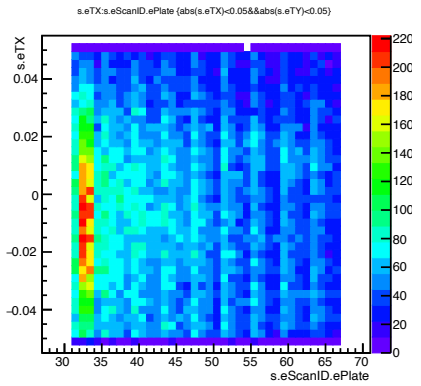


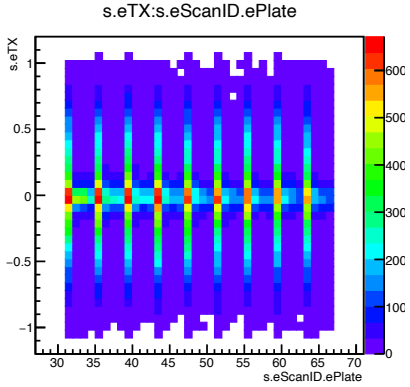


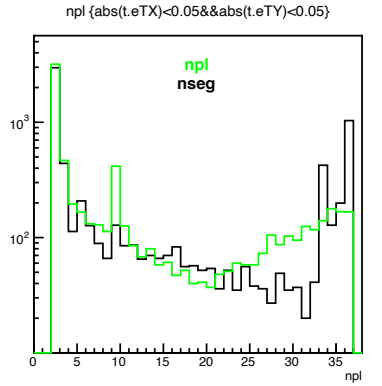


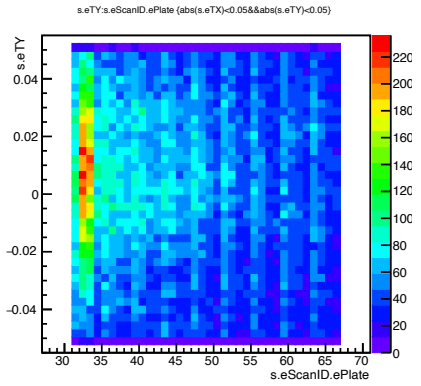


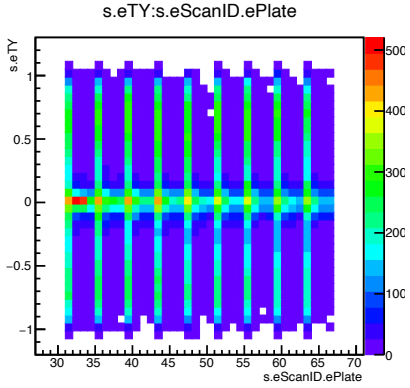


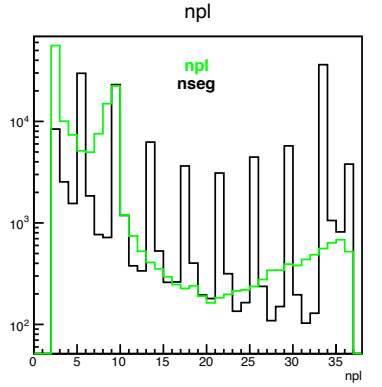






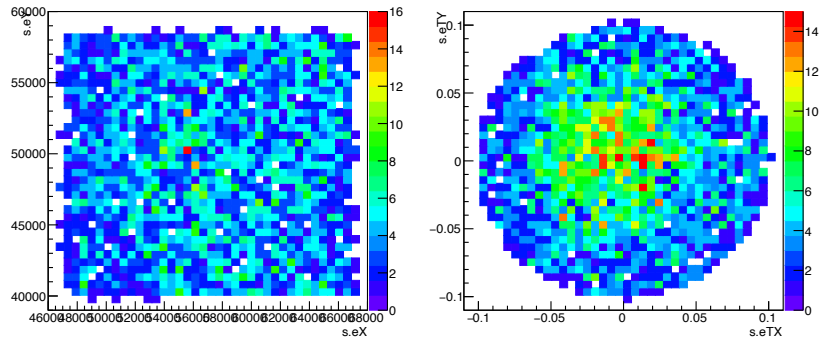




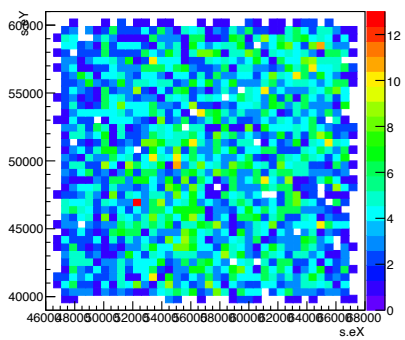


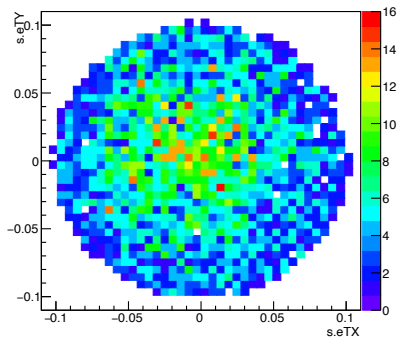
cp 30-36

Pl 30

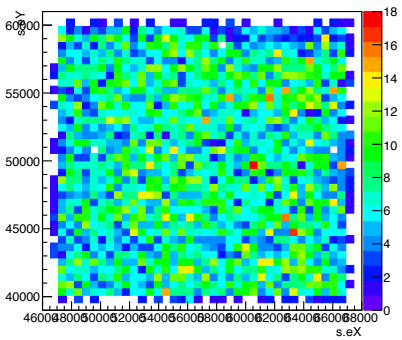


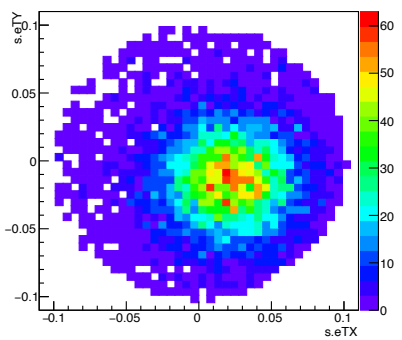
Pl 31



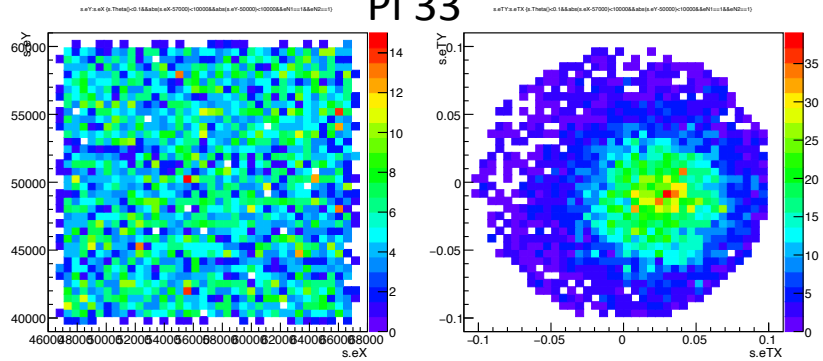


Pl 32

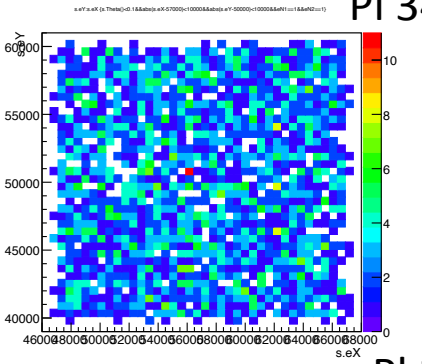


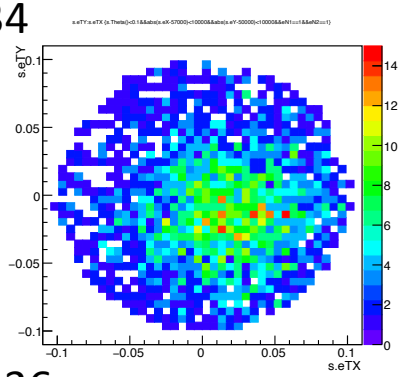


Pl 33

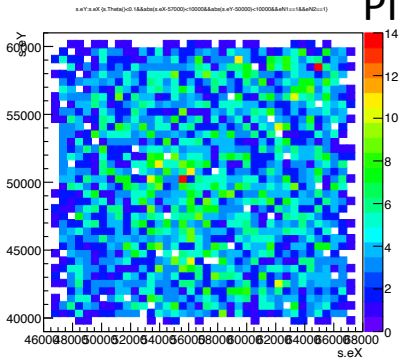


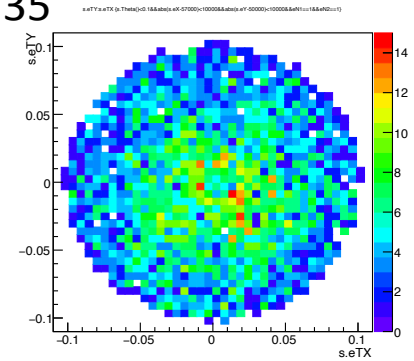
Pl 34



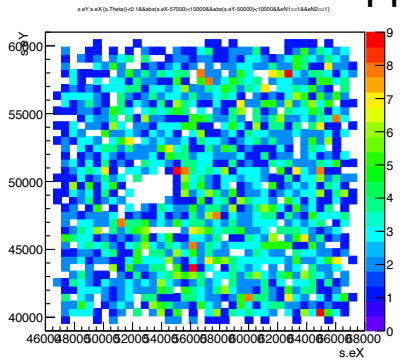


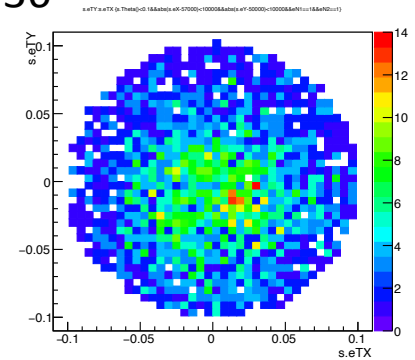
Pl 35





Pl 36

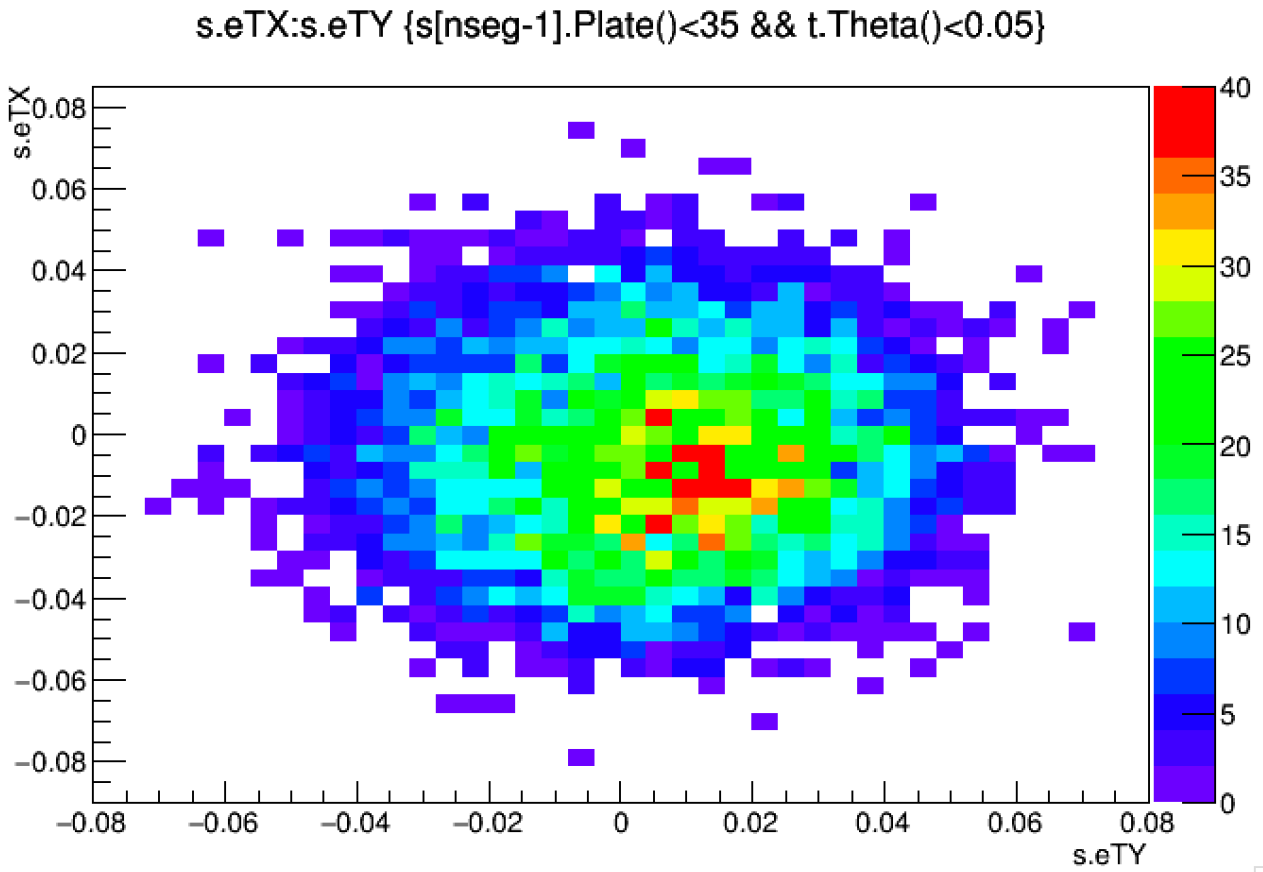


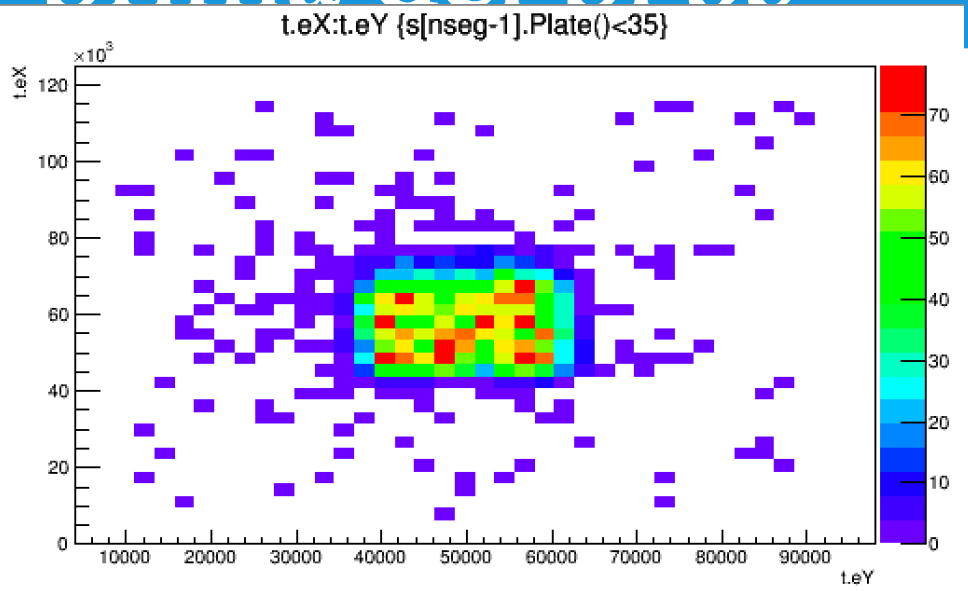


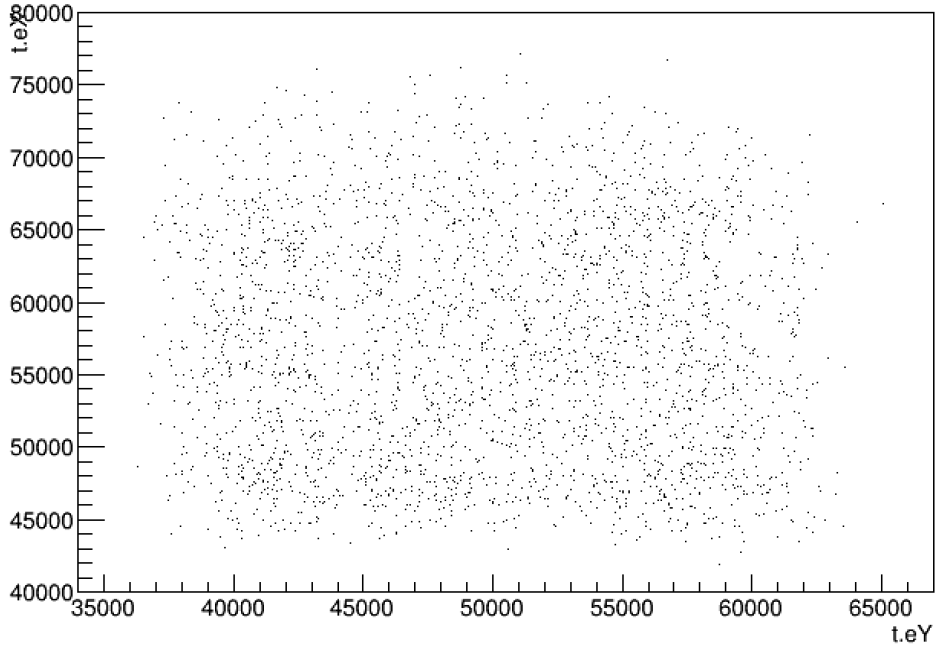
cp 30-36

R0: plate 31, tot 2157992, theta<0.06 5086
R1: plate 32, tot 67165, theta<0.06 9252
R2: plate 33, tot 38614, theta<0.06 6209
R3: plate 34, tot 22275, theta<0.06 3008
R0: plate 35, tot 1719293, theta<0.06 4834
R1: plate 36, tot 56577, theta<0.06 3262
R2: plate 37, tot 22743, theta<0.06 2904
R3: plate 38, tot 21153, theta<0.06 2743
R0: plate 39, tot 1746116, theta<0.06 4651
R1: plate 40, tot 52865, theta<0.06 3116
R2: plate 41, tot 17640, theta<0.06 2566

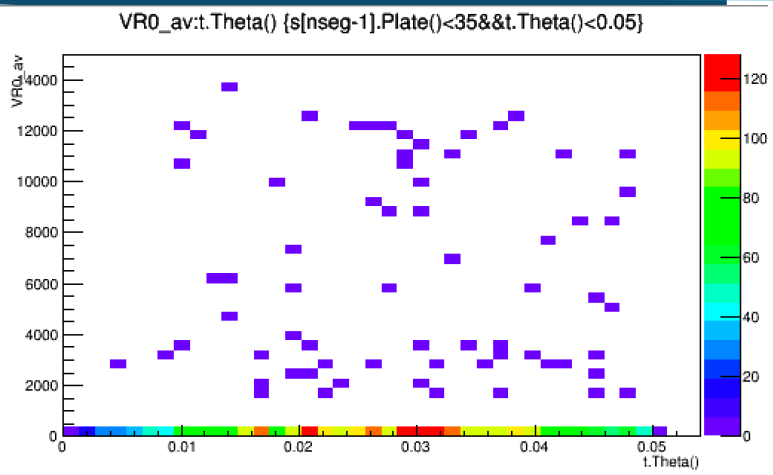
TX:TY tracce che finiscono prima del pl 35

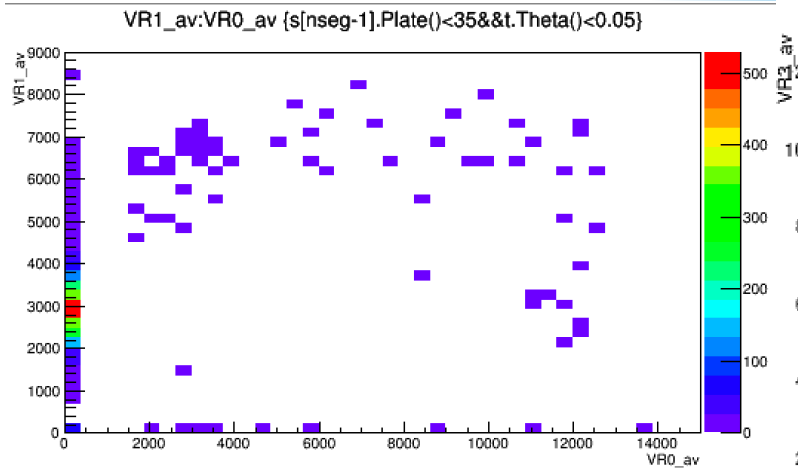


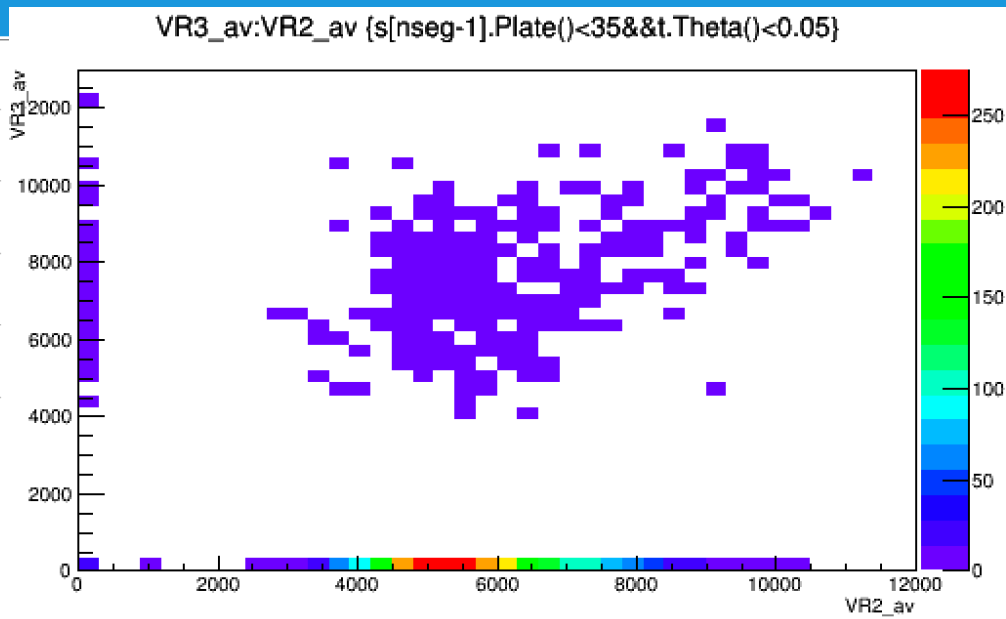


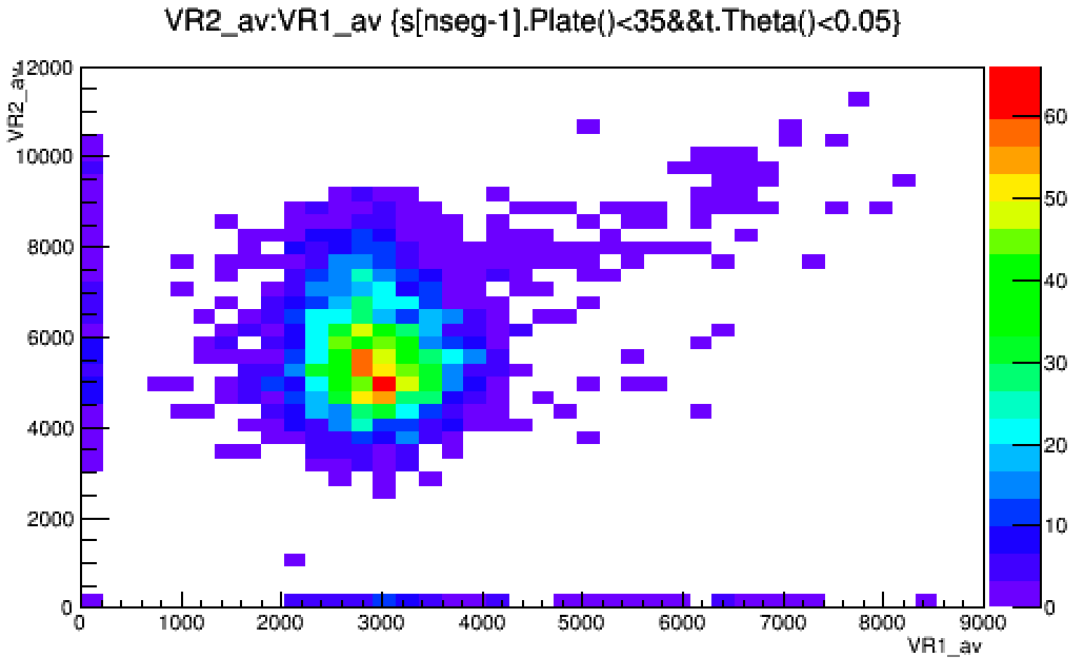


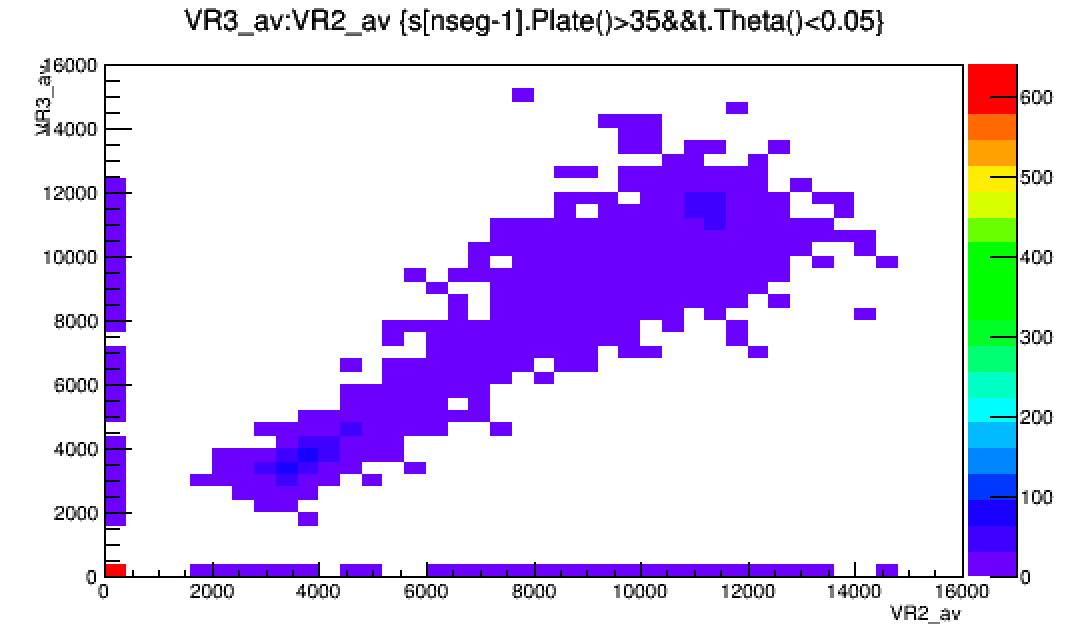
Volume


VR0_av:t.Theta() {s[nseg-1].Plate()<35&&t.Theta()<0.05}
VR0_av
t.Theta()


VR1_av:VR0_av {s[nseg-1].Plate()<35&&t.Theta()<0.05}
VR1_av
VR0_av

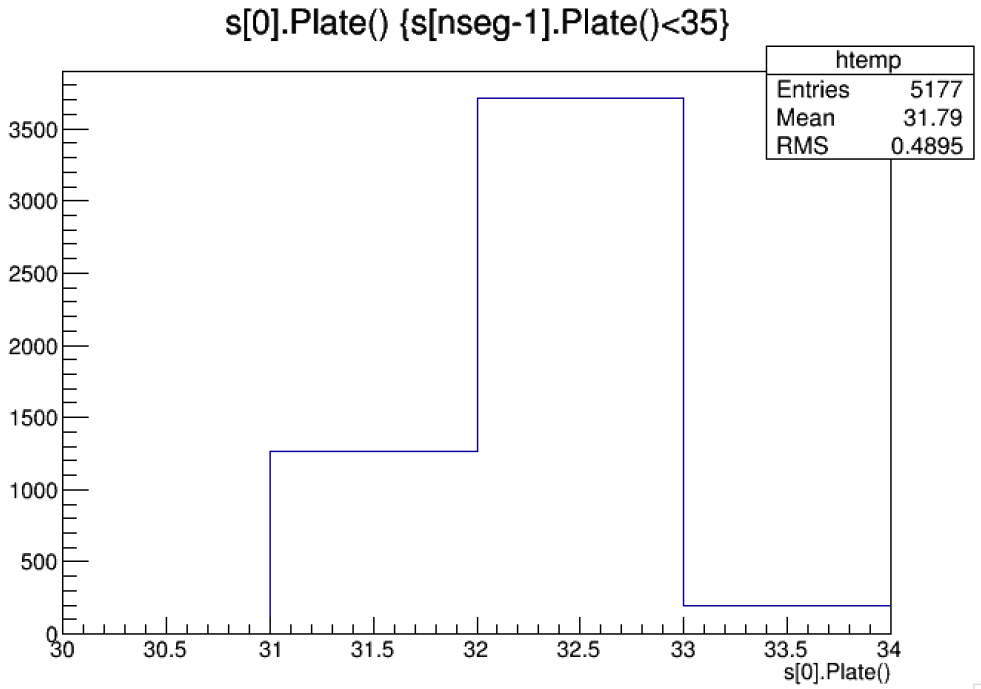

VR3_av:VR2_av {s[nseg-1].Plate()<35&&t.Theta()<0.05}
VR3_av
VR2_av

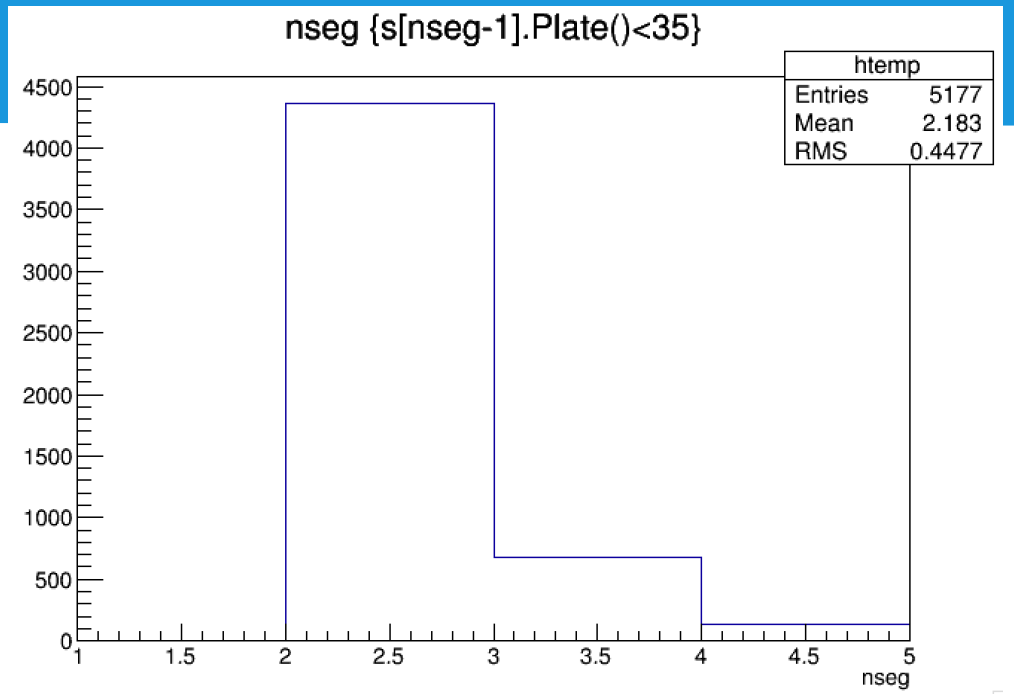

VR2_av:VR1_av {s[nseg-1].Plate()<35&&t.Theta()<0.05}
VR2_av
VR1_av

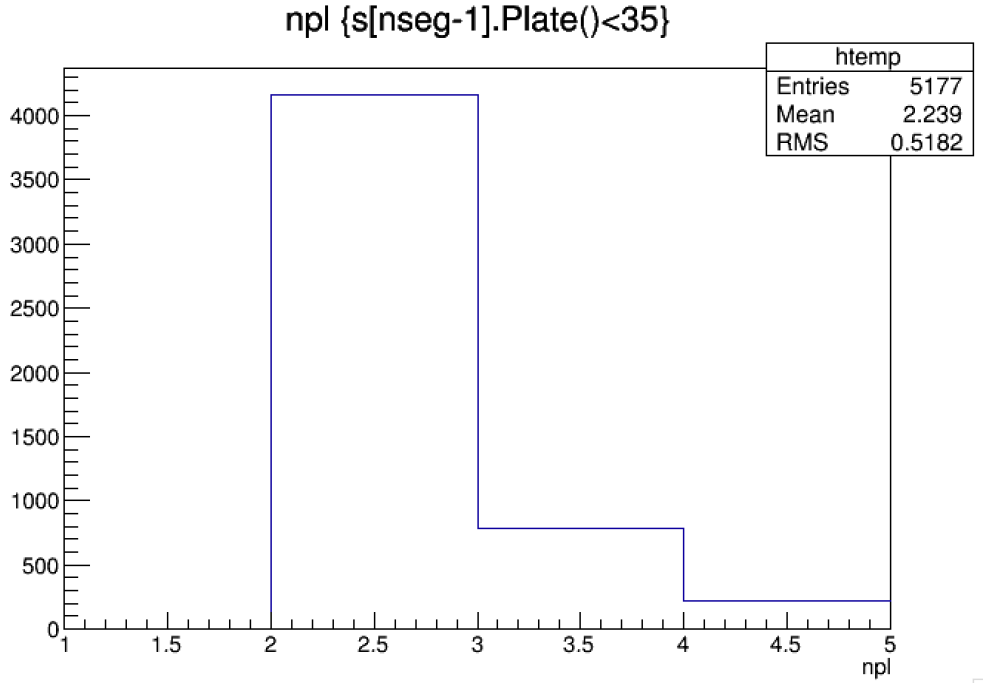

VR3_av:VR2_av {s[nseg-1].Plate()>35&&t.Theta()<0.05}
VR3_av
VR2_av

No cuts

Dove iniziano

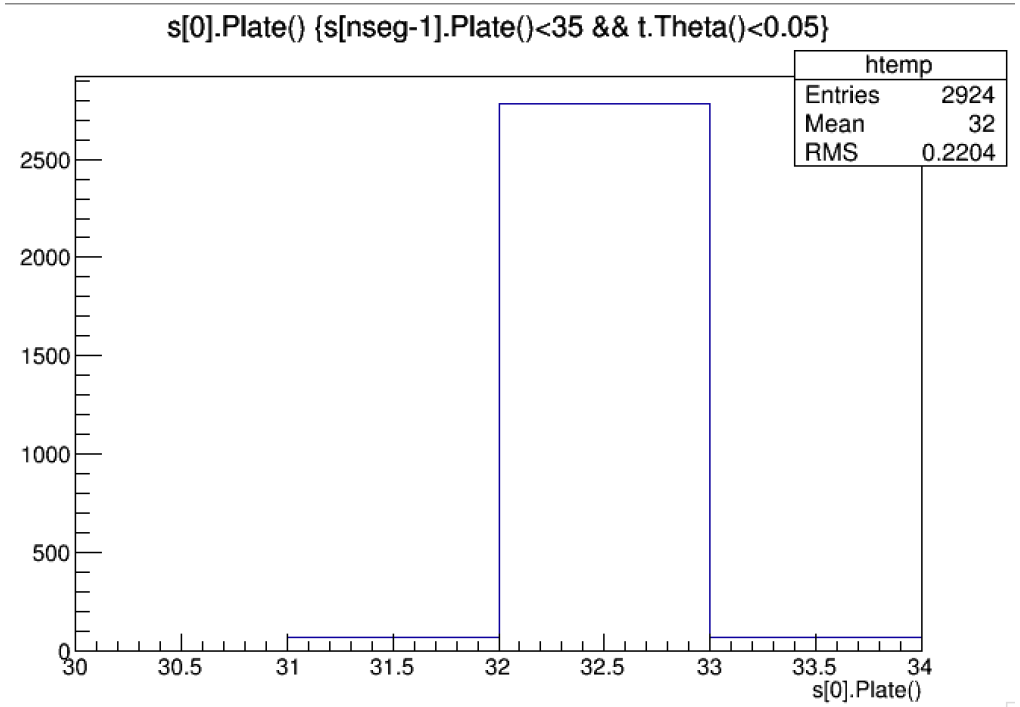


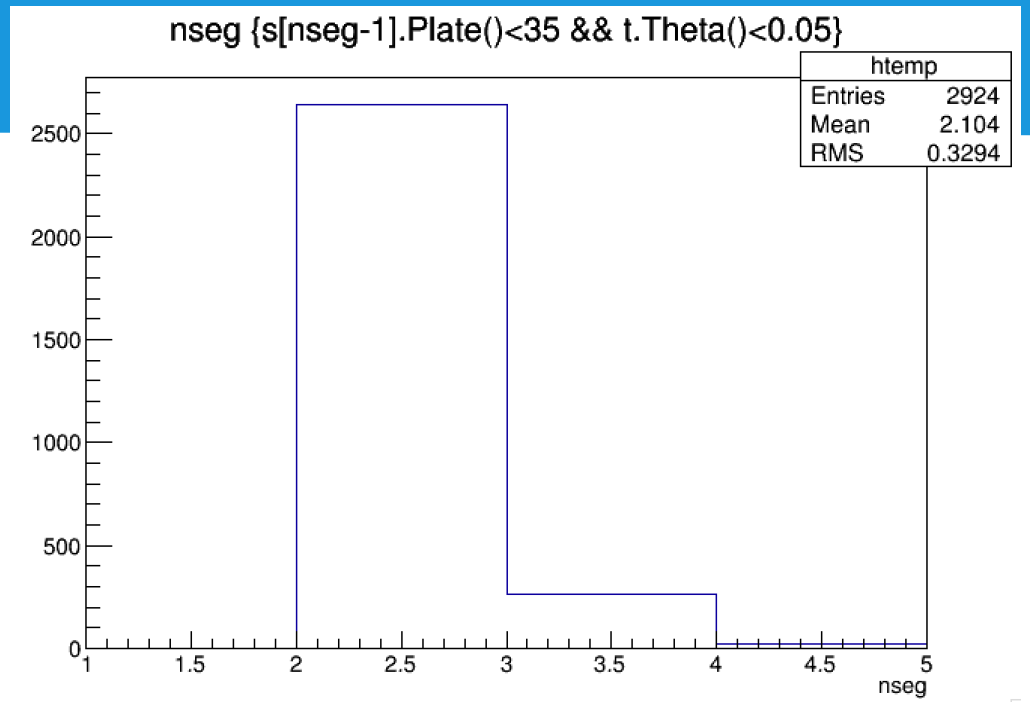


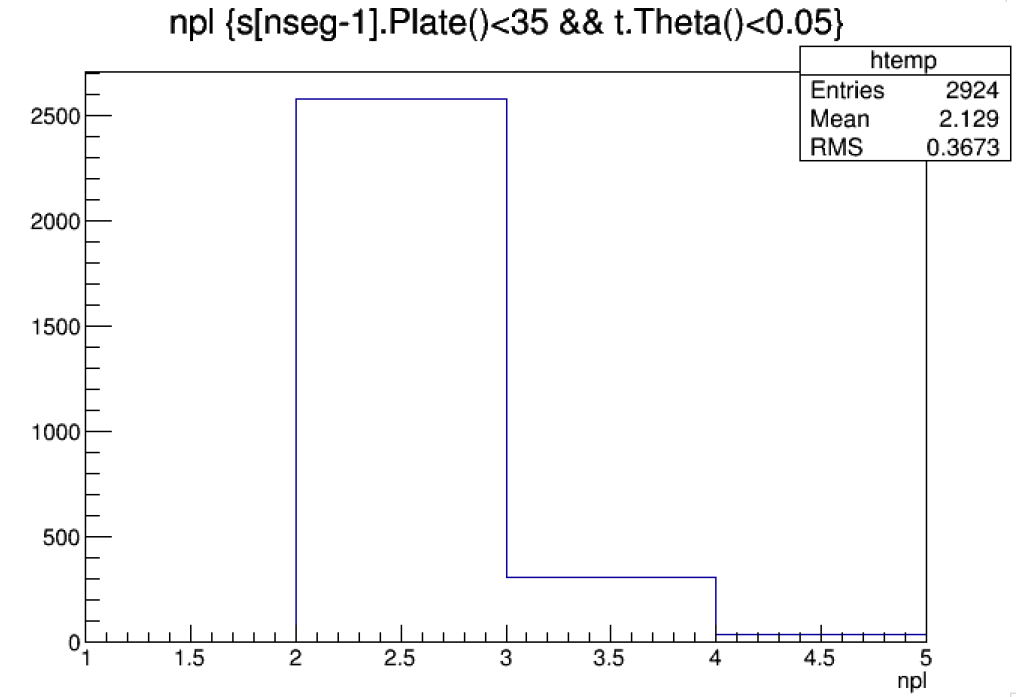


$\theta < 0.05$

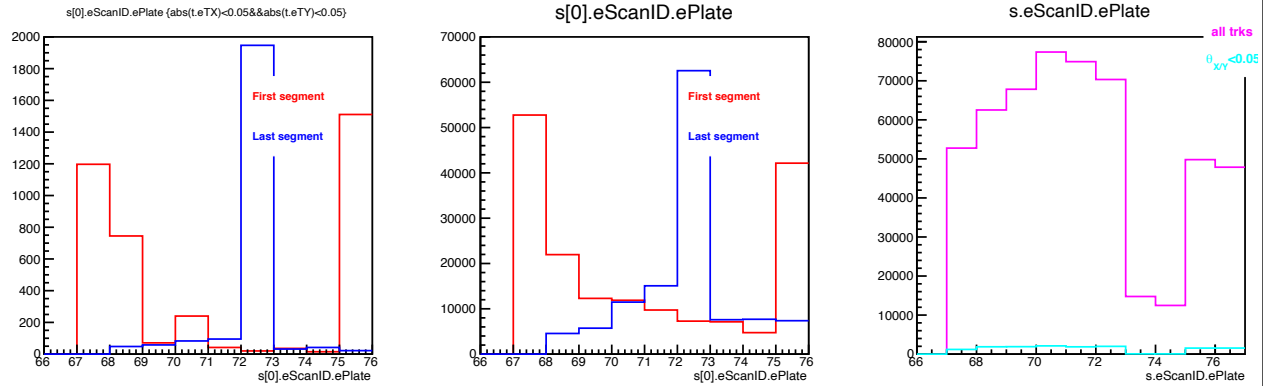
Dove iniziano

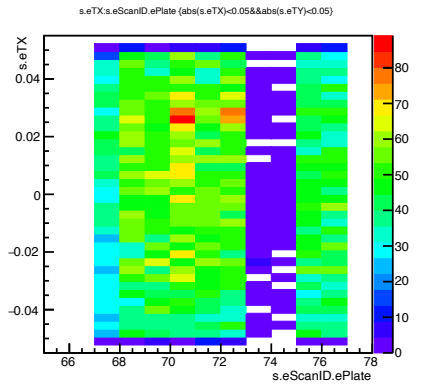


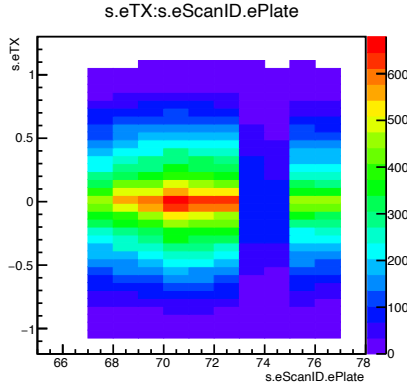


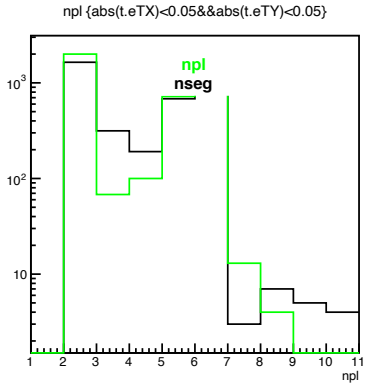


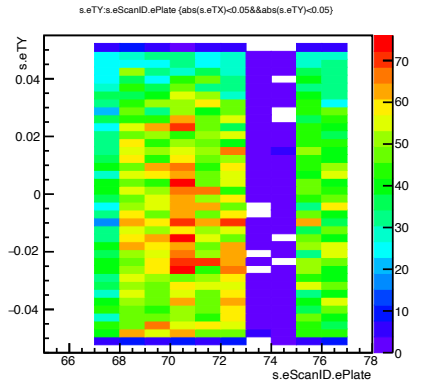
GSI 1 - S3 / BEFORE vs AFTER

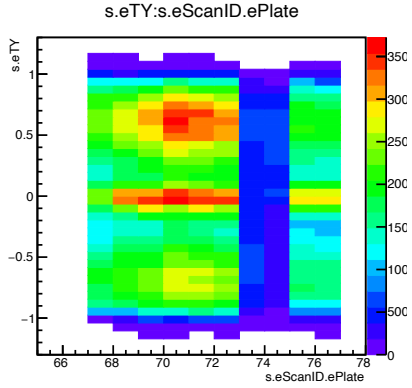


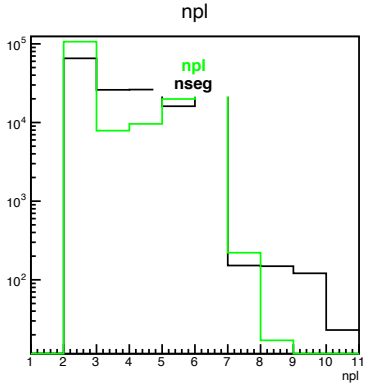


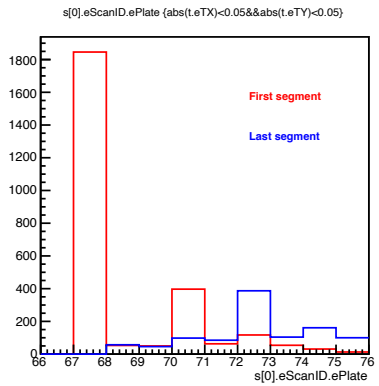


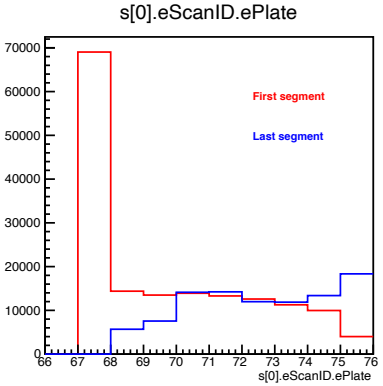


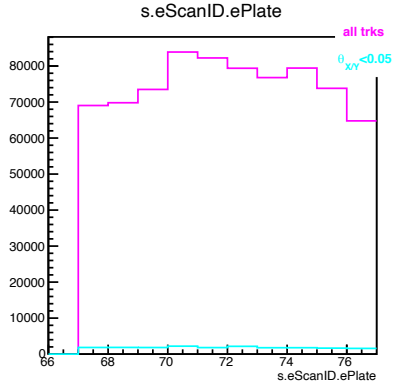


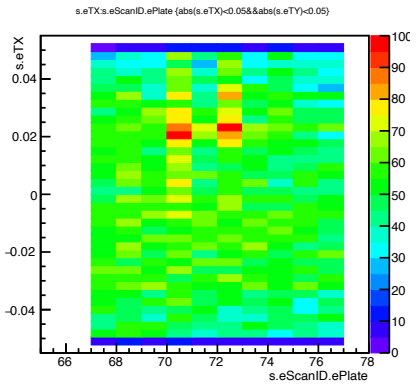


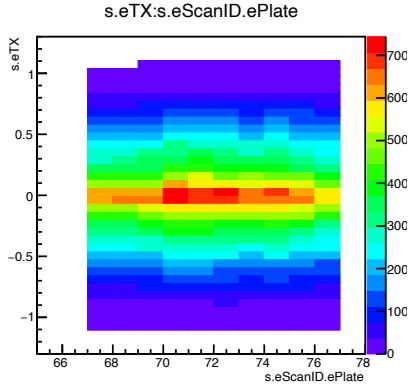


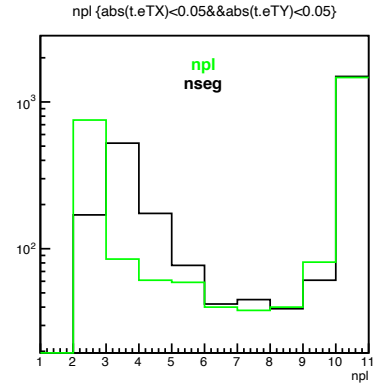


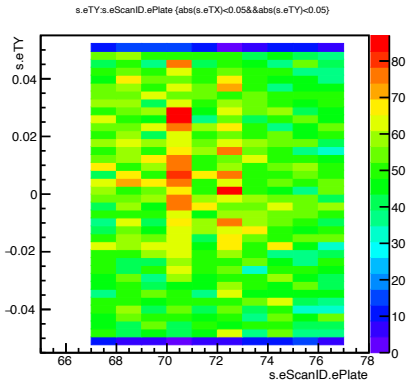


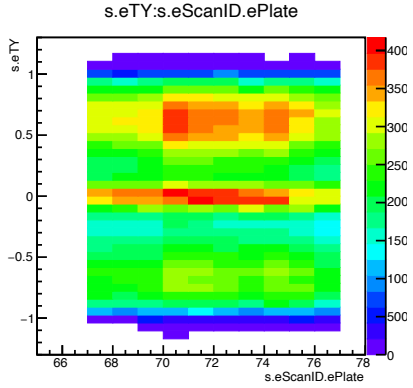


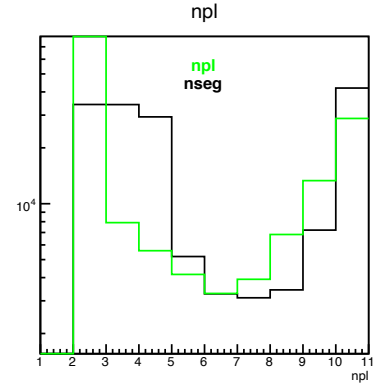




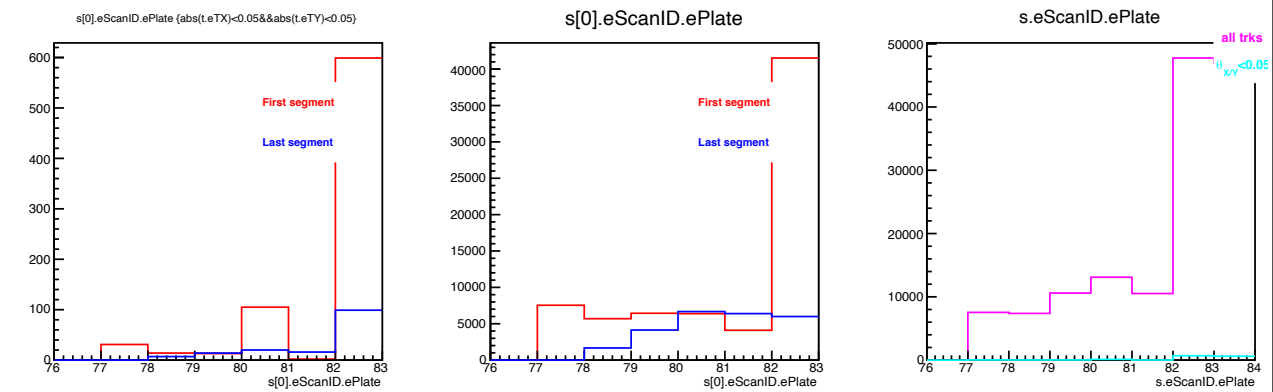


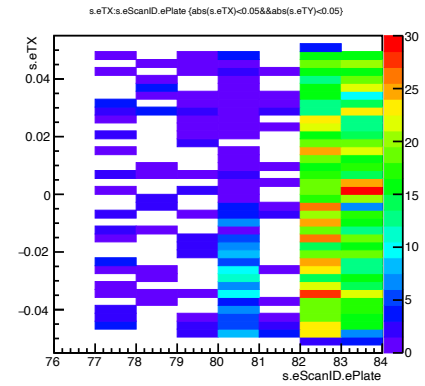


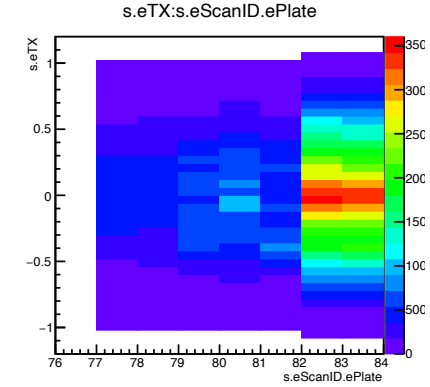


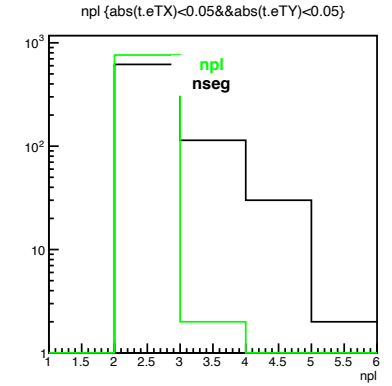


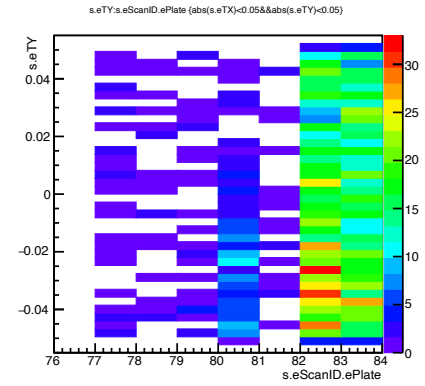
GSI 1 - S4 / BEFORE vs AFTER

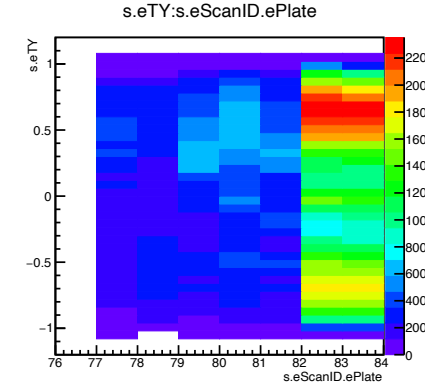


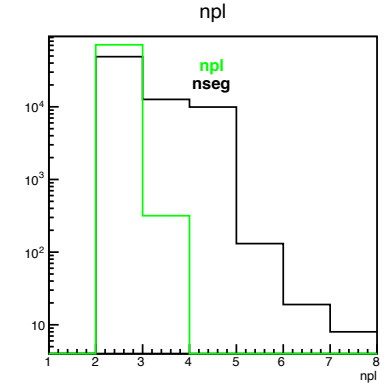


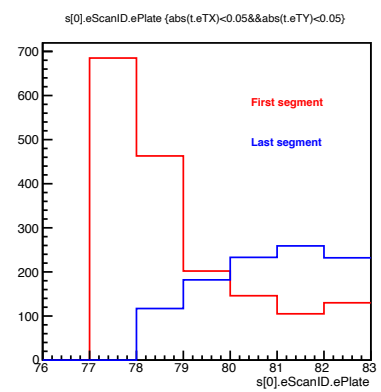


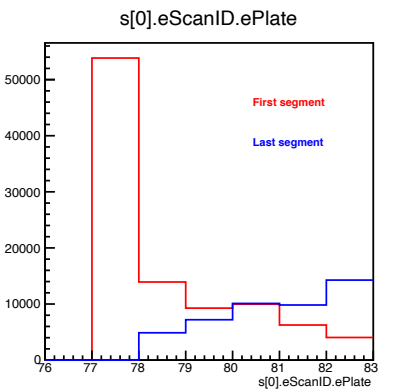


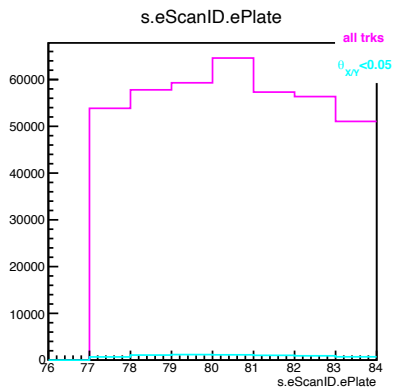


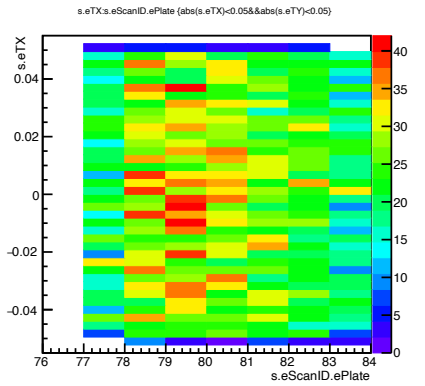


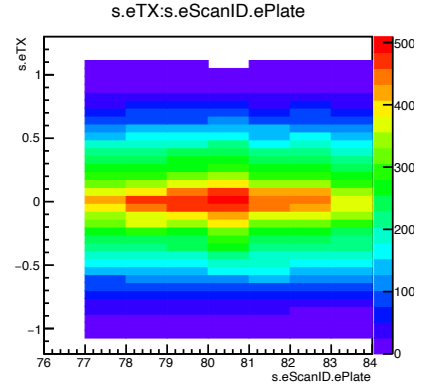


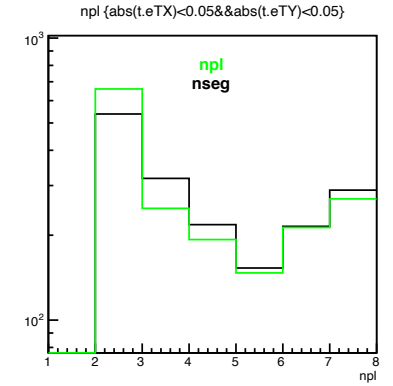


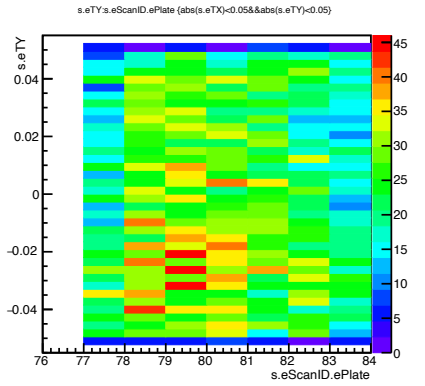


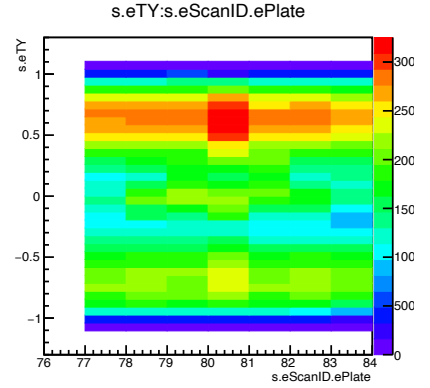


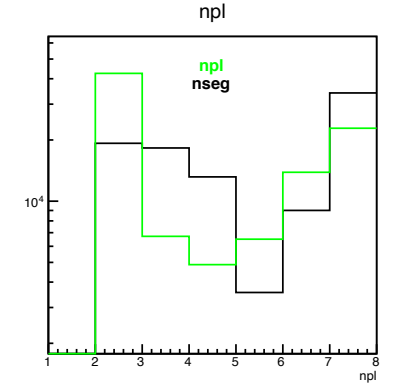




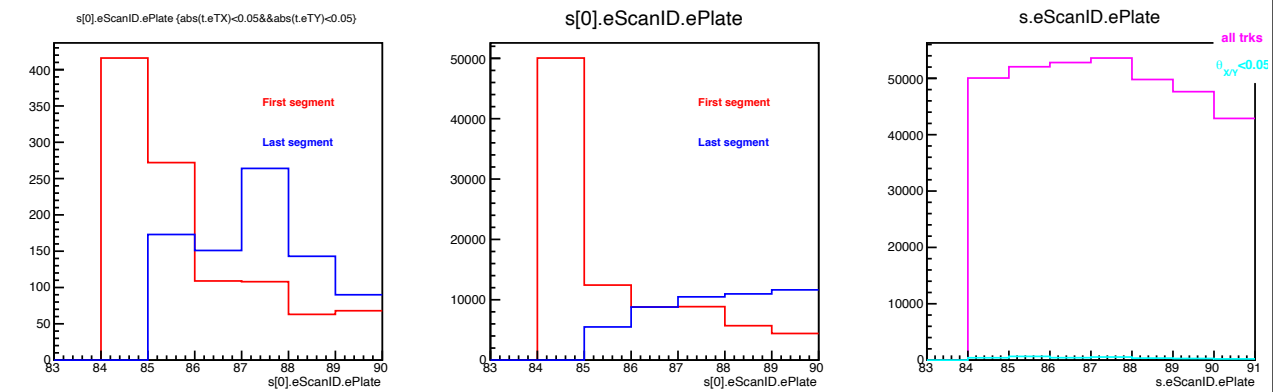


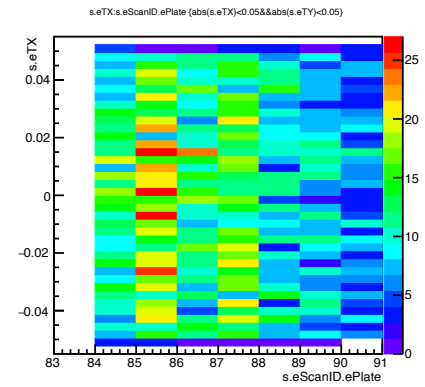


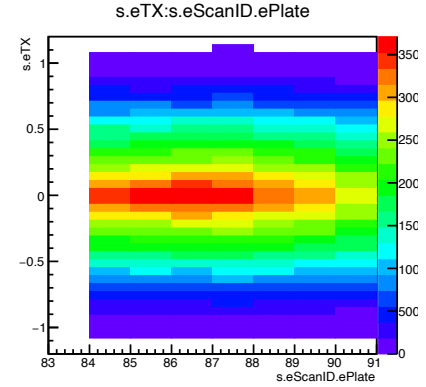


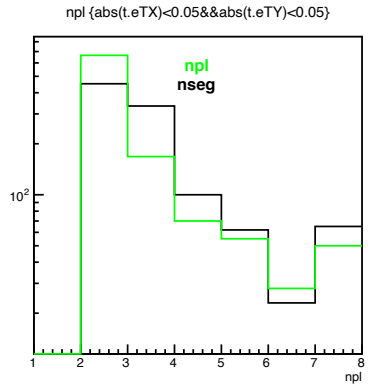


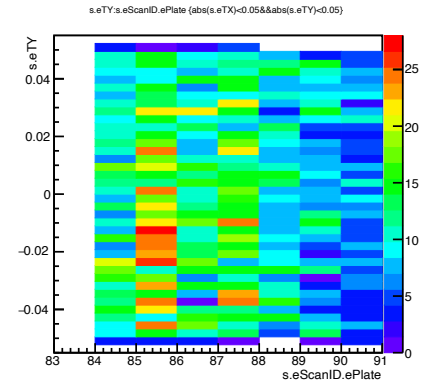
GSI 1 - S5 / BEFORE vs AFTER

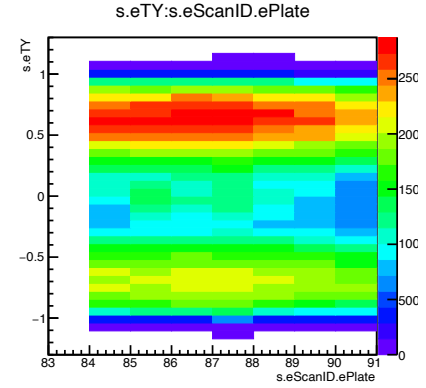


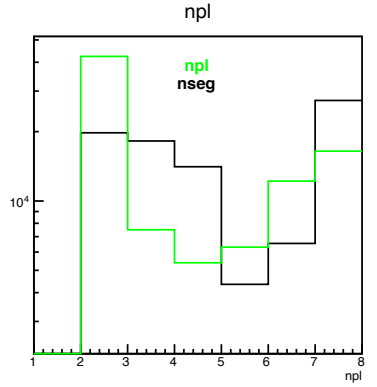


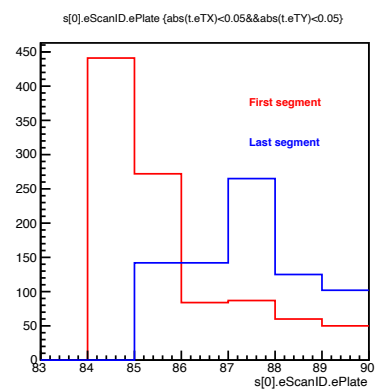


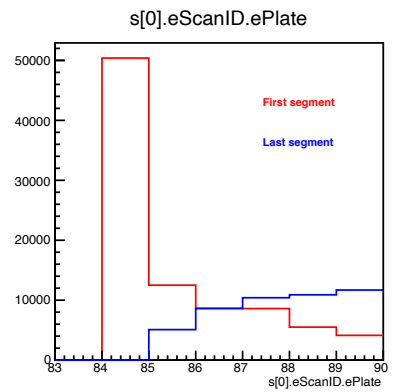


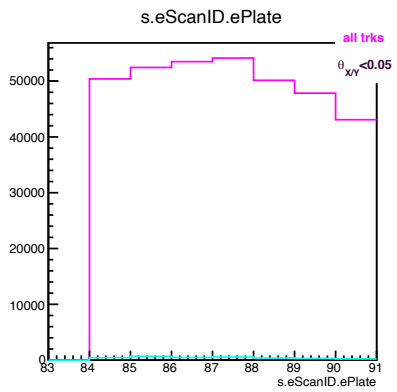


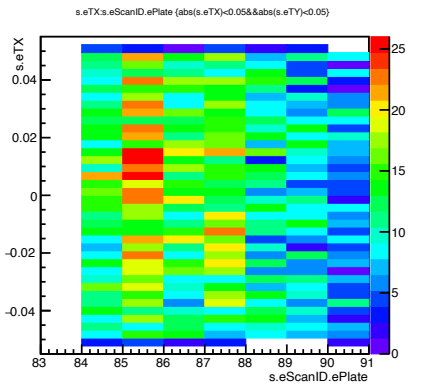


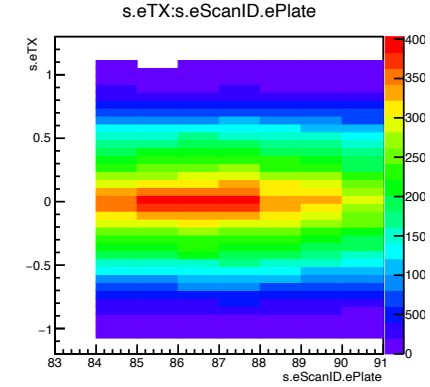


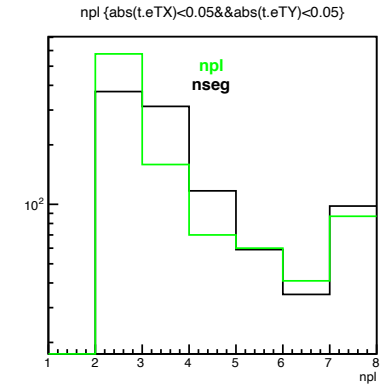


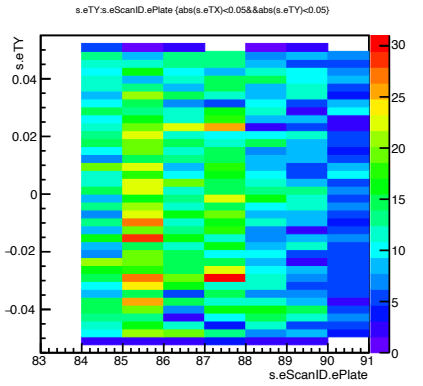


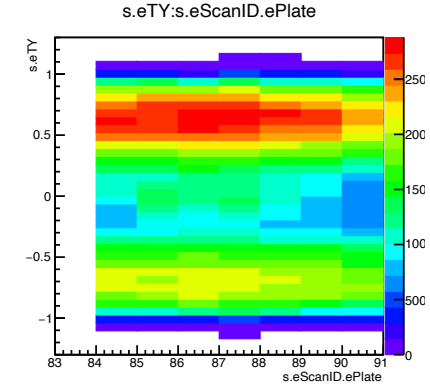


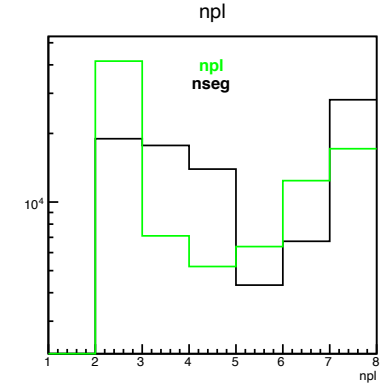




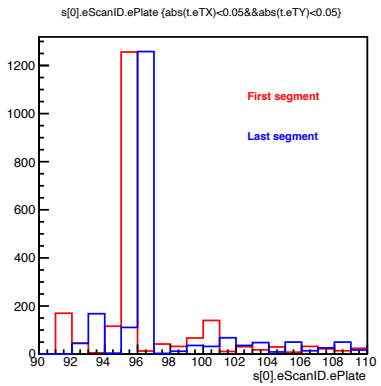


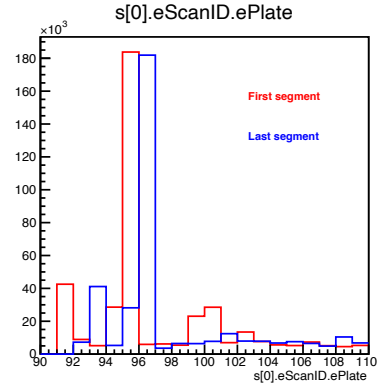


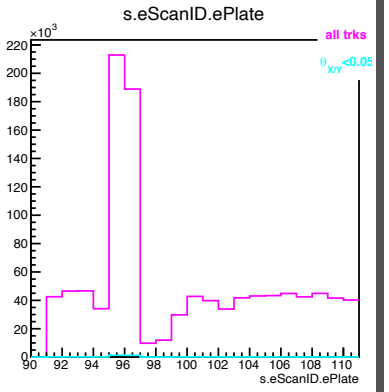


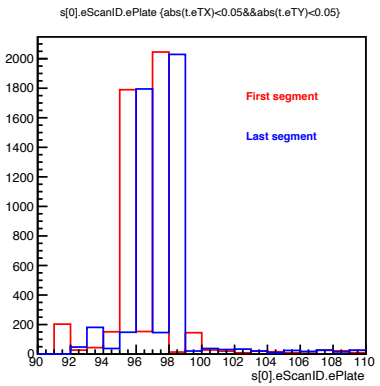


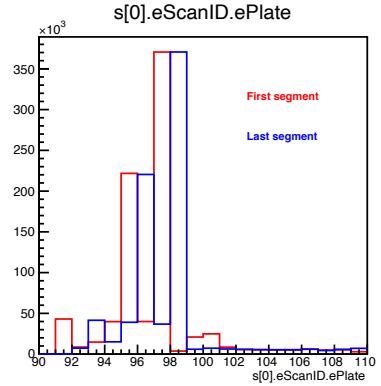
GSI 1 - S6 / BEFORE vs AFTER

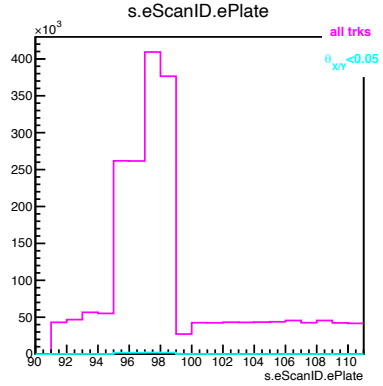


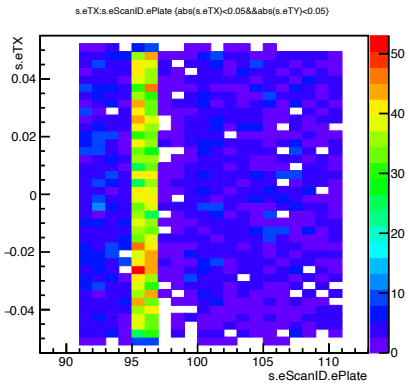


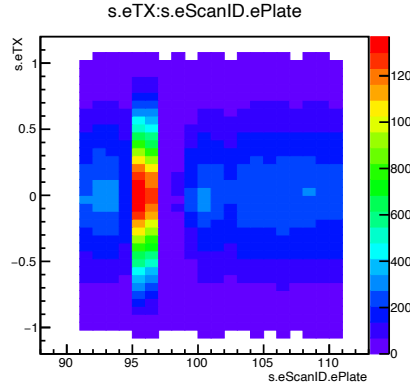


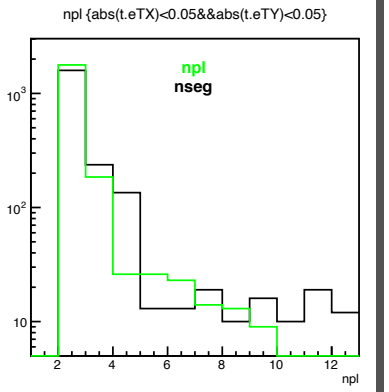


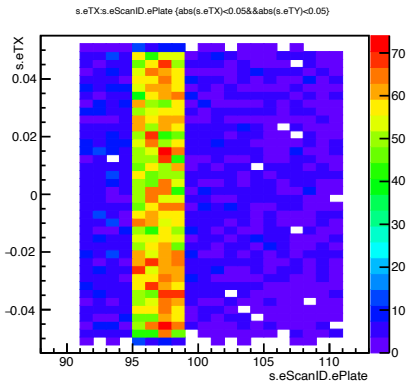


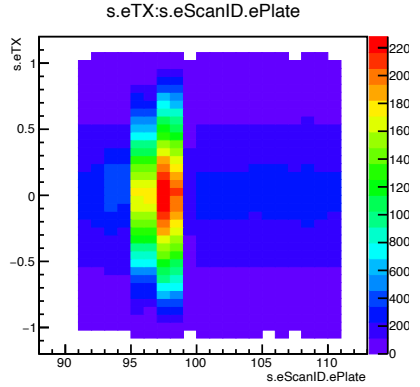


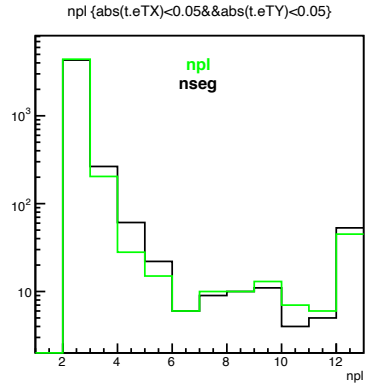


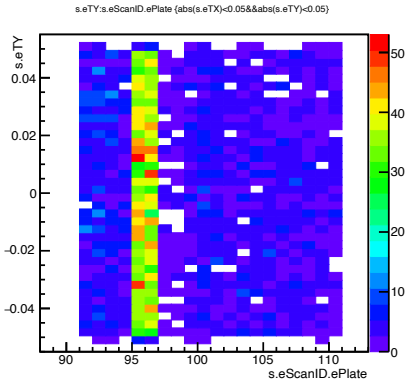


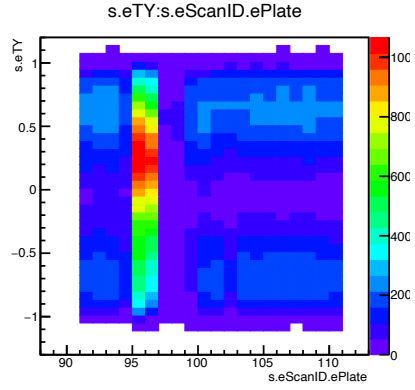


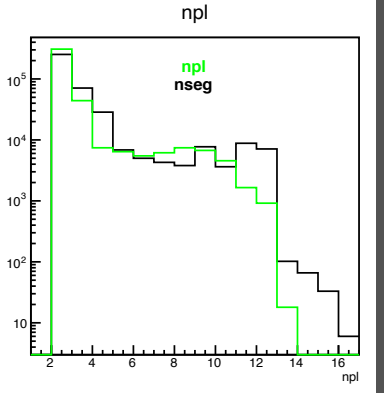


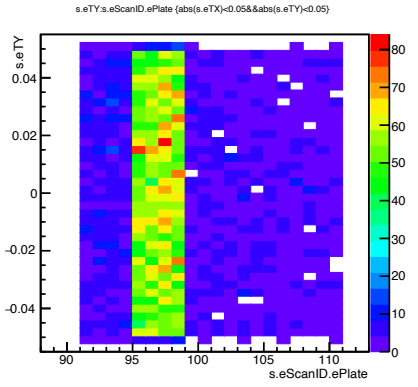


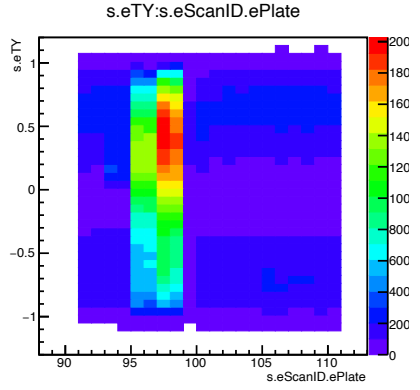


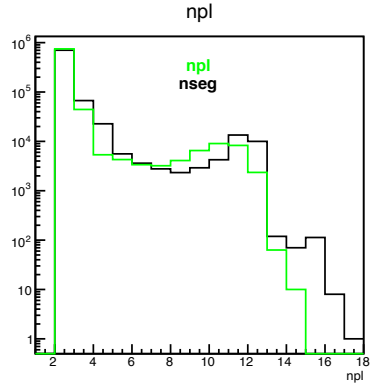




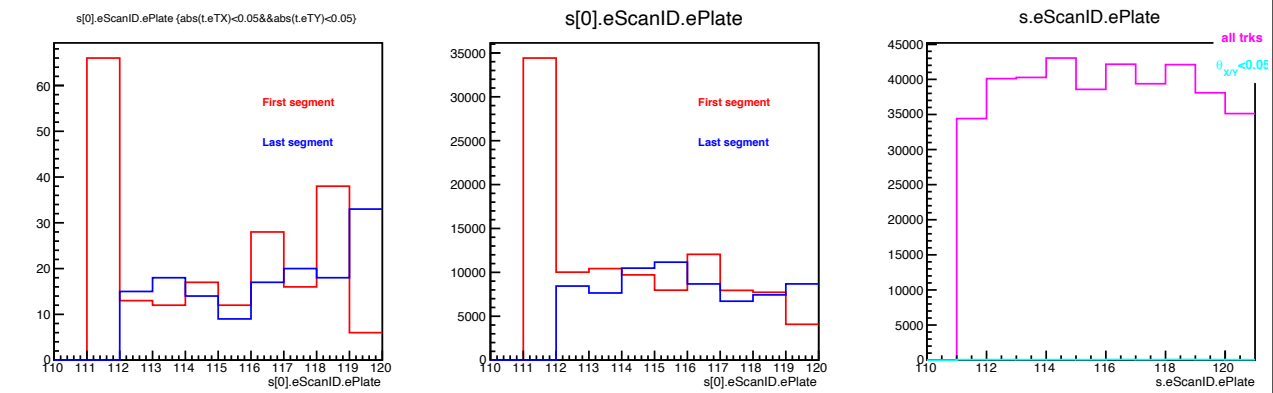


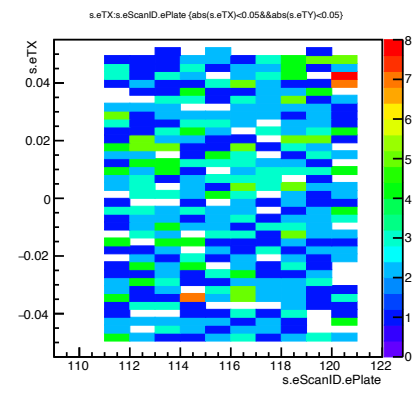


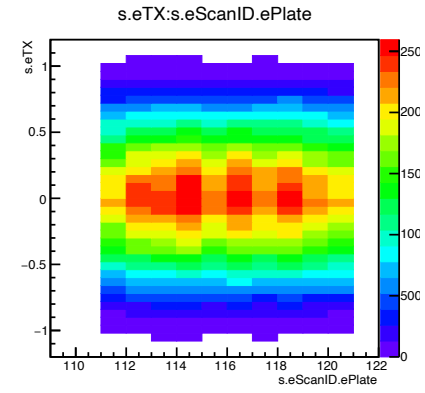


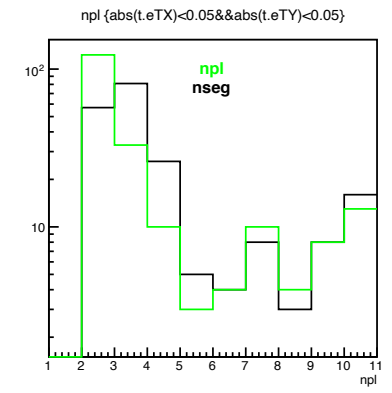


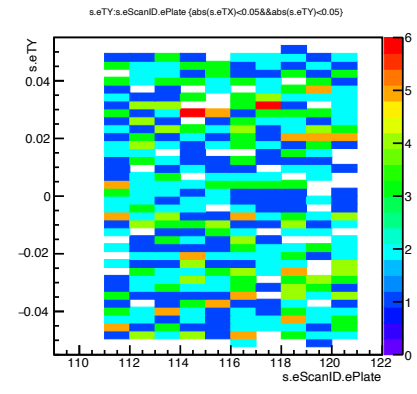
GSI 1 - S7 / BEFORE vs AFTER

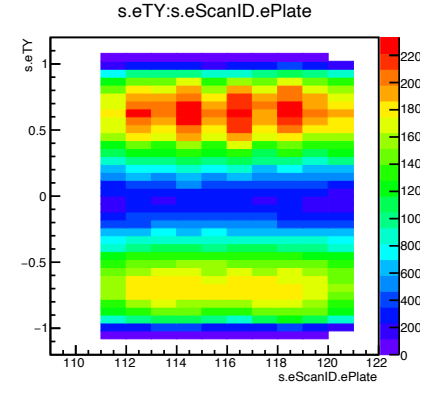


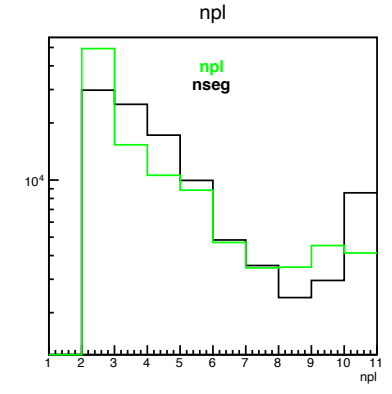


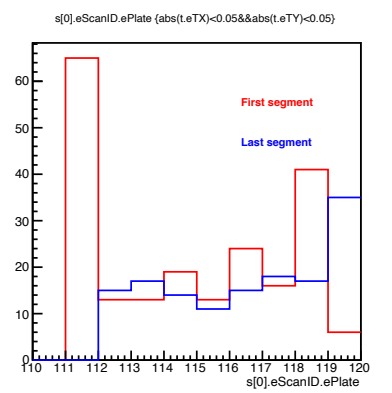


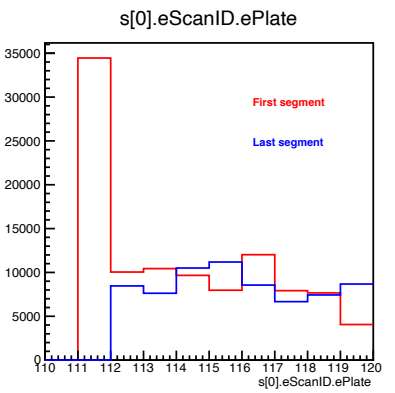


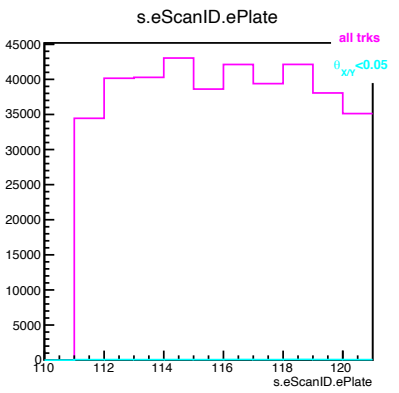


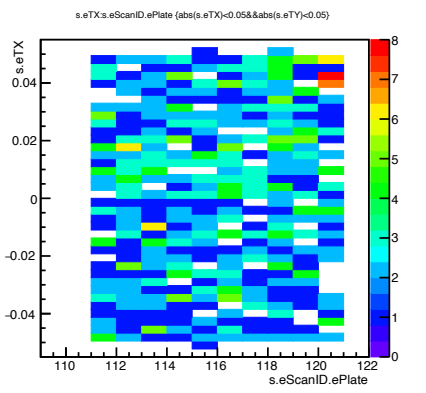


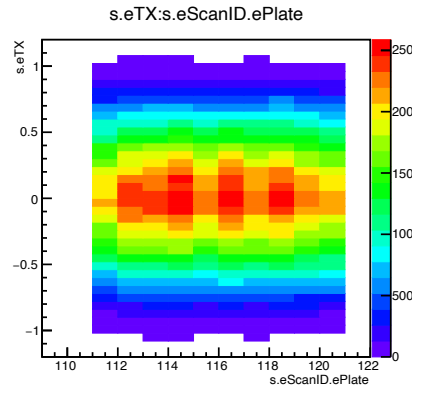


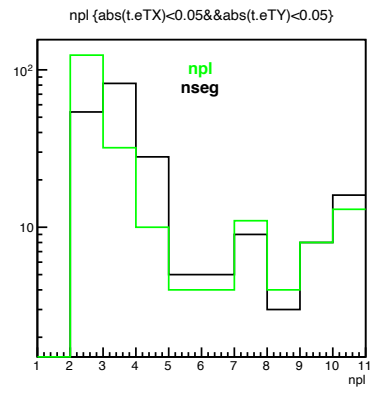


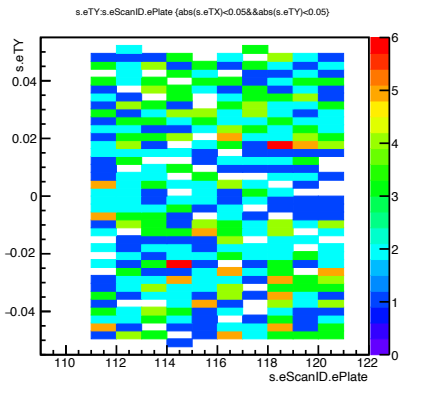


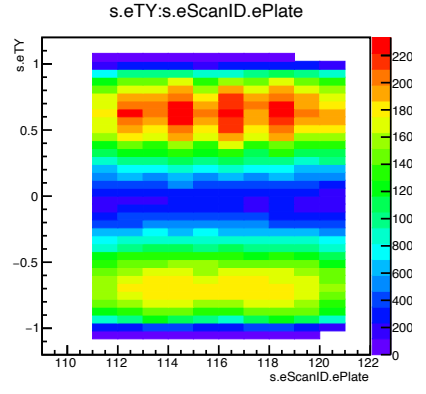


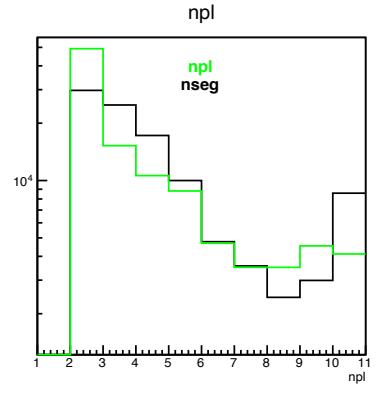




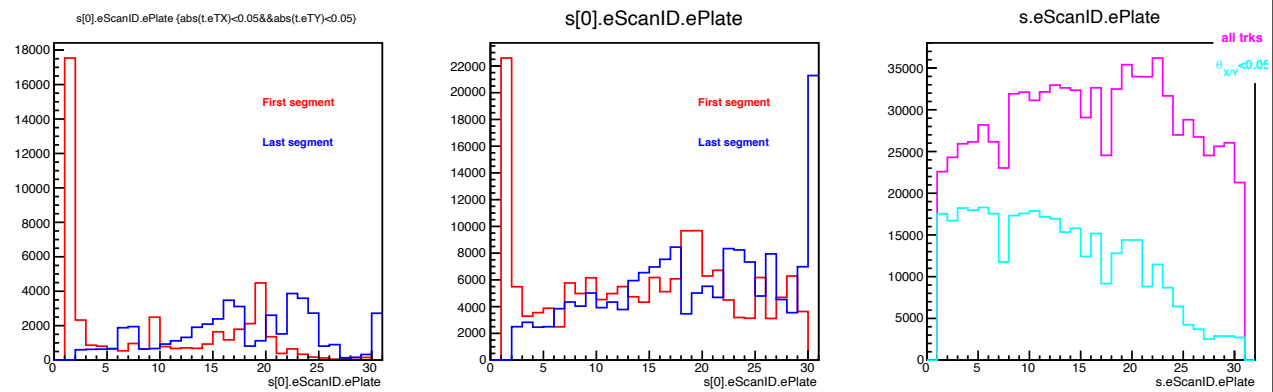


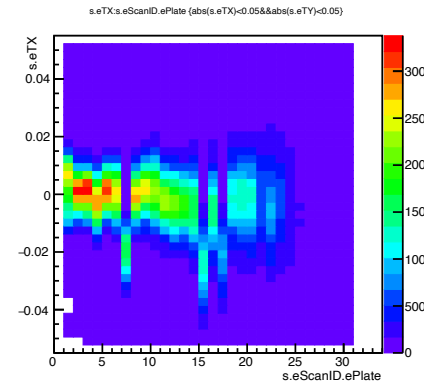


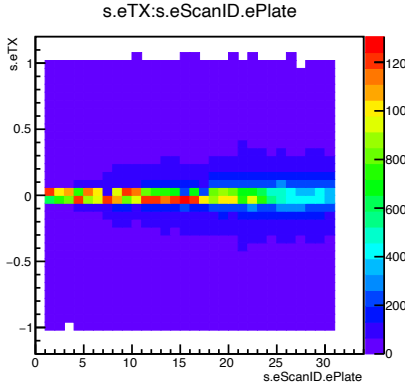


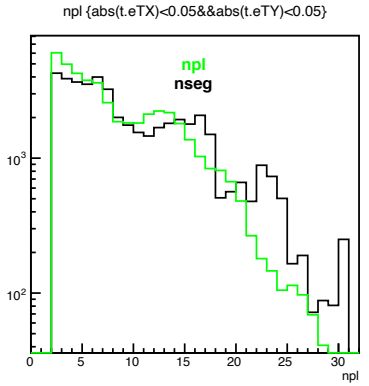


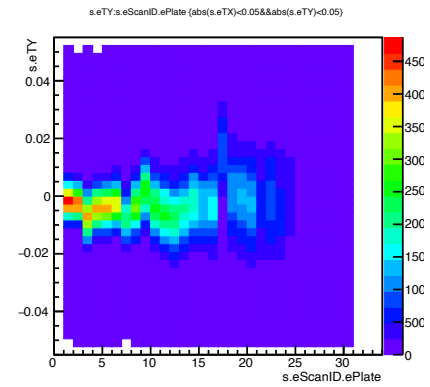
GSI 2 - S1 / BEFORE vs AFTER

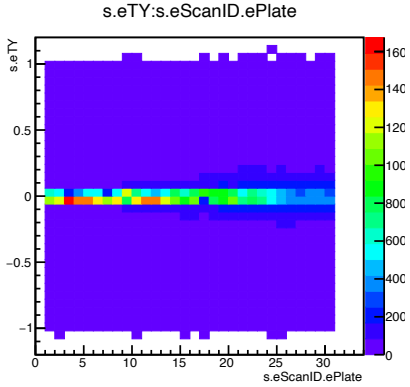


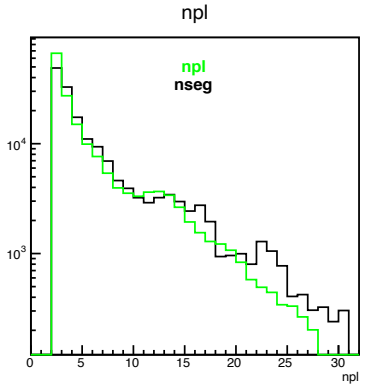


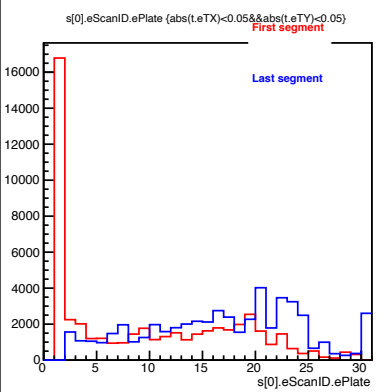


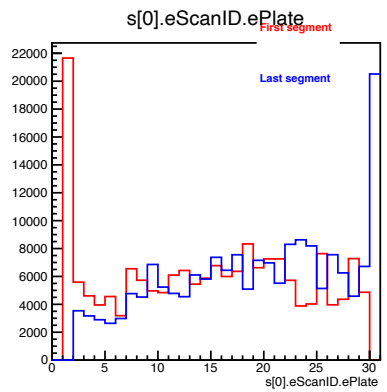


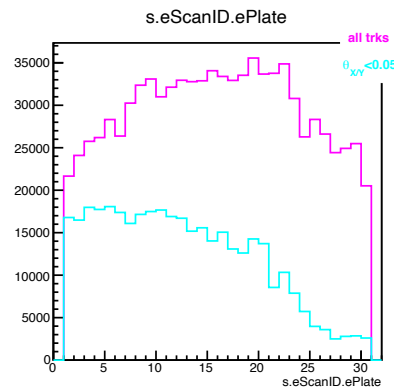


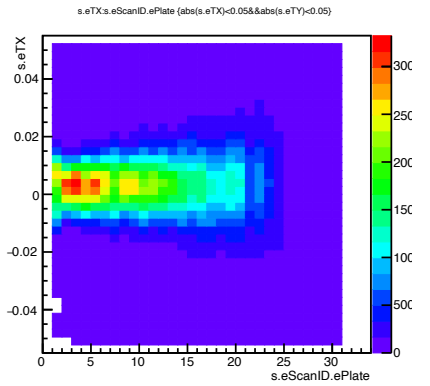


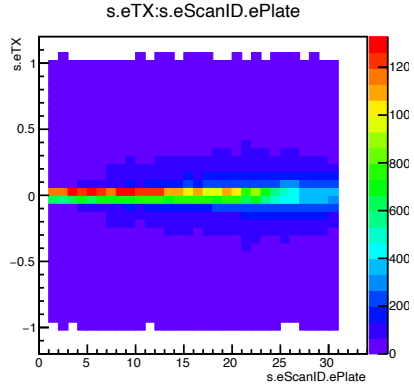


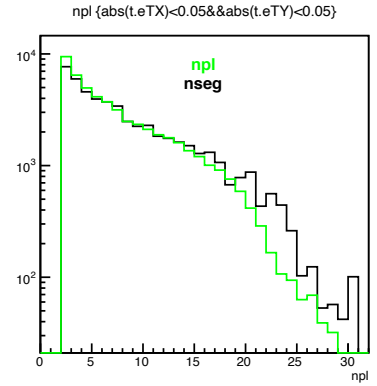


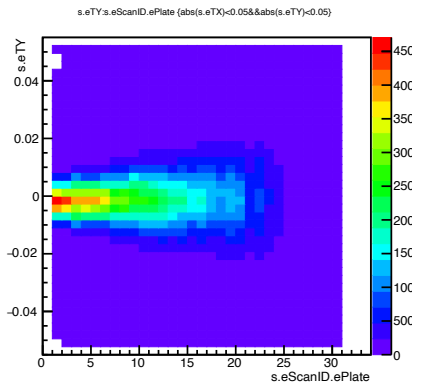


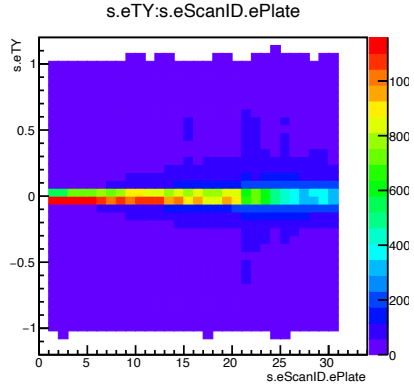


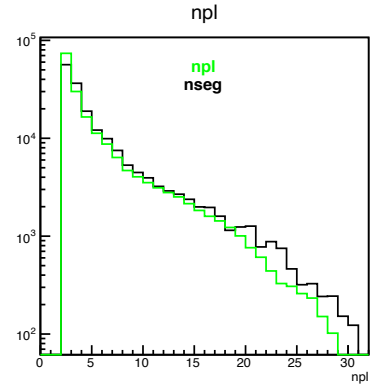




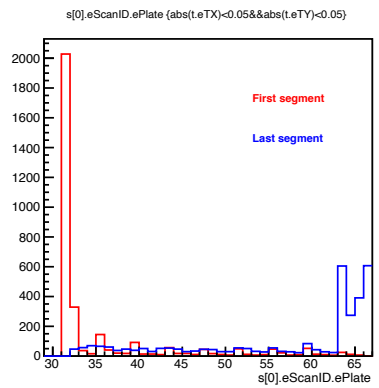


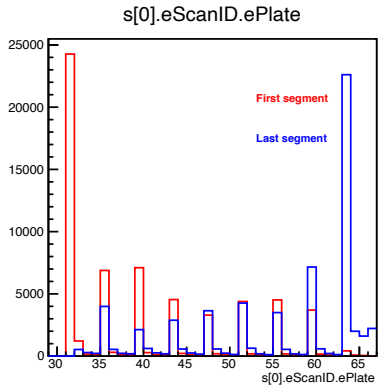


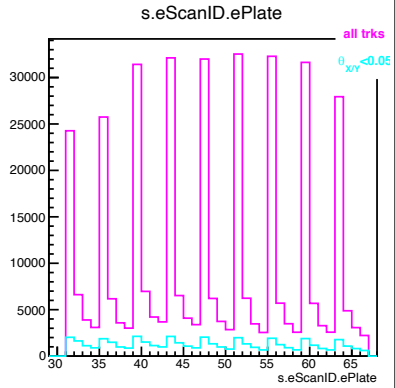


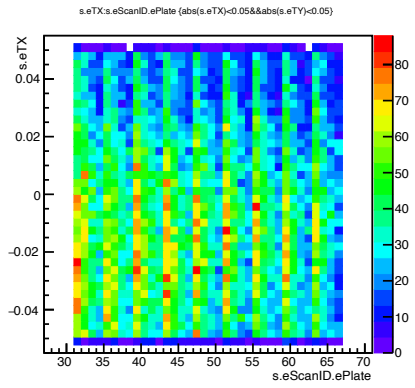


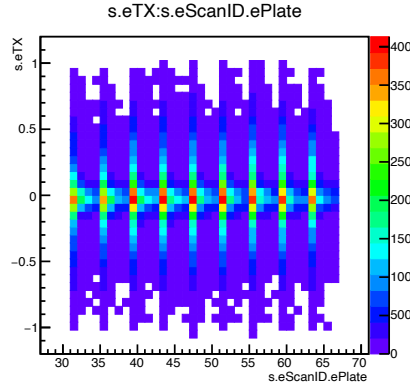
GSI 2 - S2 / BEFORE vs AFTER

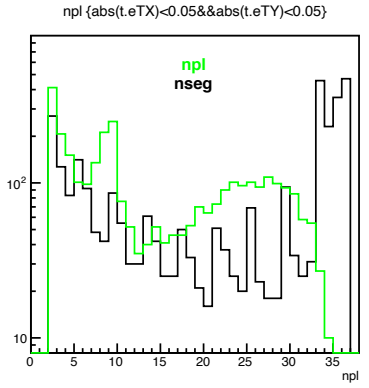


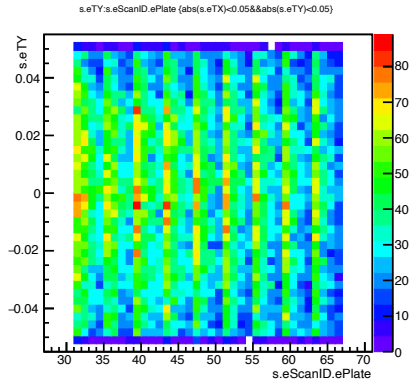


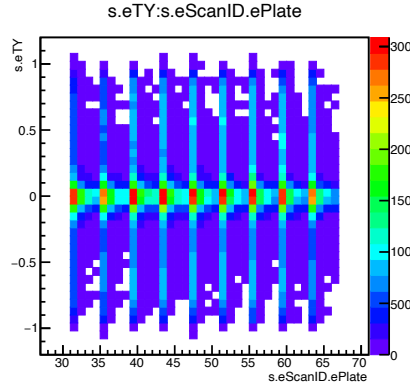


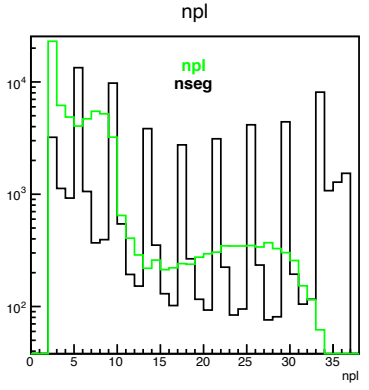


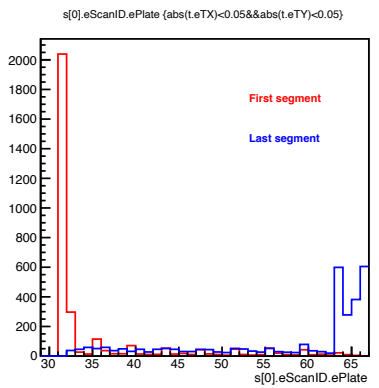


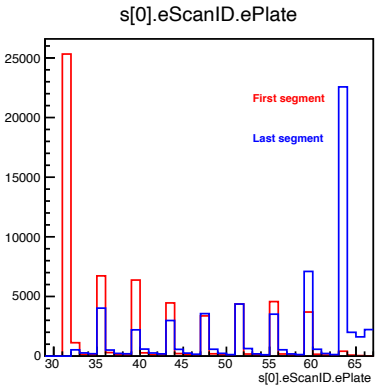


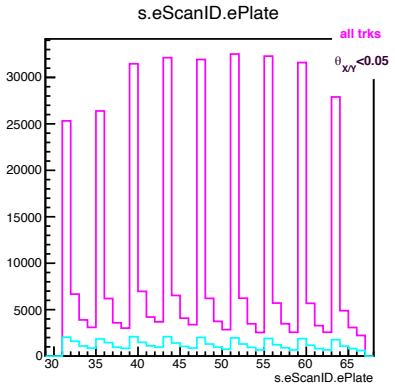


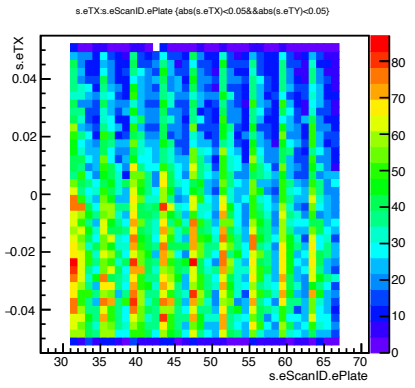


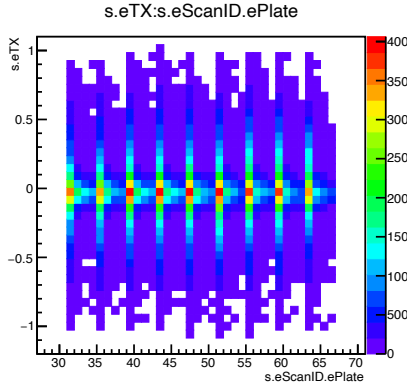


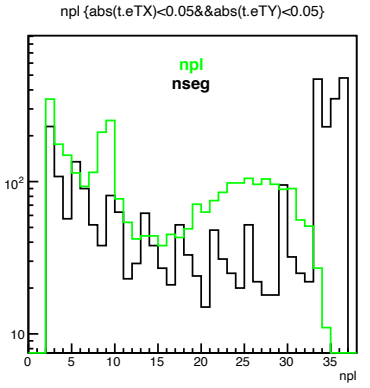


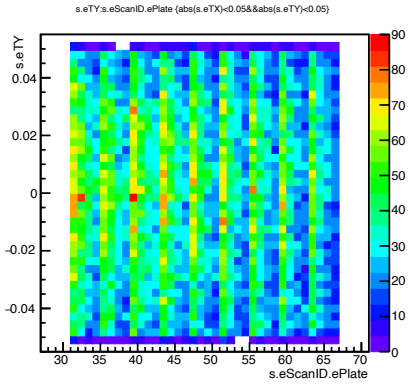


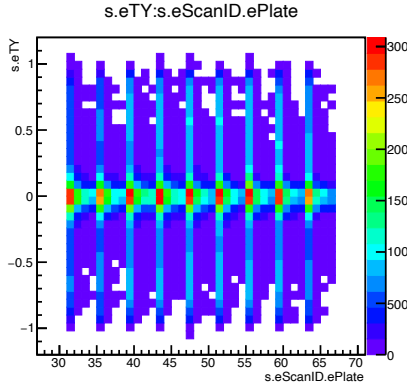


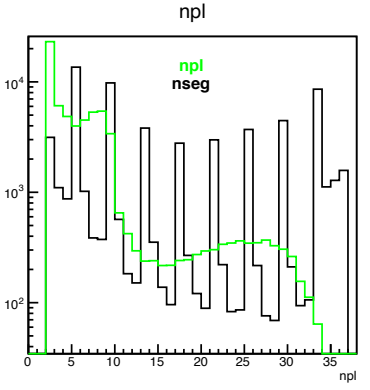




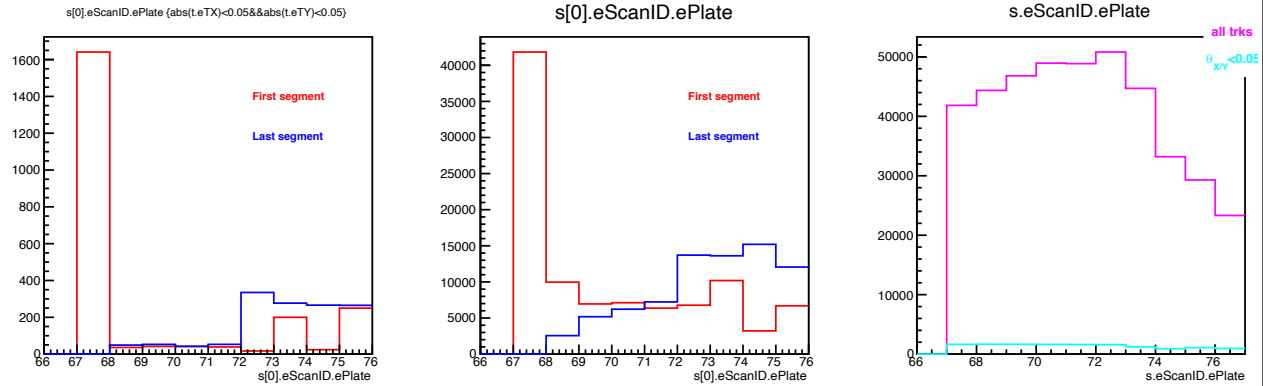


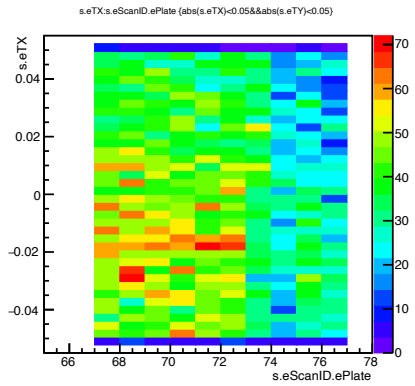


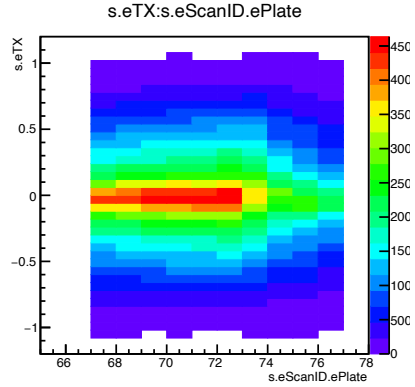


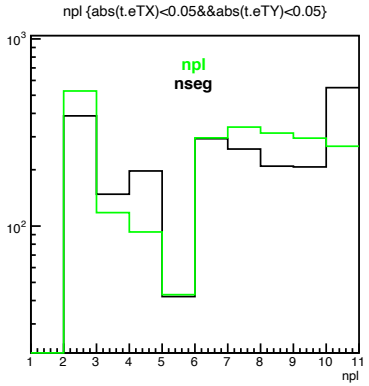


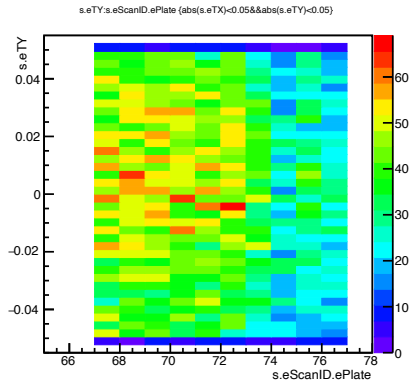
GSI 2 - S3 / BEFORE vs AFTER

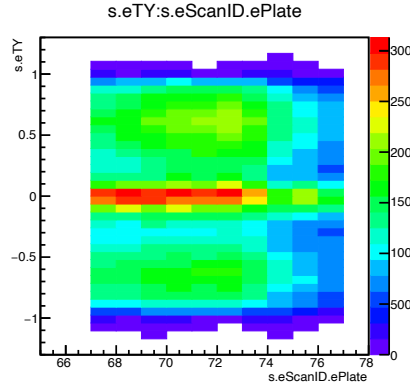


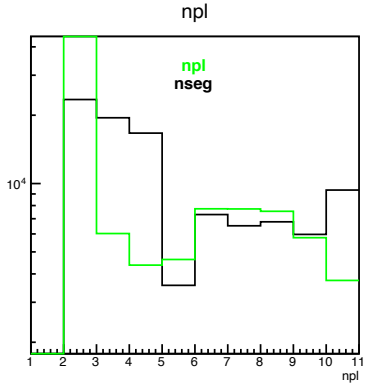


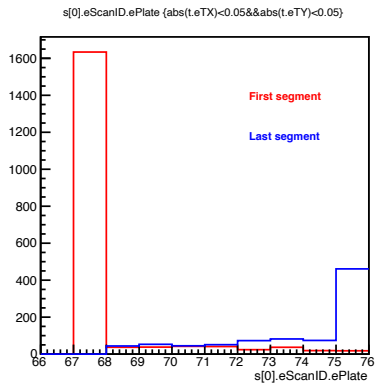


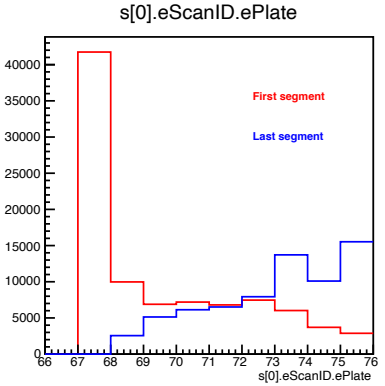


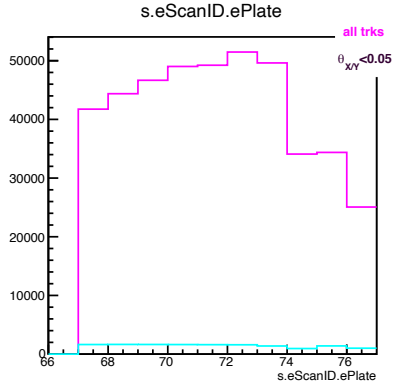


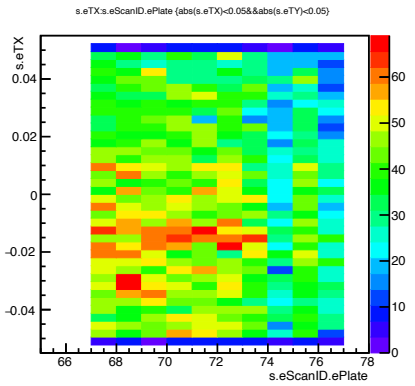


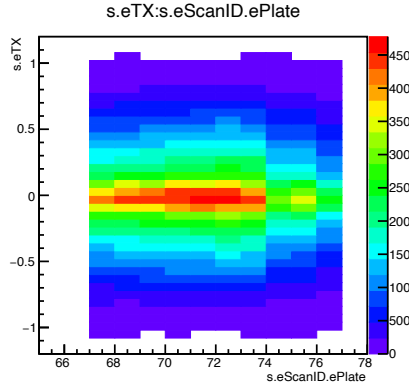


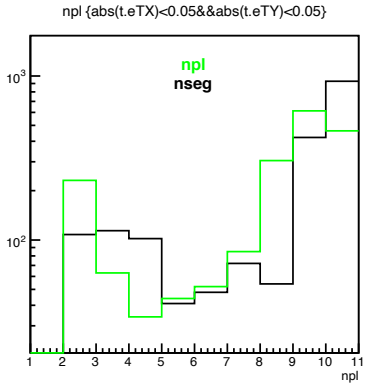


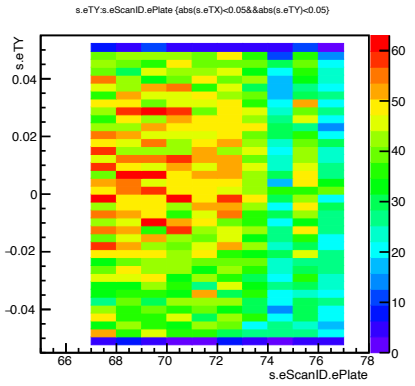


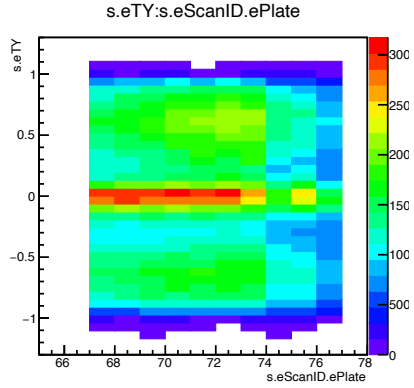


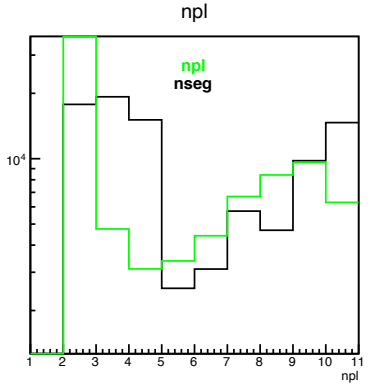




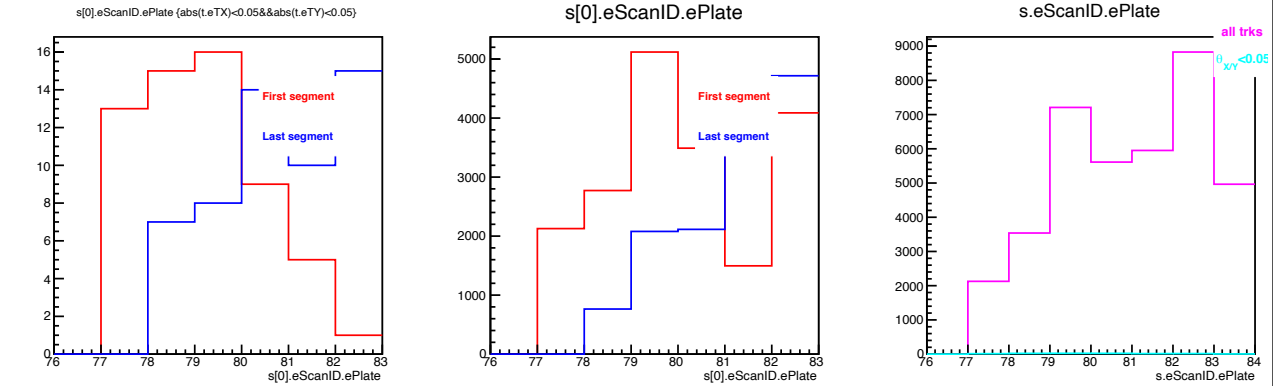


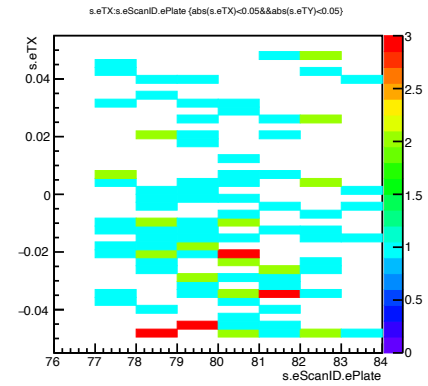


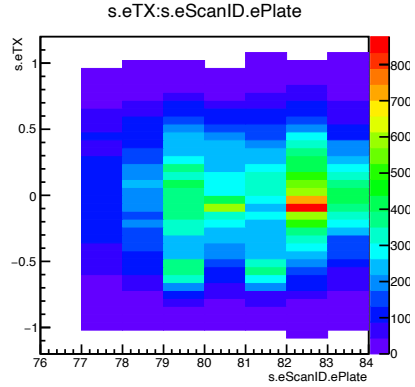


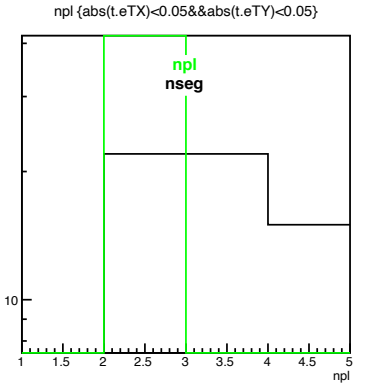


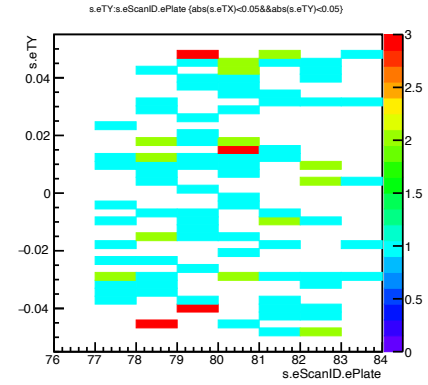
GSI 2 - S4 / BEFORE vs AFTER

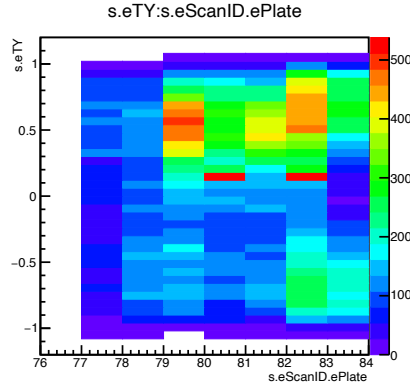


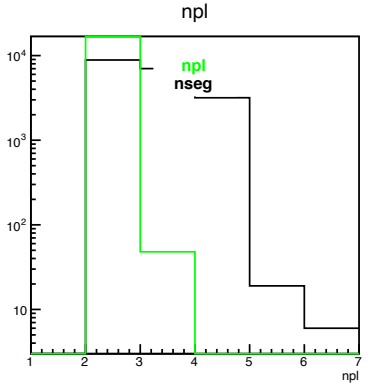


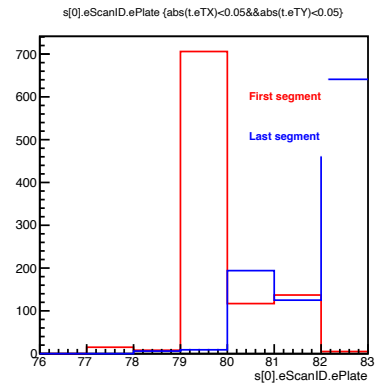


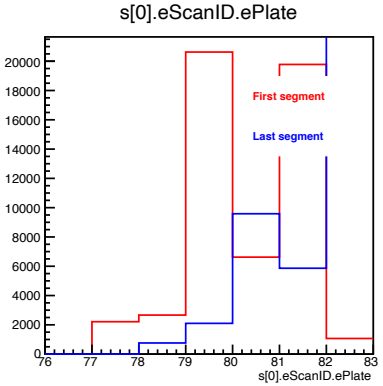


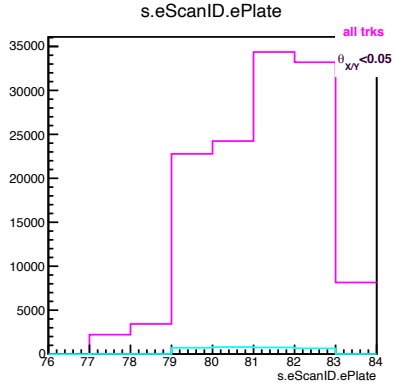


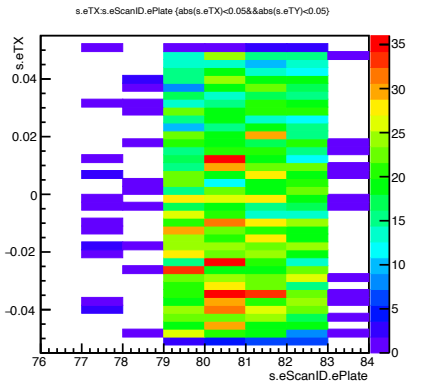


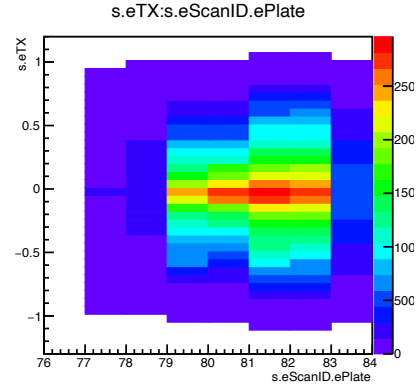


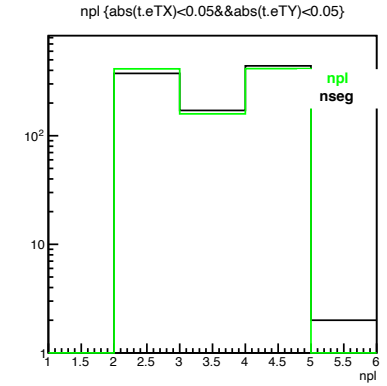


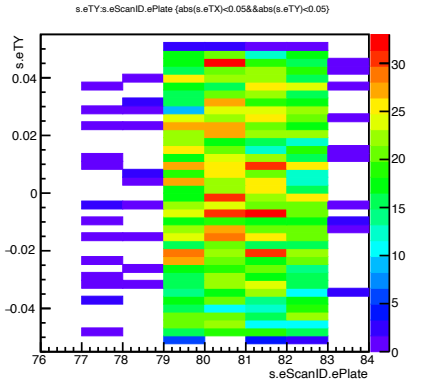


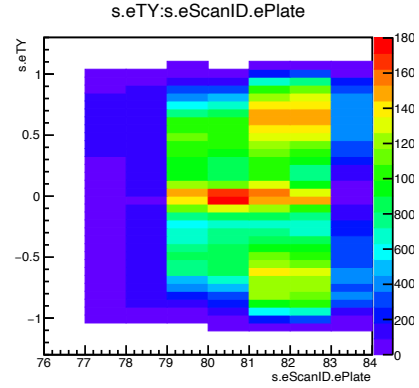


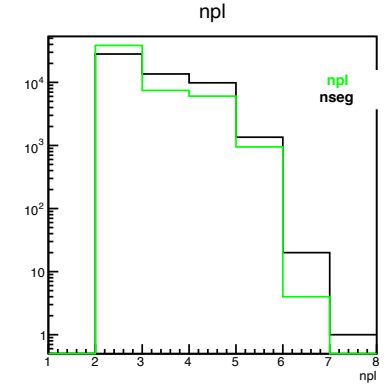




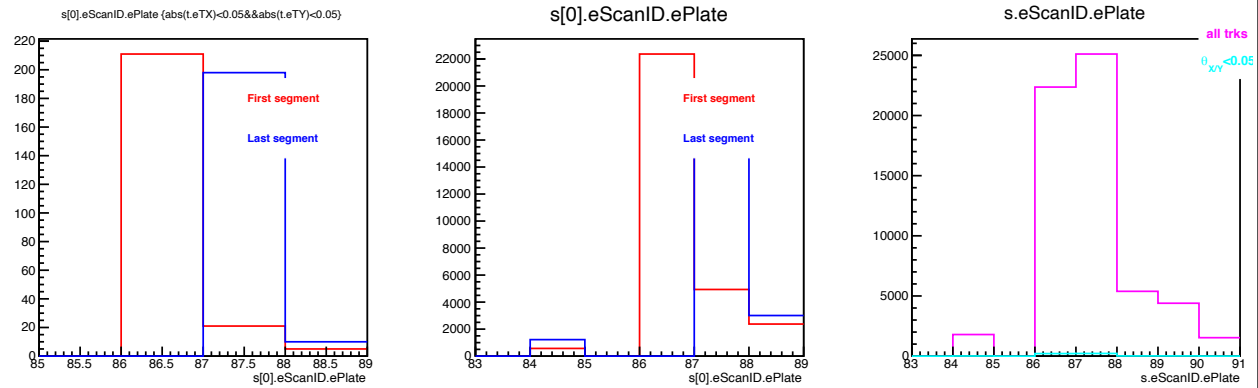


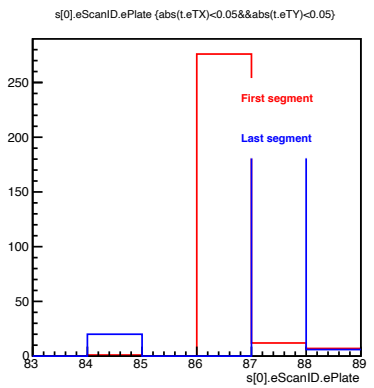


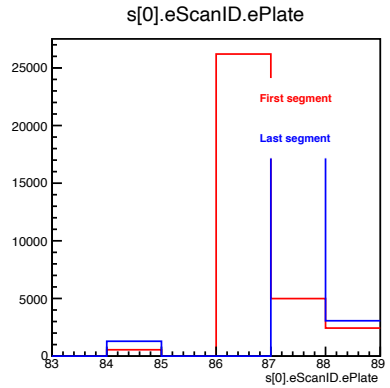


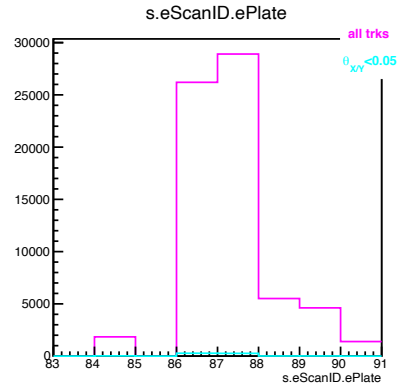


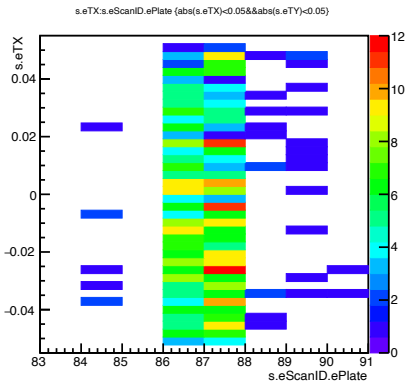
GSI 2 - S5 / BEFORE vs AFTER

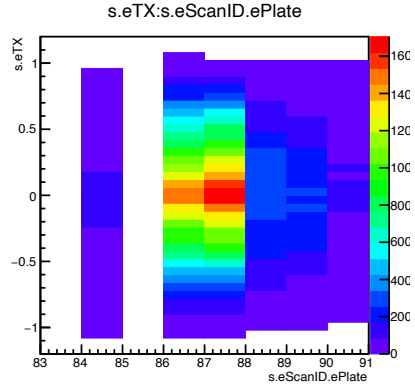


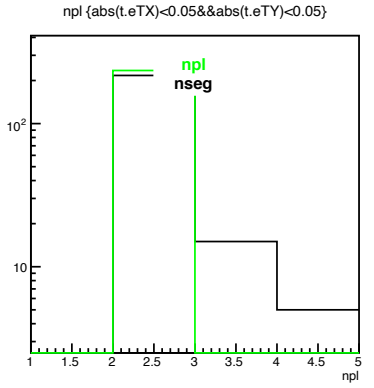


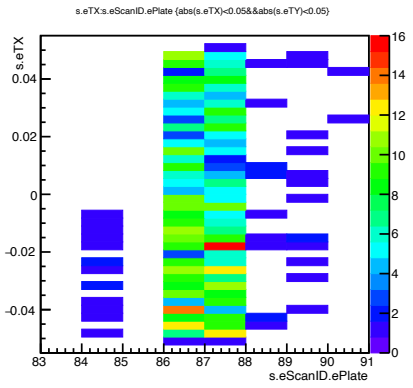


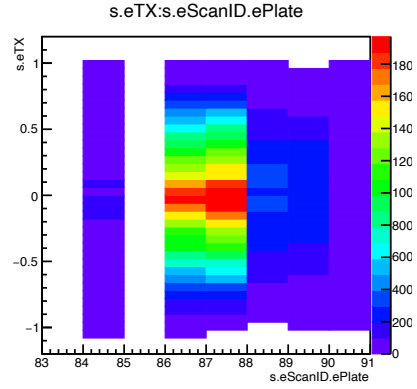


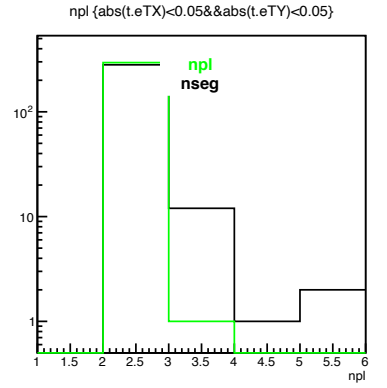


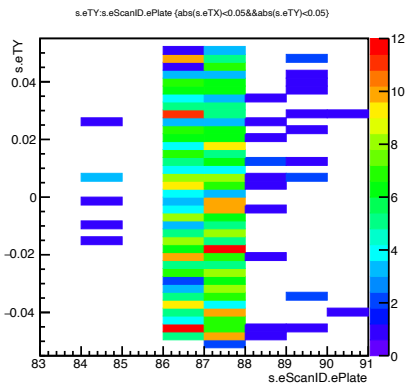


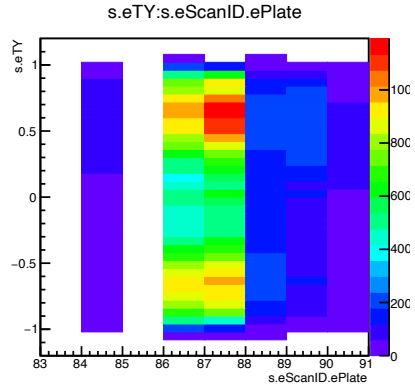


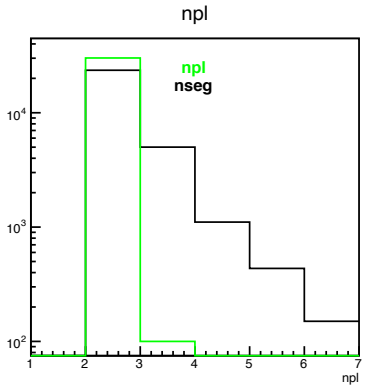


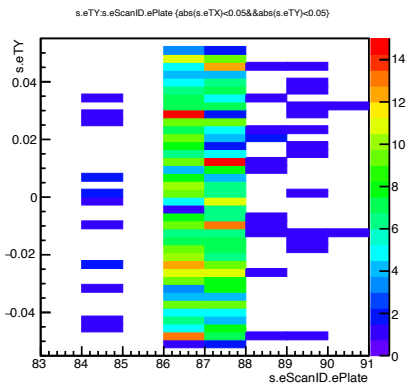


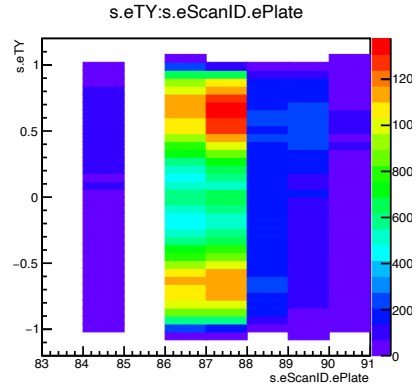


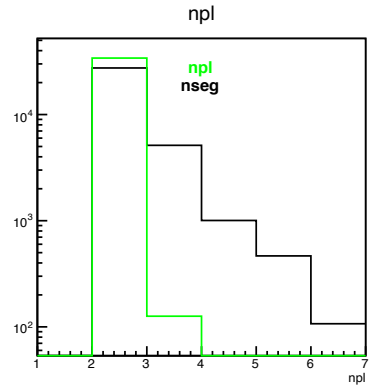




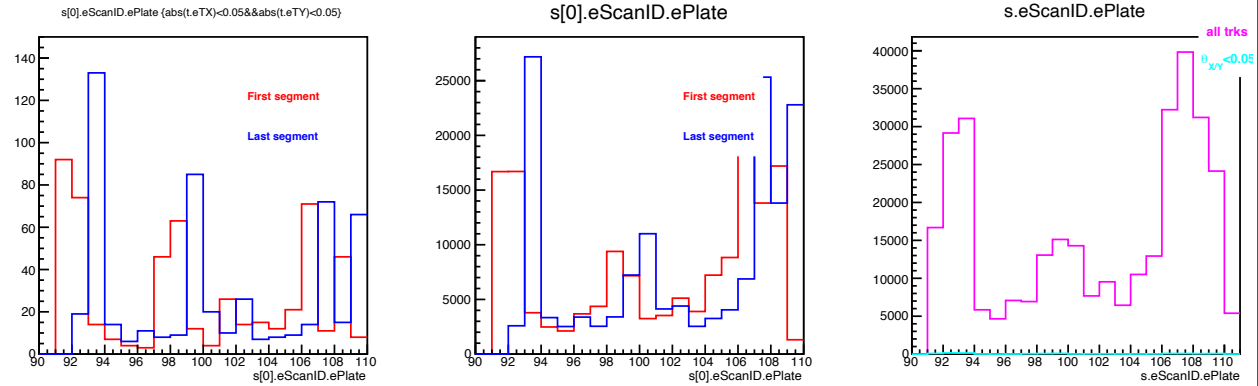


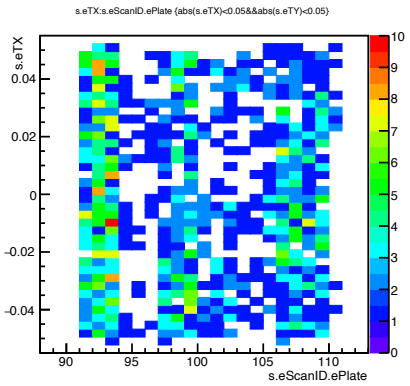


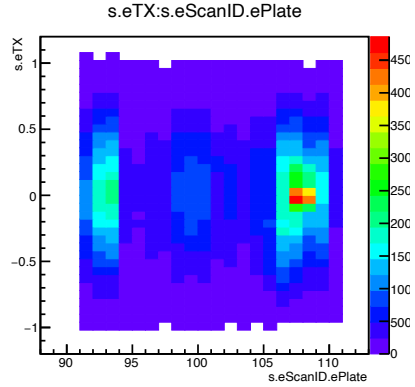


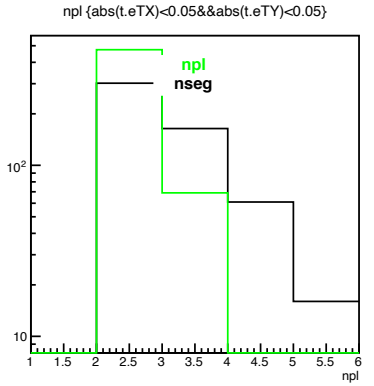


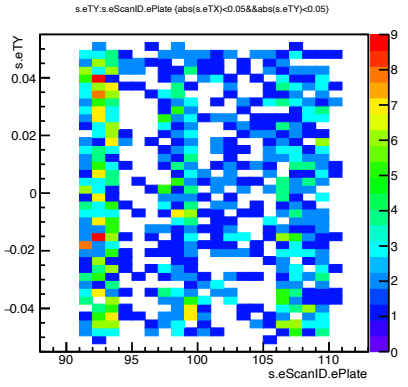
GSI 2 - S6 / BEFORE vs AFTER

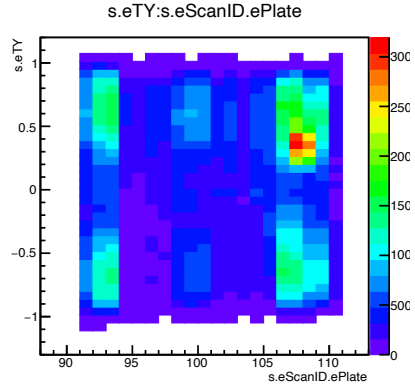


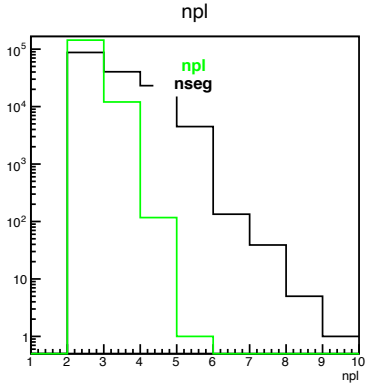


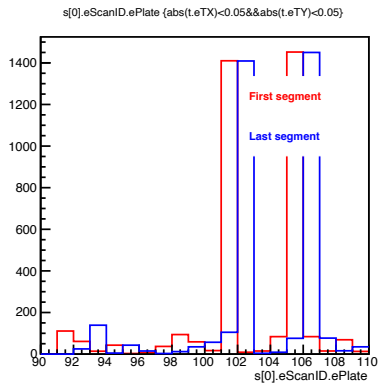


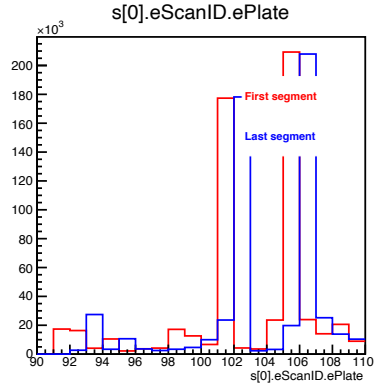


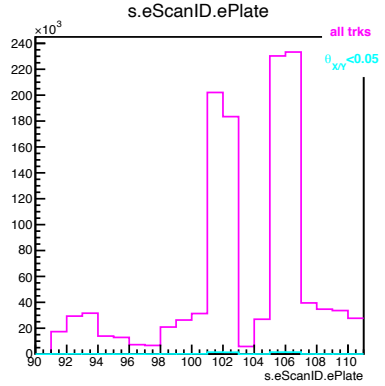


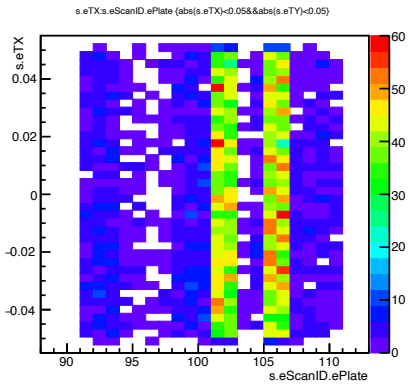


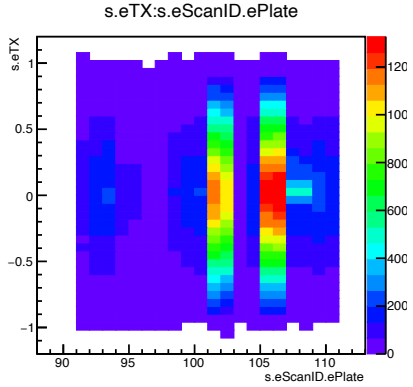


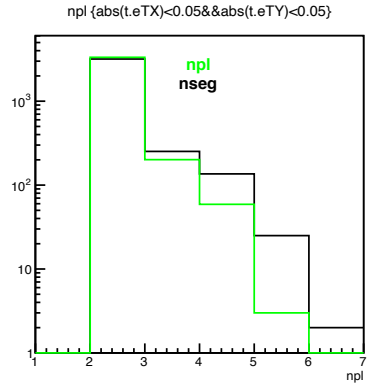


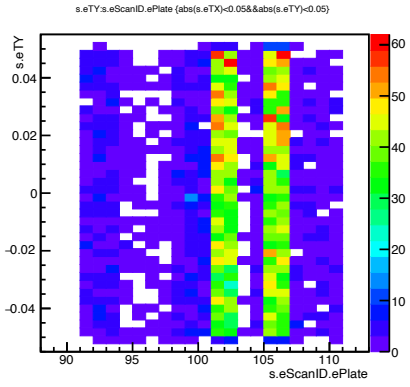


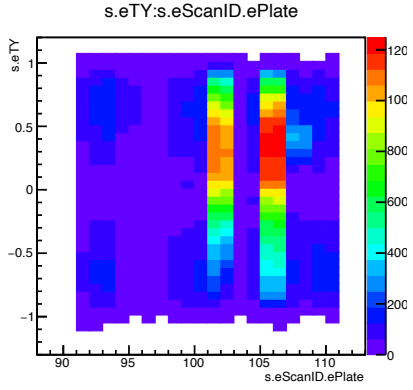


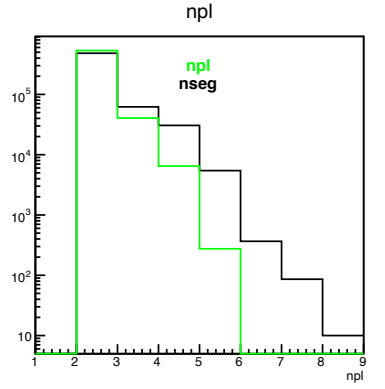




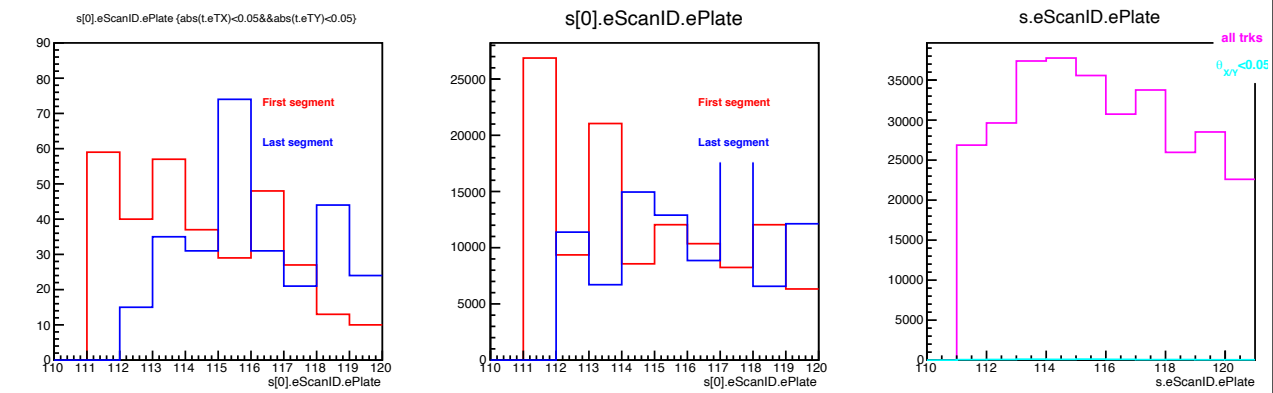


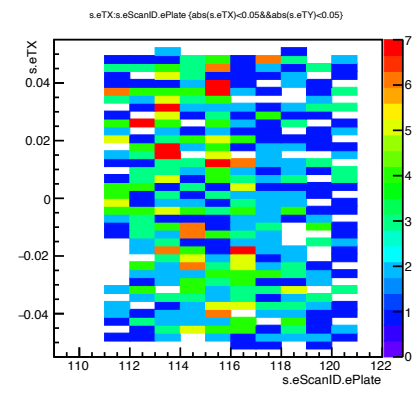


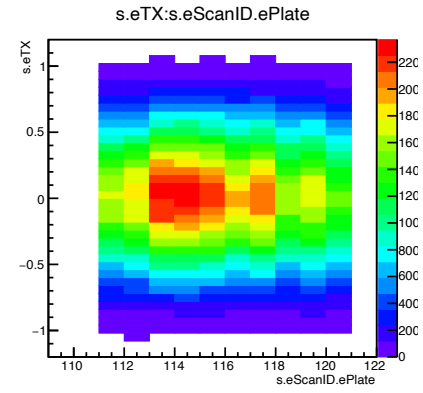


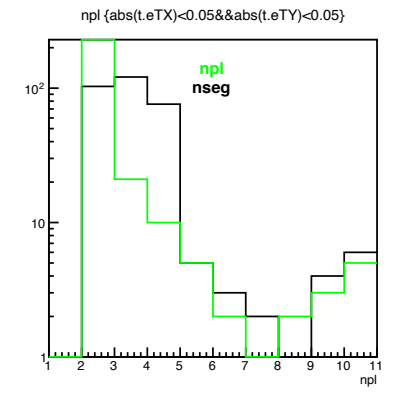


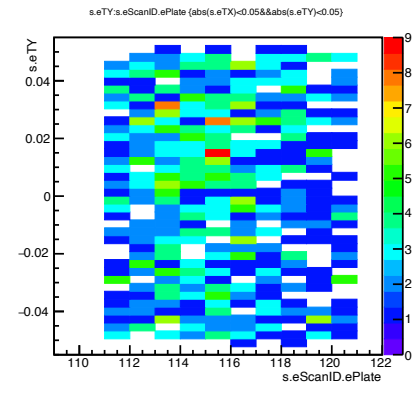
GSI 2 - S7 / BEFORE vs AFTER

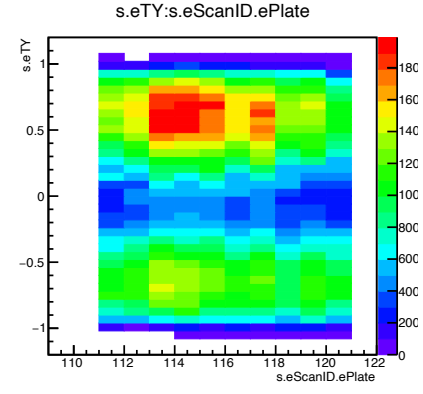


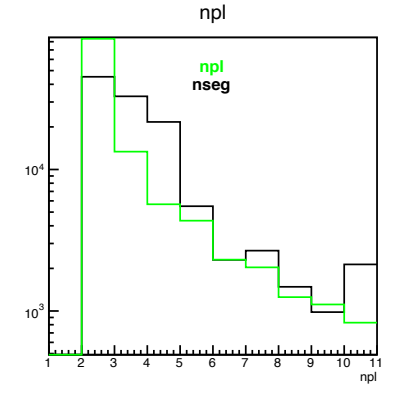


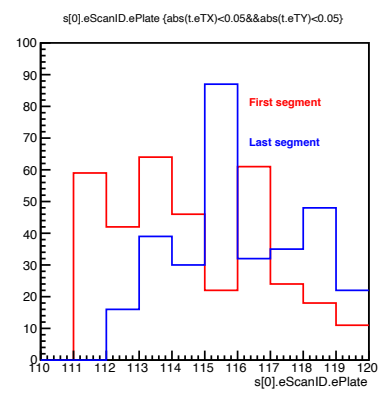


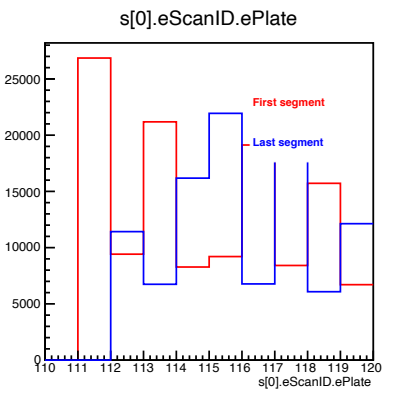


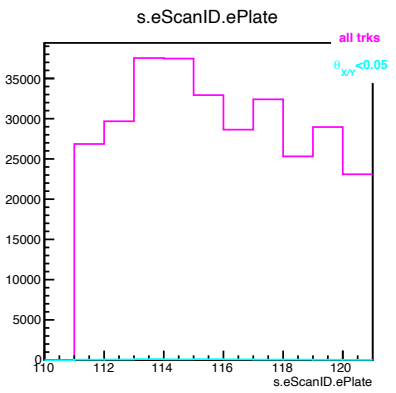


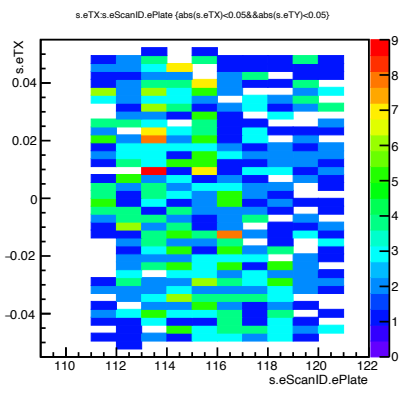


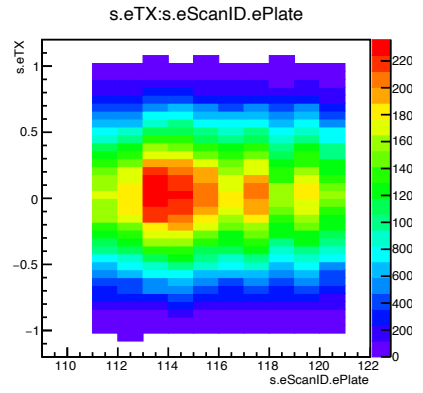


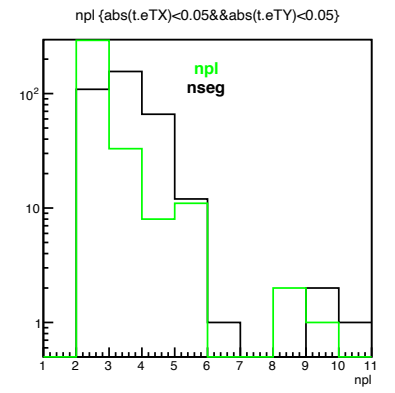


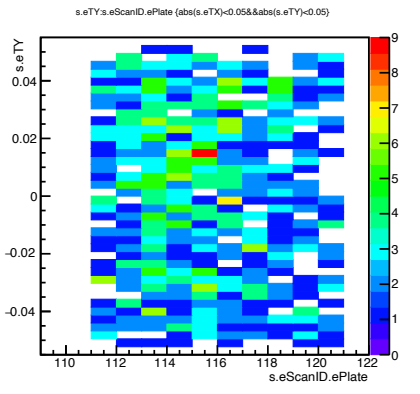


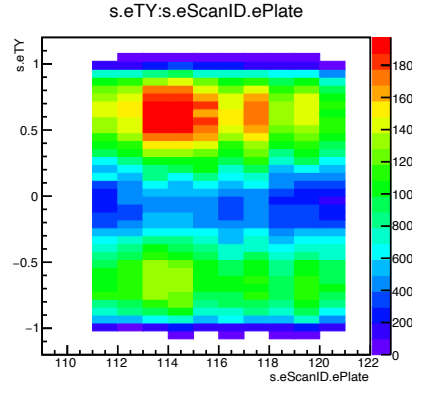


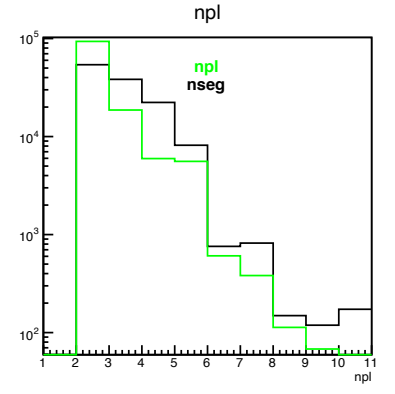








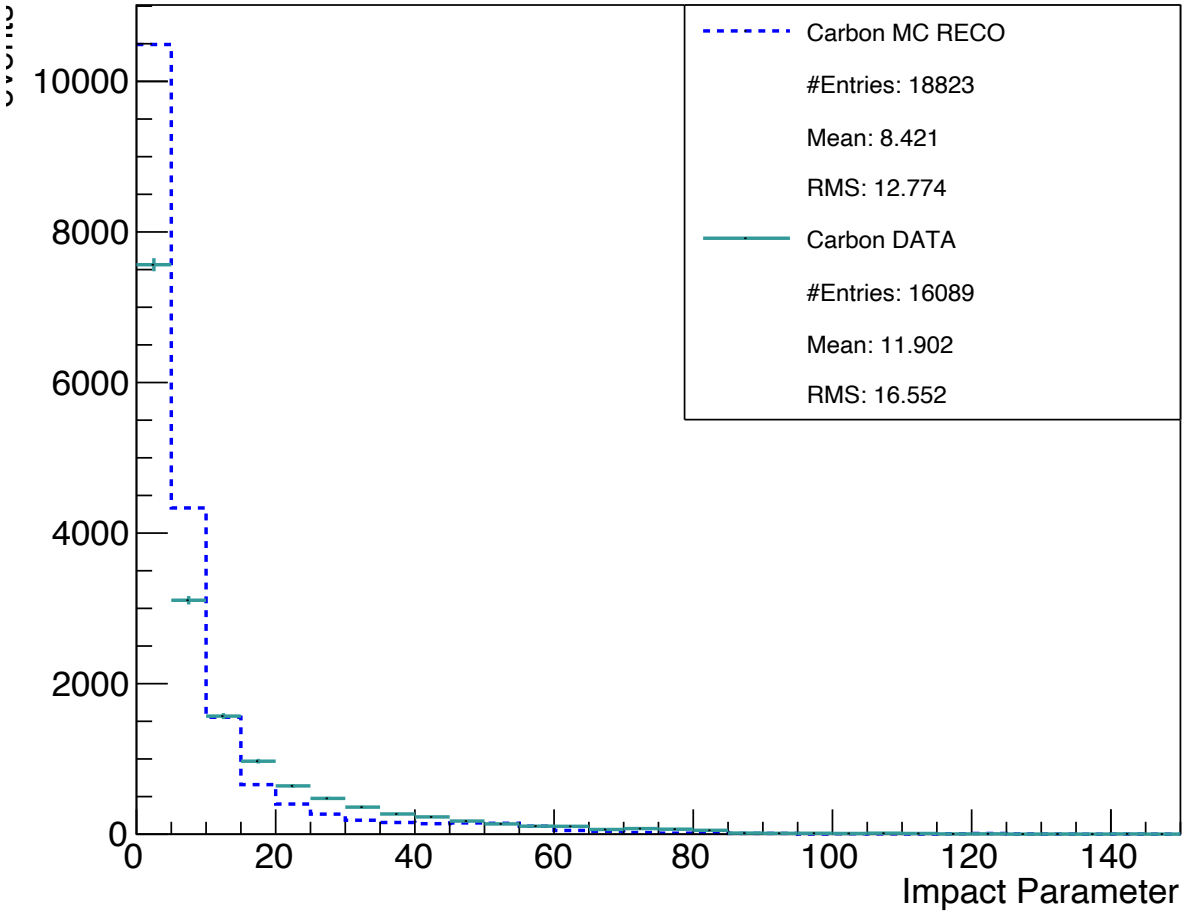




GSI1 - Number of reconstructed vertices (n≥3) and IP

n = number of tracks (parent + daughters)

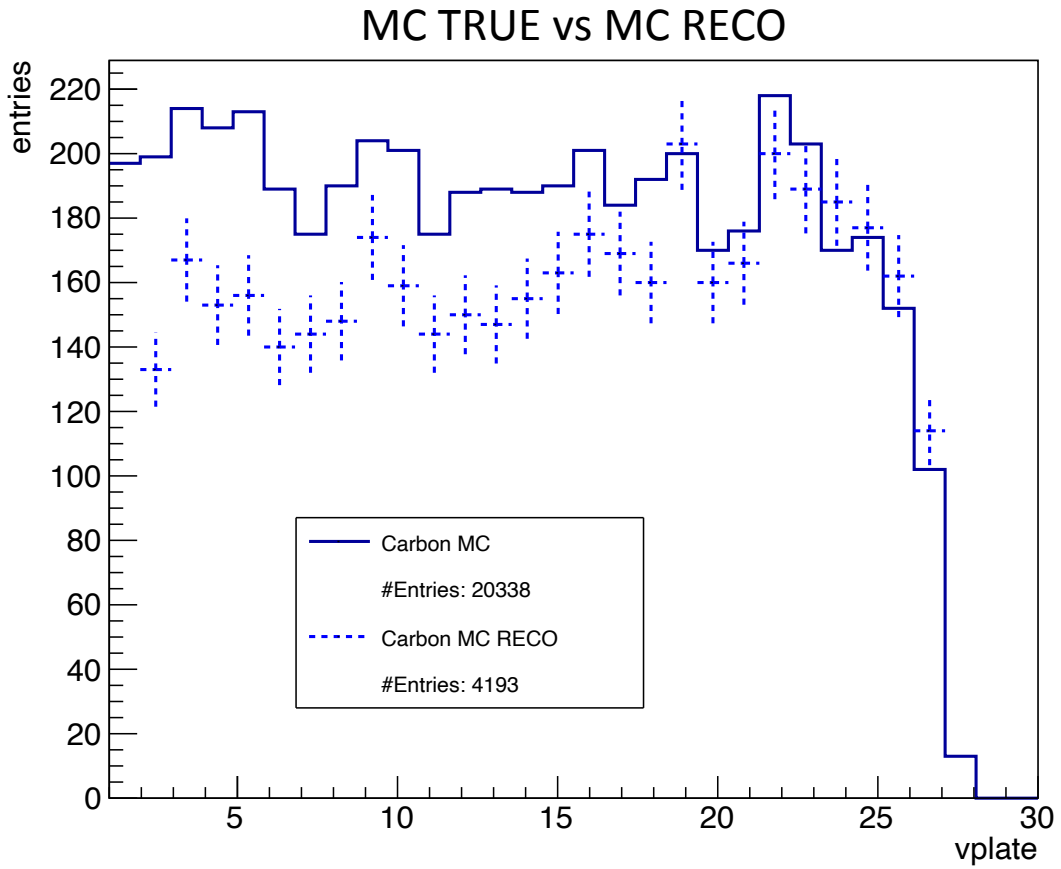
		GSI1 C target
MC	Beam particles	18990
	True vertices	5031
	Reco vertices	4193
DATA	Beam particles	19375
	Data vertices	4424

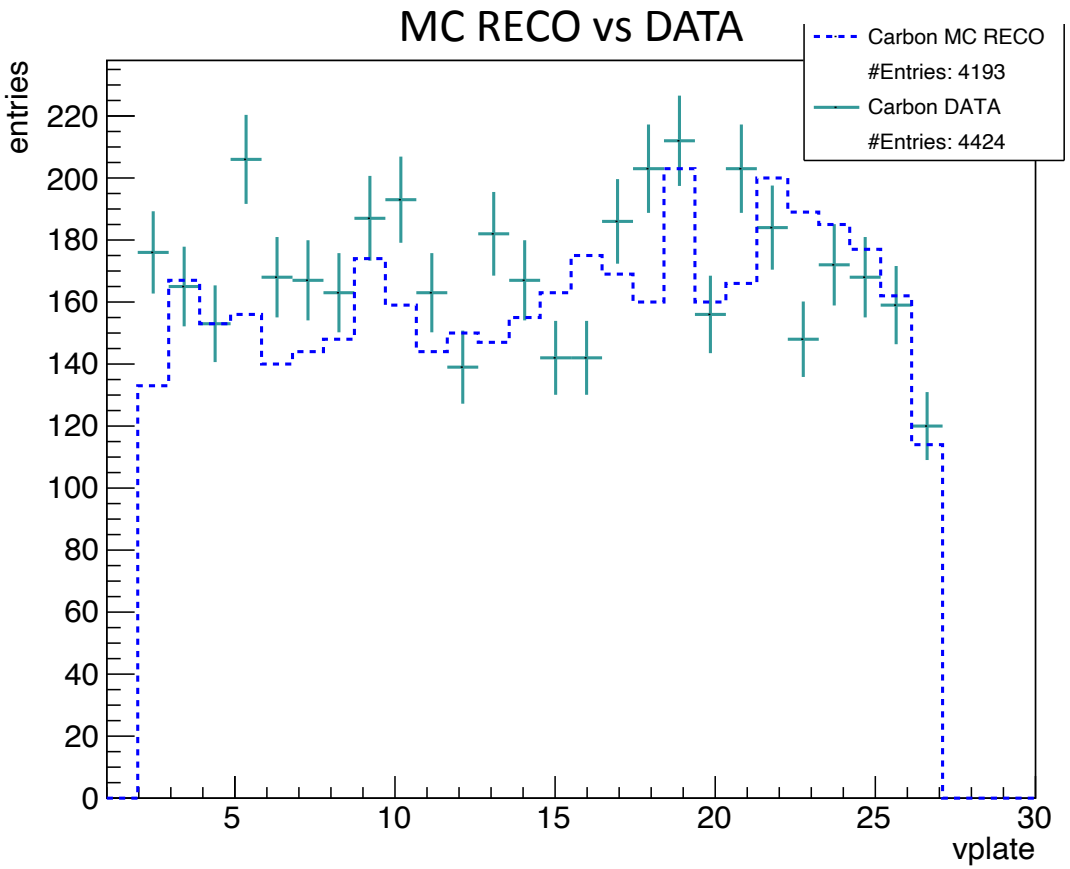


- Fine tuning MC: smearing effects to be implemented in MC to reproduce small misalignments in positions

GSI1 - Vertex Plate distribution

Distributions normalized to beam particles, requirement of at least 3 tracks in the vertex.

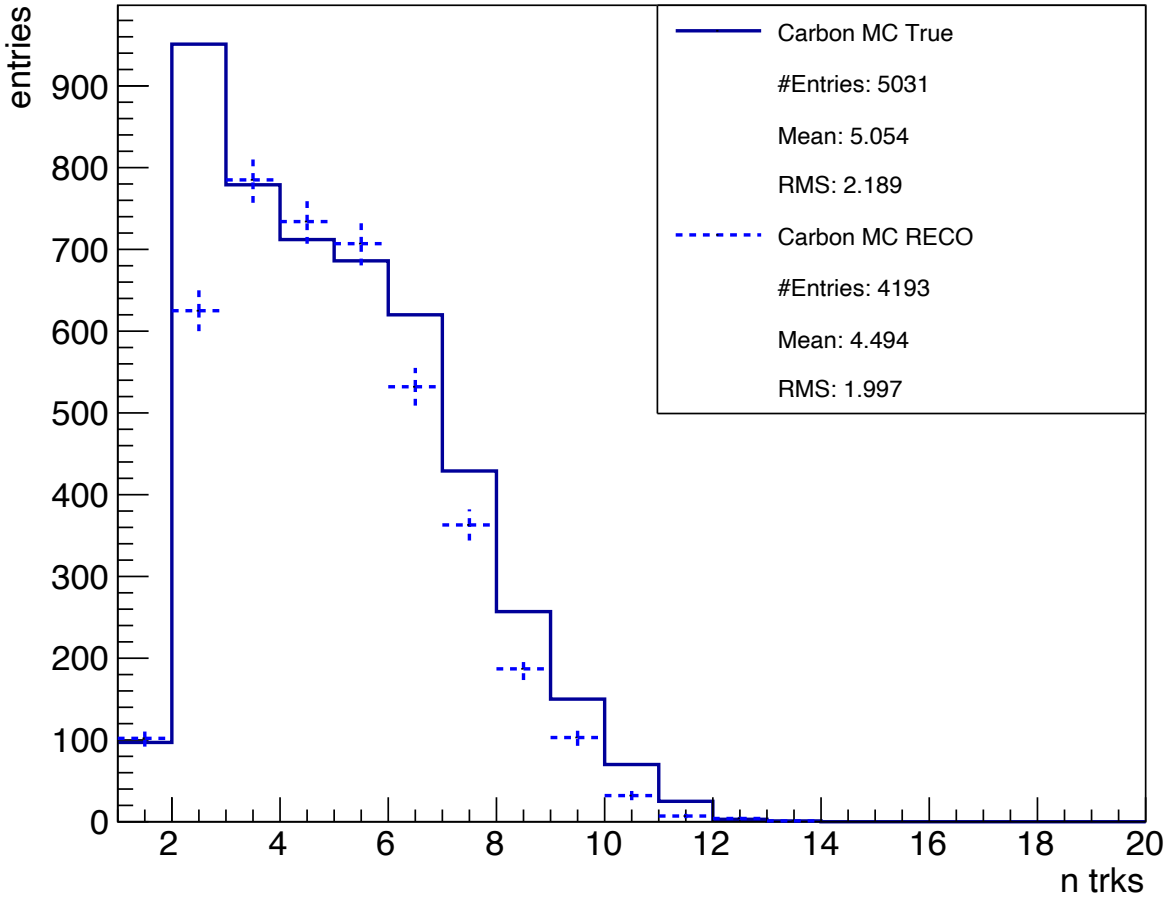




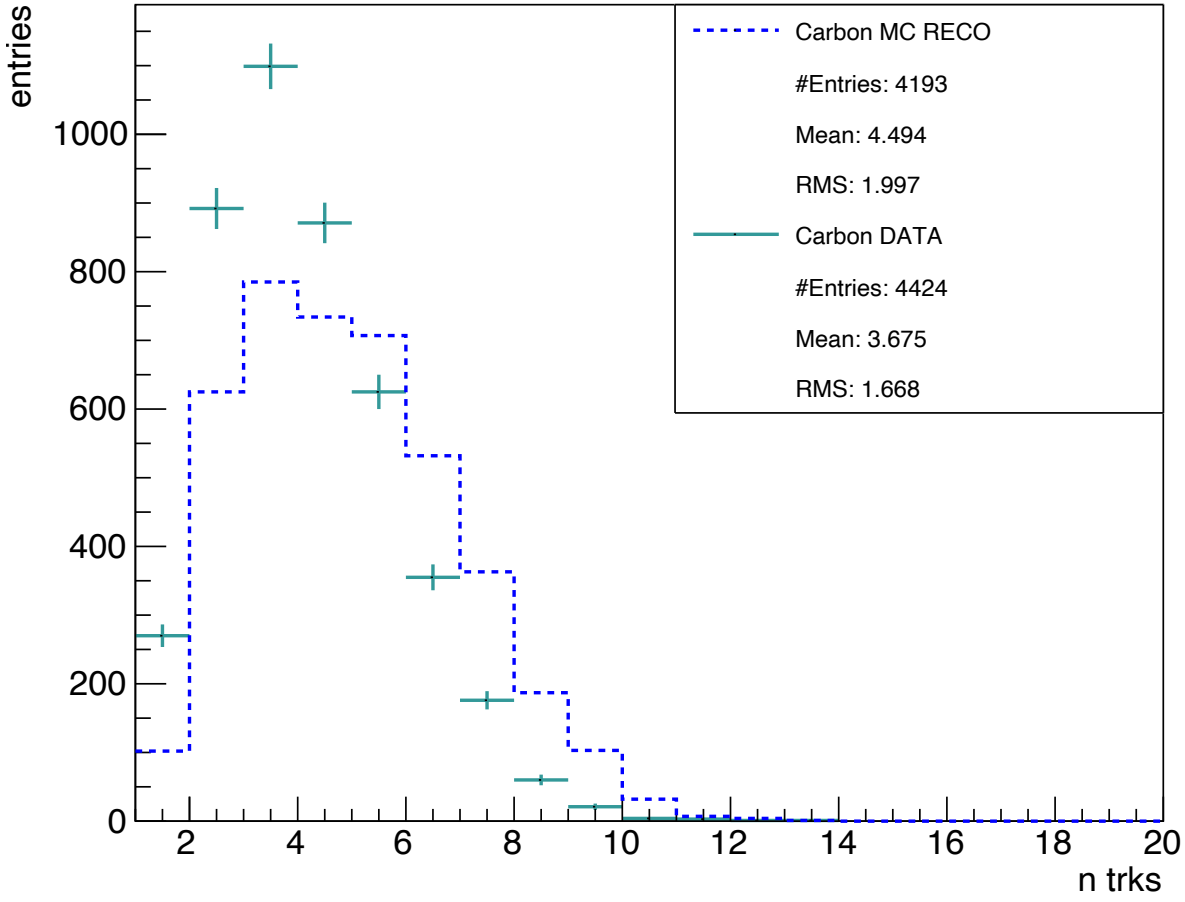
GSI1 - Fragments' multiplicity distribution

Distributions normalized to beam particles, requirement of at least 3 tracks in the vertex.

MC TRUE vs MC RECO



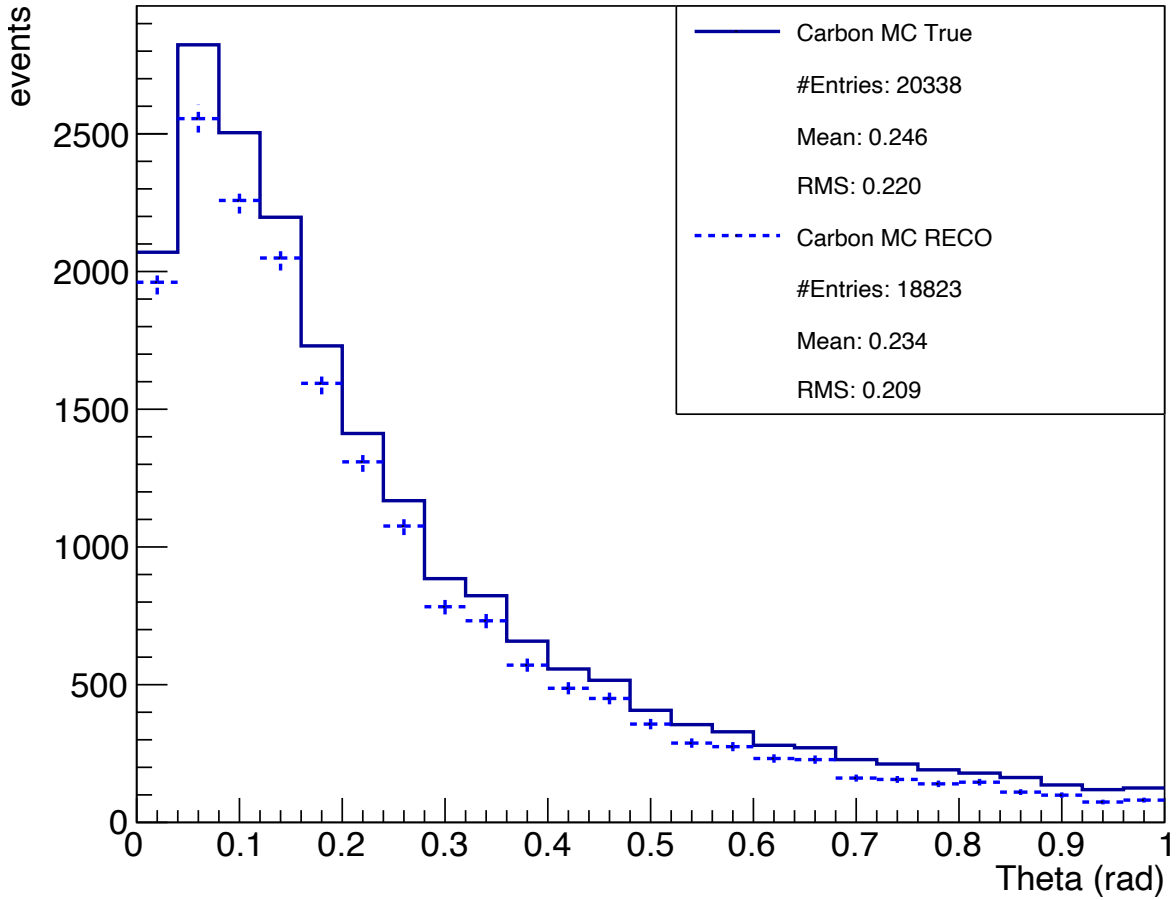
MC RECO vs DATA



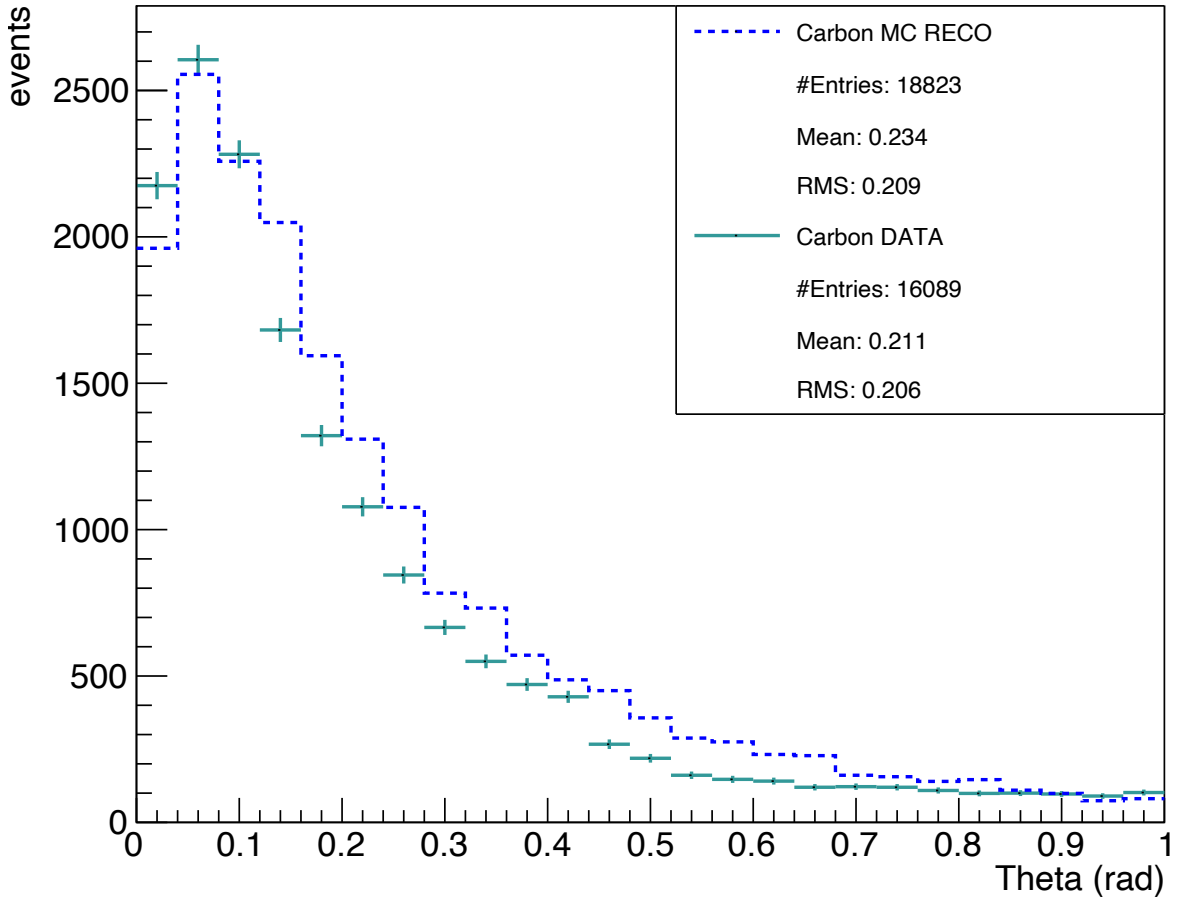
GSI1 - Fragments' angular distribution

Distributions normalized to beam particles, requirement of at least 3 tracks in the vertex.

MC TRUE vs MC RECO



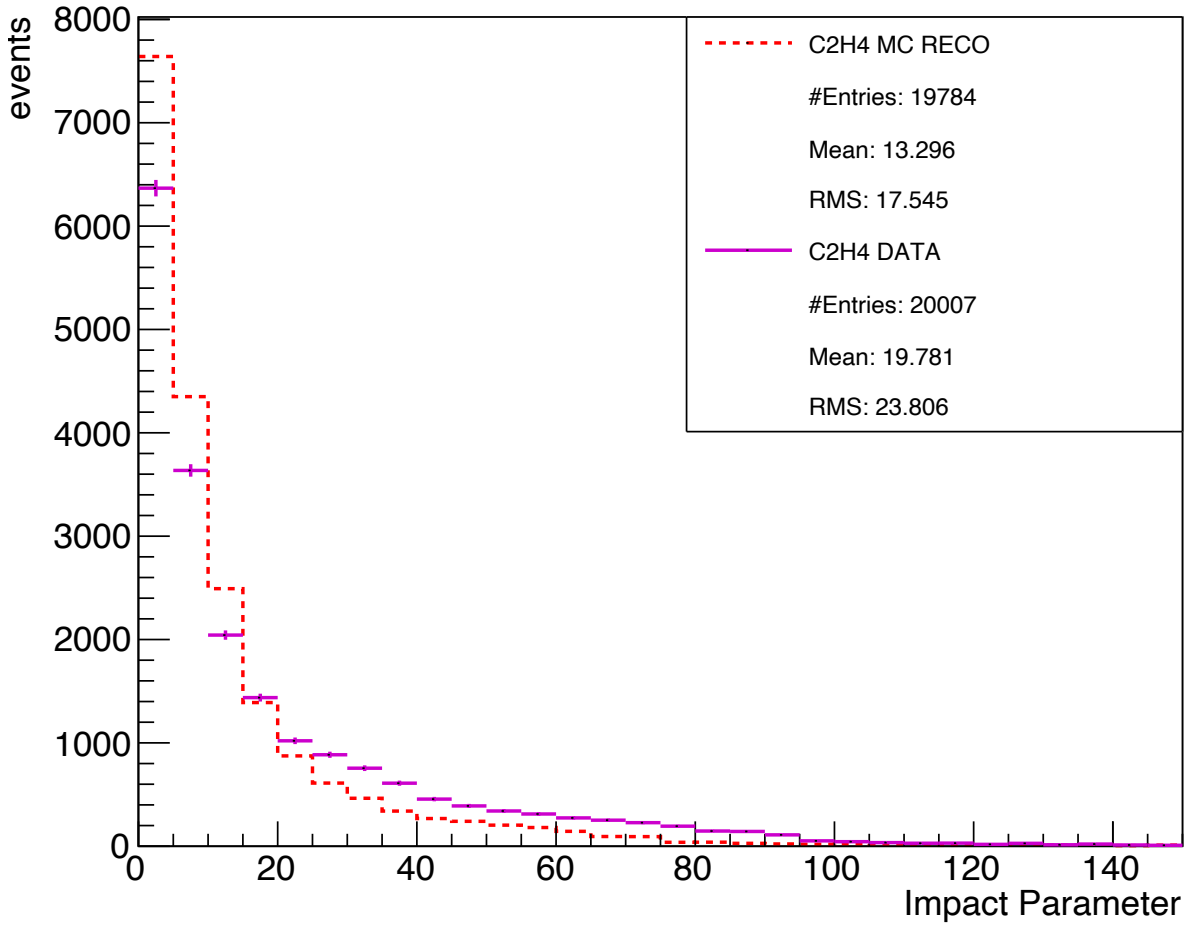
MC RECO vs DATA



GSI2 - Number of reconstructed vertices (n≥3) and IP

n = number of tracks (parent + daughters)

		GSI2 C2H4 target
MC	Beam particles	19988
	True vertices	5875
	Reco vertices	5096
DATA	Beam particles	20000
	Data vertices	6489

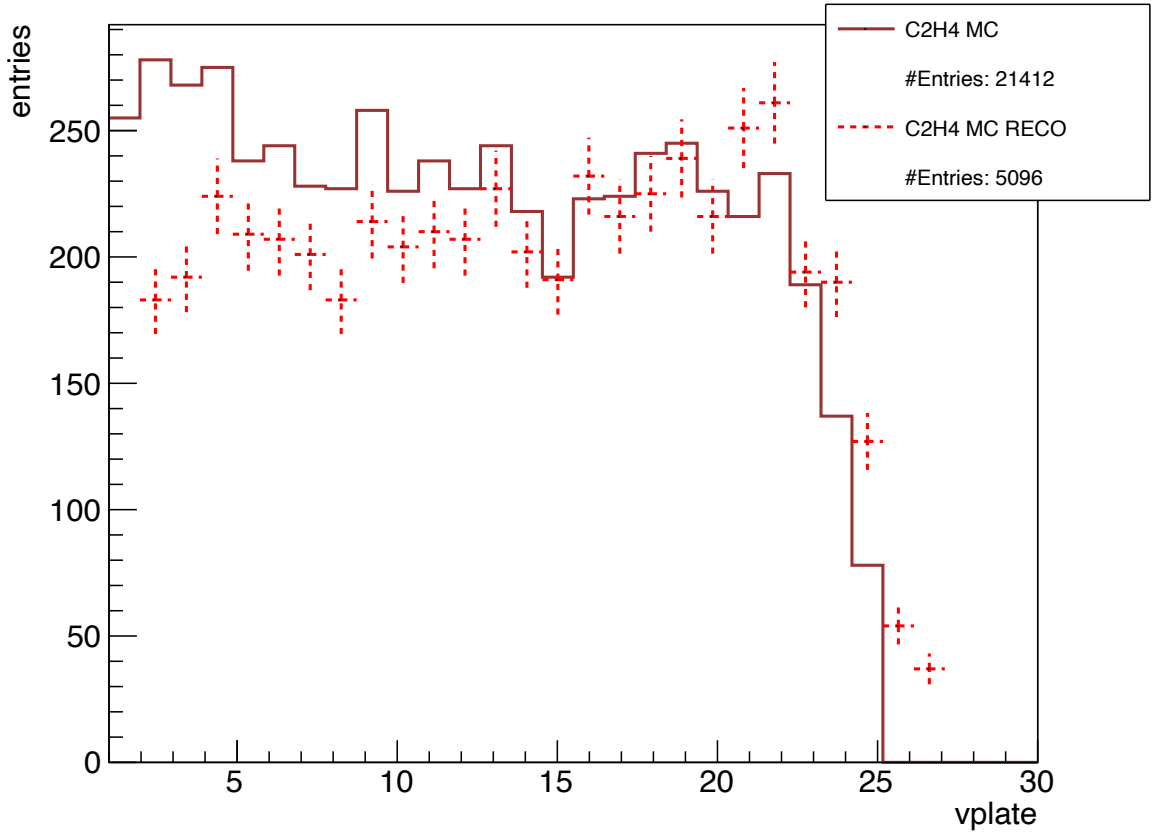


- Fine tuning MC: smearing effects to be implemented in MC to reproduce small misalignments in positions

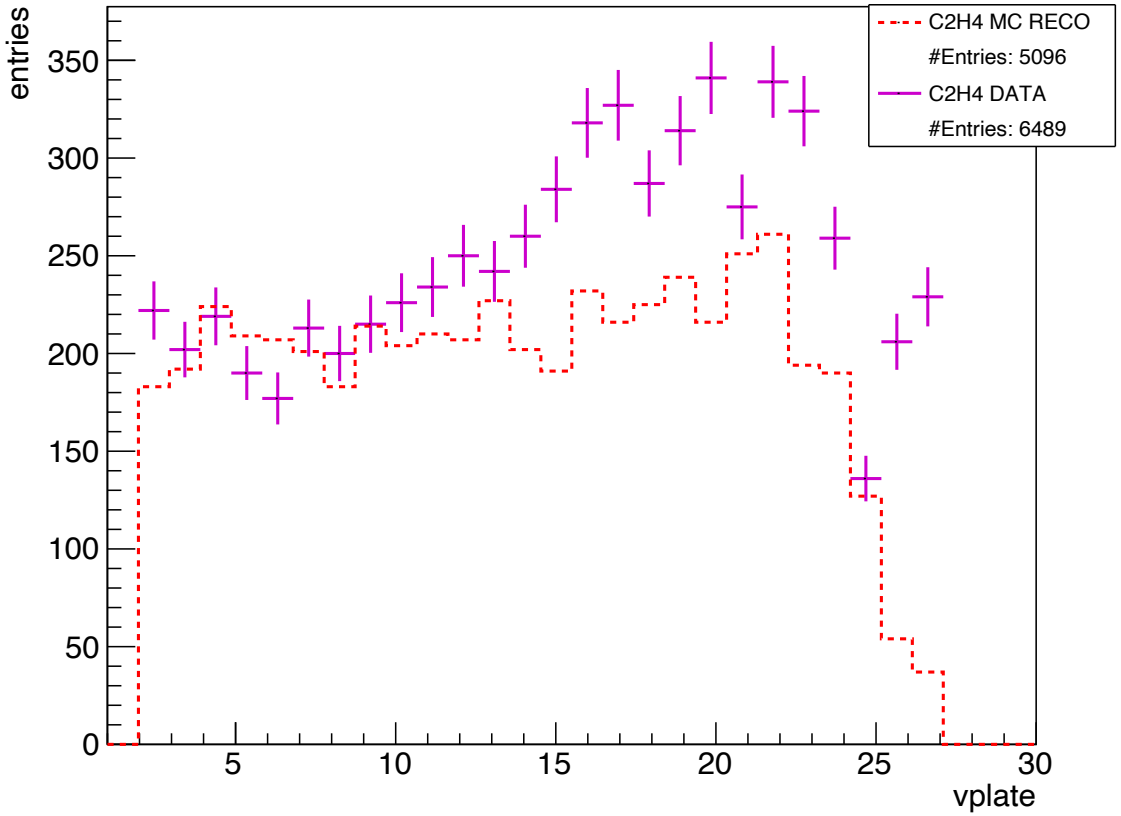
GSI2 - Vertex Plate distribution

Distributions normalized to beam particles, requirement of at least 3 tracks in the vertex.

MC TRUE vs MC RECO



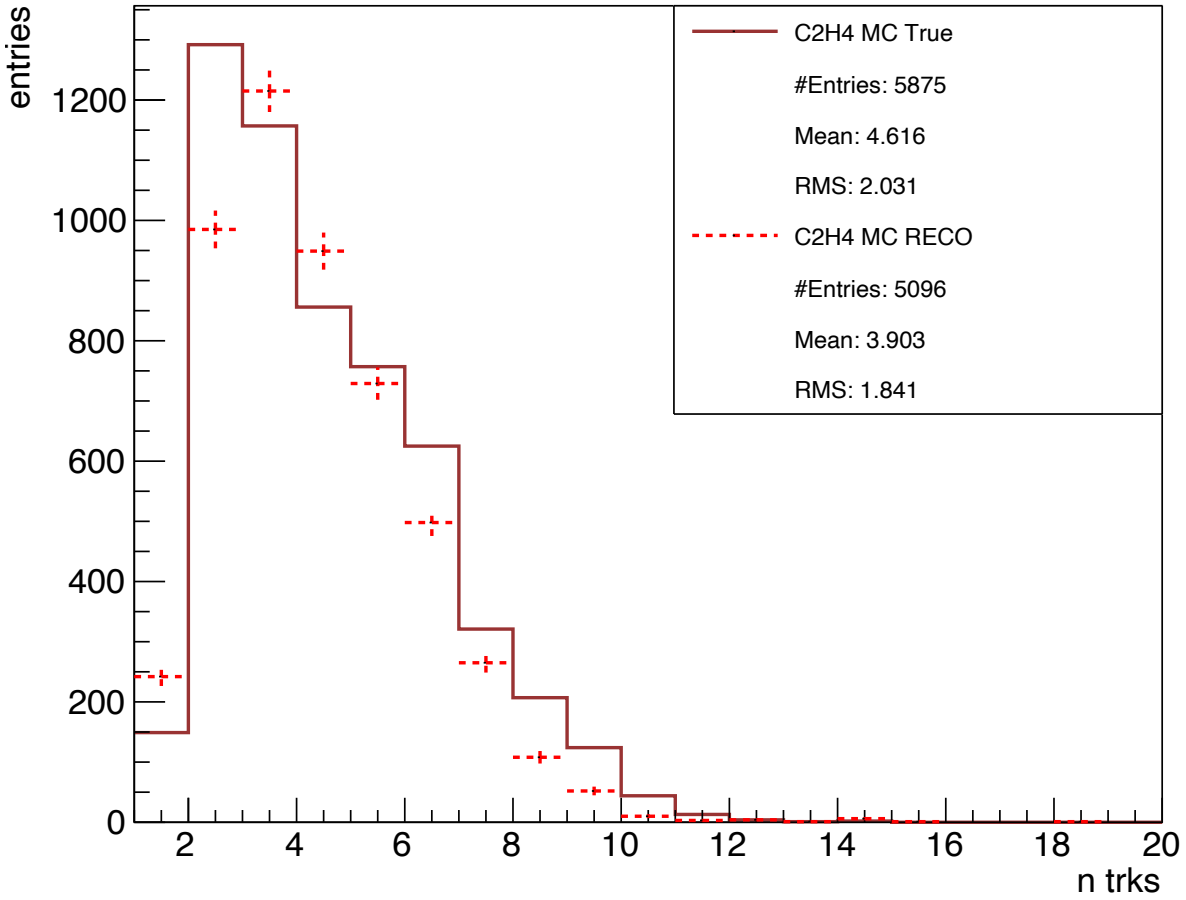
MC RECO vs DATA



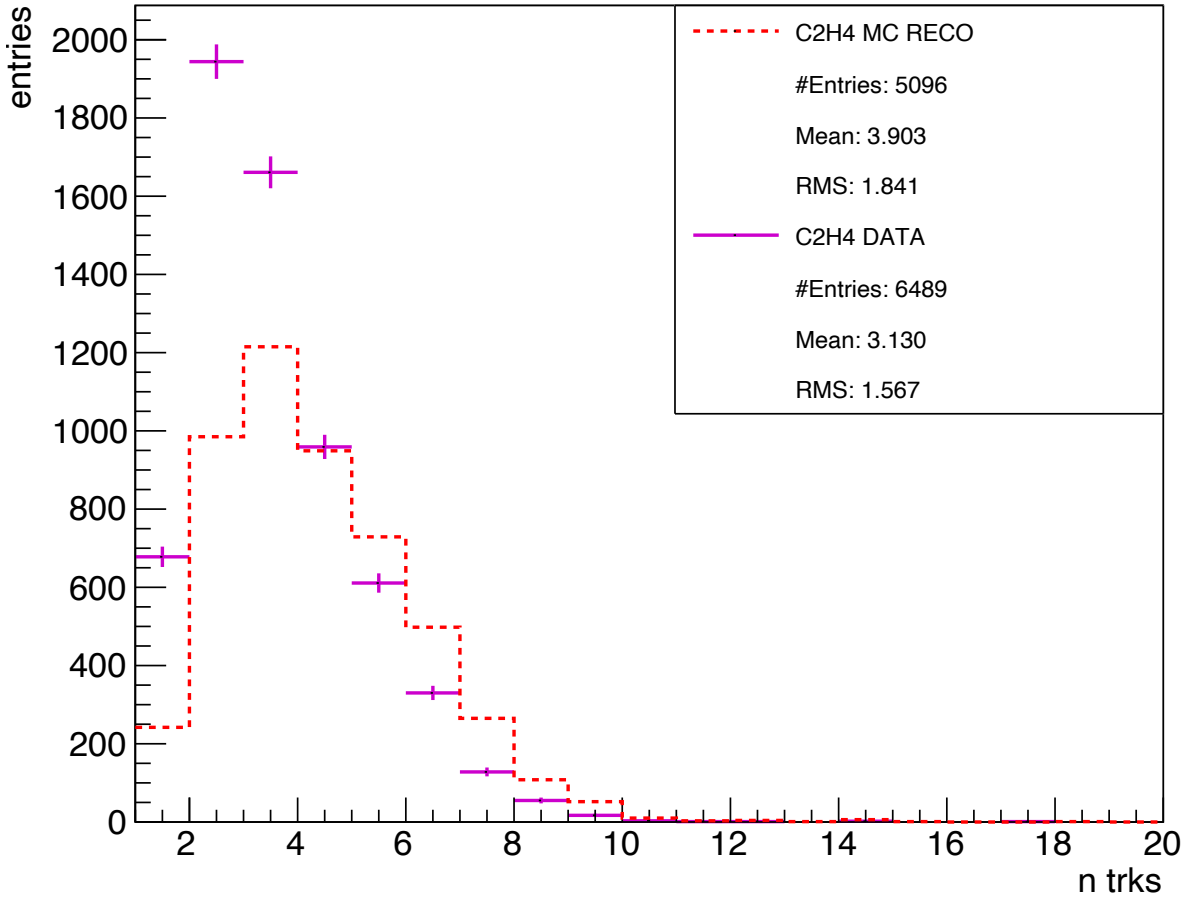
GSI2 - Fragments' multiplicity distribution

Distributions normalized to beam particles, requirement of at least 3 tracks in the vertex.

MC TRUE vs MC RECO



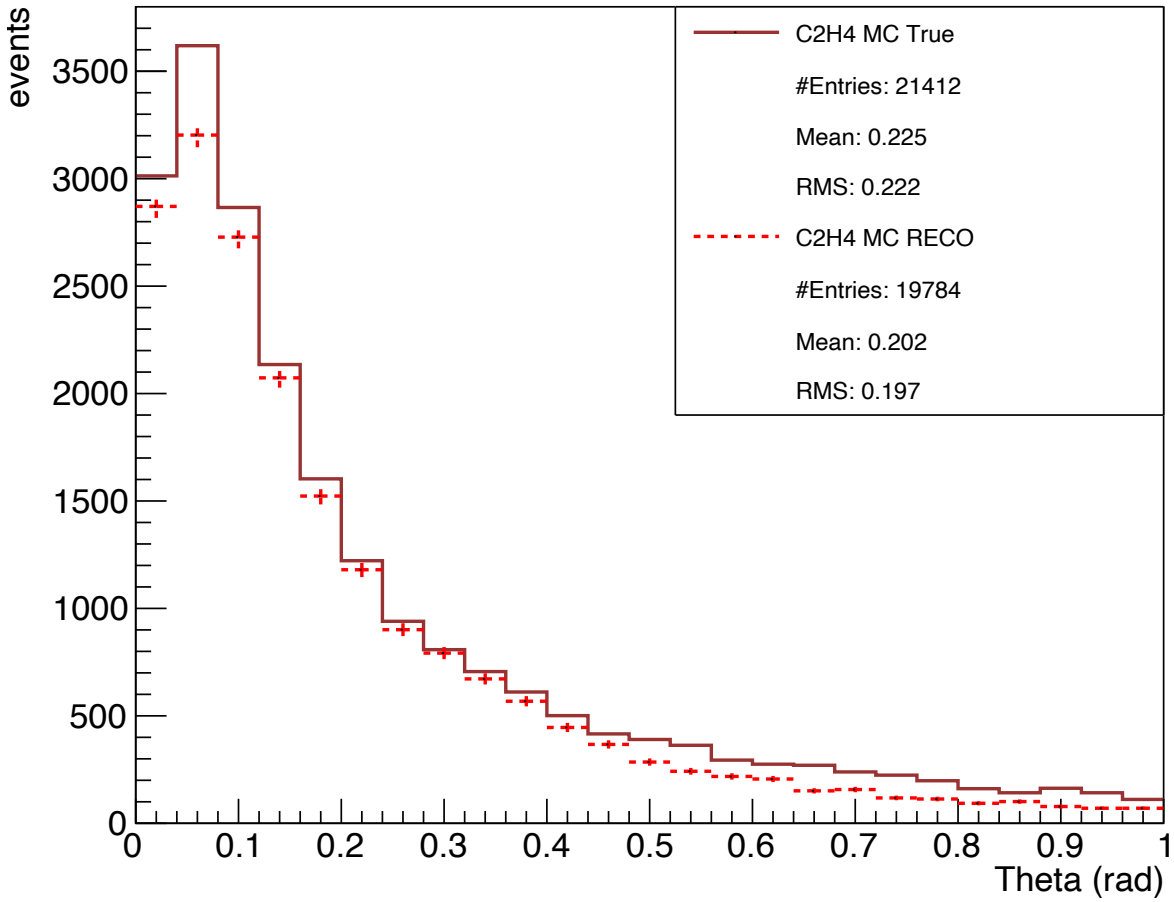
MC RECO vs DATA



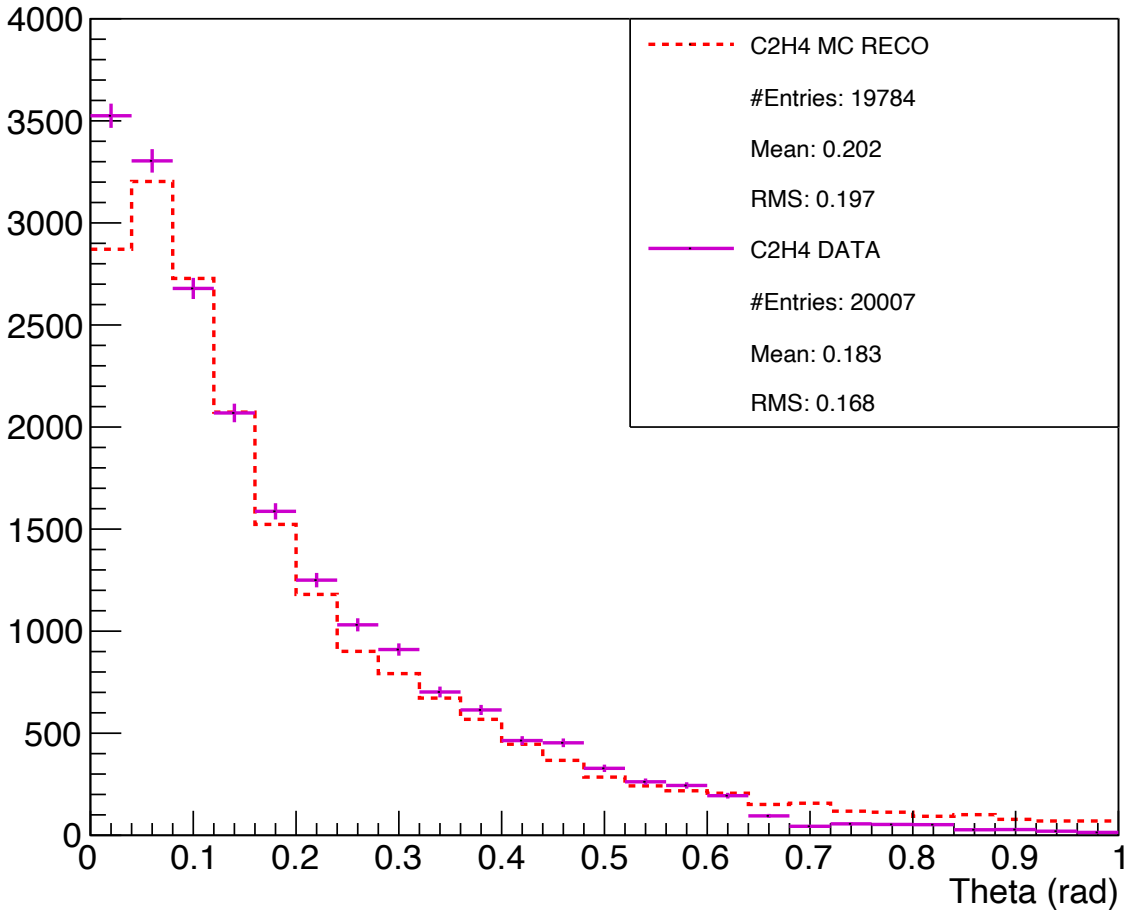
GSI2 - Fragments' angular distribution

Distributions normalized to beam particles, requirement of at least 3 tracks in the vertex.

MC TRUE vs MC RECO

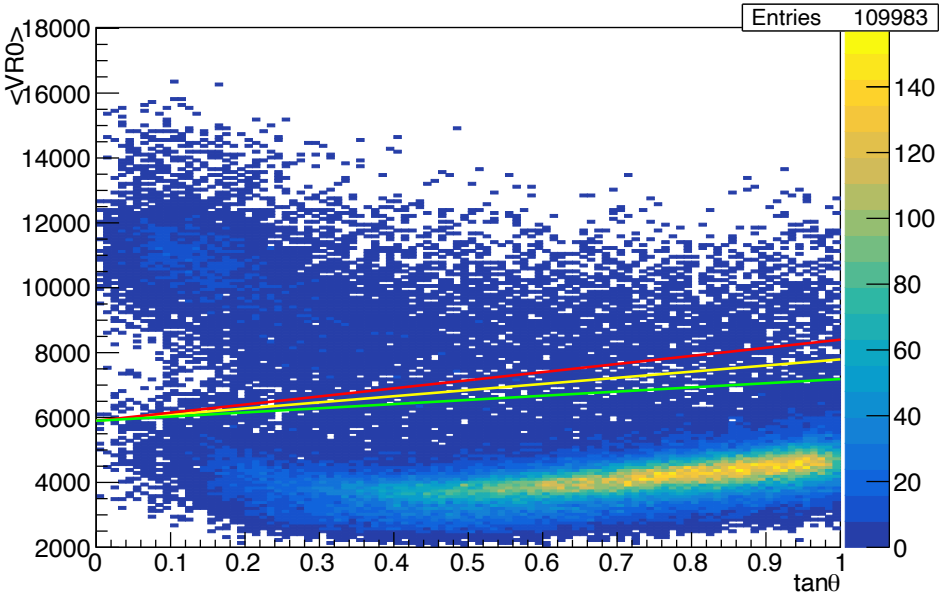


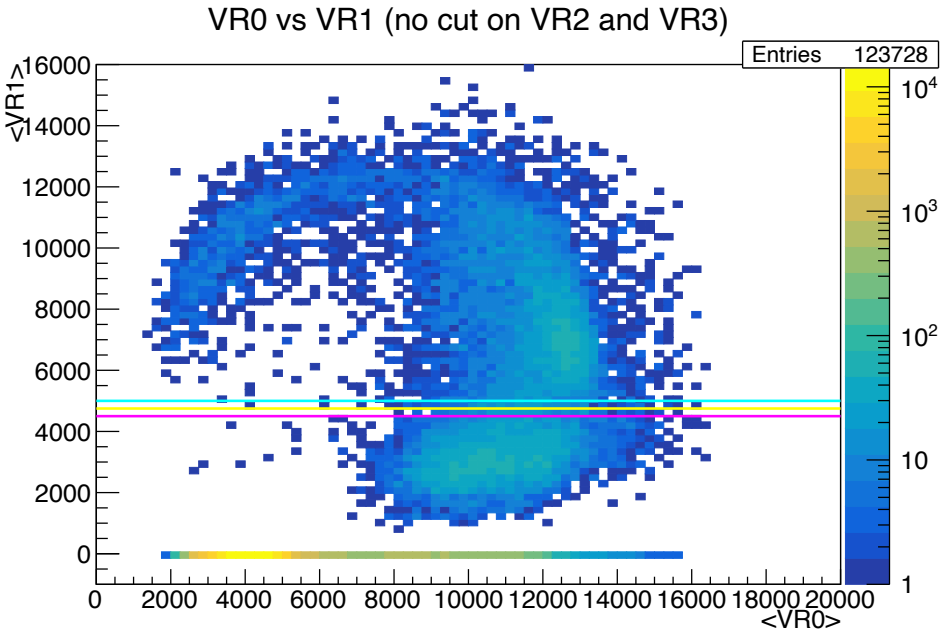
MC RECO vs DATA

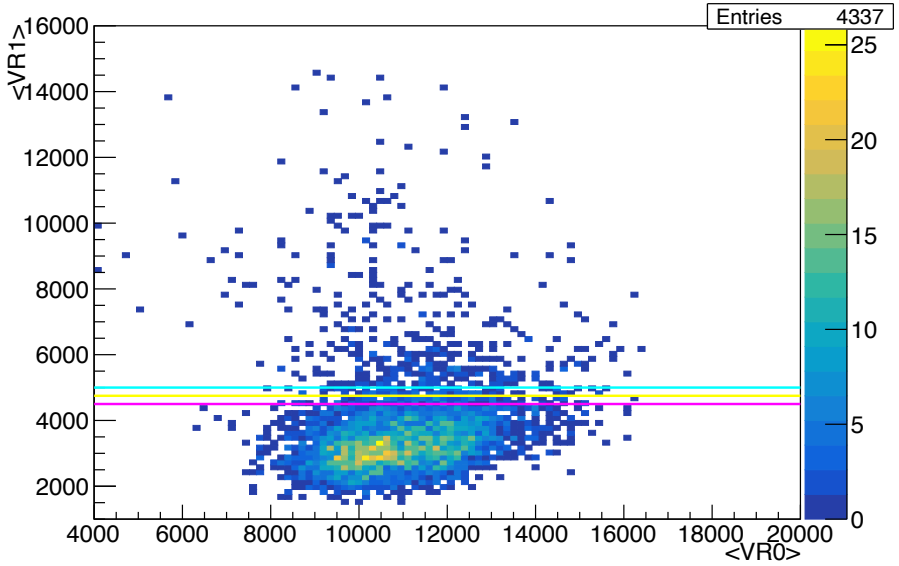


Charge measurement GSI1

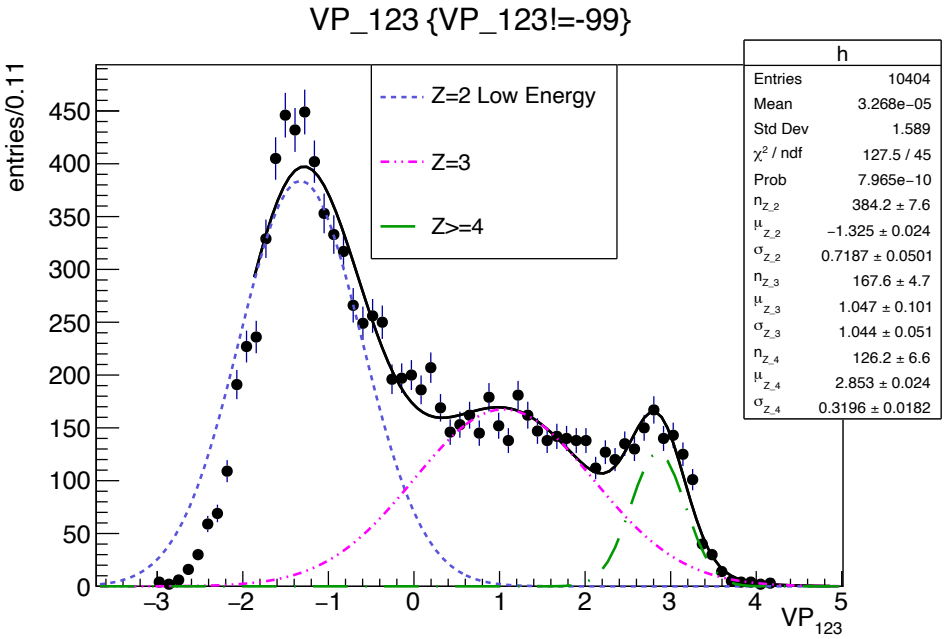
Sharp cuts

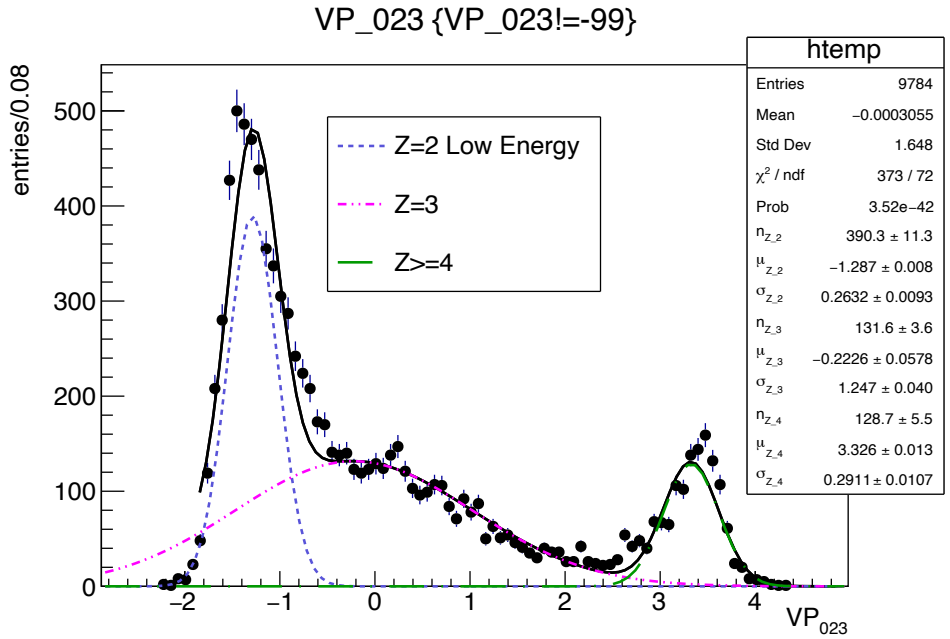

Entries 109983
<VR0>
tanθ

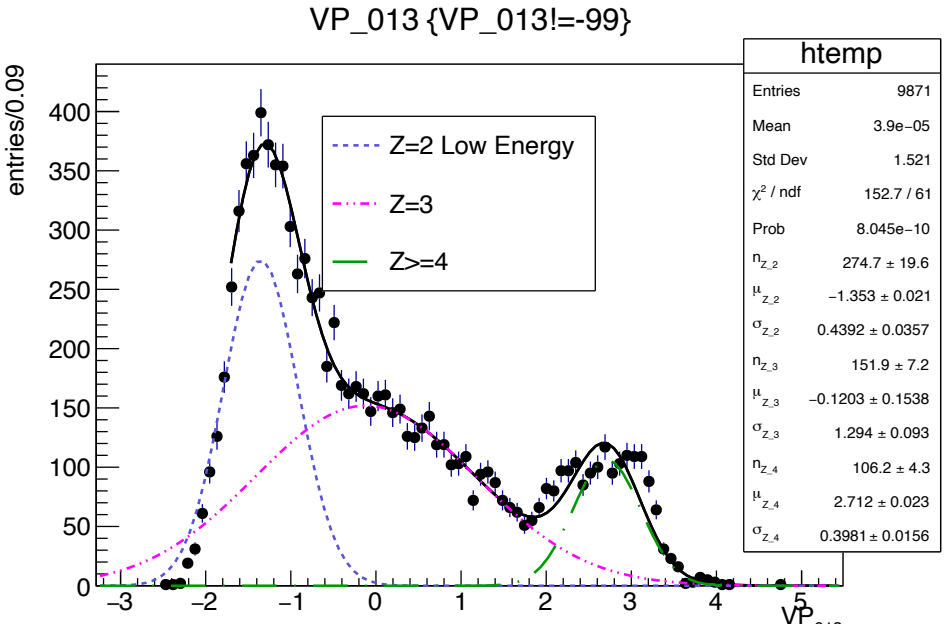

VR0 vs VR1 (no cut on VR2 and VR3)
Entries 123728
<VR1>
<VR0>

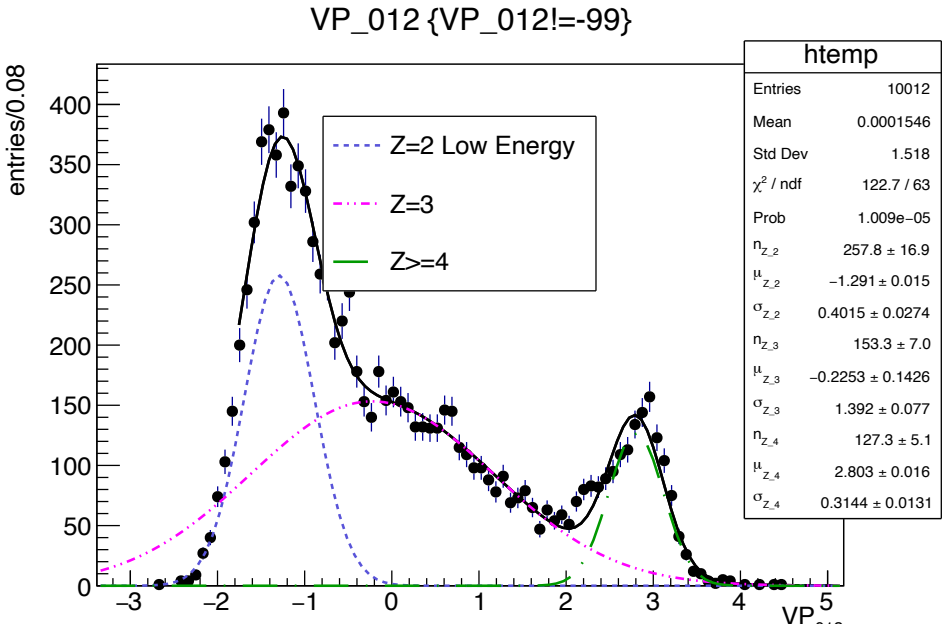

Entries 4337
<VR1>
<VR0>

PCA Fits


VP_123 {VP_123!=-99}
entries/0.11
Z=2 Low Energy
Z=3
Z>=4
VP123
h
Entries 10404
Mean 3.268e−05
Std Dev 1.589
χ² / ndf 127.5 / 45
Prob 7.965e−10
n_Z_2 384.2 ± 7.6
μ_Z_2 −1.325 ± 0.024
σ_Z_2 0.7187 ± 0.0501
n_Z_3 167.6 ± 4.7
μ_Z_3 1.047 ± 0.101
σ_Z_3 1.044 ± 0.051
n_Z_4 126.2 ± 6.6
μ_Z_4 2.853 ± 0.024
σ_Z_4 0.3196 ± 0.0182

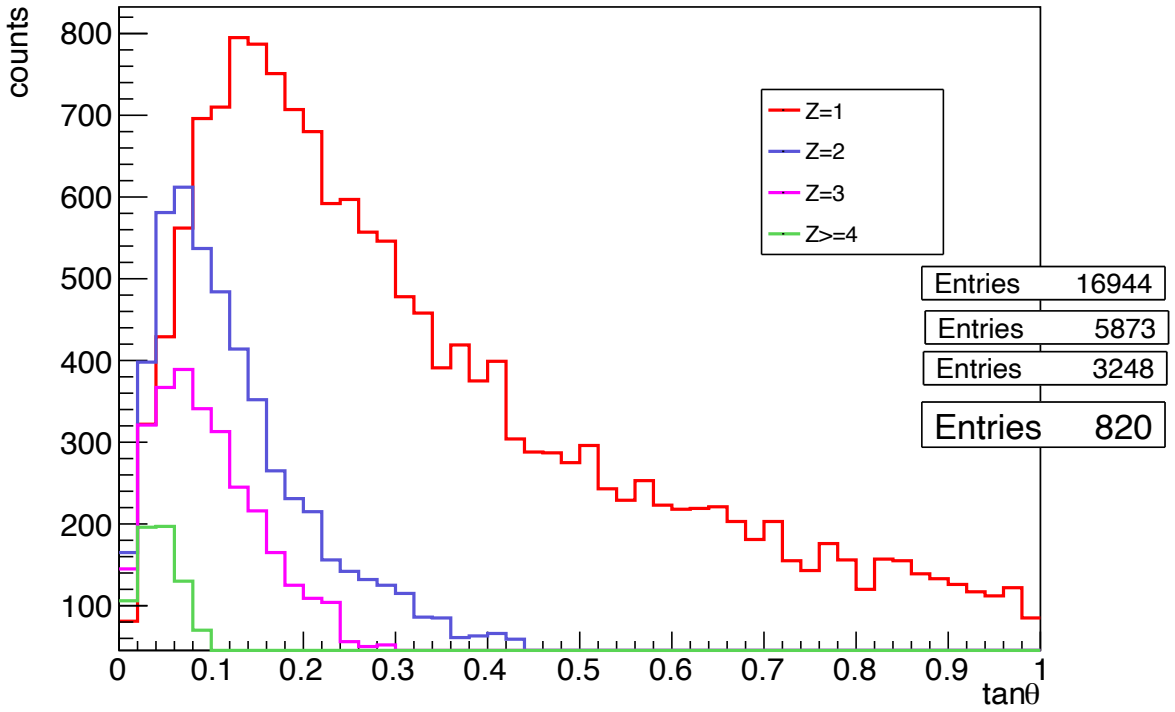

VP_023 {VP_023!=-99}
entries/0.08
Z=2 Low Energy
Z=3
Z>=4
VP023
htemp
Entries 9784
Mean −0.0003055
Std Dev 1.648
χ² / ndf 373 / 72
Prob 3.52e−42
n_Z_2 390.3 ± 11.3
μ_Z_2 −1.287 ± 0.008
σ_Z_2 0.2632 ± 0.0093
n_Z_3 131.6 ± 3.6
μ_Z_3 −0.2226 ± 0.0578
σ_Z_3 1.247 ± 0.040
n_Z_4 128.7 ± 5.5
μ_Z_4 3.326 ± 0.013
σ_Z_4 0.2911 ± 0.0107


VP_013 {VP_013!=-99}
entries/0.09
Z=2 Low Energy
Z=3
Z>=4
htemp
Entries 9871
Mean 3.9e−05
Std Dev 1.521
χ² / ndf 152.7 / 61
Prob 8.045e−10
n_Z_2 274.7 ± 19.6
μ_Z_2 −1.353 ± 0.021
σ_Z_2 0.4392 ± 0.0357
n_Z_3 151.9 ± 7.2
μ_Z_3 −0.1203 ± 0.1538
σ_Z_3 1.294 ± 0.093
n_Z_4 106.2 ± 4.3
μ_Z_4 2.712 ± 0.023
σ_Z_4 0.3981 ± 0.0156


VP_012 {VP_012!=-99}
entries/0.08
Z=2 Low Energy
Z=3
Z>=4
htemp
Entries 10012
Mean 0.0001546
Std Dev 1.518
χ² / ndf 122.7 / 63
Prob 1.009e−05
n_Z_2 257.8 ± 16.9
μ_Z_2 −1.291 ± 0.015
σ_Z_2 0.4015 ± 0.0274
n_Z_3 153.3 ± 7.0
μ_Z_3 −0.2253 ± 0.1426
σ_Z_3 1.392 ± 0.077
n_Z_4 127.3 ± 5.1
μ_Z_4 2.803 ± 0.016
σ_Z_4 0.3144 ± 0.0131

Preliminary results

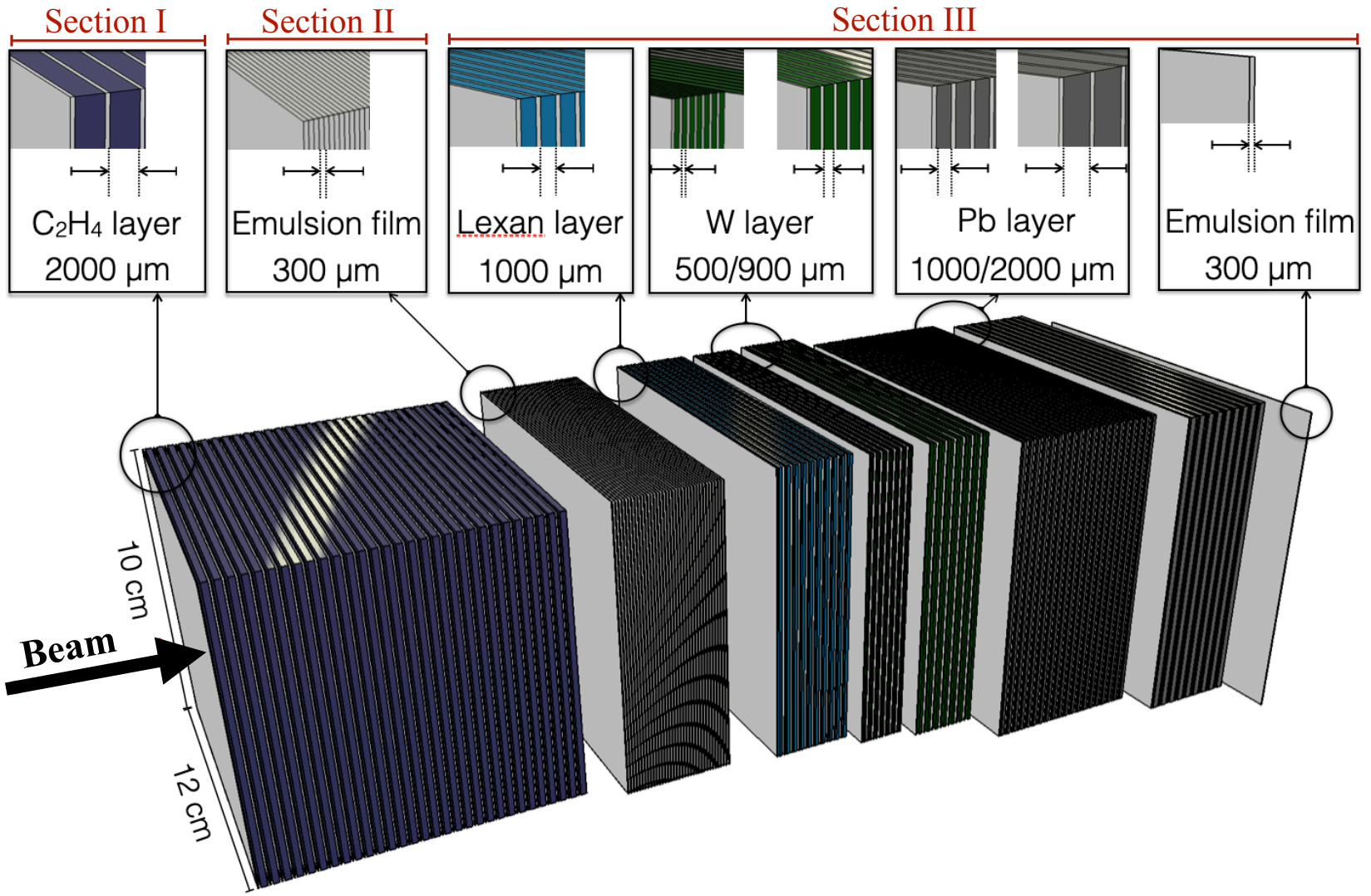
Z	N particle	% total	% charged
0	96840	78%	
1	16944	14%	63%
2	5873	5%	22%
3	3248	3%	12%
4	820	1%	3%
tot	123725		



THANK YOU!

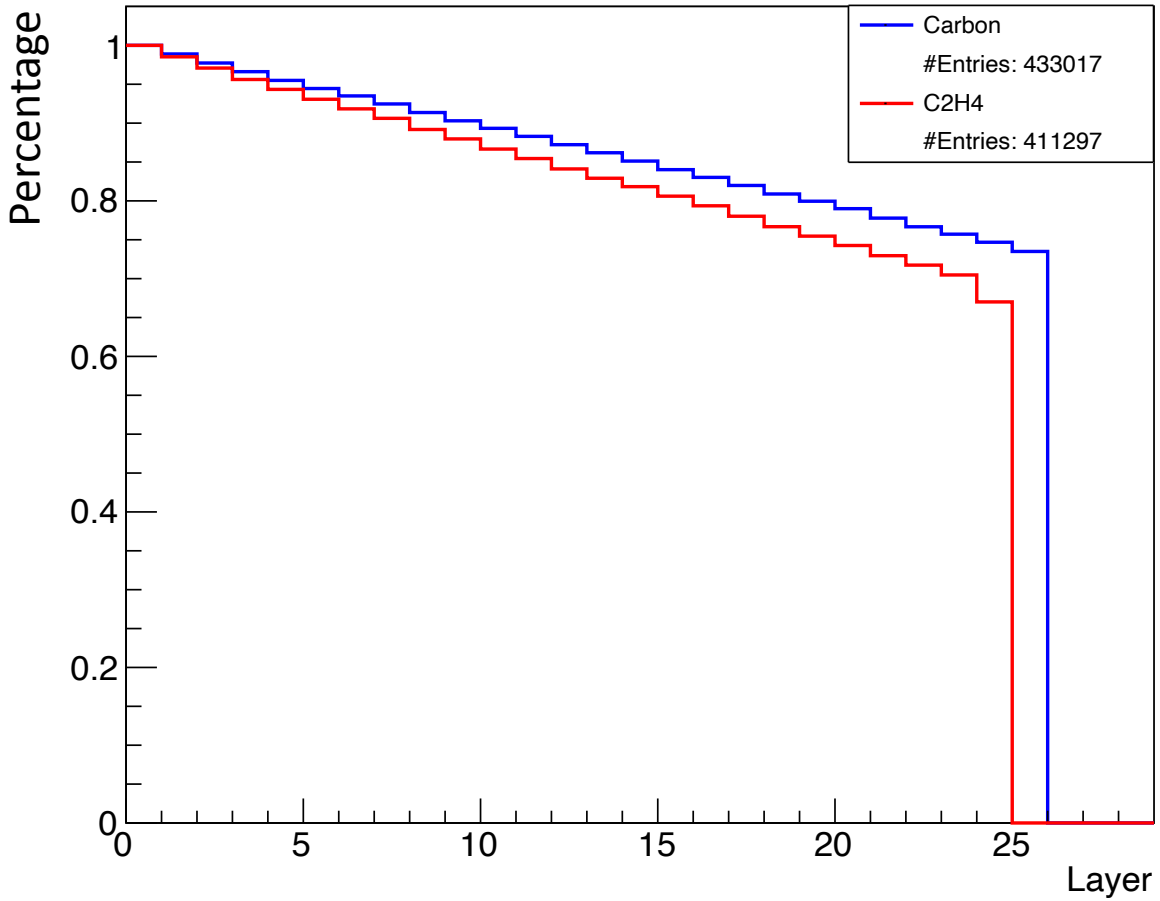
BACK UP SLIDES

Detector Structure



Mean Oxygen Kinetic Energy per layer distribution (MC)

Surviving Oxygens per layer



Mean Oxy Ekin per nucleon in each layer