

for SPS: **actual Endep vs baricenter**

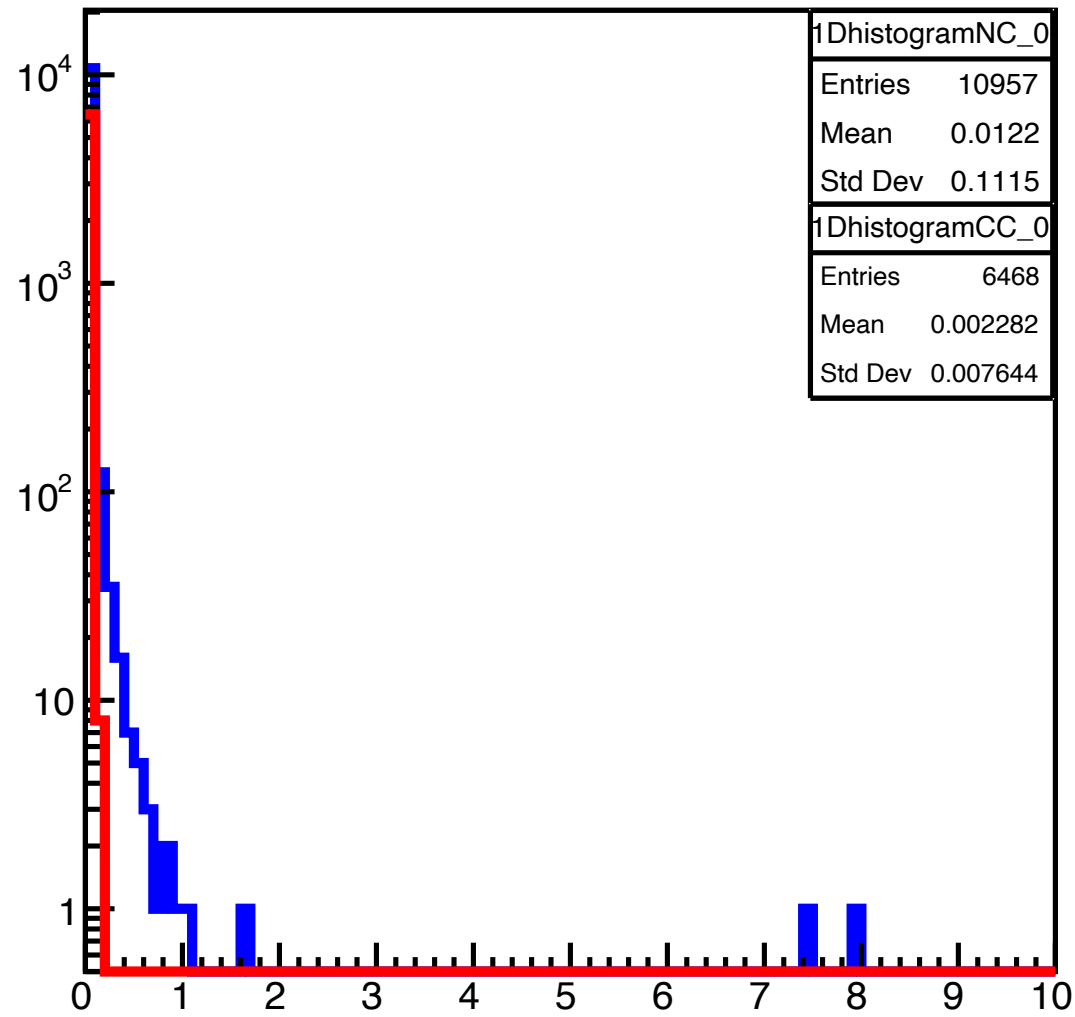
Ratio: between **Sum hadron energy (real Edep)** to baricenter for different z level

NC - blue

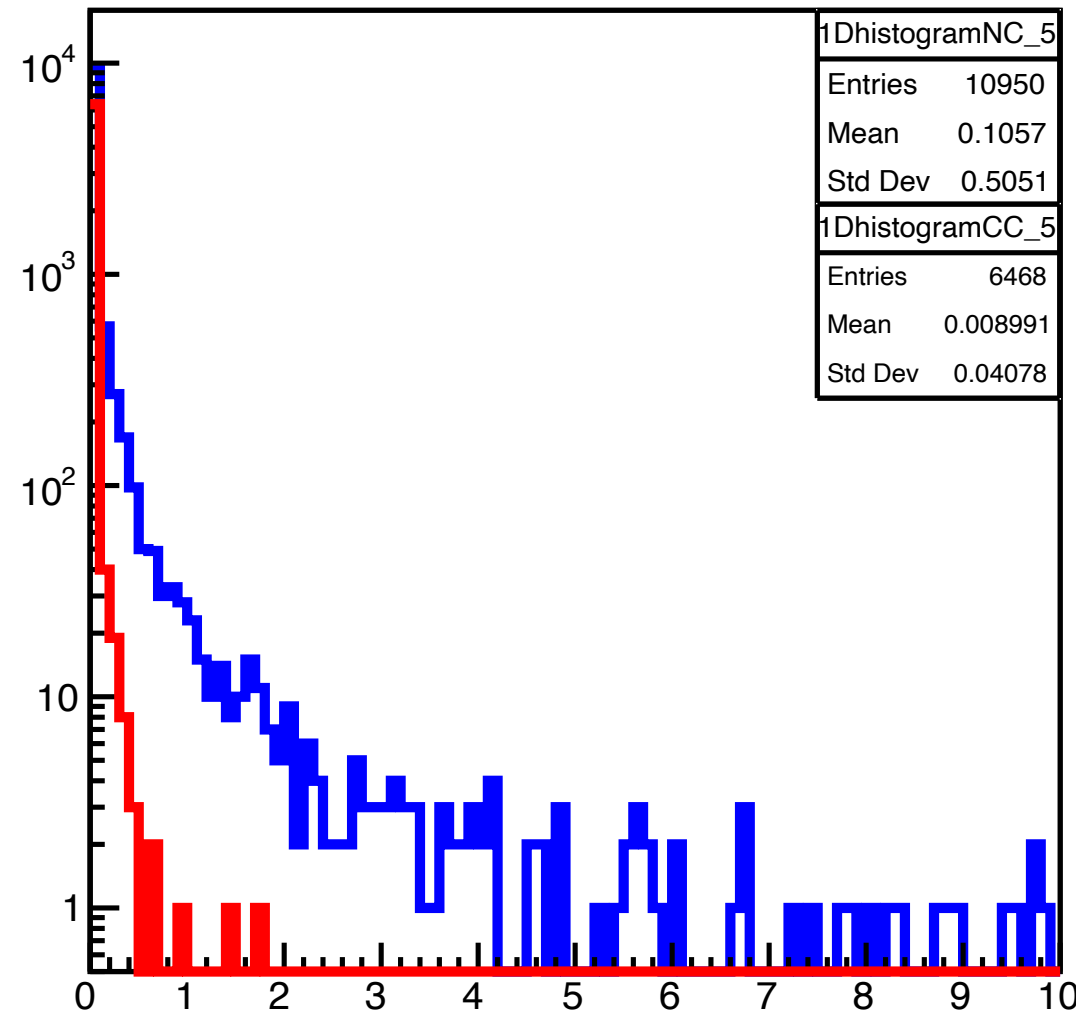
CC - red

hist(cogXY/Edep)

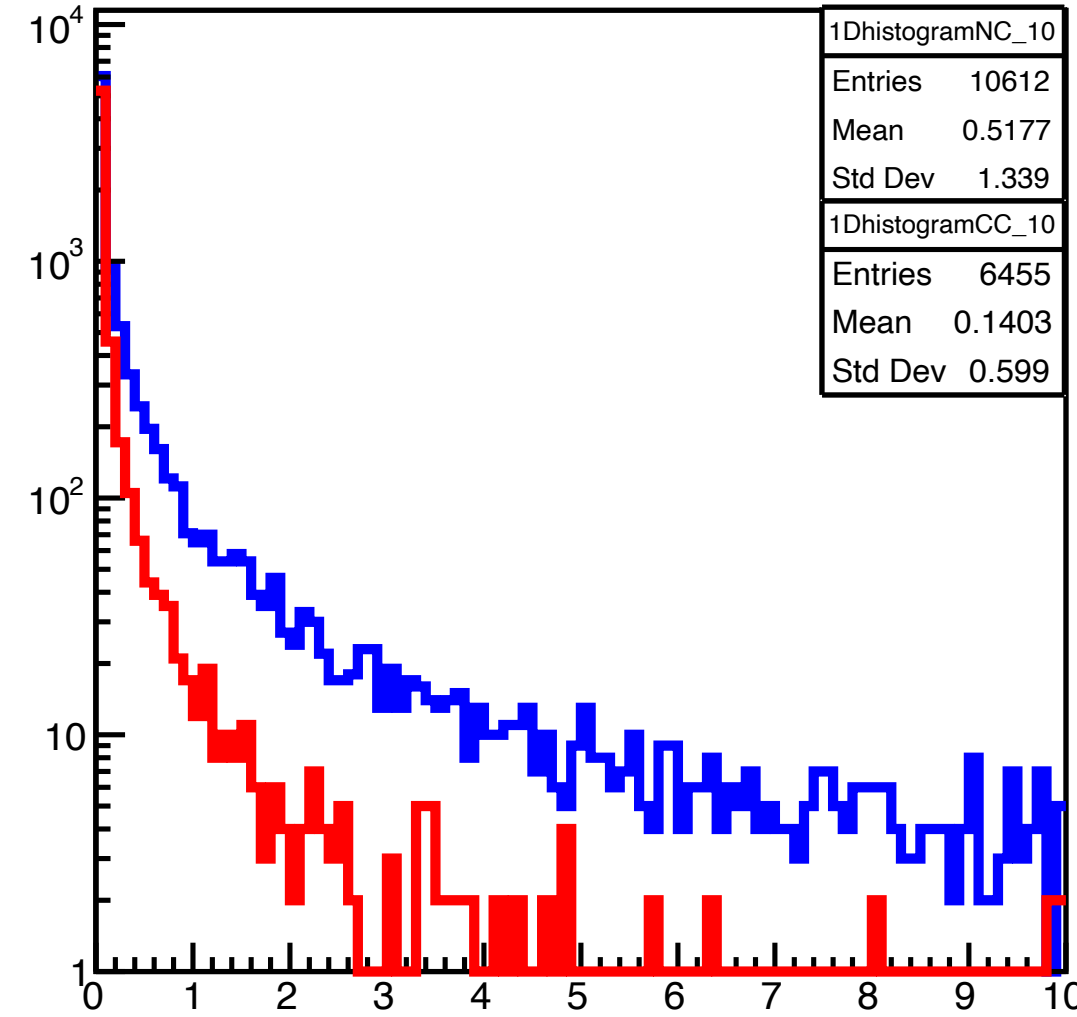
ratio: Energy / sqrt(cogX^2 + cogY^2) for i=0



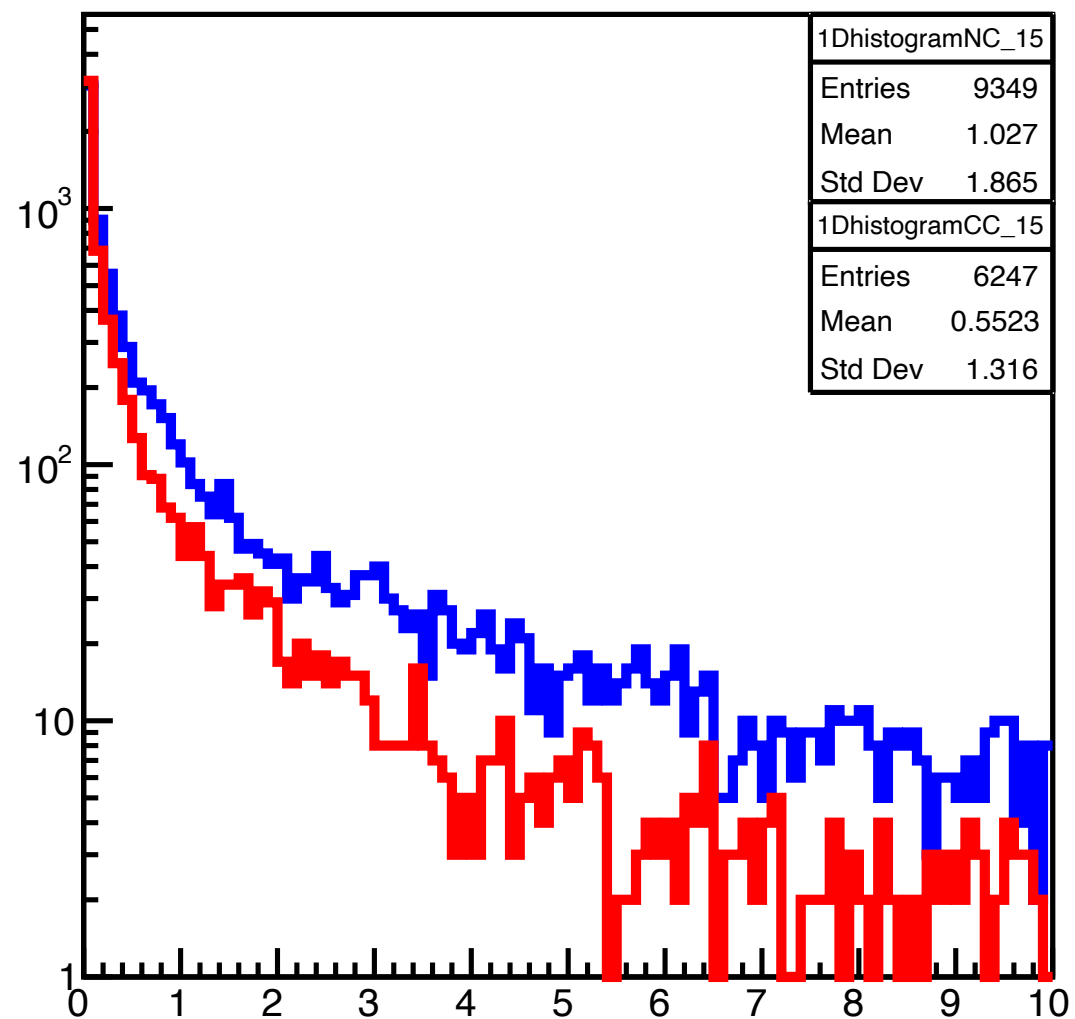
ratio: Energy / sqrt(cogX^2 + cogY^2) for i=5



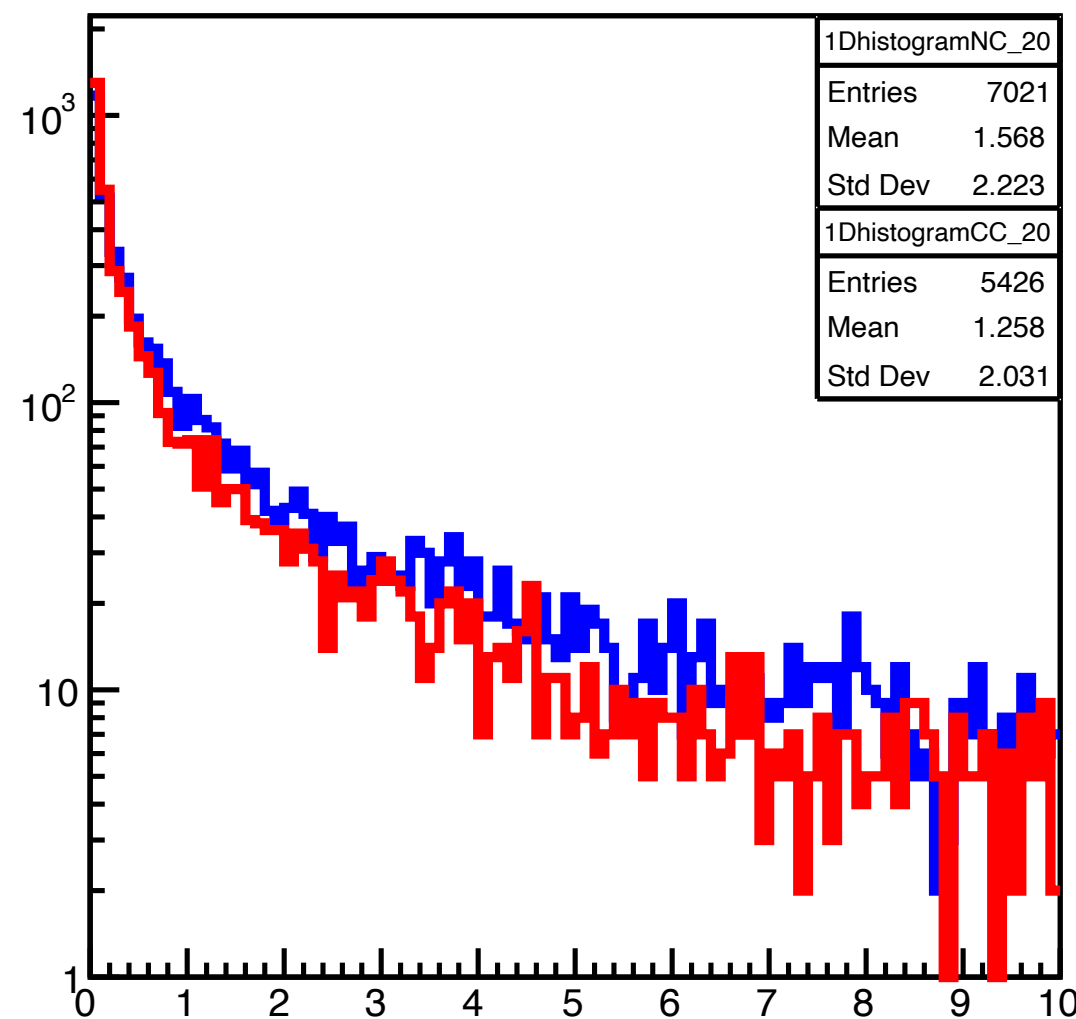
ratio: Energy / sqrt(cogX^2 + cogY^2) for i=10



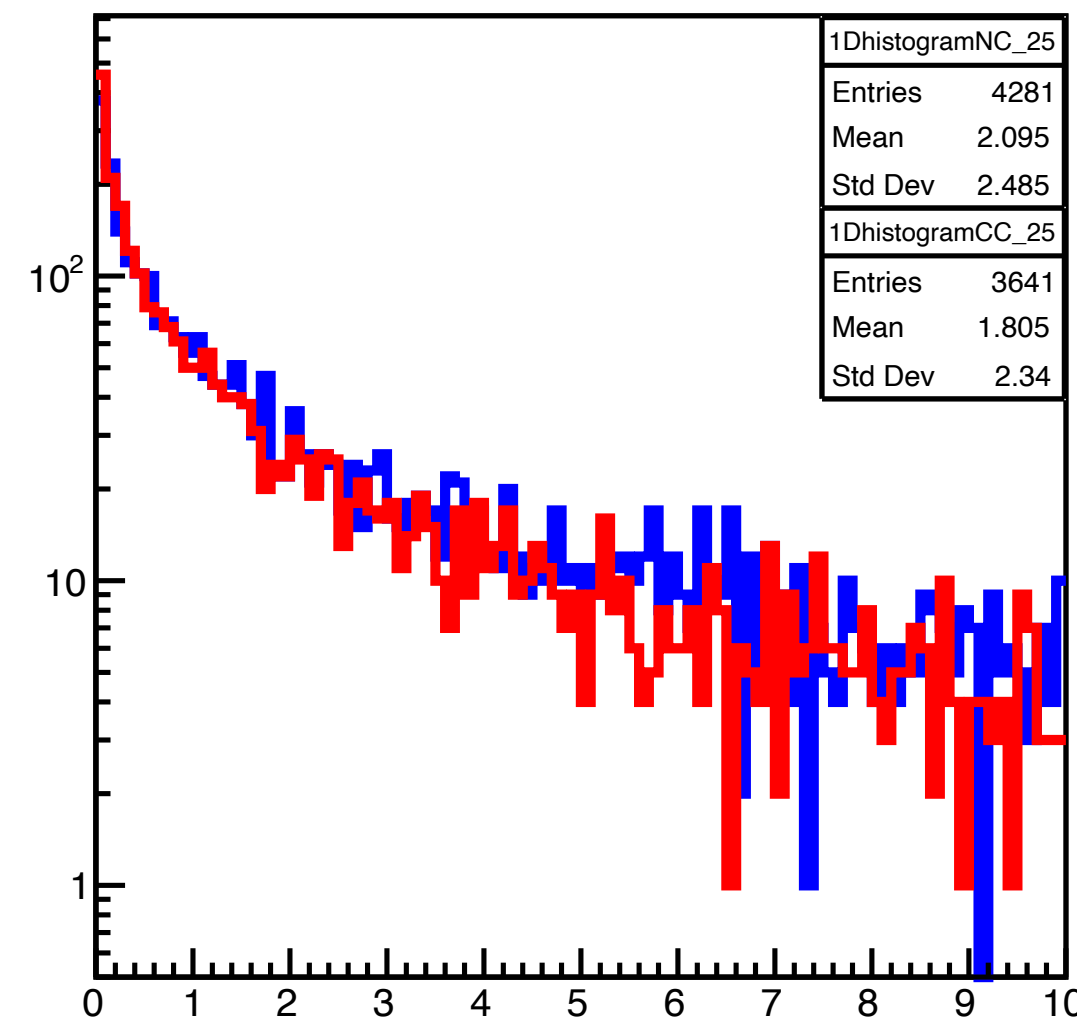
ratio: Energy / sqrt(cogX^2 + cogY^2) for i=15



ratio: Energy / sqrt(cogX^2 + cogY^2) for i=20

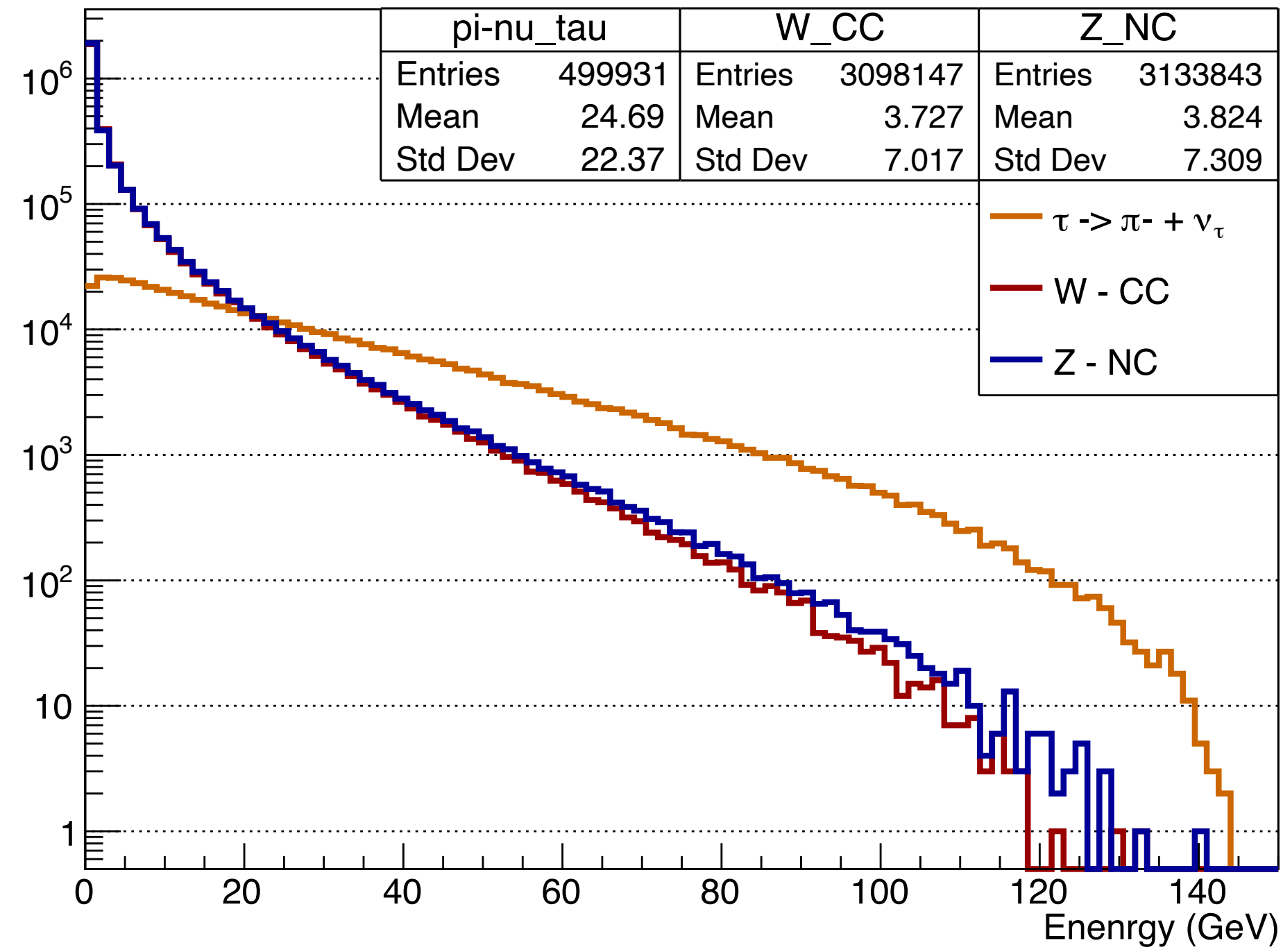


ratio: Energy / sqrt(cogX^2 + cogY^2) for i=25

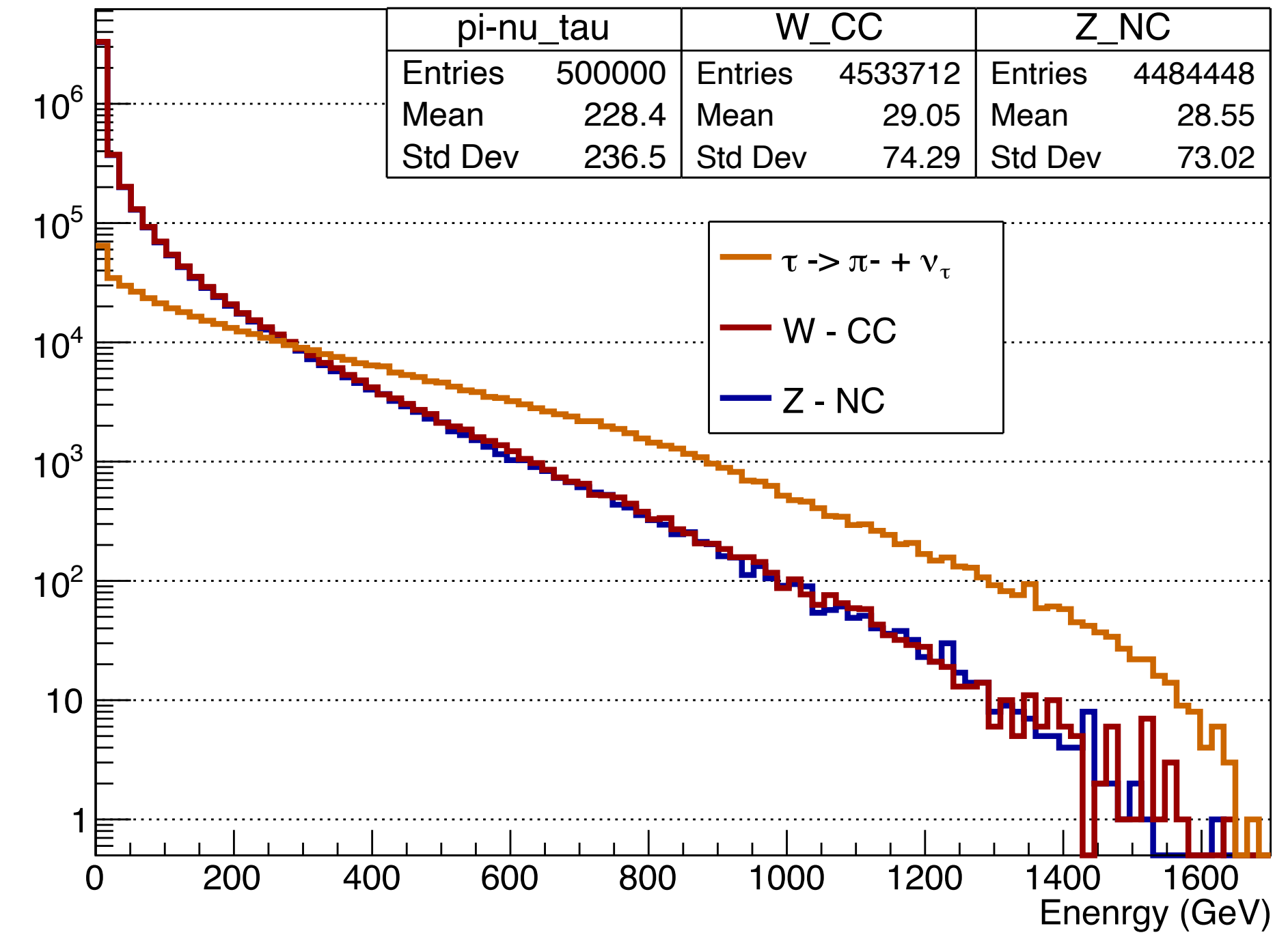


LHC neutrino spectrum

SPS - charged hadron energy



LHC - charged hadron energy



Event display

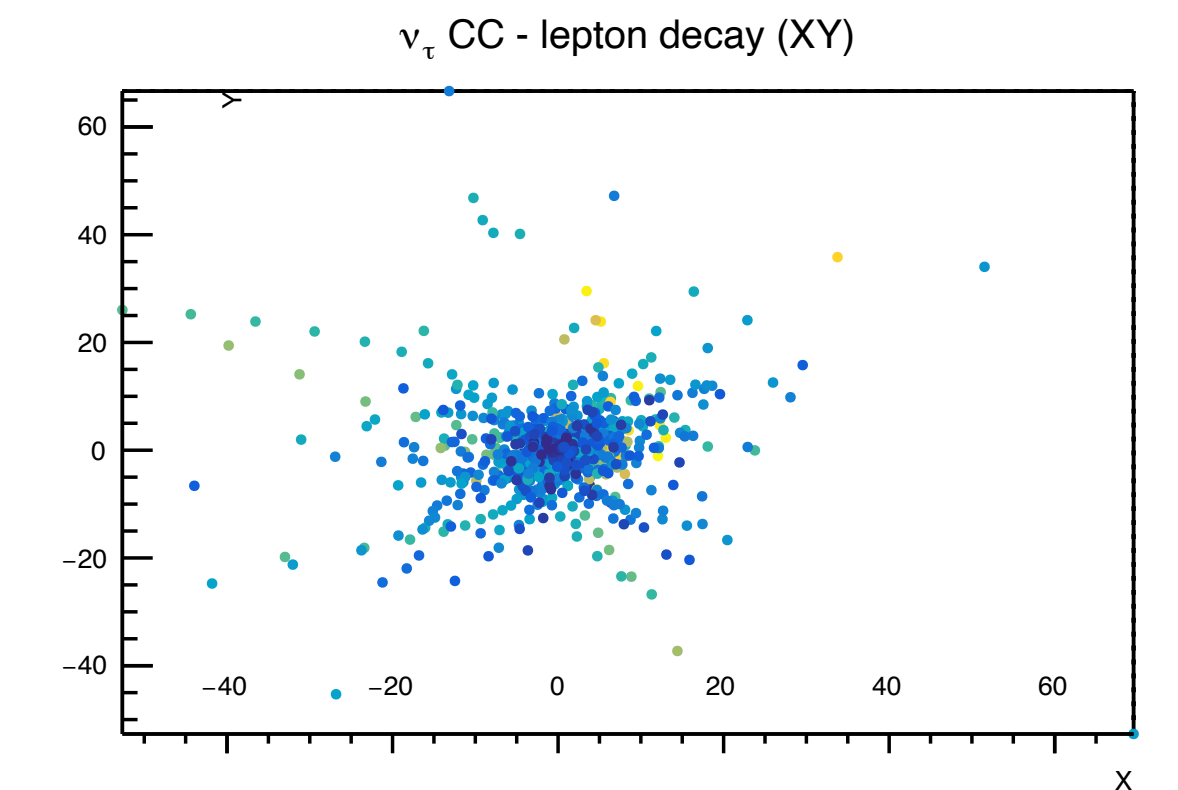
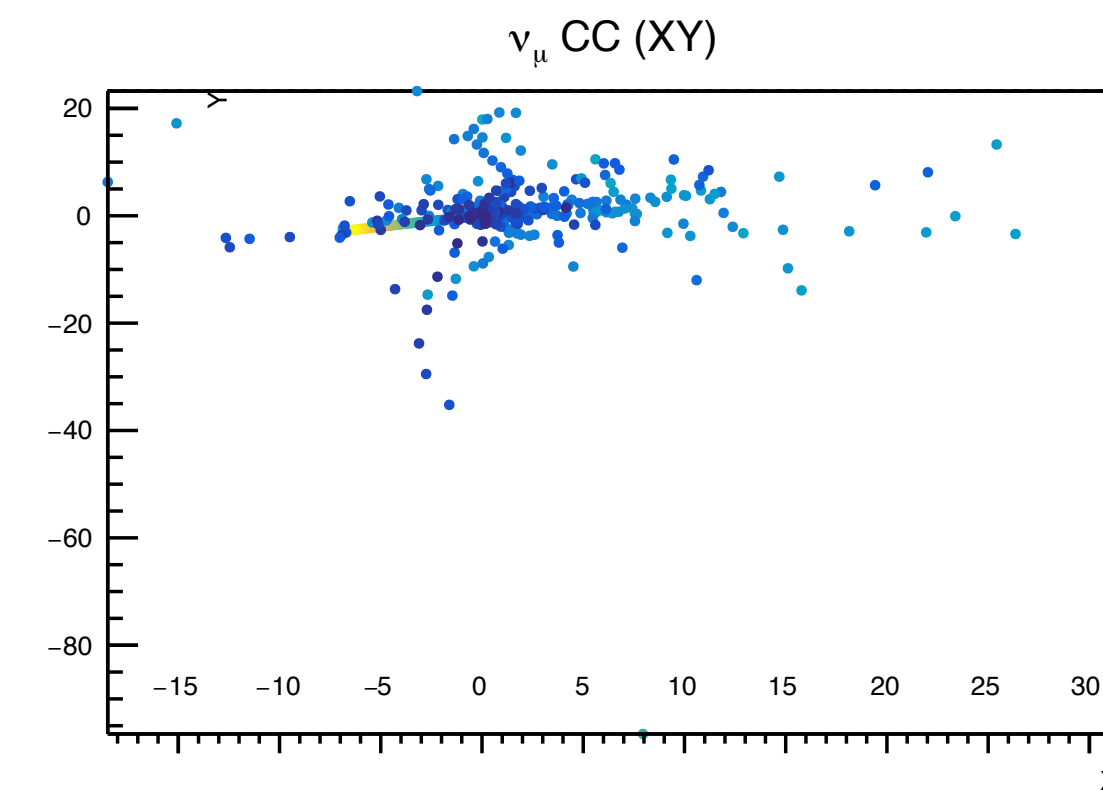
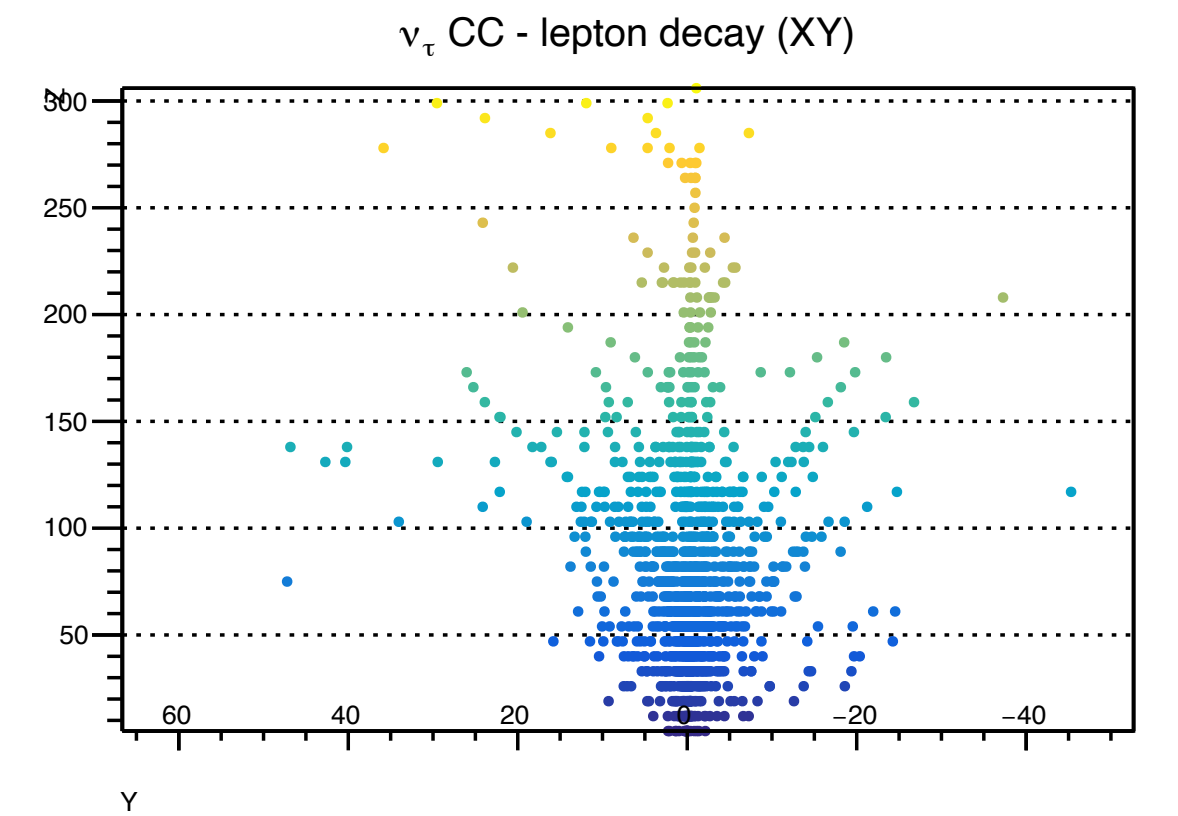
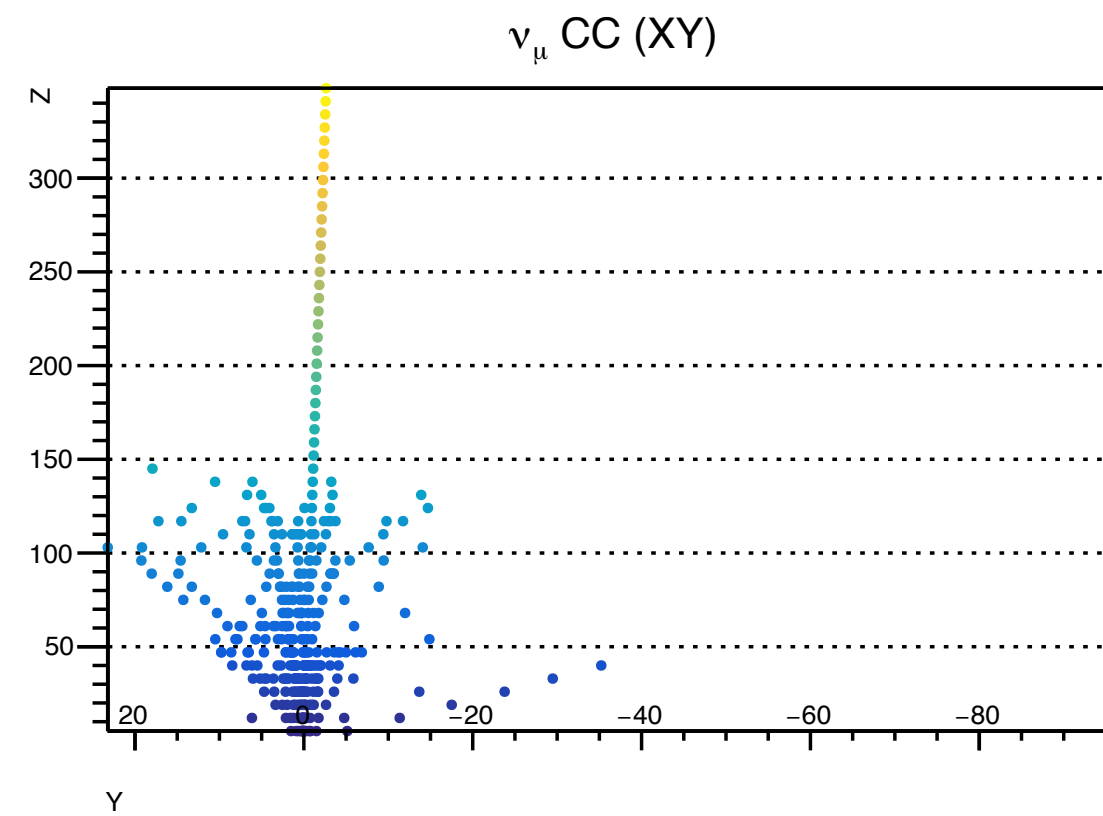
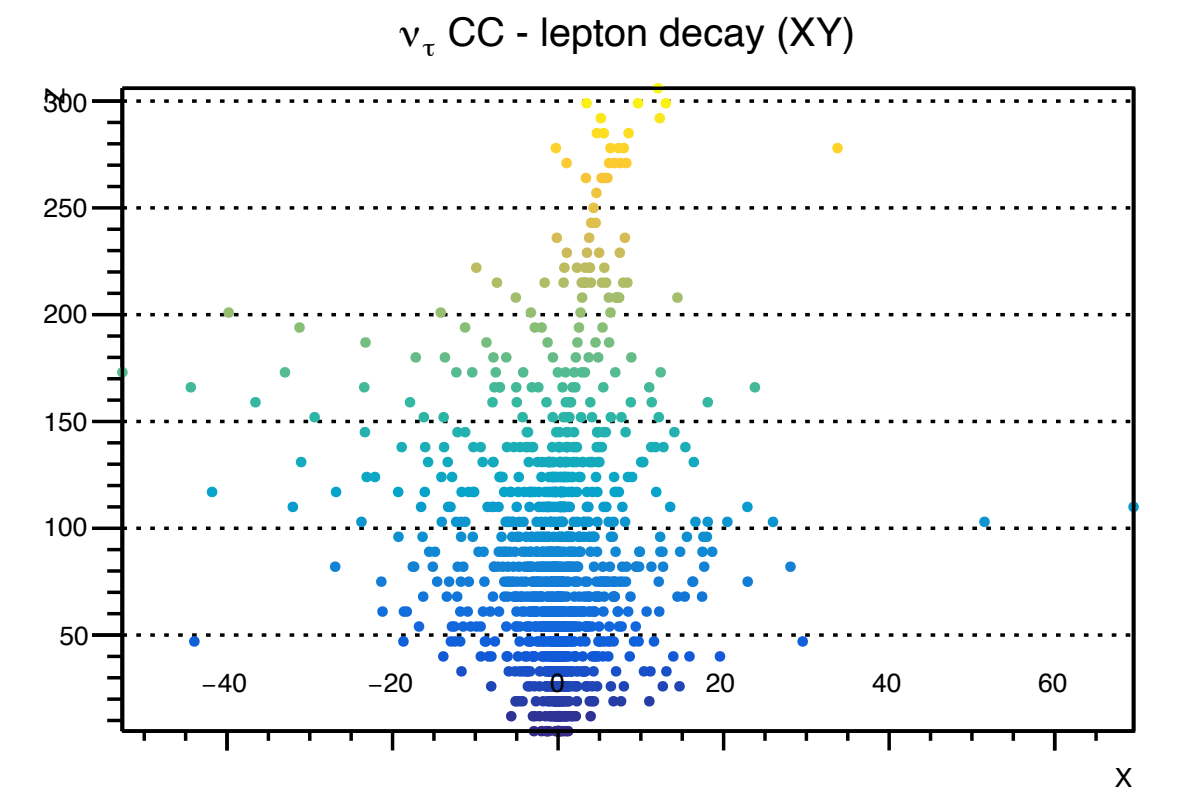
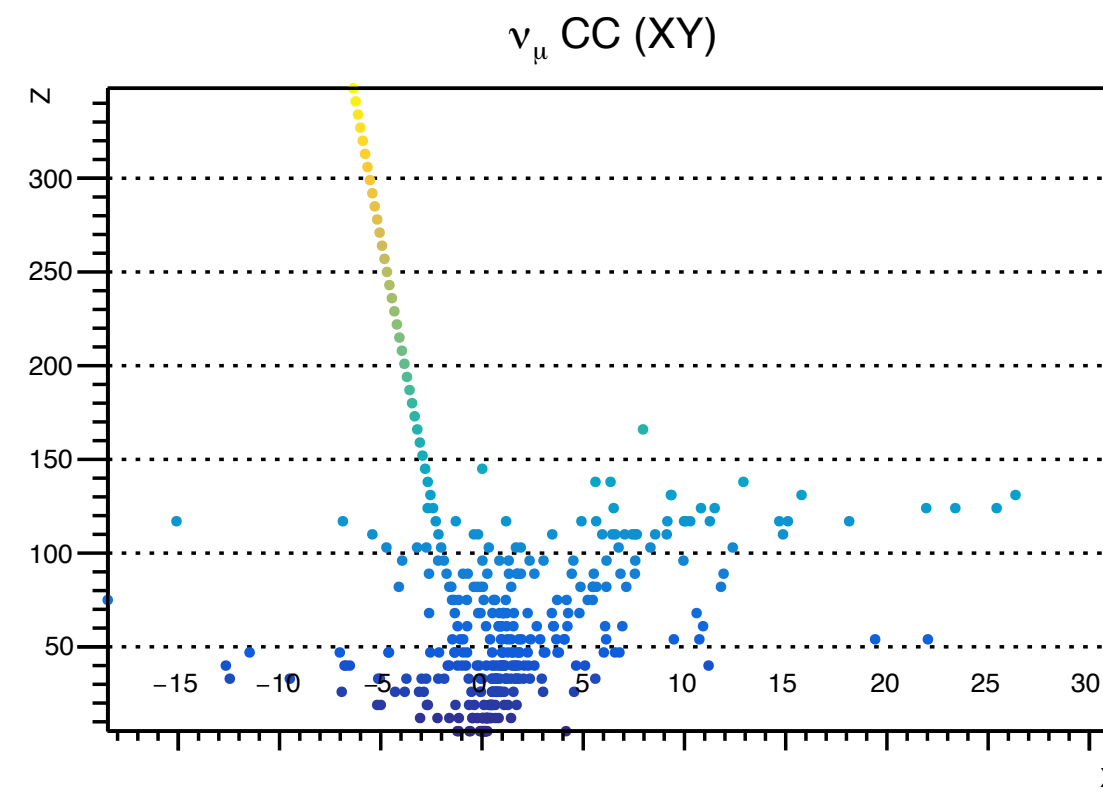
mu

1	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
1	14	8.39861e+02	0.00000e+00	0.00000e+00	8.39861e+02
1	13	4.99534e+02	-1.00399e+01	-3.81986e+00	4.99418e+02
1	2000000001	3.41255e+02	9.91040e+00	3.82859e+00	3.40365e+02
1	92	3.41255e+02	9.91040e+00	3.82859e+00	3.40365e+02

tau

23	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
23	16	8.34026e+02	0.00000e+00	0.00000e+00	8.34026e+02
23	15	4.01053e+01	-1.99954e+00	3.09453e-01	4.00148e+01
23	2000000001	7.94849e+02	2.01045e+00	-2.72291e-01	7.94035e+02
23	92	7.94849e+02	2.01045e+00	-2.72291e-01	7.94035e+02

same initial neutrino energy



mu dead layer 5

Event display

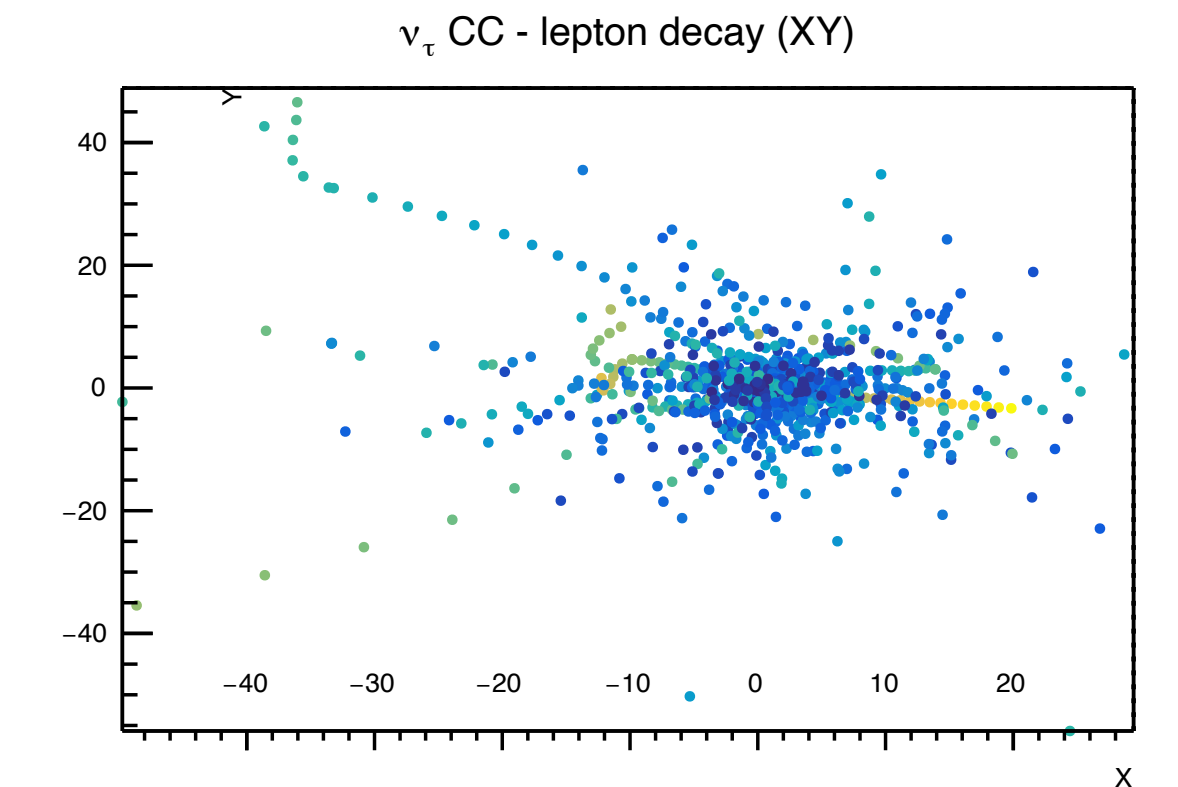
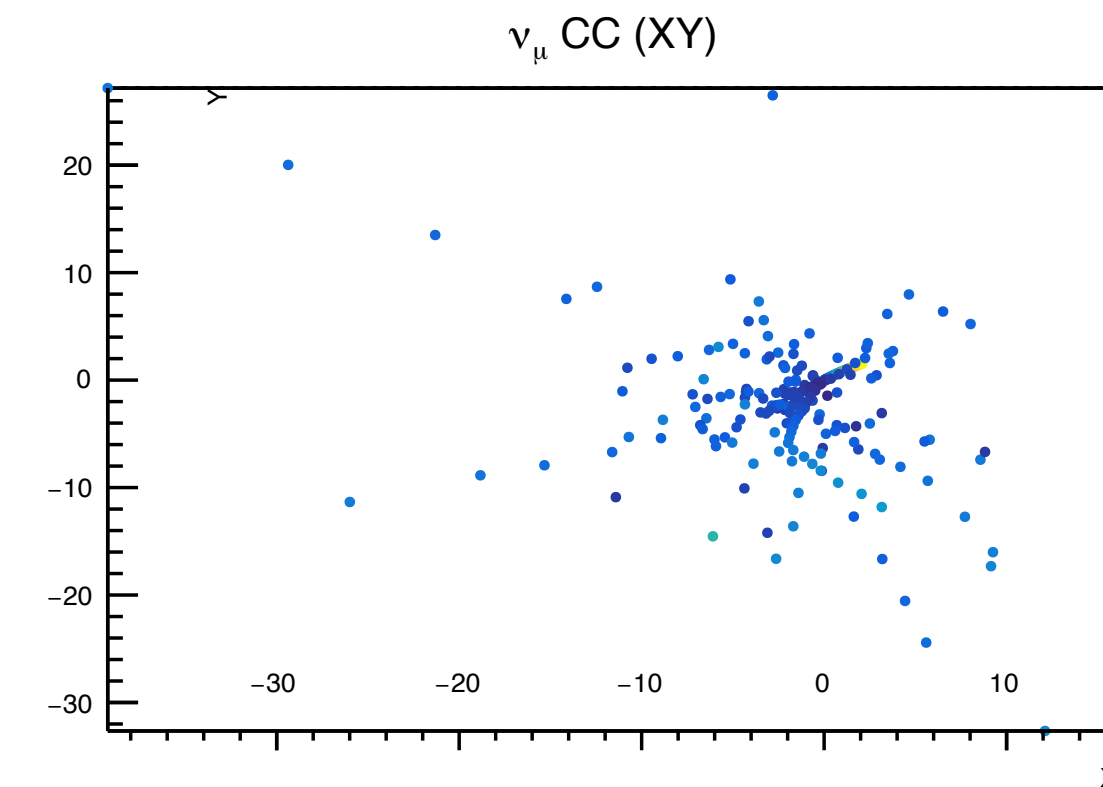
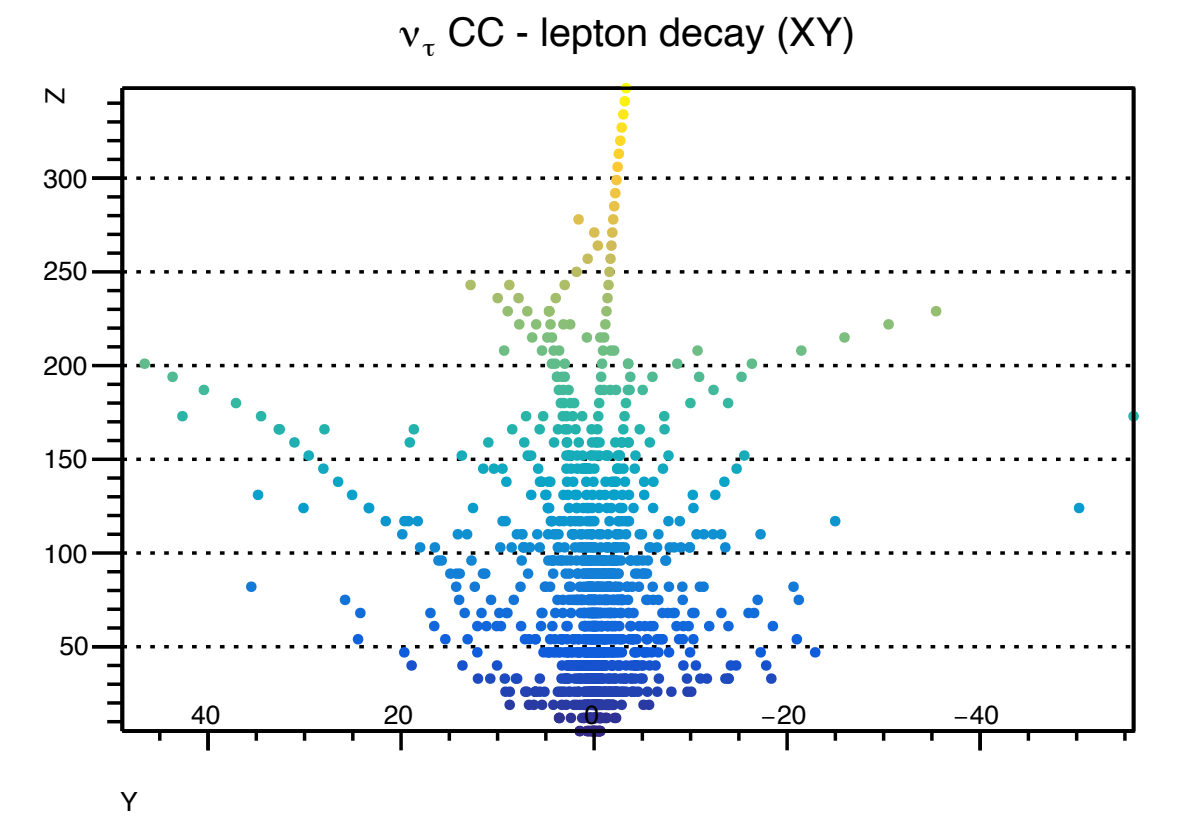
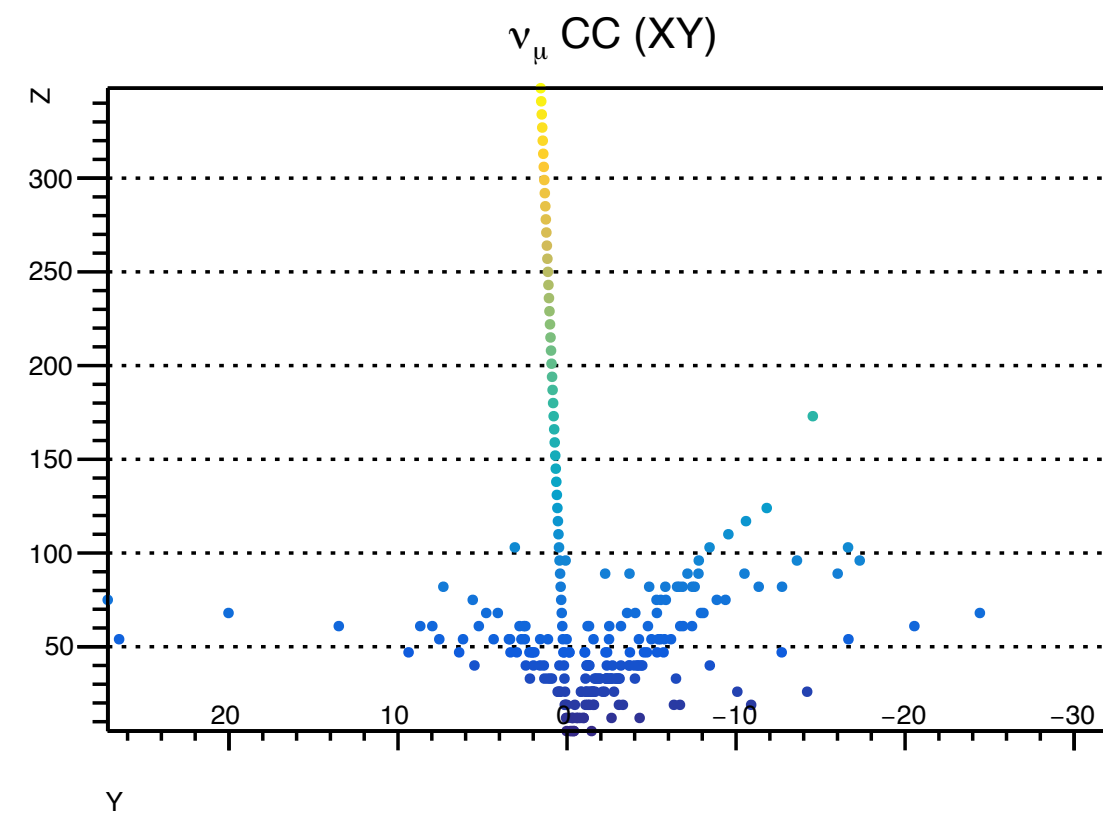
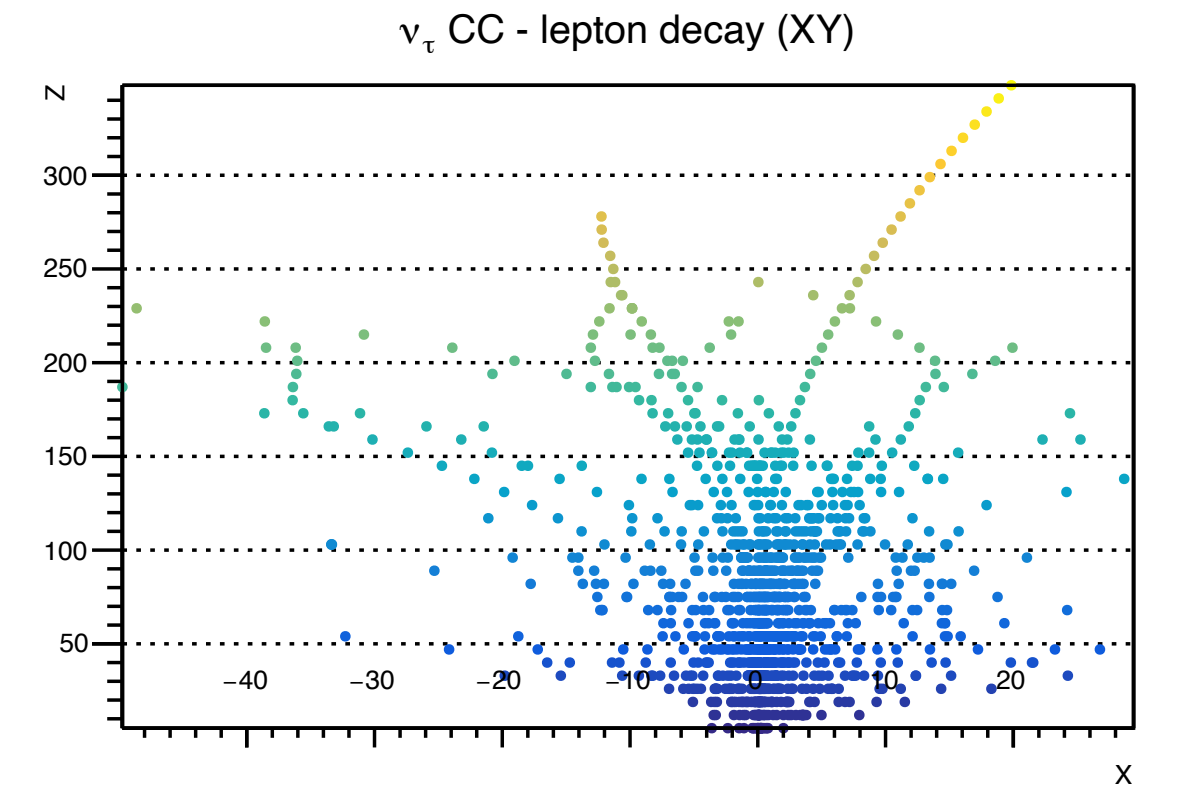
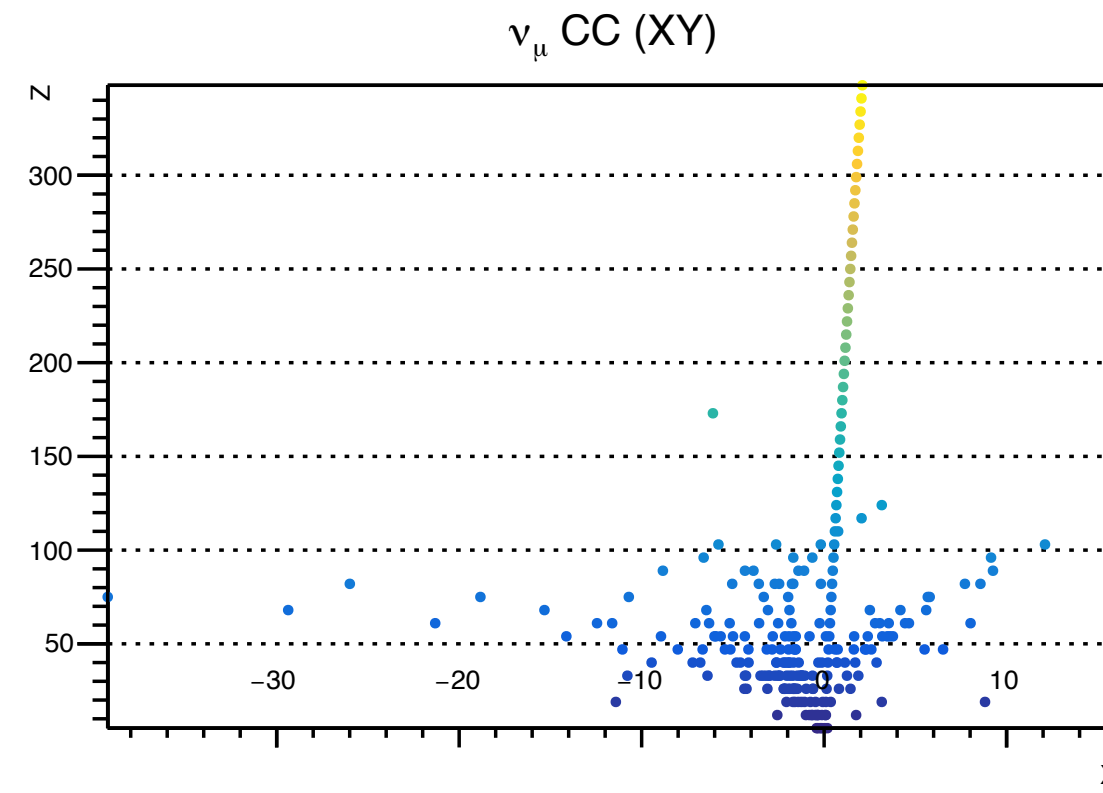
mu

26	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
26	14	9.99193e+02	0.00000e+00	0.00000e+00	9.99193e+02
26	13	9.15863e+02	4.60715e+00	4.22090e+00	9.15842e+02
26	2000000001	8.42580e+01	-4.67386e+00	-4.36175e+00	8.32610e+01
26	92	8.42580e+01	-4.67386e+00	-4.36175e+00	8.32610e+01

tau

552	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
552	16	1.07138e+03	0.00000e+00	0.00000e+00	1.07138e+03
552	15	2.25546e+02	-5.34381e+00	3.40881e+00	2.25450e+02
552	2000000001	8.46760e+02	5.57056e+00	-3.34060e+00	8.45996e+02
552	92	8.46760e+02	5.57056e+00	-3.34060e+00	8.45996e+02

same initial neutrino energy



Event display

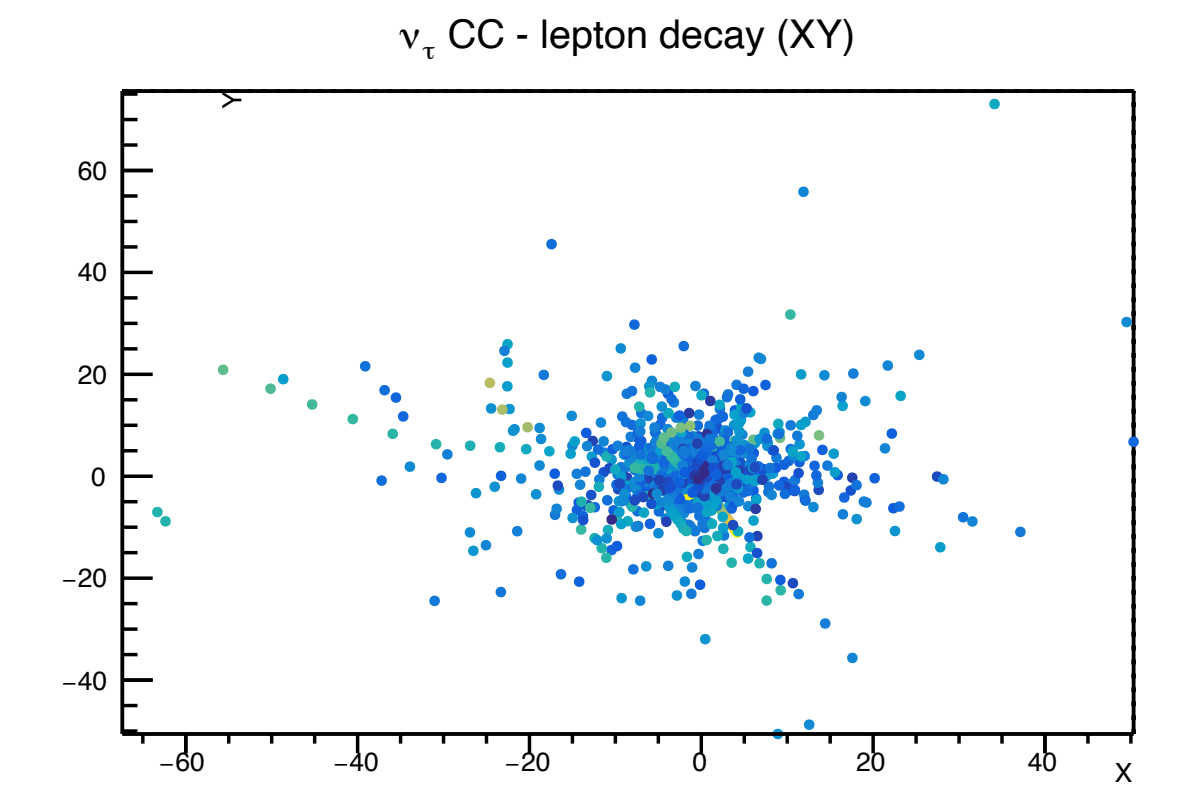
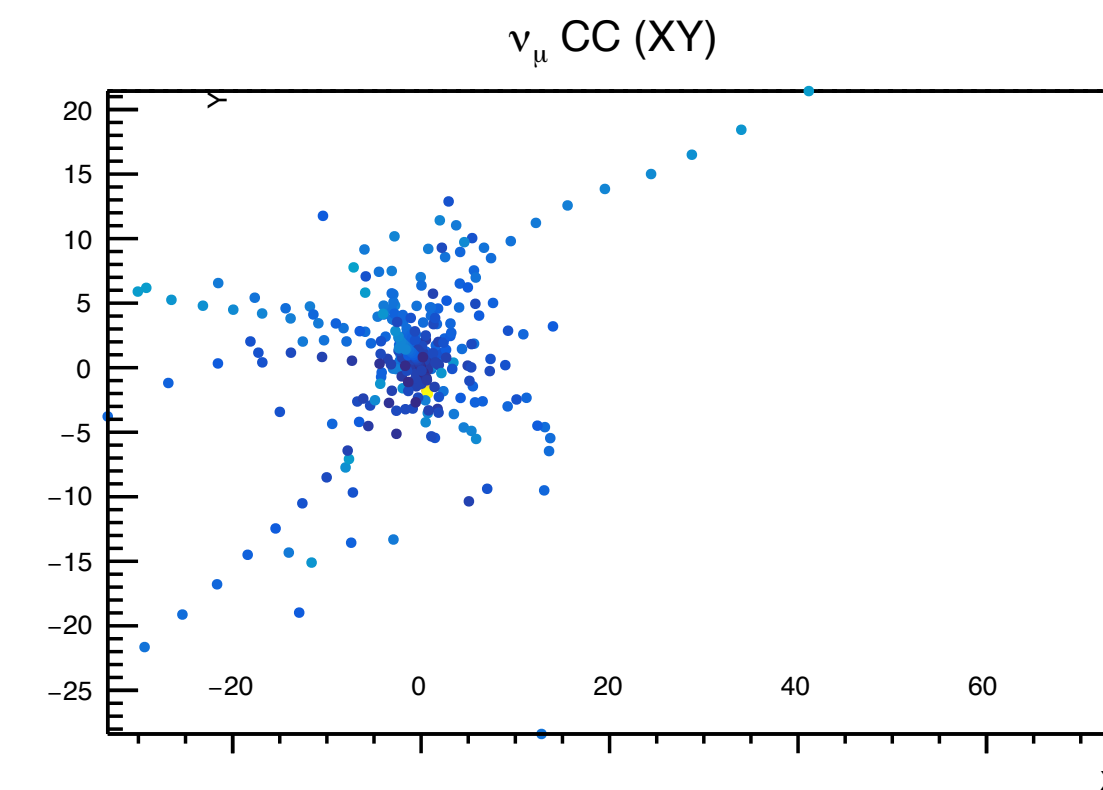
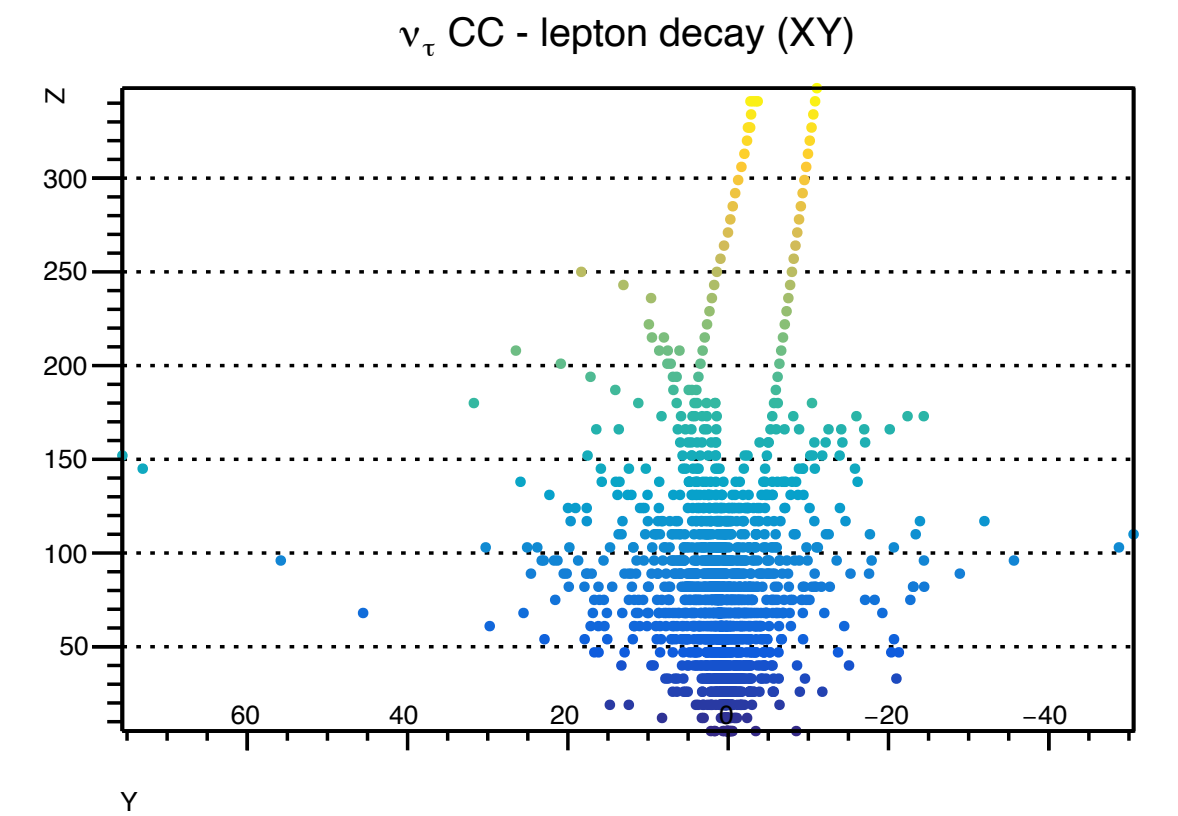
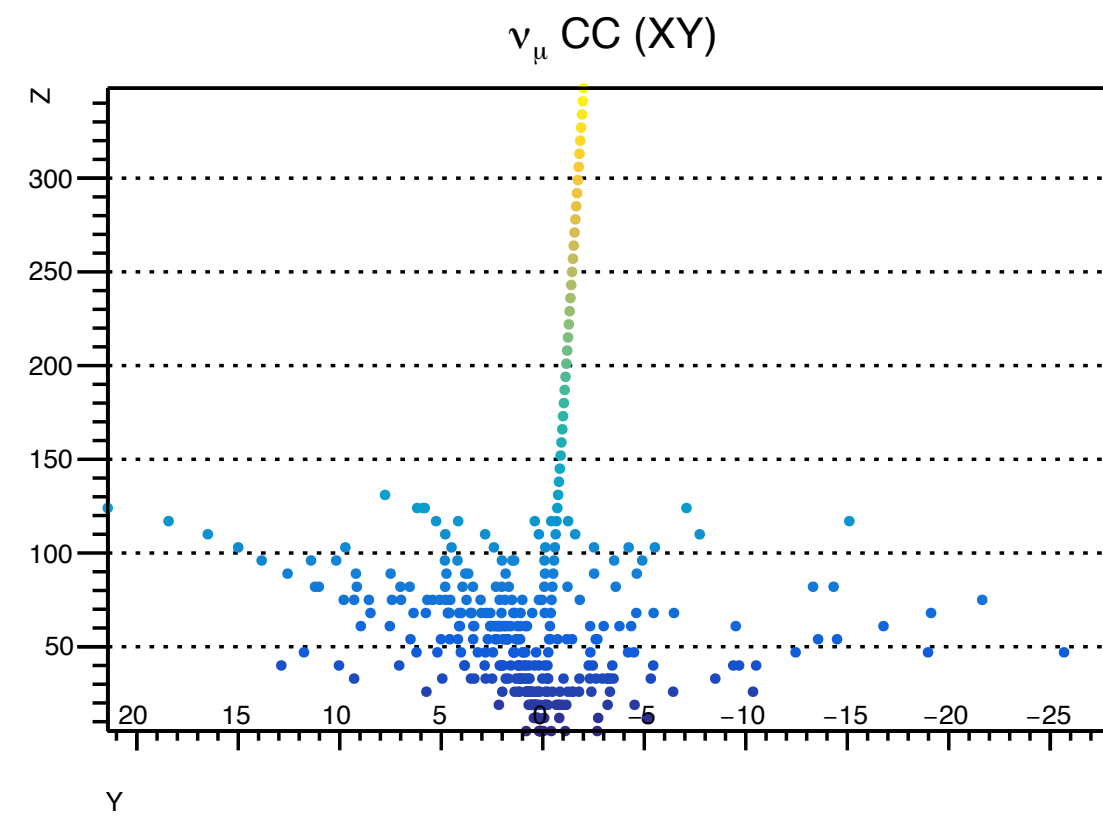
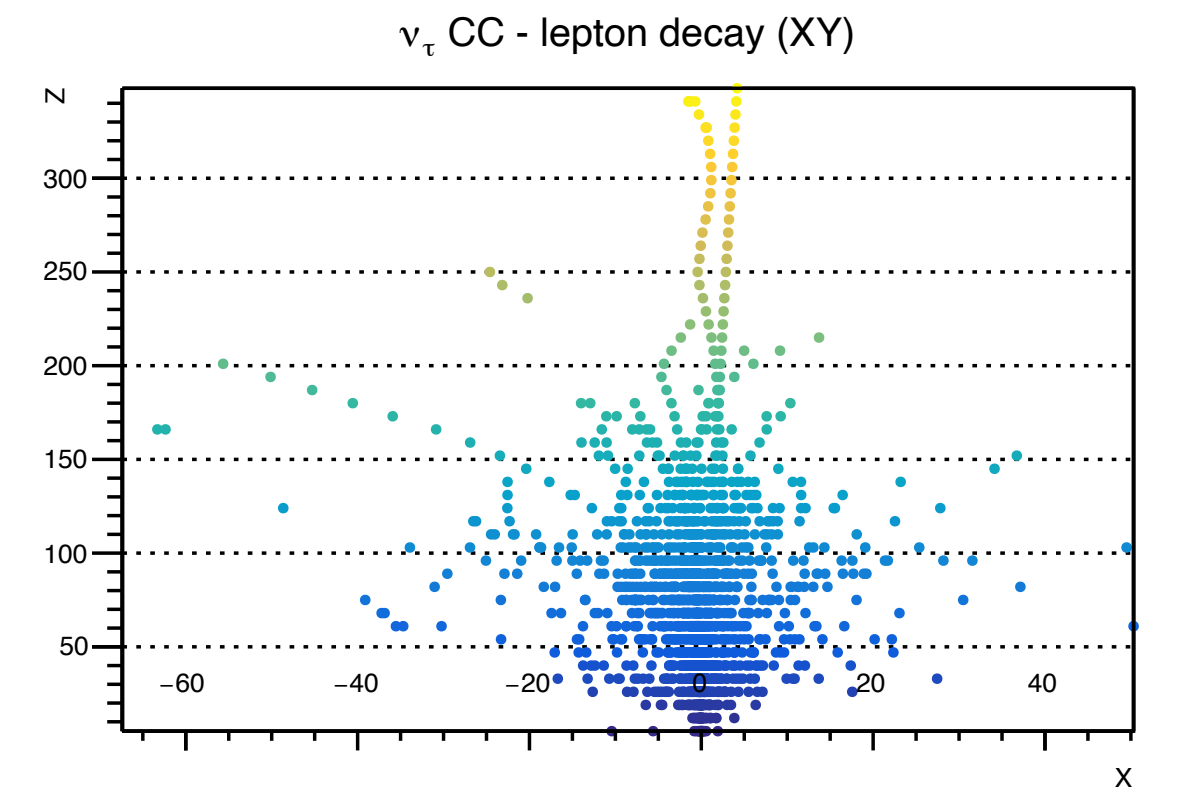
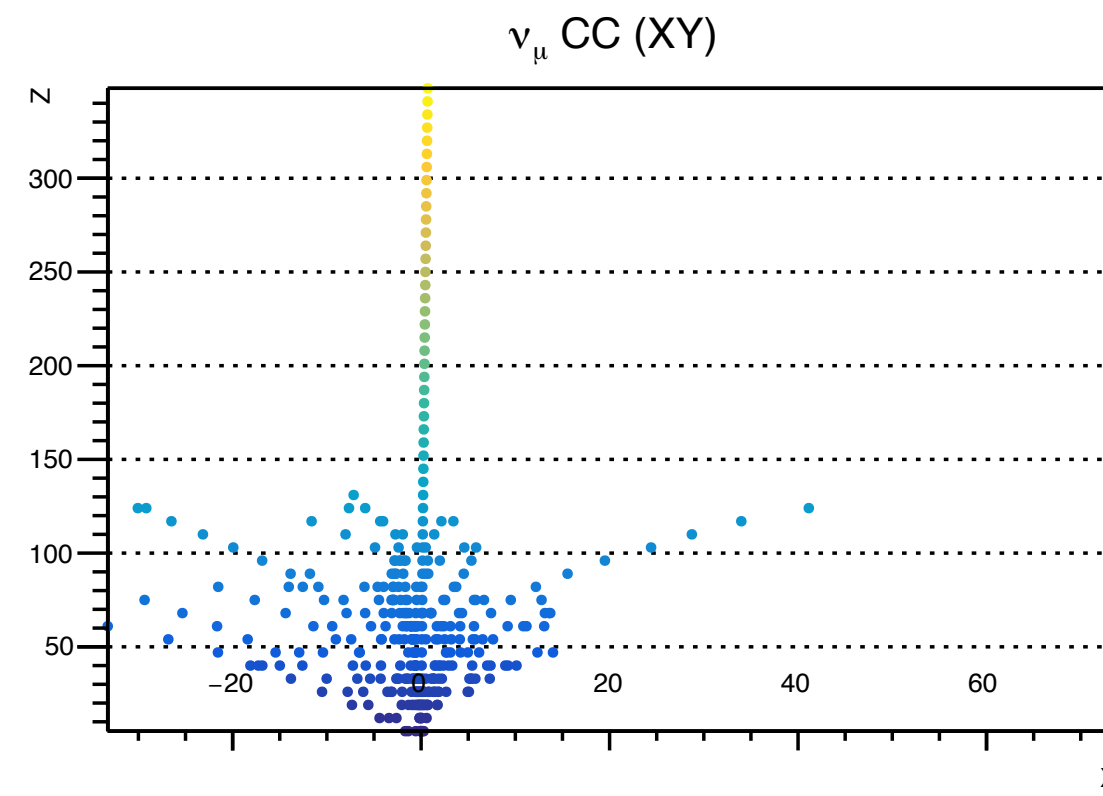
mu

7	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
7	14	1.63050e+03	0.00000e+00	0.00000e+00	1.63050e+03
7	13	1.35656e+03	1.82642e+00	-7.80741e+00	1.35654e+03
7	2000000001	2.74866e+02	-1.76108e+00	7.59414e+00	2.74001e+02
7	92	2.74866e+02	-1.76108e+00	7.59414e+00	2.74001e+02

tau

33	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
33	16	1.69338e+03	0.00000e+00	0.00000e+00	1.69338e+03
33	15	5.70540e+02	6.50285e+00	-1.83278e+01	5.70206e+02
33	2000000001	1.12377e+03	-6.38265e+00	1.81133e+01	1.12322e+03
33	92	1.12377e+03	-6.38265e+00	1.81133e+01	1.12322e+03

same initial neutrino energy



Event display

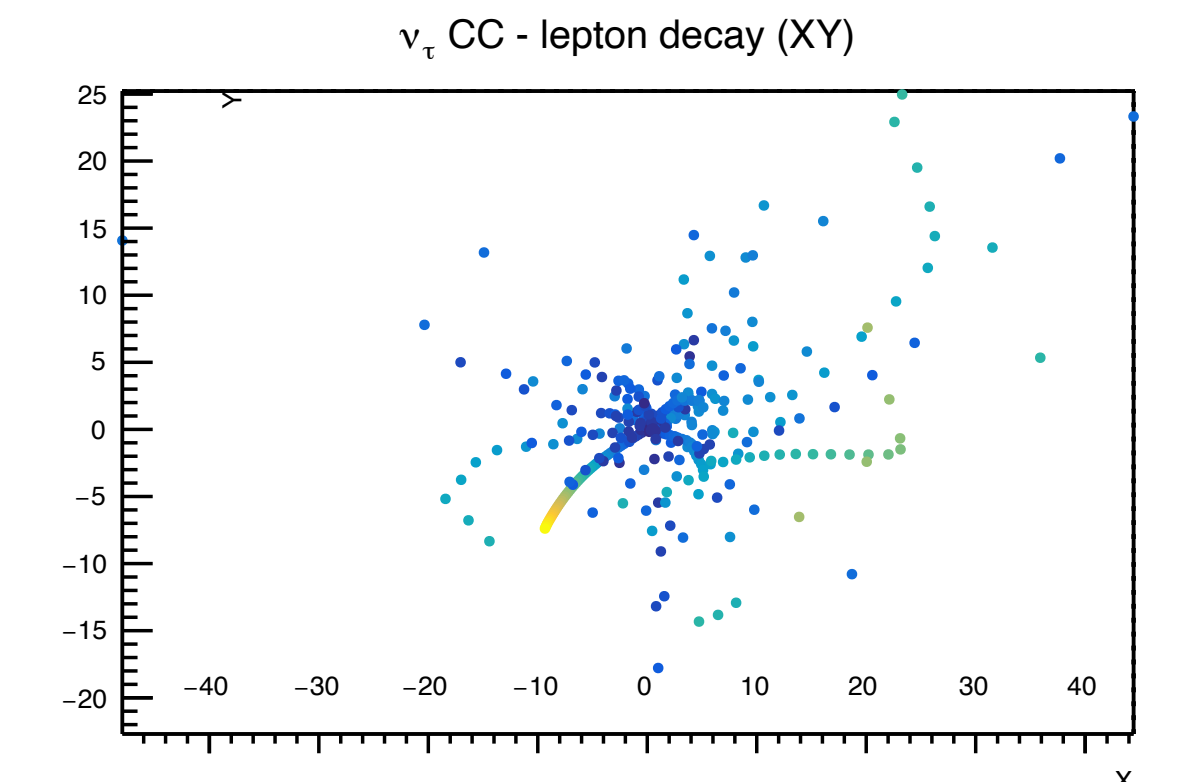
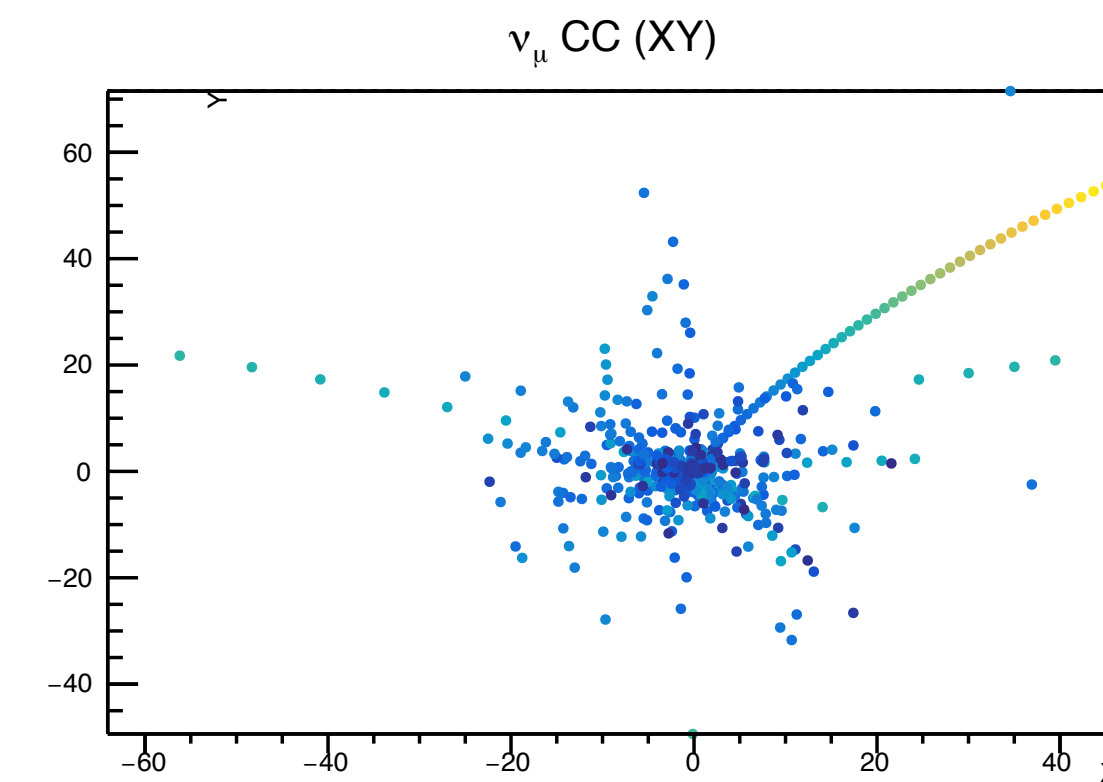
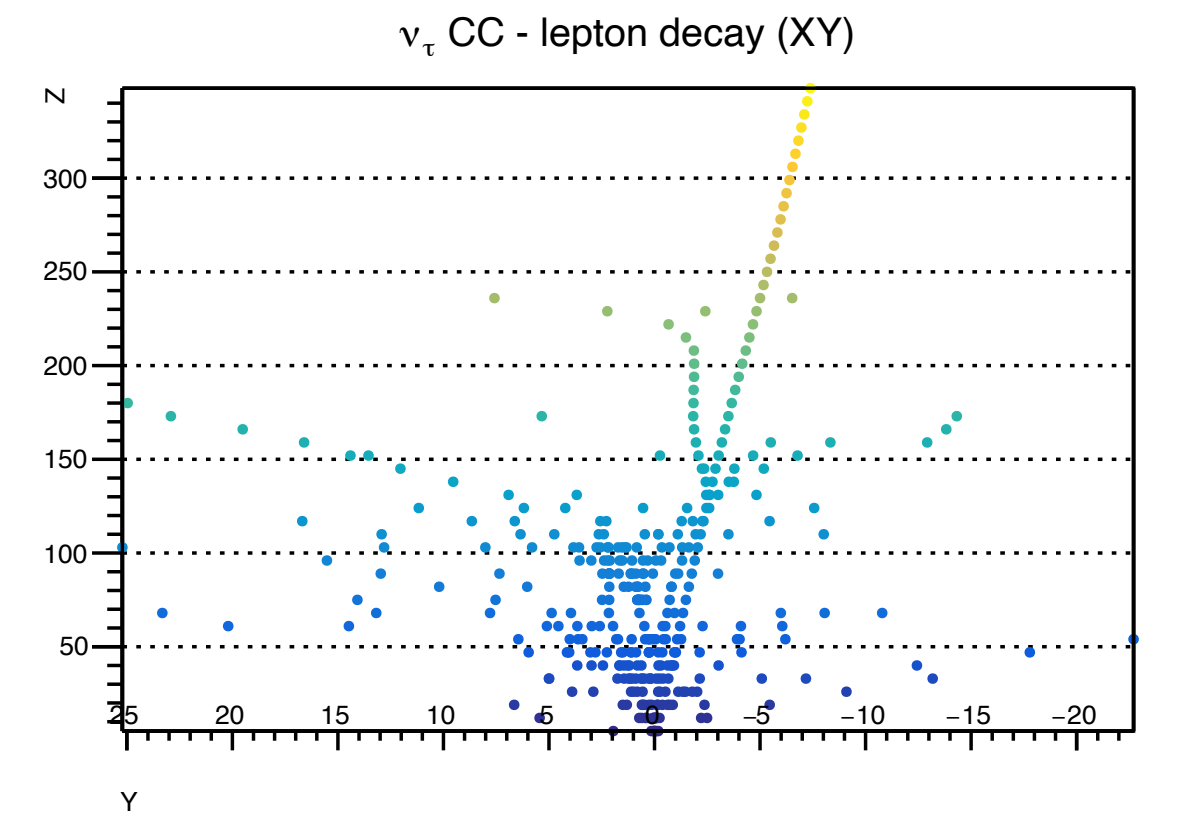
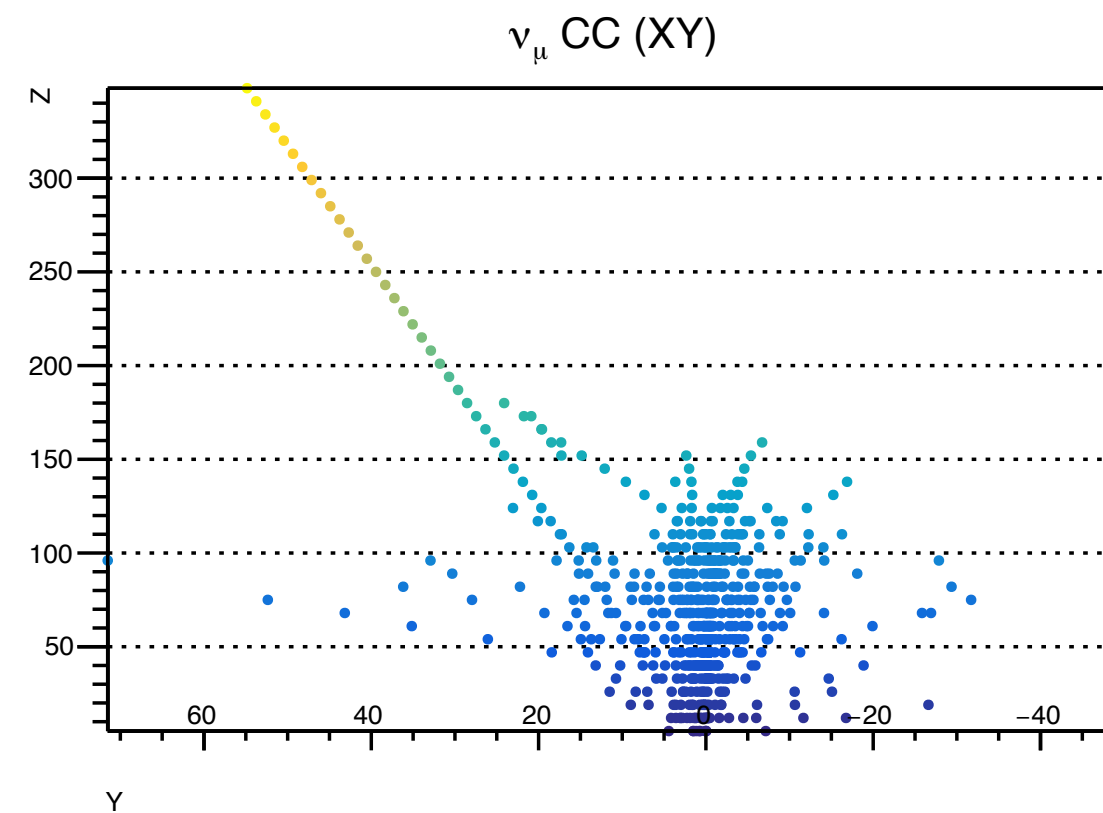
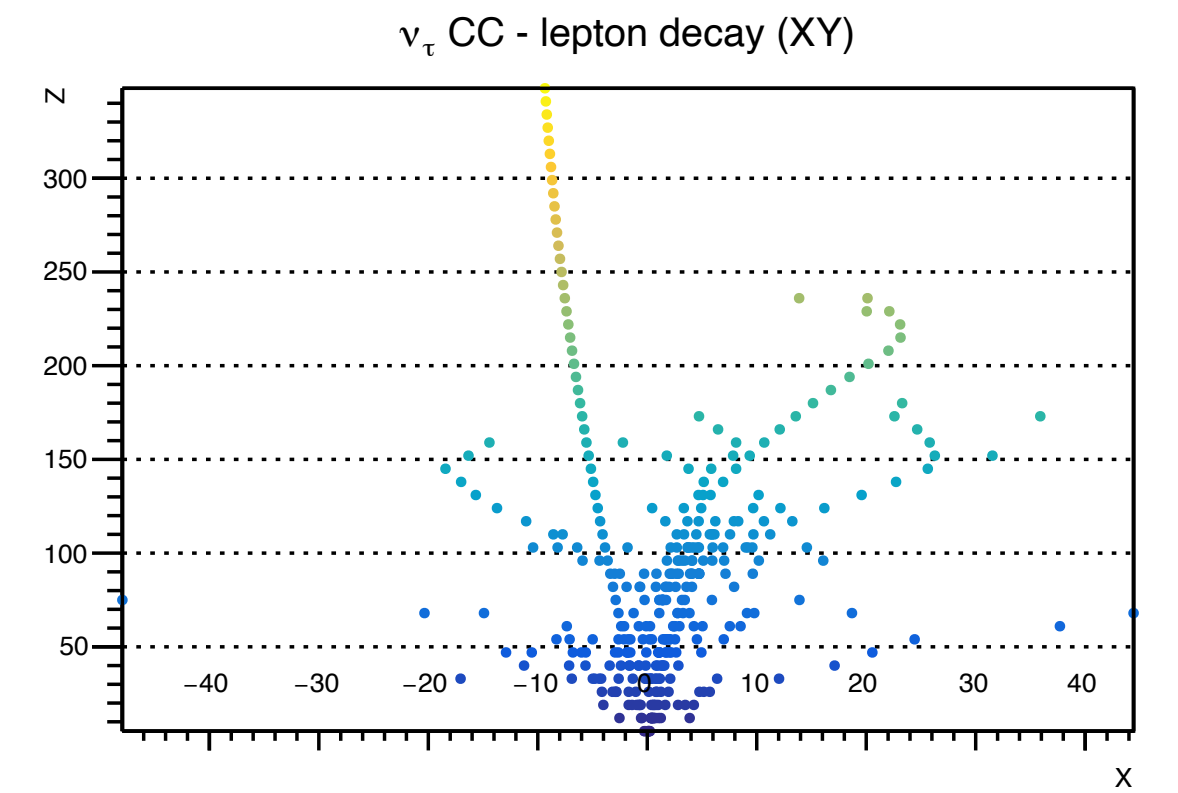
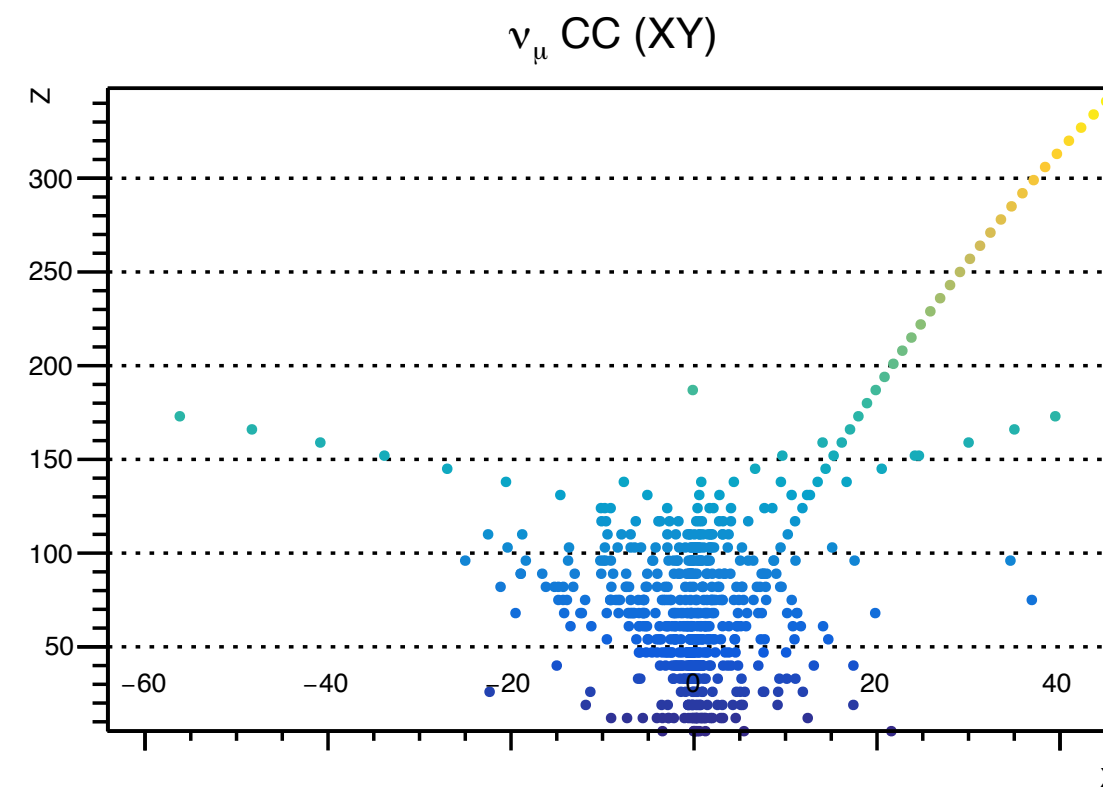
mu

20	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
20	14	4.16672e+02	0.00000e+00	0.00000e+00	4.16672e+02
20	13	1.74483e+01	1.25421e+00	2.71812e+00	1.71893e+01
20	2000000001	4.00152e+02	-1.20262e+00	-2.59551e+00	3.99548e+02
20	92	4.00152e+02	-1.20262e+00	-2.59551e+00	3.99547e+02

tau

130	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
130	16	4.28146e+02	0.00000e+00	0.00000e+00	4.28146e+02
130	15	1.91298e+02	-7.07425e+00	-1.43351e+00	1.91154e+02
130	2000000001	2.37775e+02	7.25018e+00	1.53343e+00	2.36995e+02
130	92	2.37775e+02	7.25018e+00	1.53343e+00	2.36995e+02

same initial neutrino energy



Event display

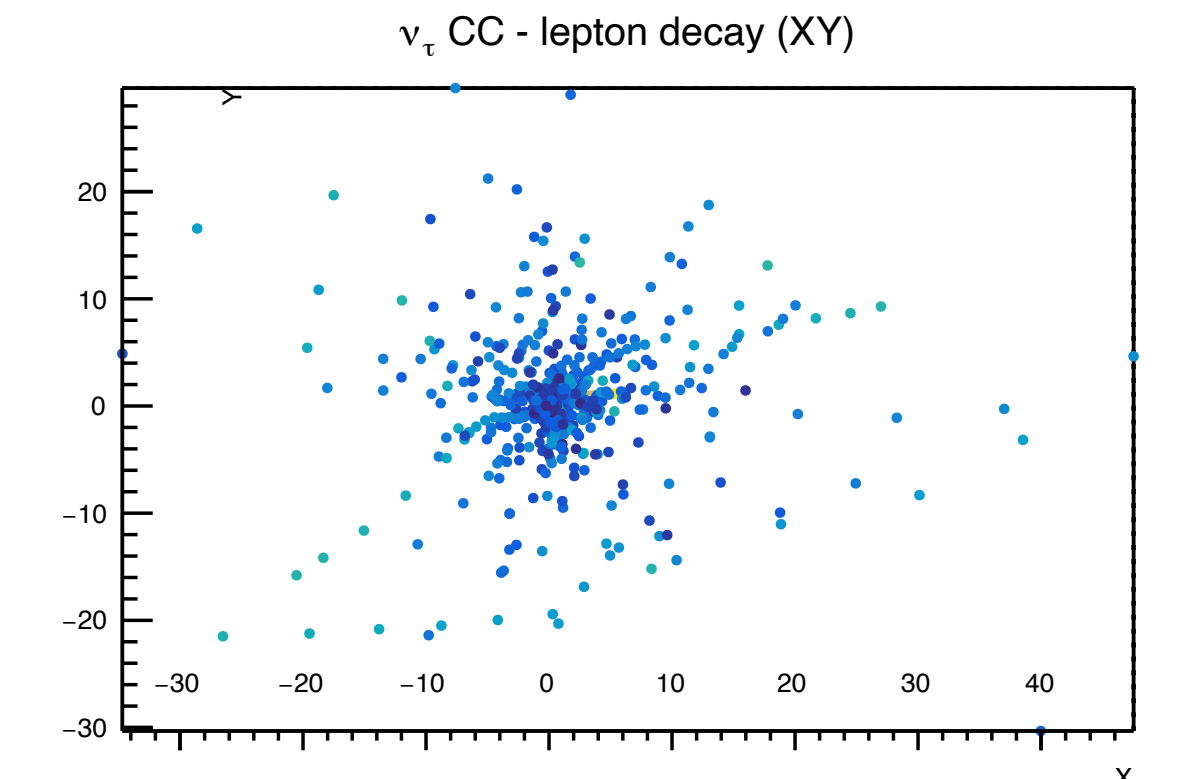
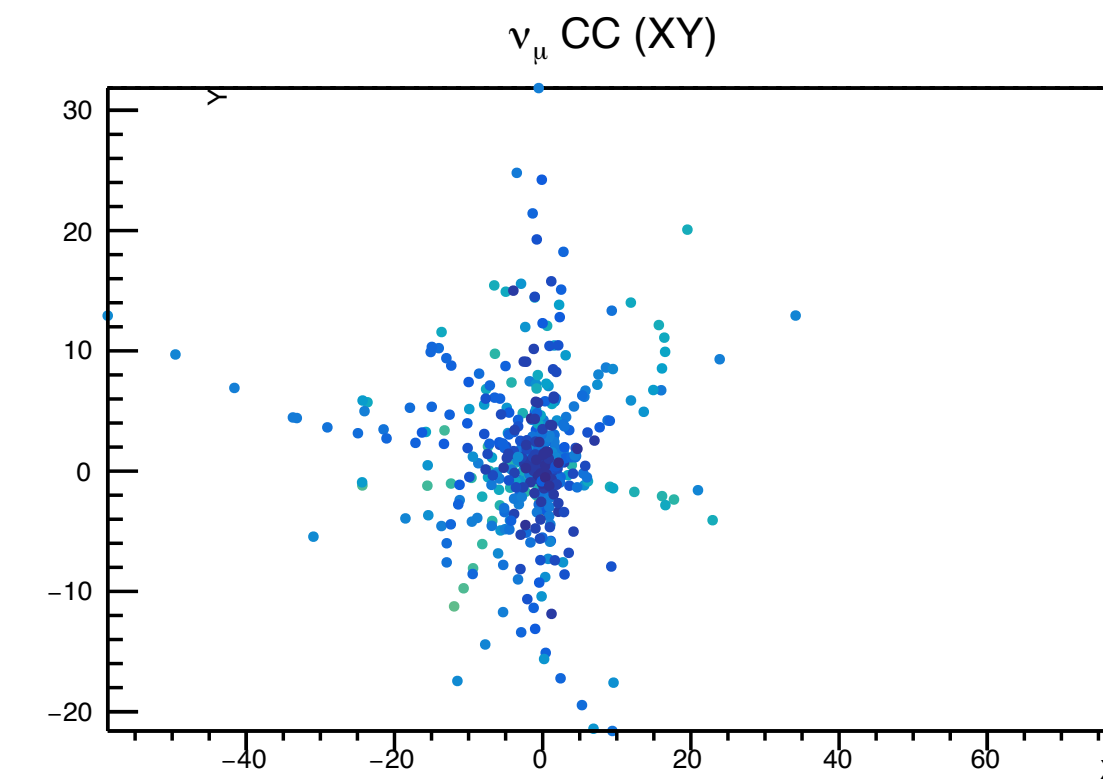
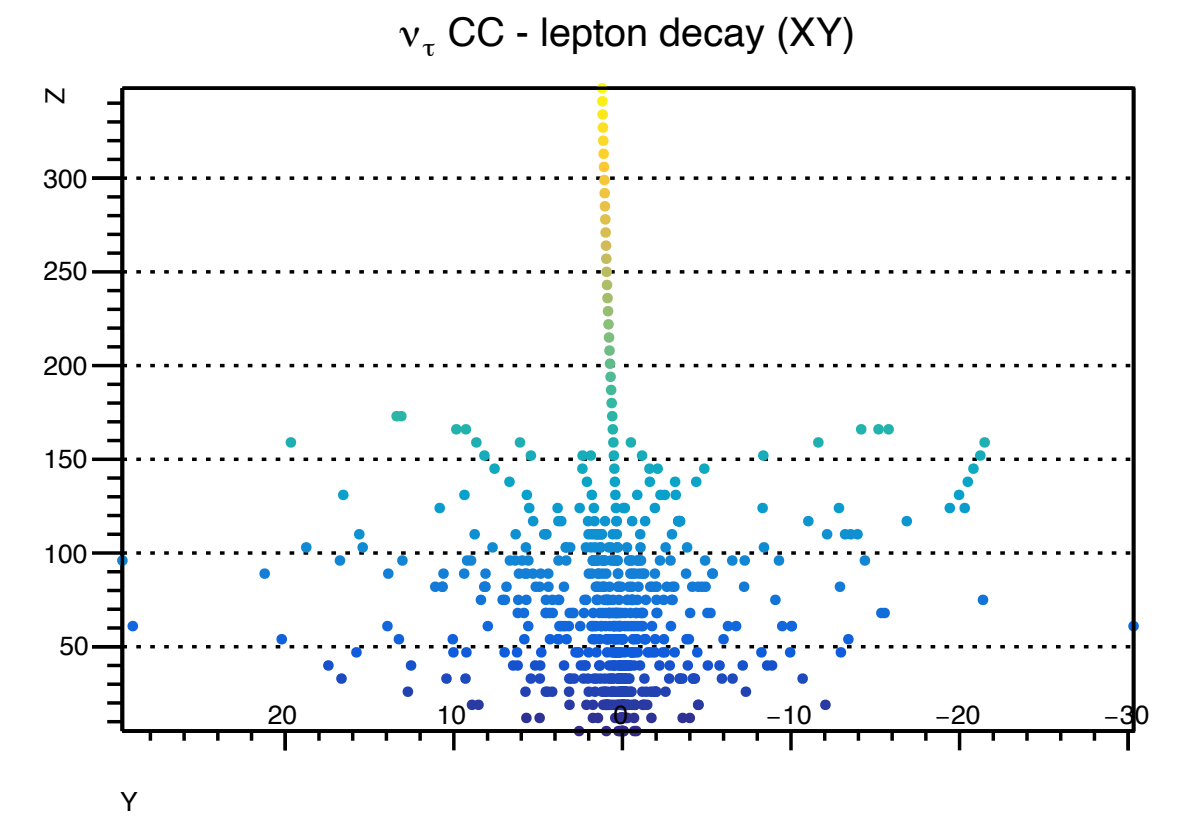
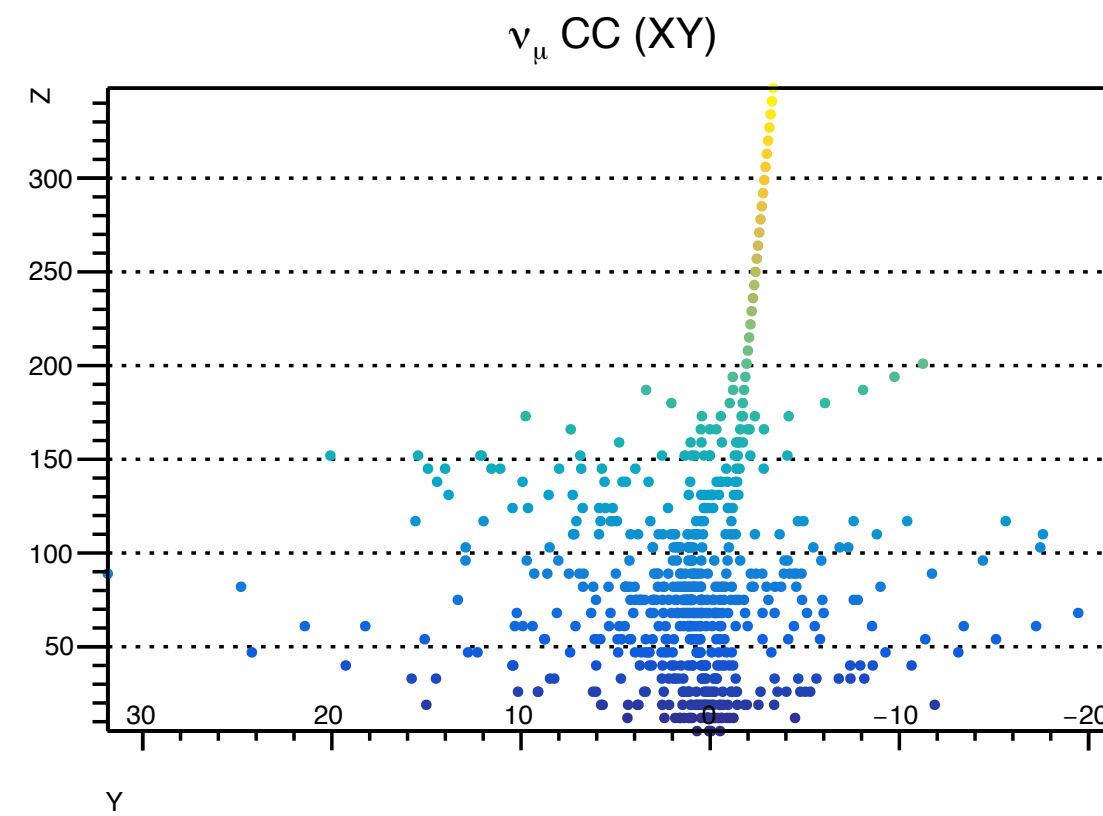
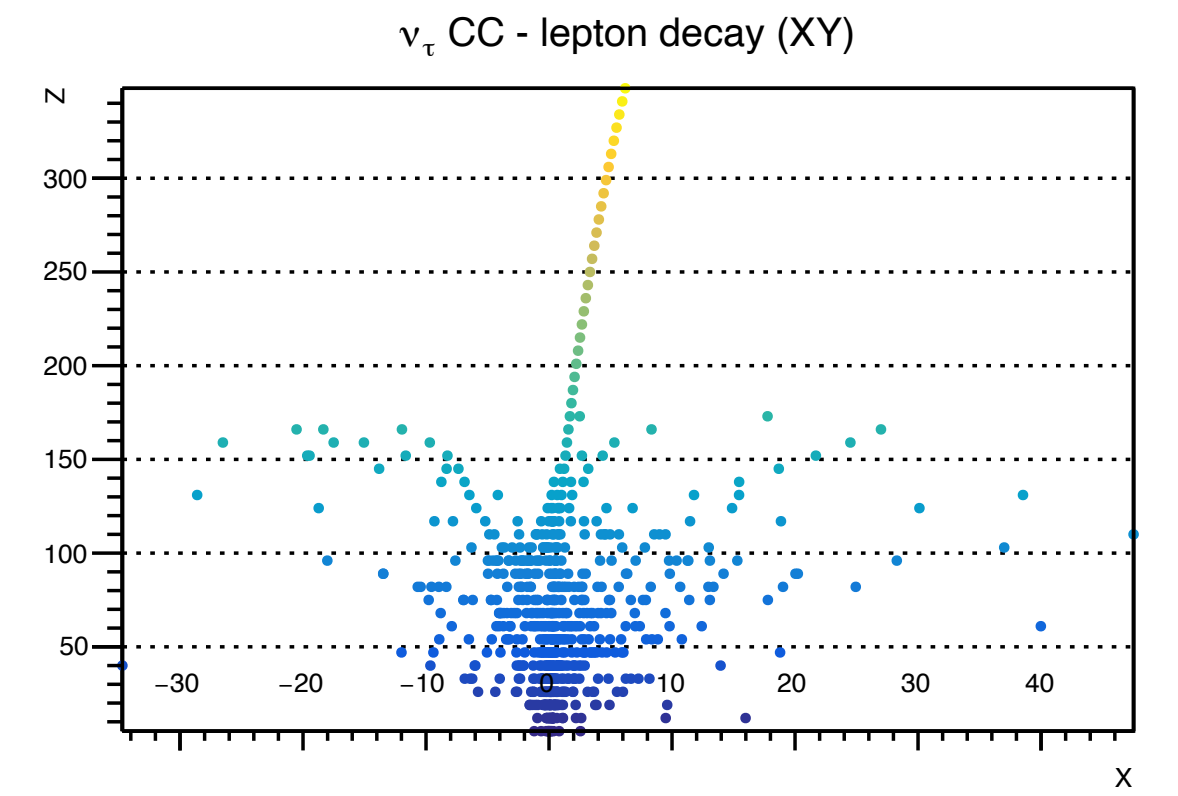
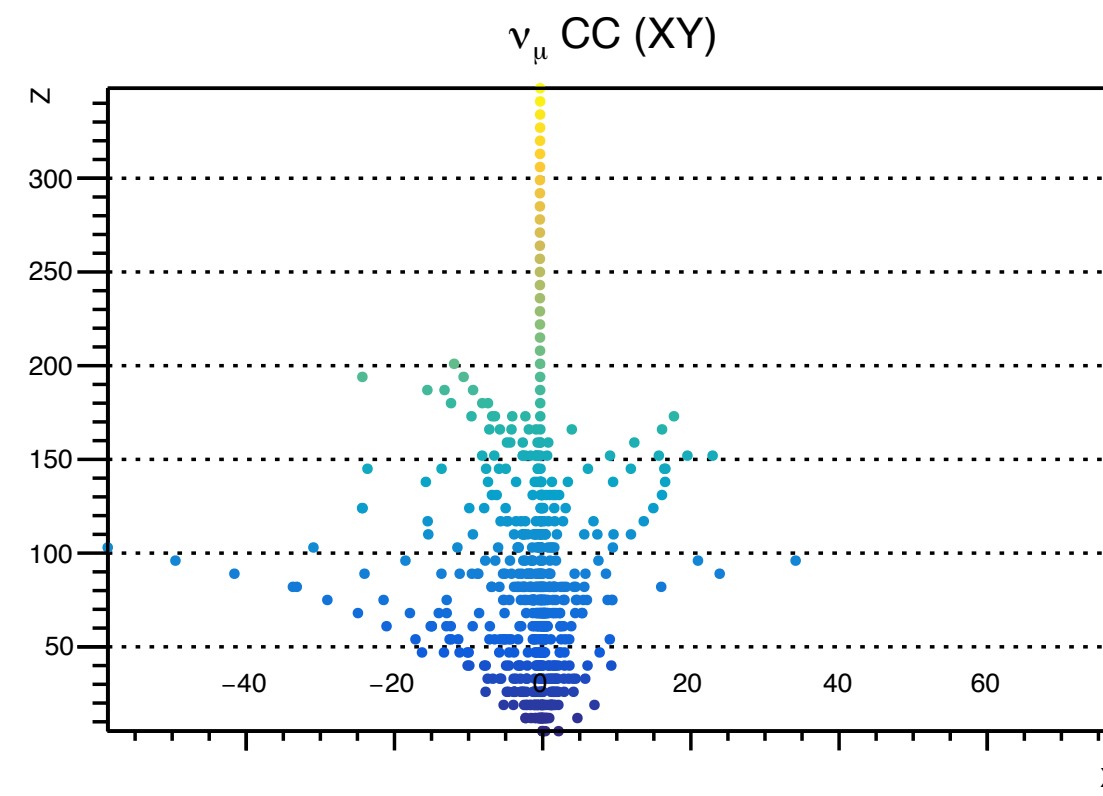
mu

6	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
6	14	9.74530e+02	0.00000e+00	0.00000e+00	9.74530e+02
6	13	5.27350e+02	-1.45225e+00	-5.05015e+00	5.27323e+02
6	2000000001	4.48108e+02	1.35226e+00	4.93685e+00	4.47078e+02
6	92	4.48108e+02	1.35226e+00	4.93685e+00	4.47078e+02

tau

24	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
24	16	1.37483e+03	0.00000e+00	0.00000e+00	1.37483e+03
24	15	8.78052e+02	-2.78711e+00	9.79117e-01	8.78046e+02
24	2000000001	4.97708e+02	2.83145e+00	-1.07119e+00	4.96825e+02
24	92	4.97708e+02	2.83145e+00	-1.07119e+00	4.96825e+02

same hadron cluster energy



Event display

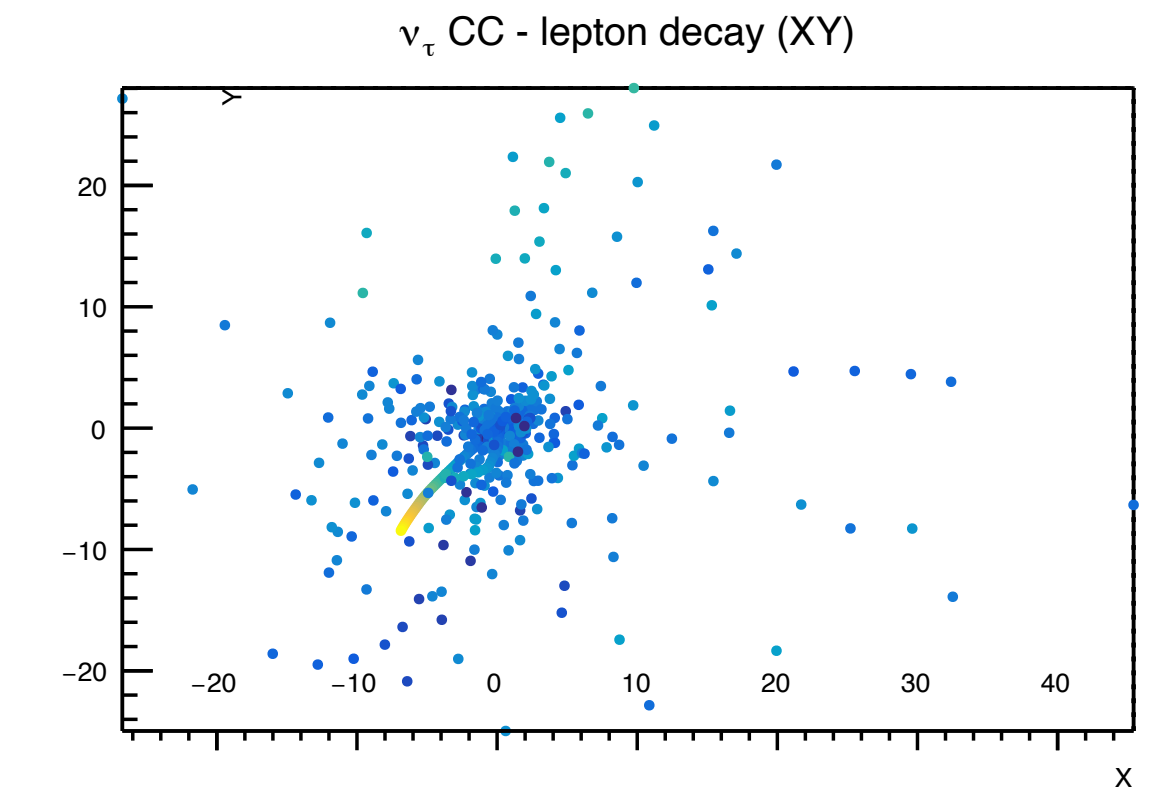
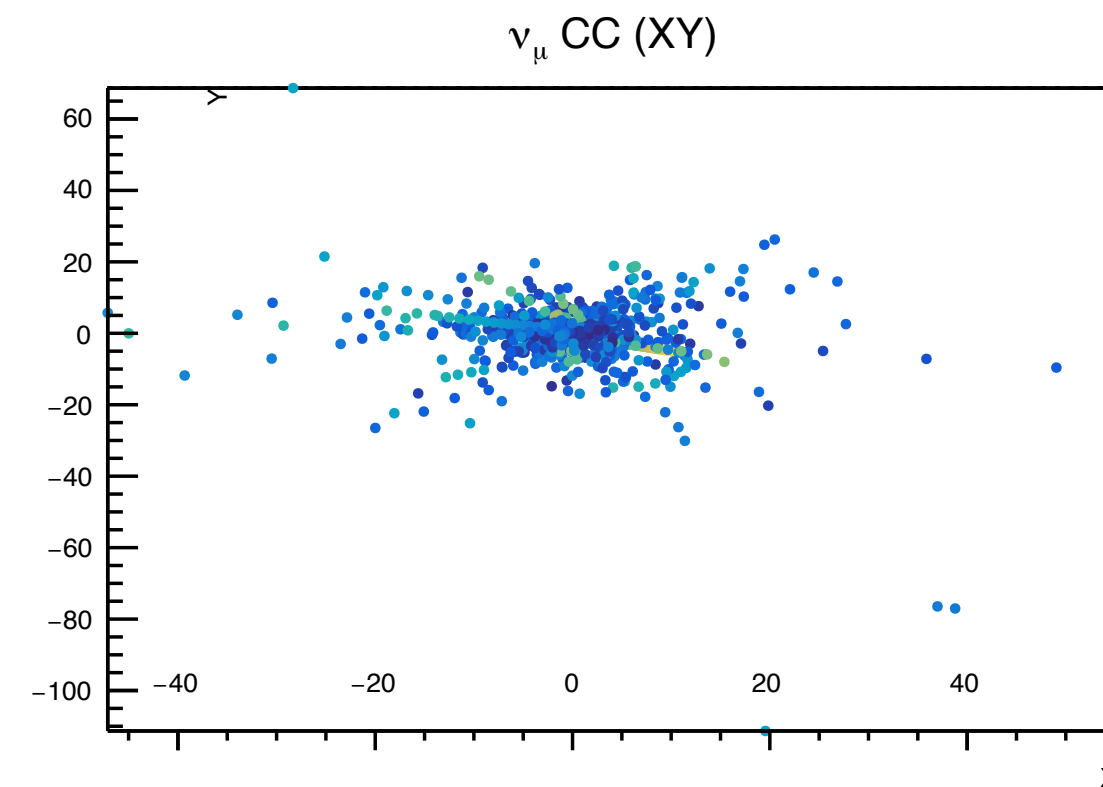
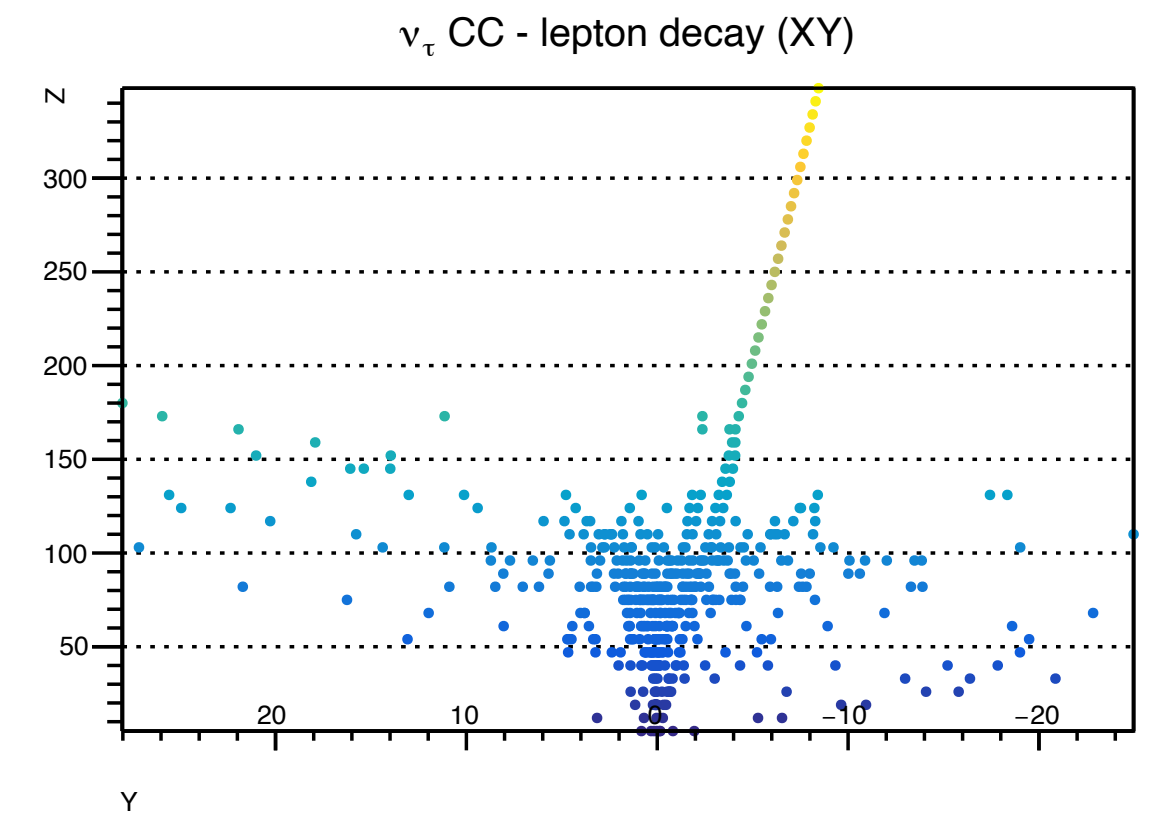
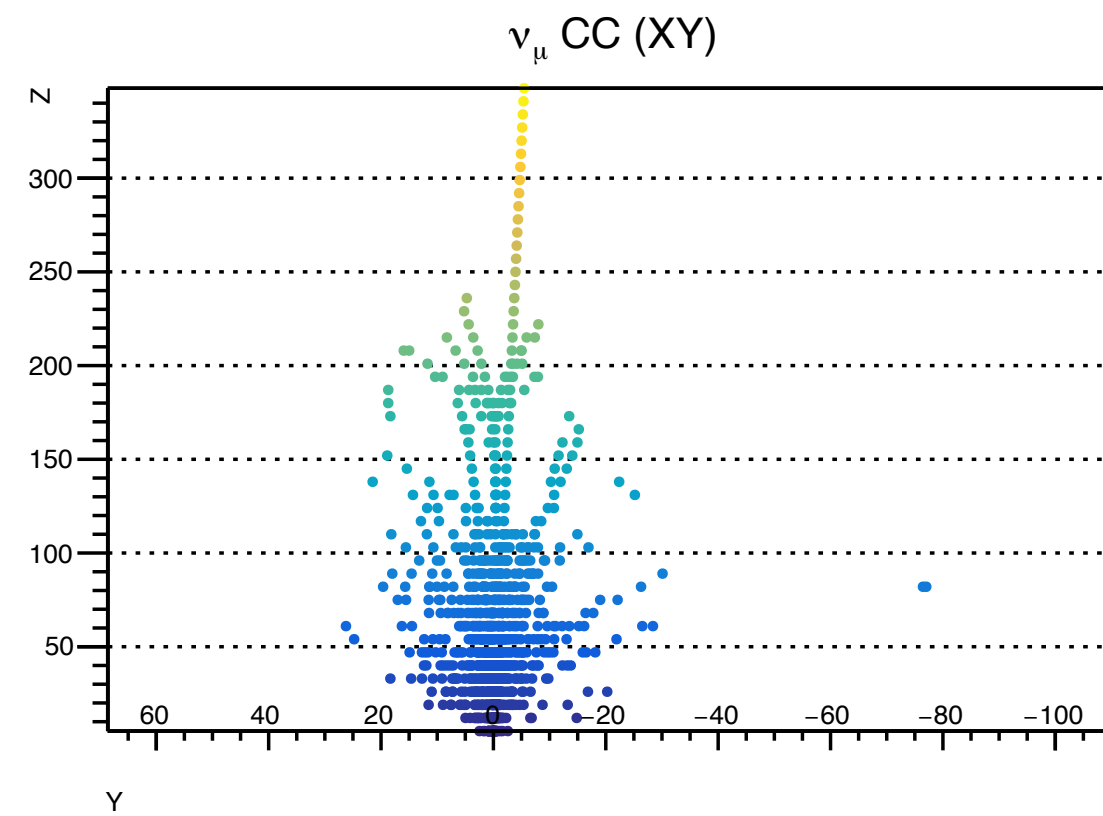
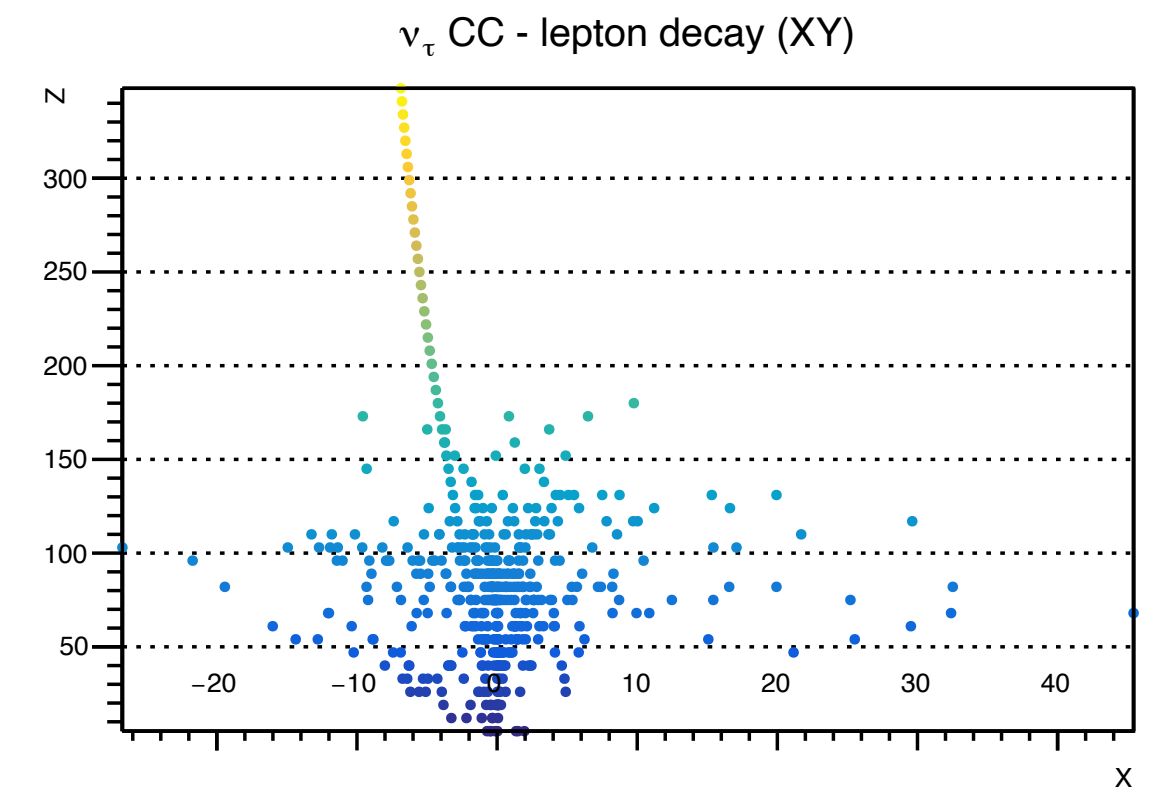
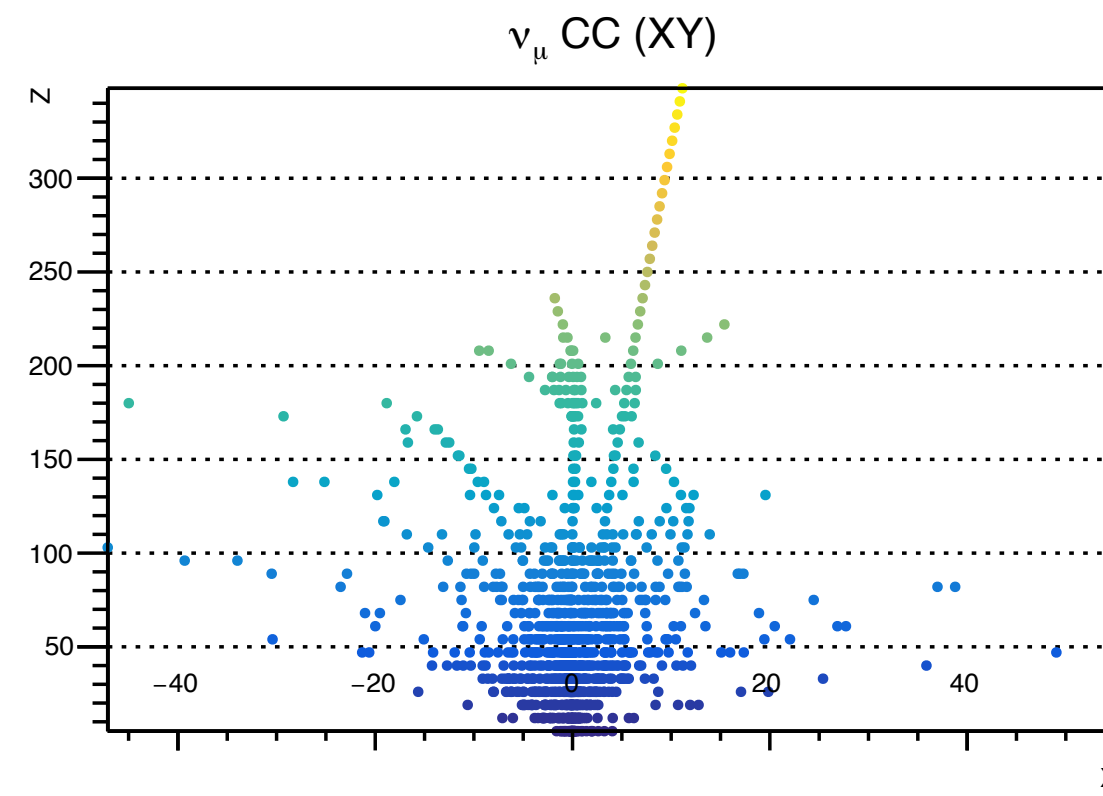
mu

41	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
41	14	1.62061e+03	0.00000e+00	0.00000e+00	1.62061e+03
41	13	1.76249e+02	4.59508e+00	-2.87215e+00	1.76165e+02
41	2000000001	1.44529e+03	-4.79167e+00	2.94821e+00	1.44452e+03
41	92	1.44529e+03	-4.79167e+00	2.94821e+00	1.44452e+03

tau

36	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
36	16	1.64917e+03	0.00000e+00	0.00000e+00	1.64917e+03
36	15	2.46508e+02	-7.18721e+00	-6.05183e+00	2.46323e+02
36	2000000001	1.40359e+03	7.21221e+00	6.14282e+00	1.40293e+03
36	92	1.40359e+03	7.21221e+00	6.14282e+00	1.40293e+03

same hadron cluster energy



Event display

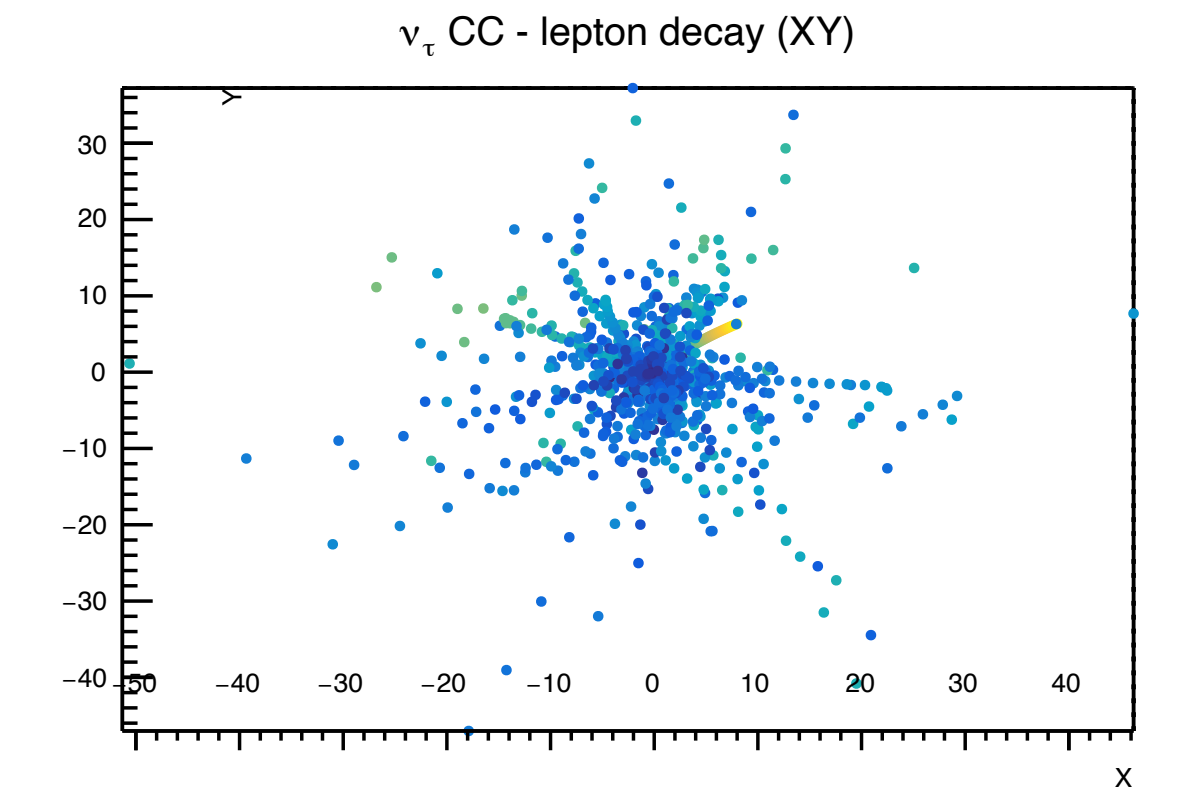
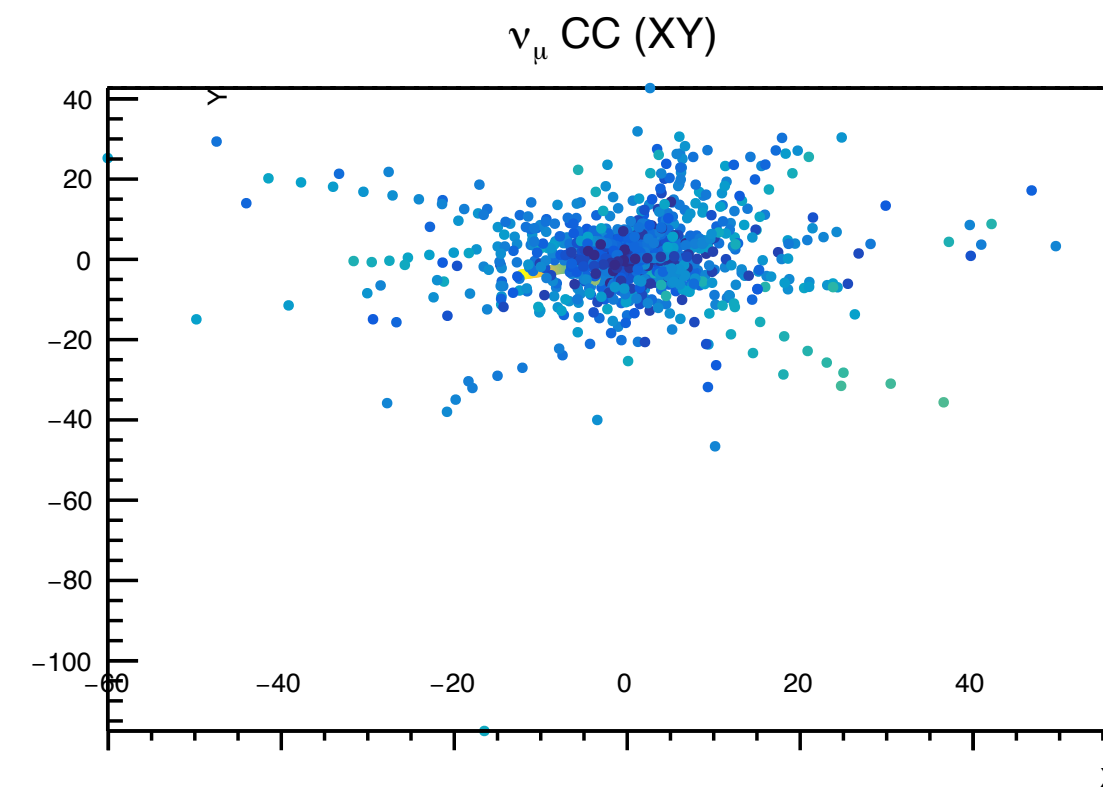
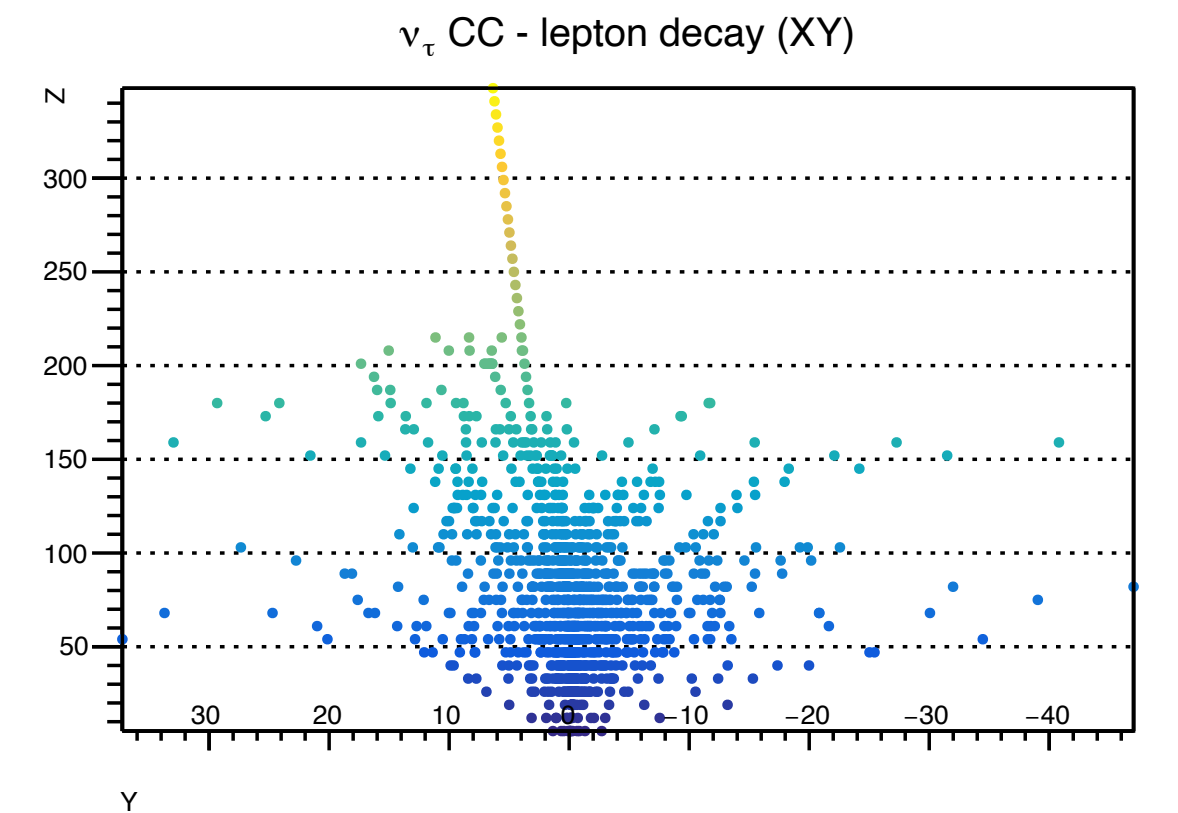
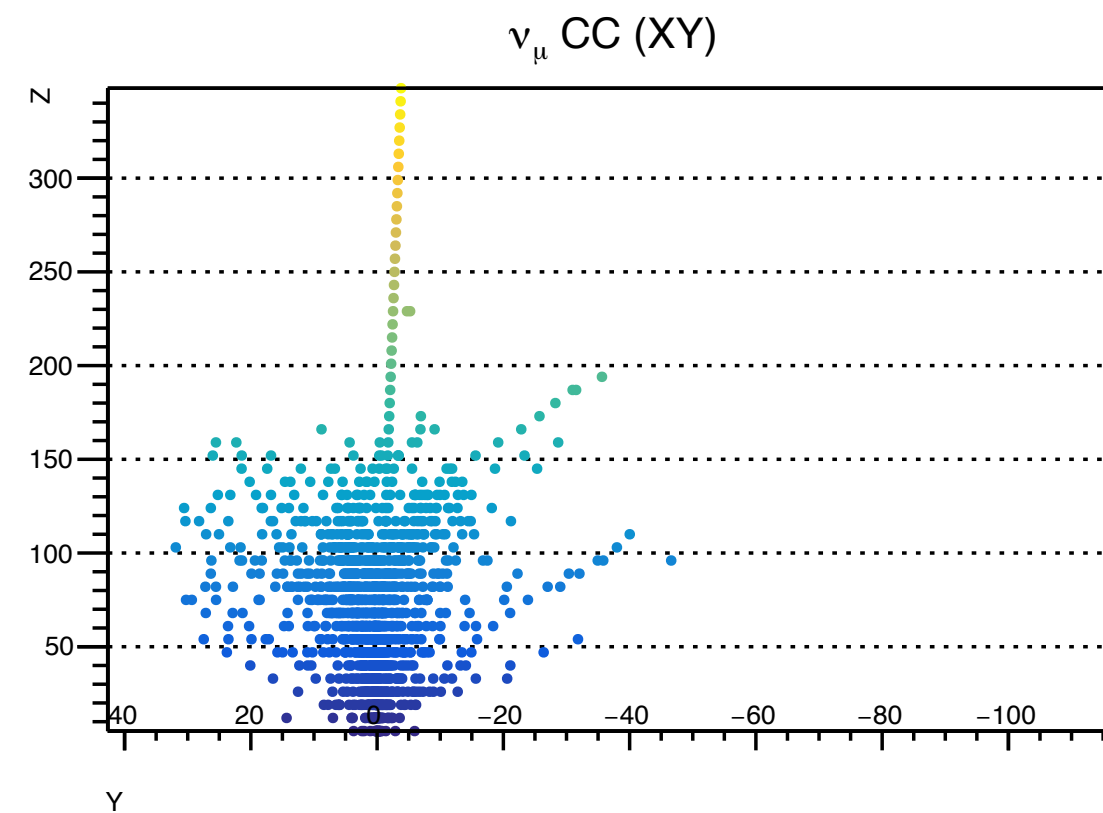
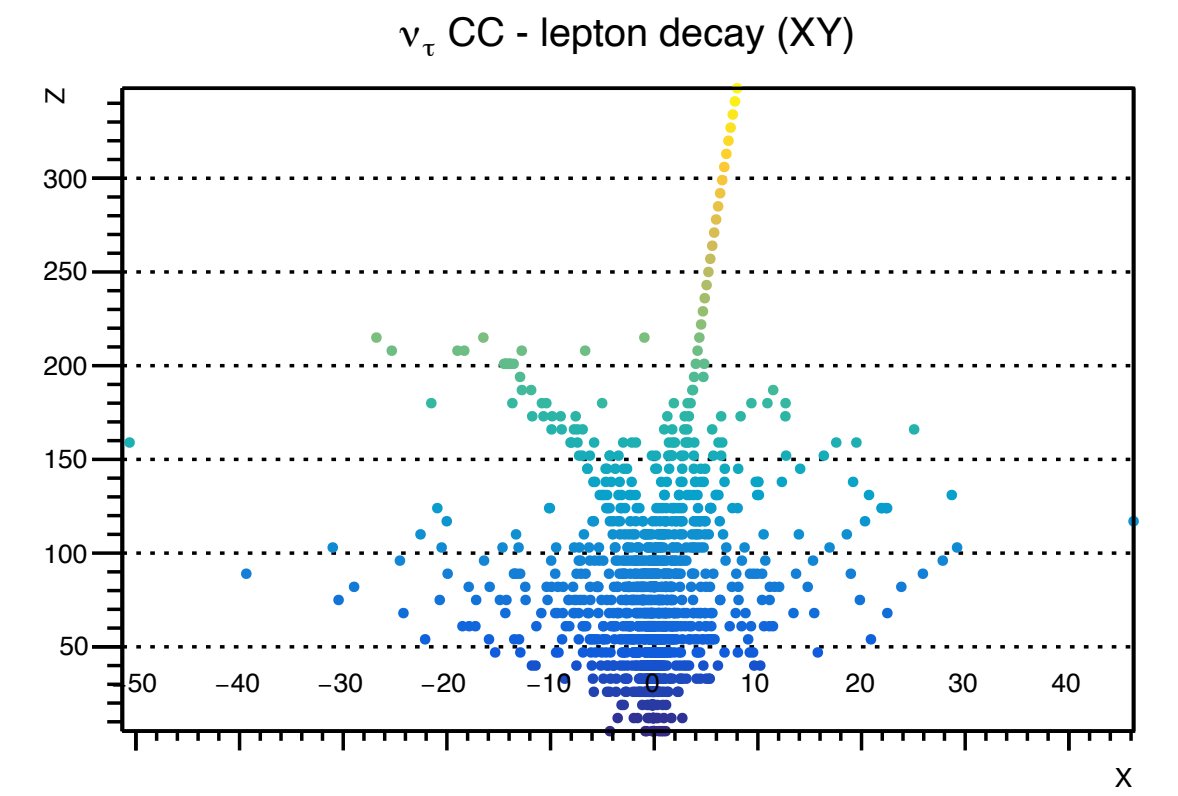
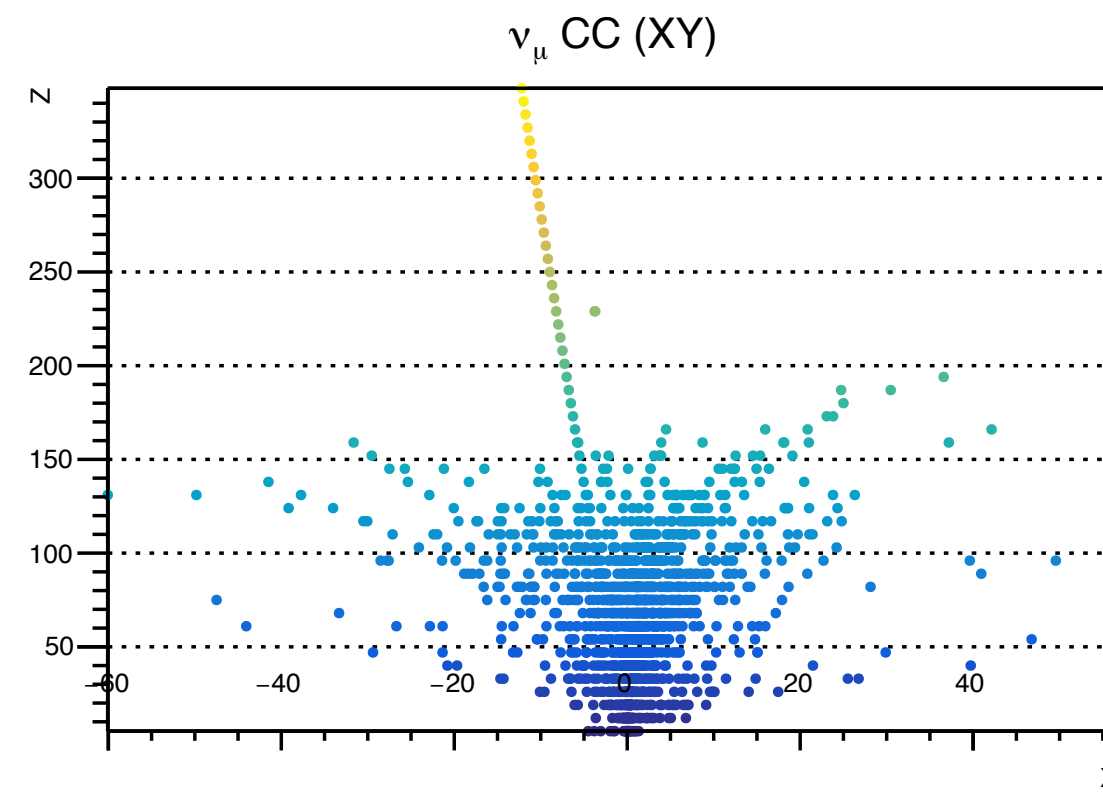
mu

205	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
205	14	1.26811e+03	0.00000e+00	0.00000e+00	1.26811e+03
205	13	4.33766e+02	-1.62799e+01	-4.72839e+00	4.33435e+02
205	2000000001	8.35271e+02	1.63257e+01	4.89331e+00	8.34552e+02
205	92	8.35271e+02	1.63257e+01	4.89331e+00	8.34552e+02

tau

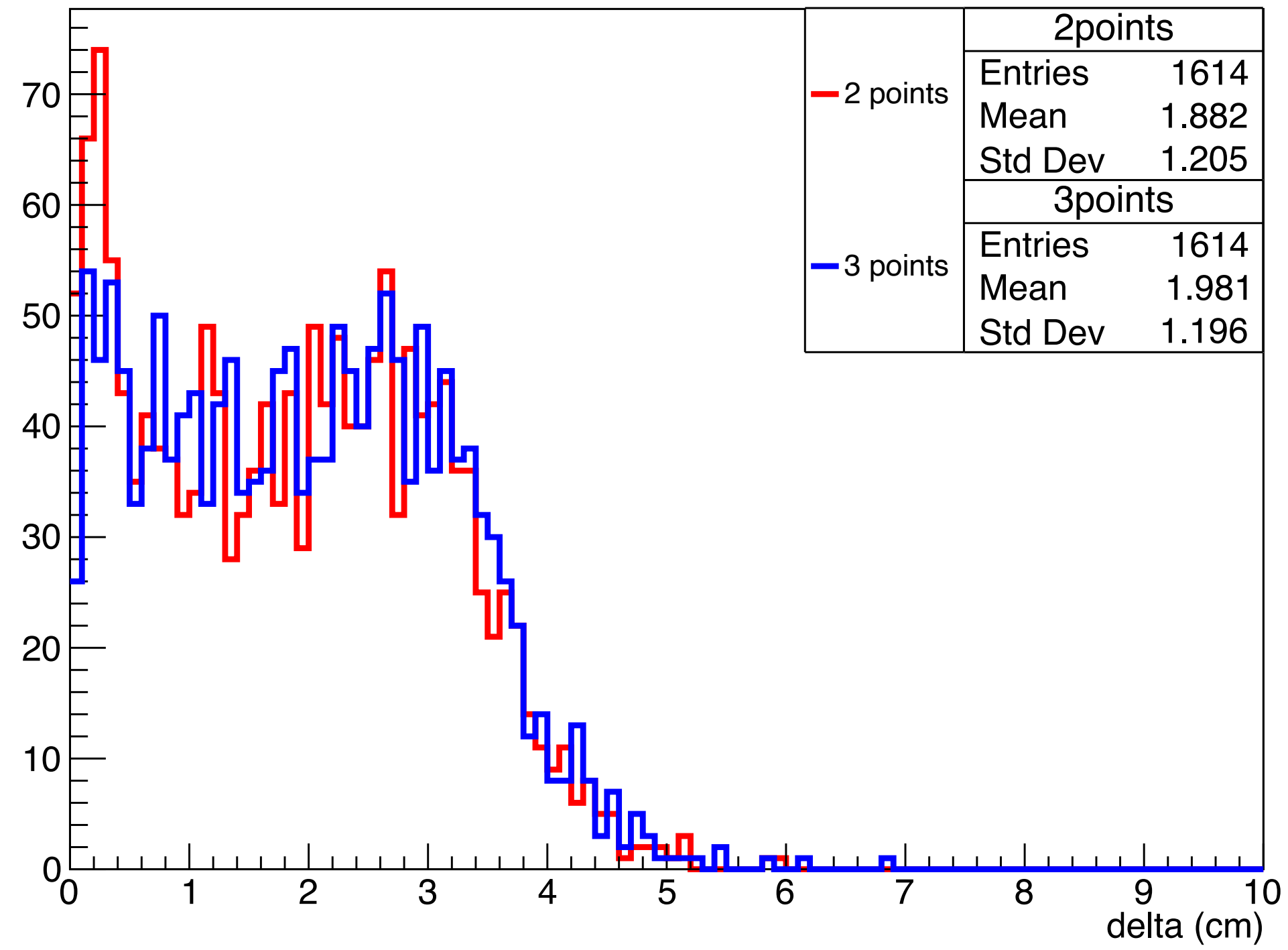
184	PID	Energy, GeV	p_x, GeV	p_y, GeV	p_z, GeV
184	16	1.24029e+03	0.00000e+00	0.00000e+00	1.24029e+03
184	15	4.06749e+02	5.41545e+00	7.36229e+00	4.06642e+02
184	2000000001	8.34465e+02	-5.64187e+00	-7.38272e+00	8.33566e+02
184	92	8.34465e+02	-5.64187e+00	-7.38272e+00	8.33566e+02

same hadron cluster energy



LHC: neutrino vertex reconstruction

LHC Accuracy of neutrino vertex reconstruction (DISNC)



TGeo class ROOT

