

Mizuche MC Event display

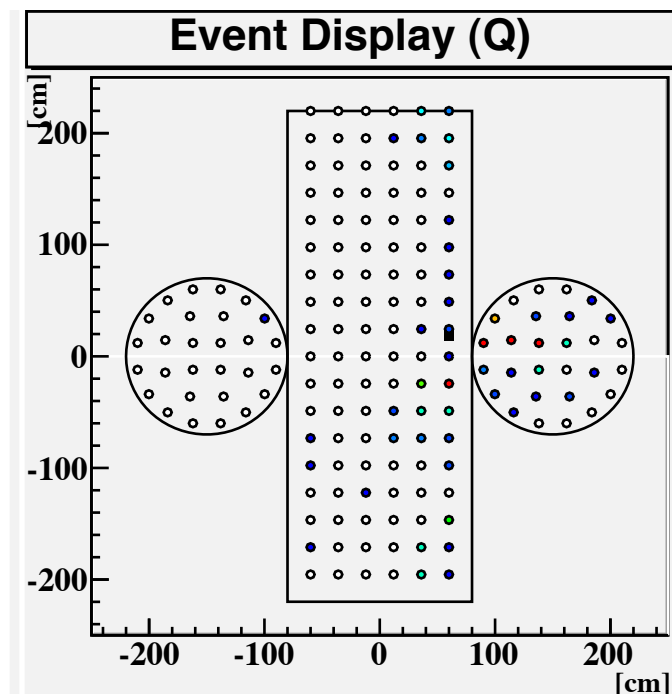
Content

- Event display of each neutrino interaction mode.
 - CCQE
 - CC π , π s
 - CCDis
 - NC π , π s
 - NCDis

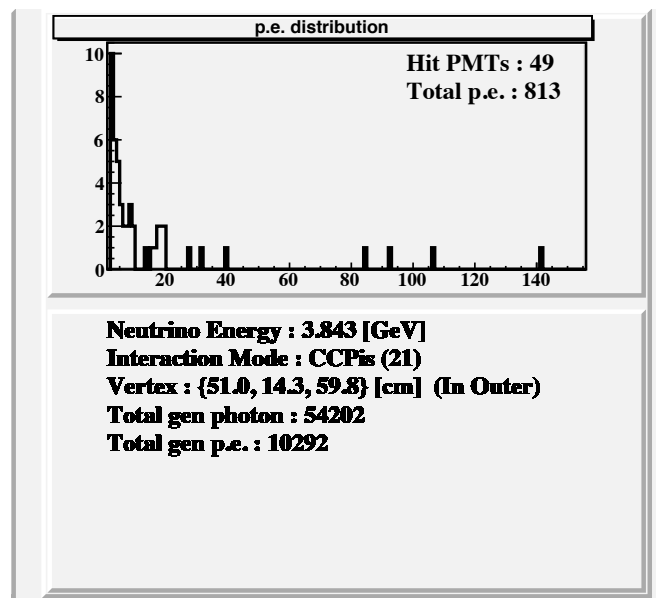
MC setting

- Jnubeam 10d fluka
- NEUT(5.0.6.) water-target
- Geant4
 - PMTのQEをアップデートする前
 - MCにバグがあり、生成粒子の情報をとってこれなかった。
 - 直して粒子の情報をとれるようにする。
- 今回はp.e.分布についてのみだが、次にはtime分布も表示.

Event display



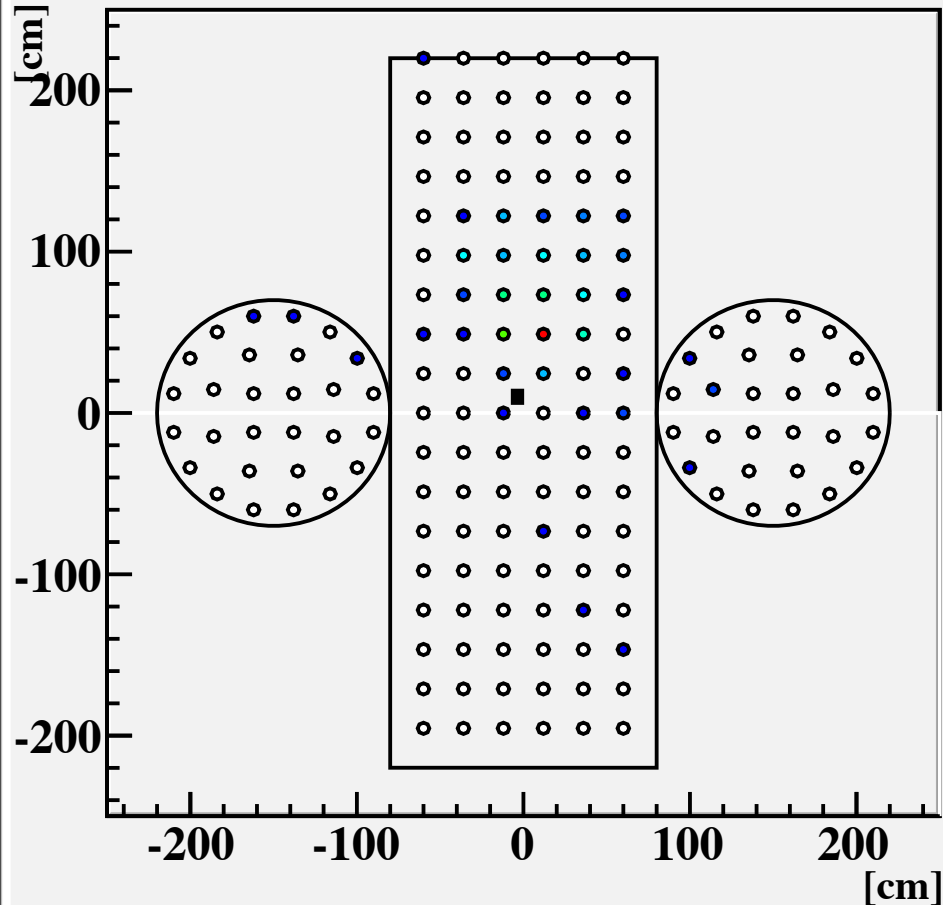
- ビームの向きはプロット左から右
- 小さい円がPMT。PMTの色は光量に応じて変化
 - 2 p.e. ~ 48p.e.: 青色 ~ 赤色
 - 3p.e.毎に色のグラデーションが変化
 - 48p.e. 以上 : 赤色
- タンク・PMTのサイズはスペック通り



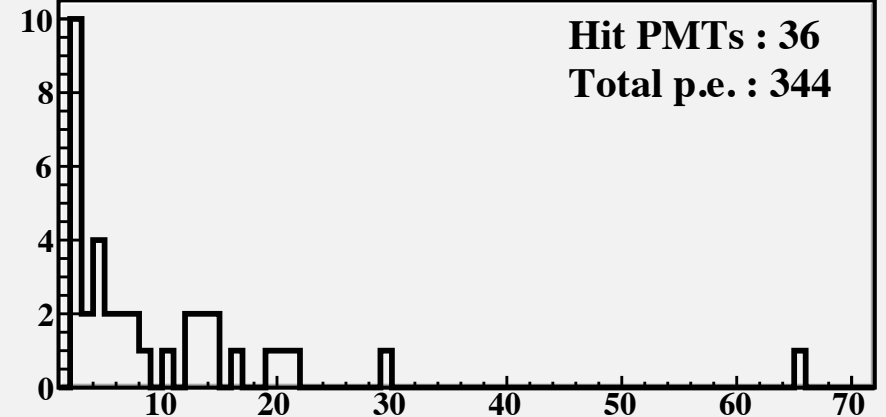
- p.e. distributionはこのイベントの各PMTでの光量分布 (HIT threshold ≥ 2 p.e.)
- 下にはMCのture情報を記載
 - ここに粒子の情報も載せたい.

CCQE

Event Display (Q)



p.e. distribution



Neutrino Energy : 0.727 [GeV]

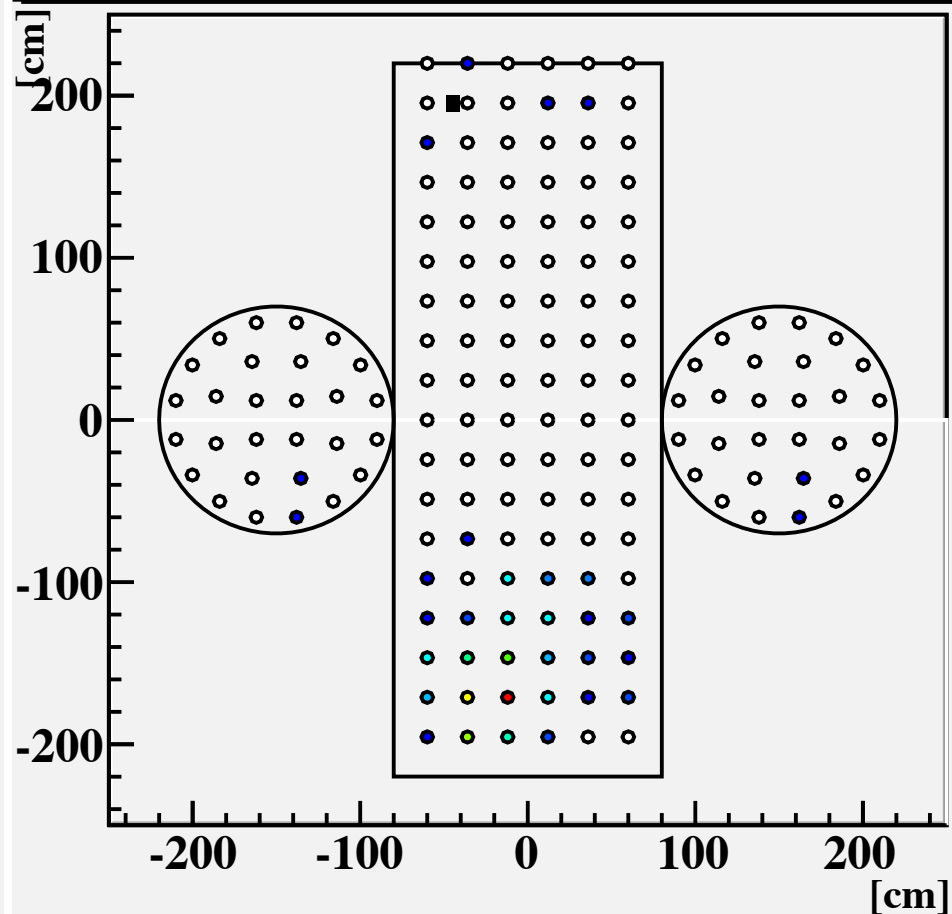
Interaction Mode : CCQE (1)

Vertex : {59.7, 8.6, -3.6} [cm] (In Outer)

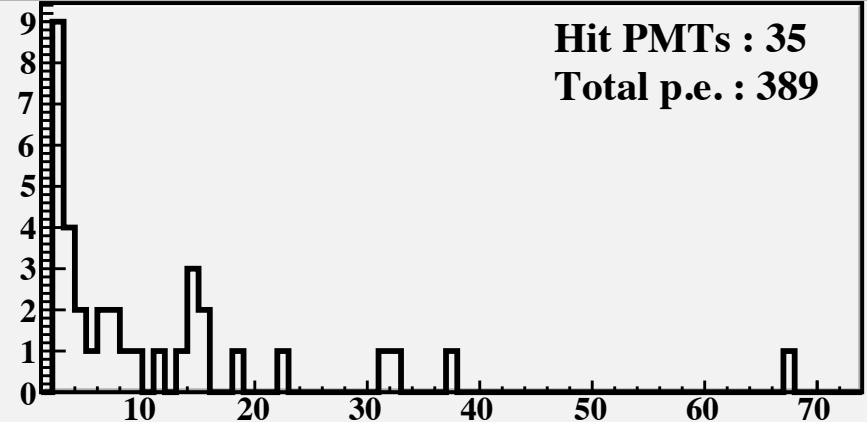
Total gen photon : 25060

Total gen p.e. : 4759

Event Display (Q)



p.e. distribution



Neutrino Energy : 0.614 [GeV]

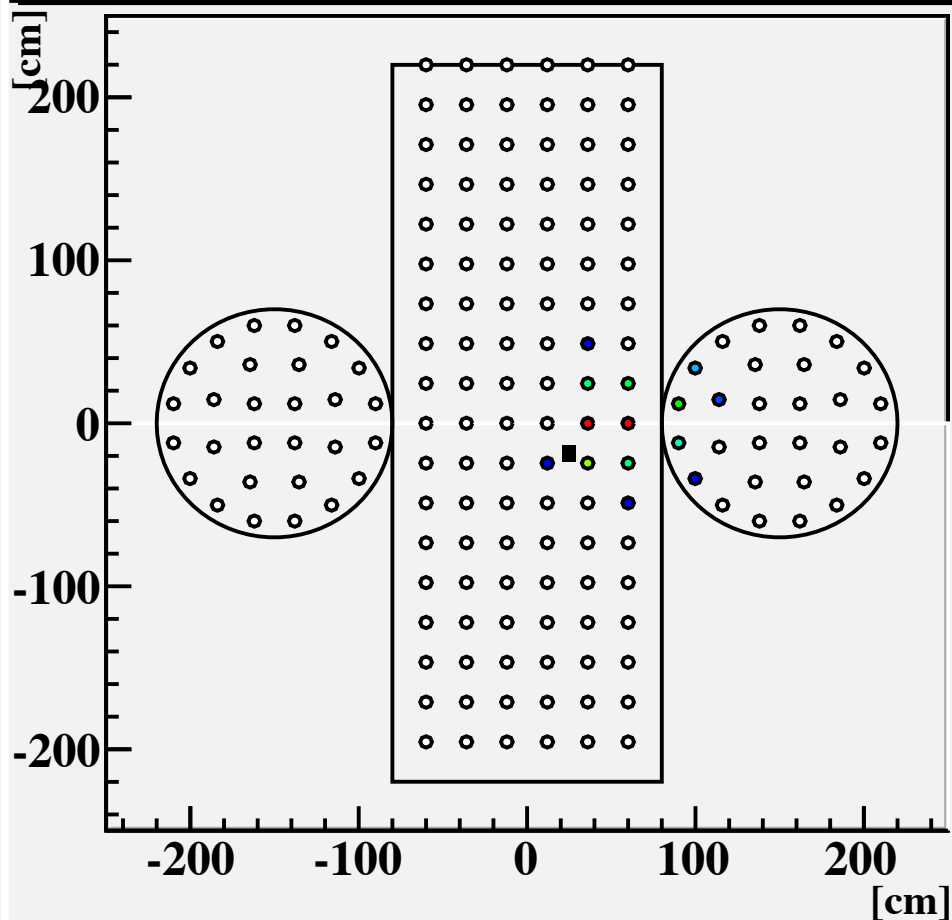
Interaction Mode : CCQE (1)

Vertex : {-35.6, 13.1, -44.7} [cm] (In FV)

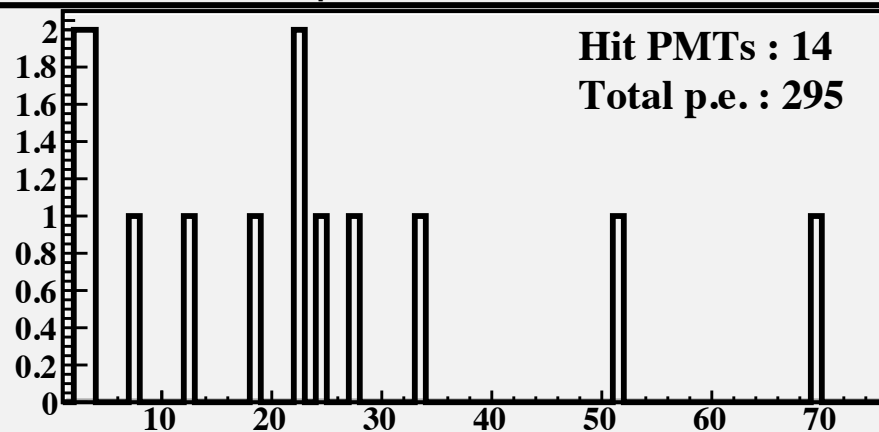
Total gen photon : 33952

Total gen p.e. : 6330

Event Display (Q)



p.e. distribution



Neutrino Energy : 0.964 [GeV]

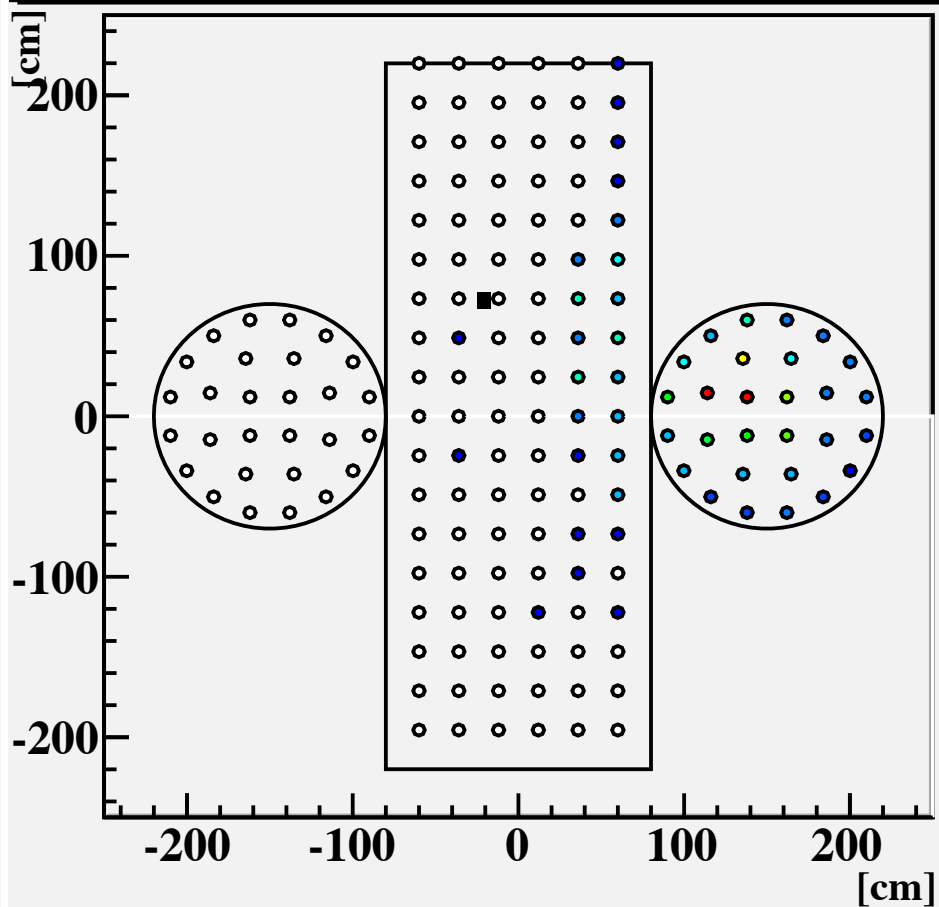
Interaction Mode : CCQE (1)

Vertex : {29.1, -8.0, 25.0} [cm] (In FV)

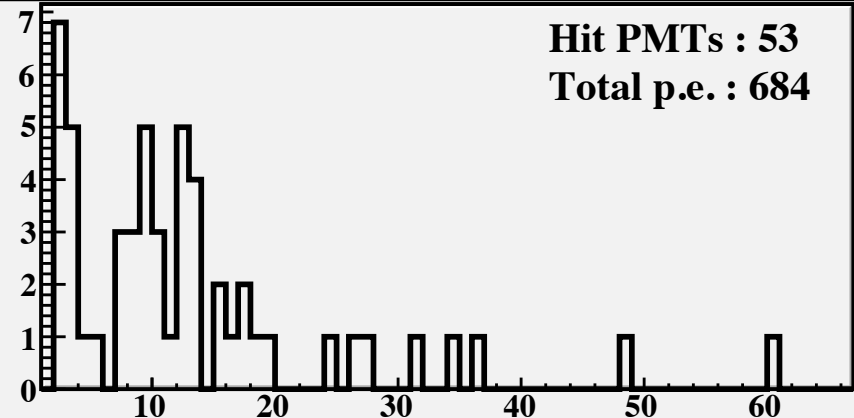
Total gen photon : 24795

Total gen p.e. : 4814

Event Display (Q)



p.e. distribution



Neutrino Energy : 3.741 [GeV]

Interaction Mode : CCQE (1)

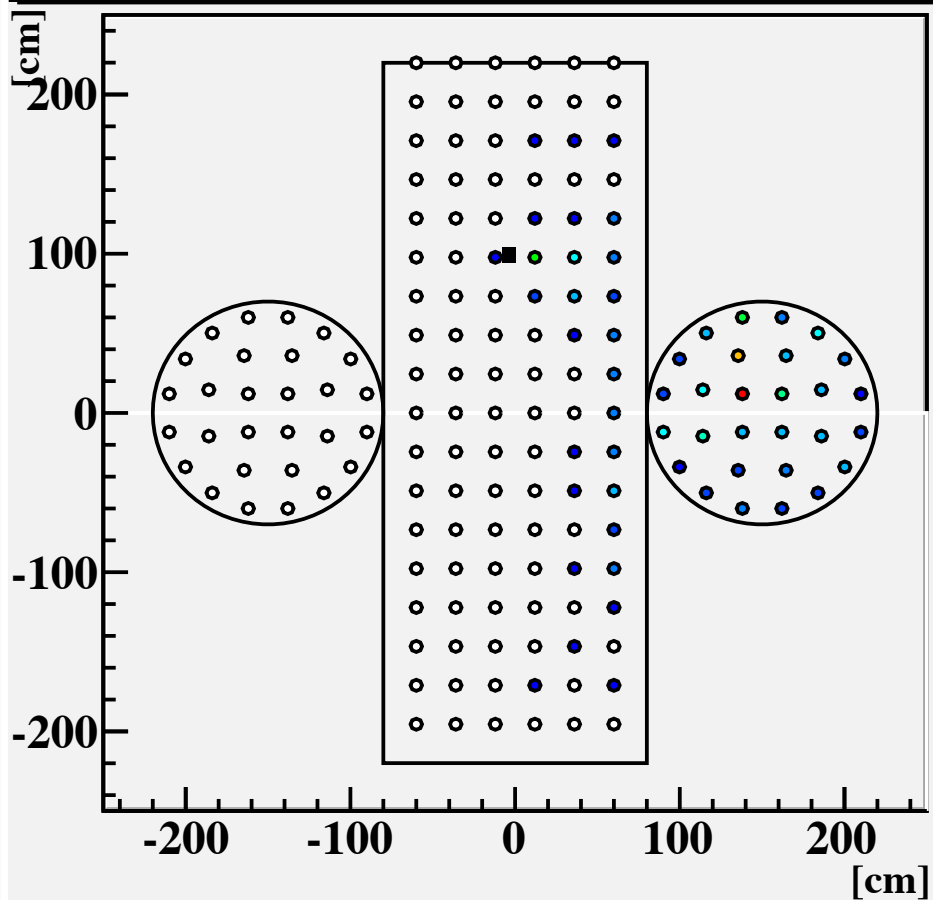
Vertex : {15.8, 26.1, -20.9} [cm] (In FV)

Total gen photon : 56862

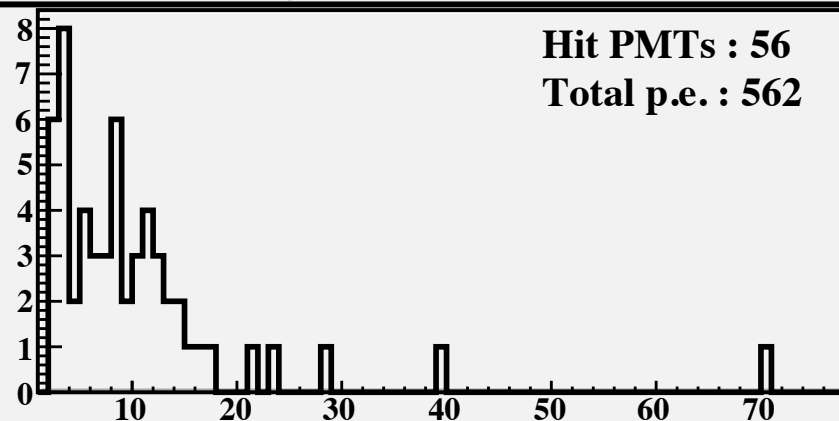
Total gen p.e. : 11028

CCIπ

Event Display (Q)



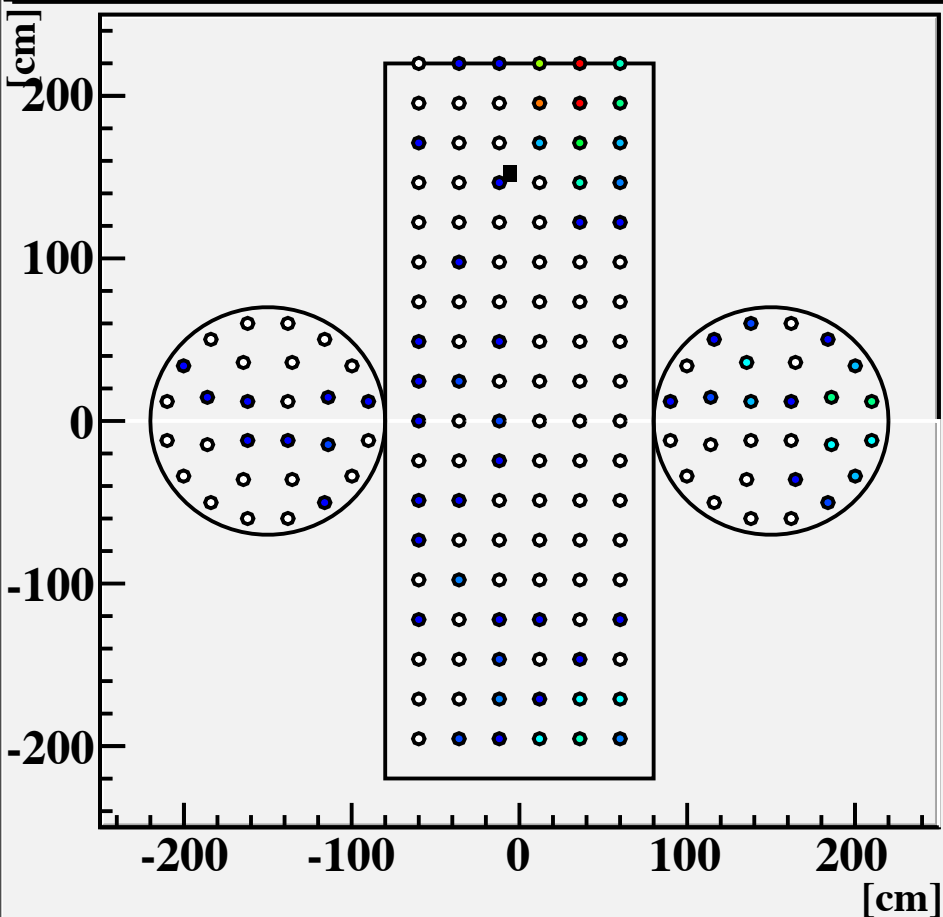
p.e. distribution



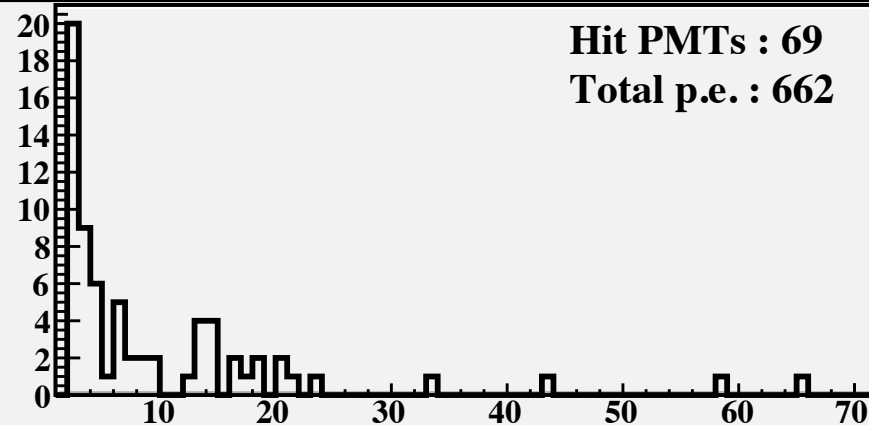
Hit PMTs : 56
Total p.e. : 562

Neutrino Energy : 0.834 [GeV]
Interaction Mode : CC1Pi (11)
Vertex : {10.2, 64.8, -3.9} [cm] (In Outer)
Total gen photon : 39325
Total gen p.e. : 7498

Event Display (Q)



p.e. distribution



Hit PMTs : 69

Total p.e. : 662

Neutrino Energy : 1.606 [GeV]

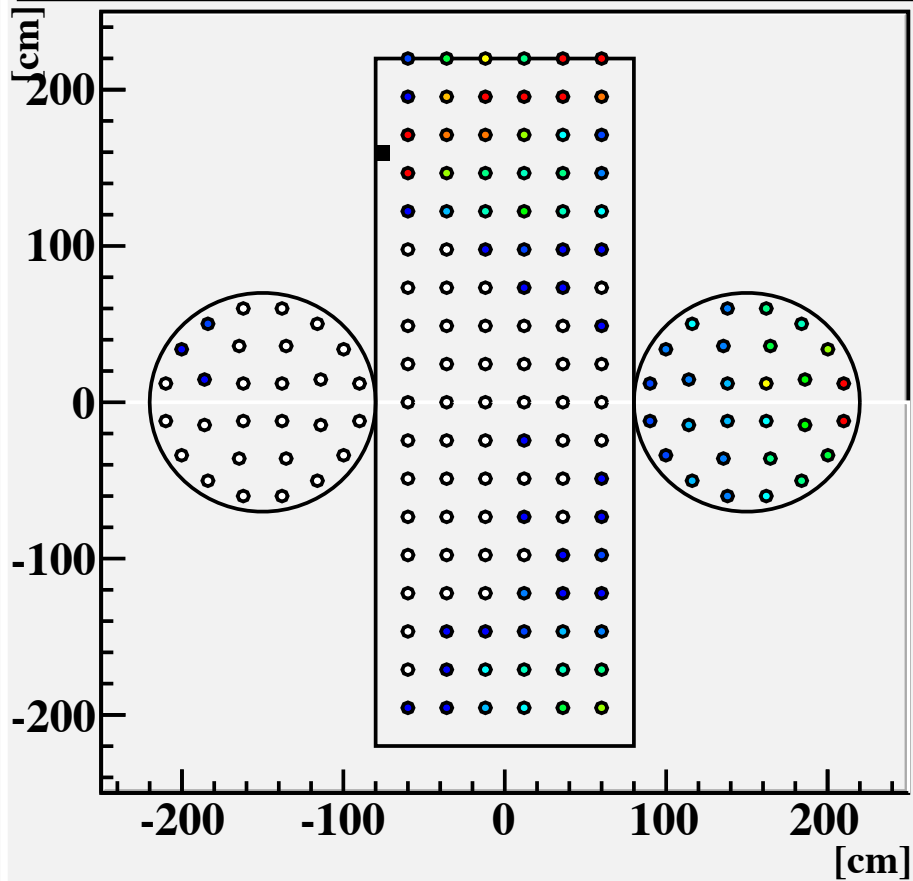
Interaction Mode : CC1Pi (11)

Vertex : {-16.3, 23.7, -5.7} [cm] (In FV)

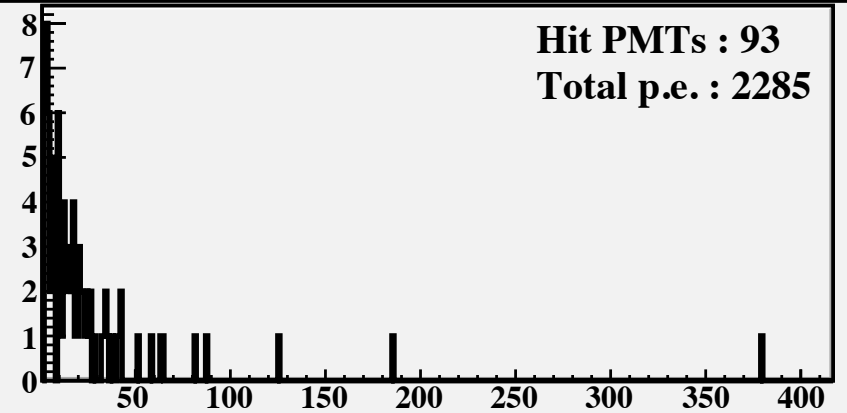
Total gen photon : 56042

Total gen p.e. : 10873

Event Display (Q)

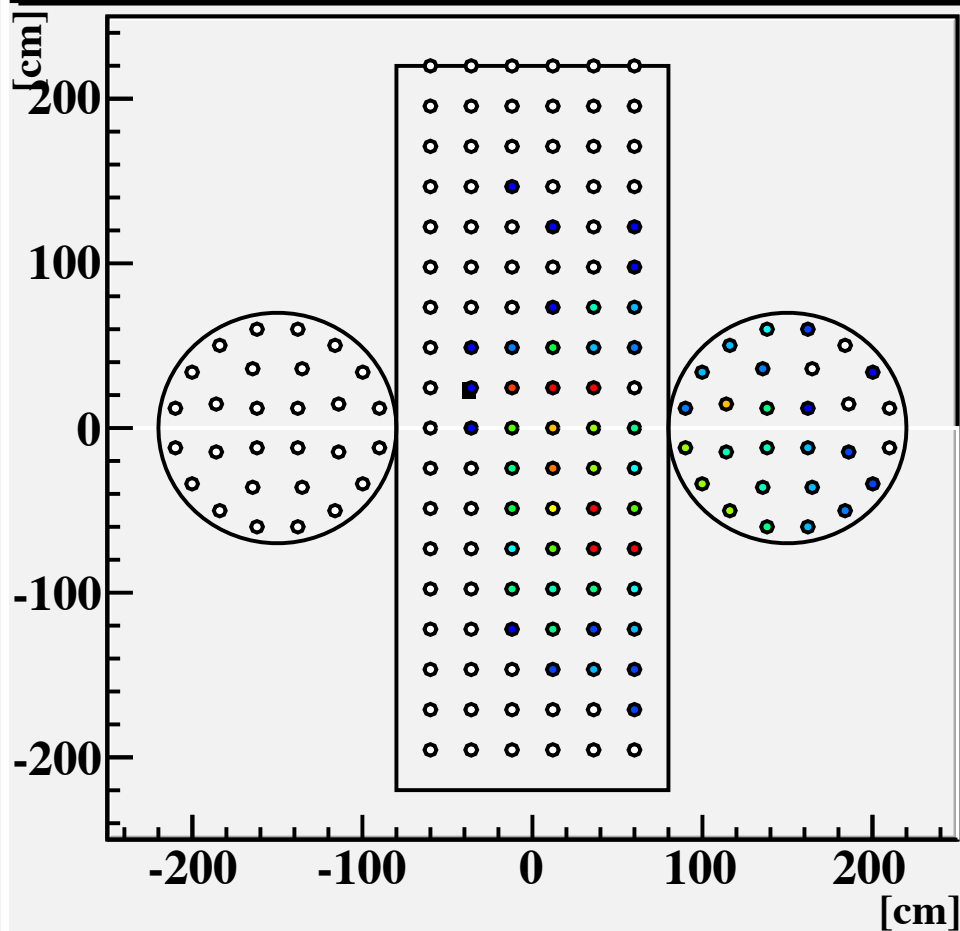


p.e. distribution

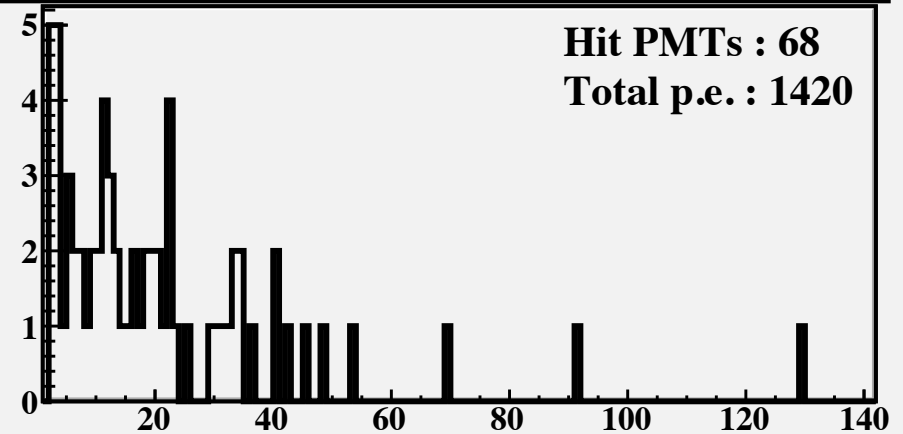


Neutrino Energy : 4.088 [GeV]
Interaction Mode : CC1Pi (12)
Vertex : {-34.9, 40.5, -75.0} [cm] (In Outer)
Total gen photon : 148569
Total gen p.e. : 28644

Event Display (Q)



p.e. distribution

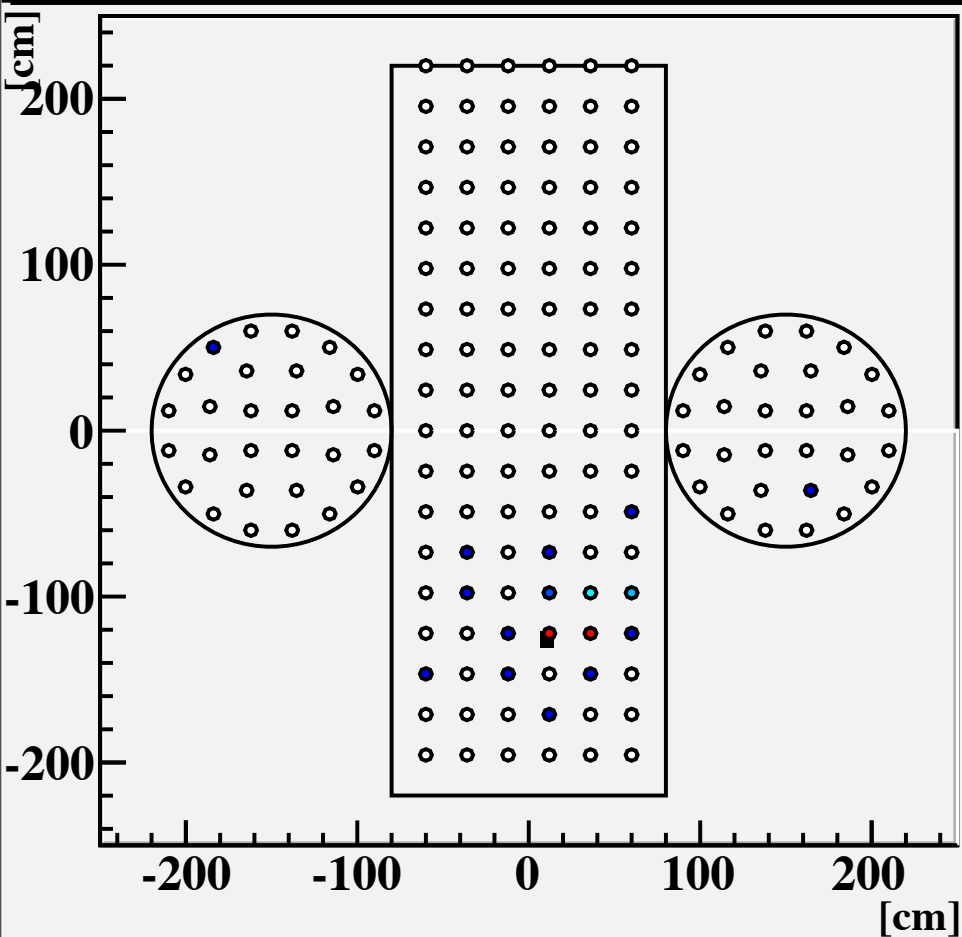


Hit PMTs : 68
Total p.e. : 1420

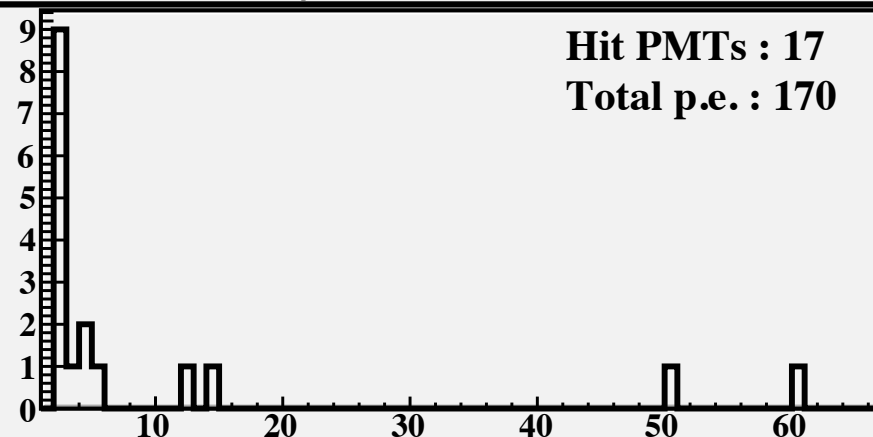
Neutrino Energy : 5.458 [GeV]
Interaction Mode : CC1Pi (13)
Vertex : {37.3, 12.5, -37.2} [cm] (In FV)
Total gen photon : 98144
Total gen p.e. : 19091

CCπs

Event Display (Q)



p.e. distribution



Neutrino Energy : 1.617 [GeV]

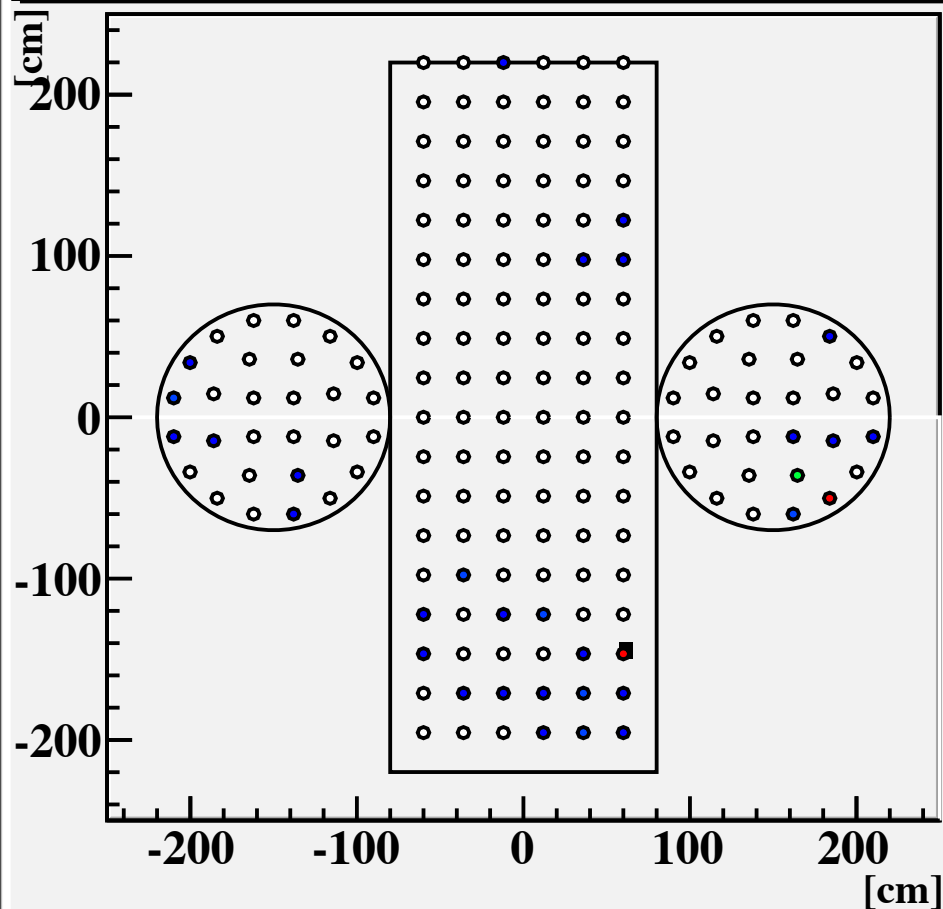
Interaction Mode : CCPis (21)

Vertex : {-8.6, -36.6, 10.4} [cm] (In FV)

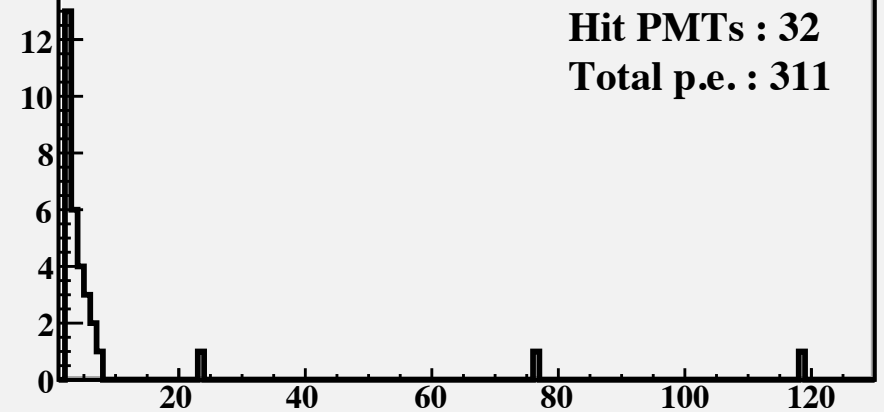
Total gen photon : 17413

Total gen p.e. : 3301

Event Display (Q)



p.e. distribution



Neutrino Energy : 2.184 [GeV]

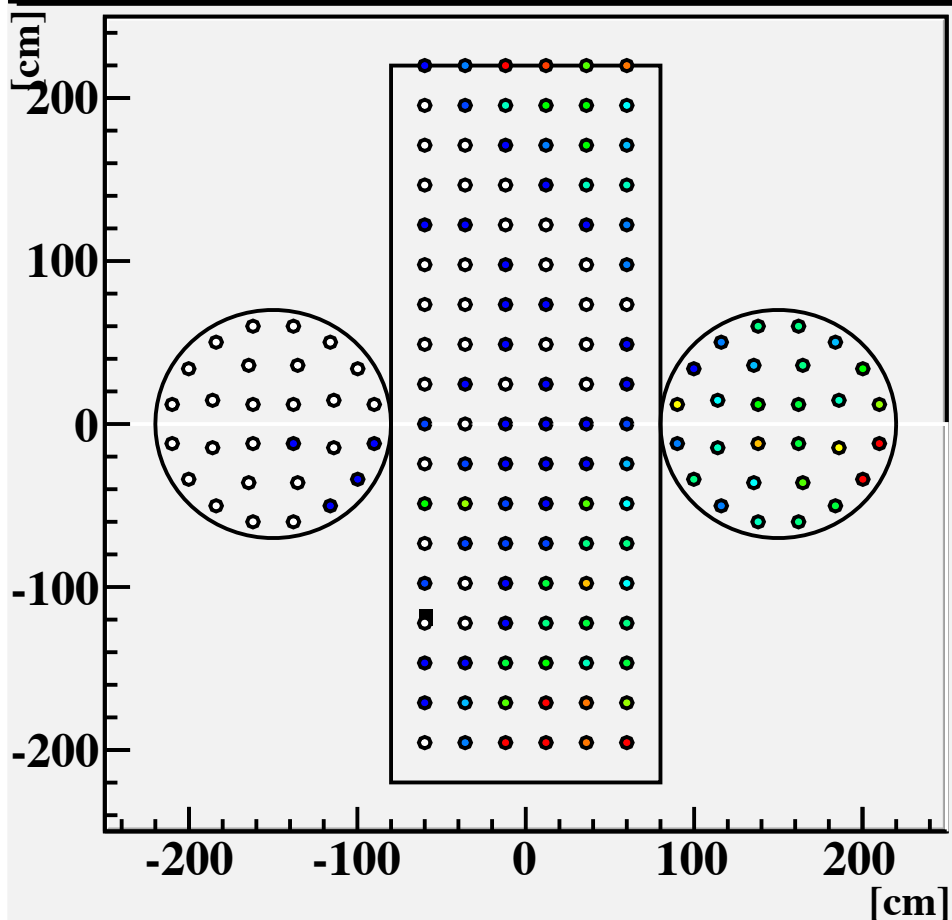
Interaction Mode : CCPis (21)

Vertex : {-23.5, -43.1, 61.4} [cm] (In Outer)

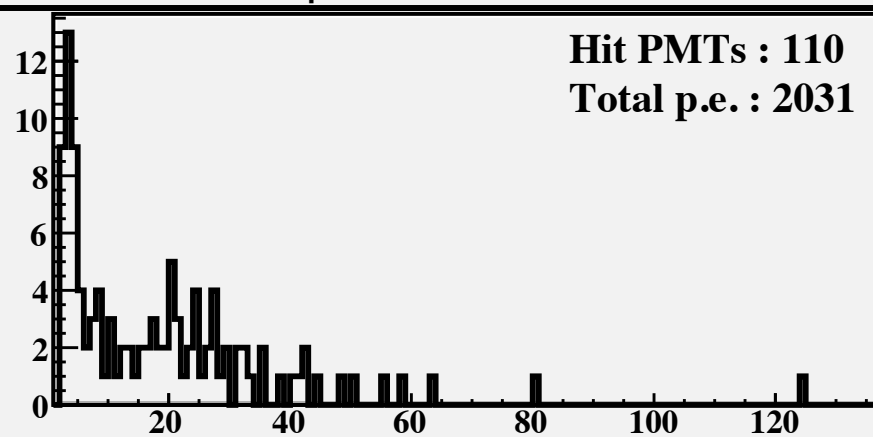
Total gen photon : 26603

Total gen p.e. : 5205

Event Display (Q)



p.e. distribution

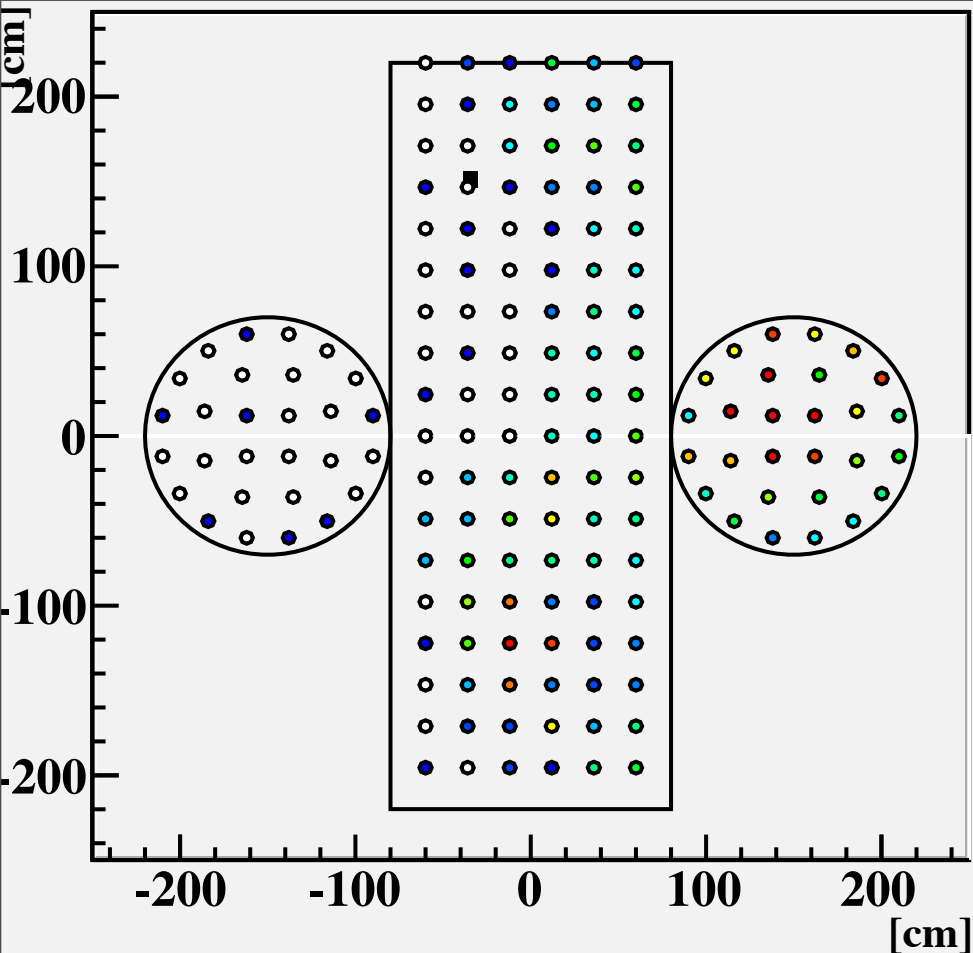


Hit PMTs : 110
Total p.e. : 2031

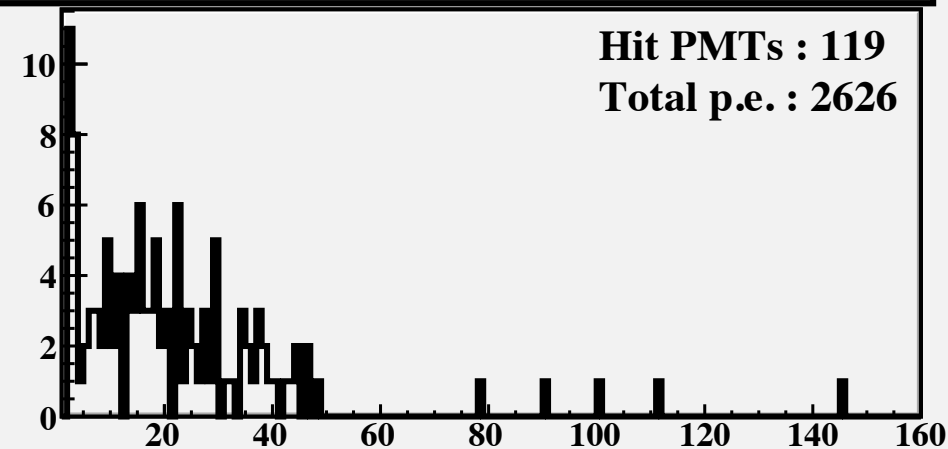
Neutrino Energy : 3.672 [GeV]
Interaction Mode : CCPis (21)
Vertex : {-1.7, -13.7, -59.4} [cm] (In Outer)
Total gen photon : 170471
Total gen p.e. : 32641

CC DIS

Event Display (Q)



p.e. distribution



Neutrino Energy : 3.975 [GeV]

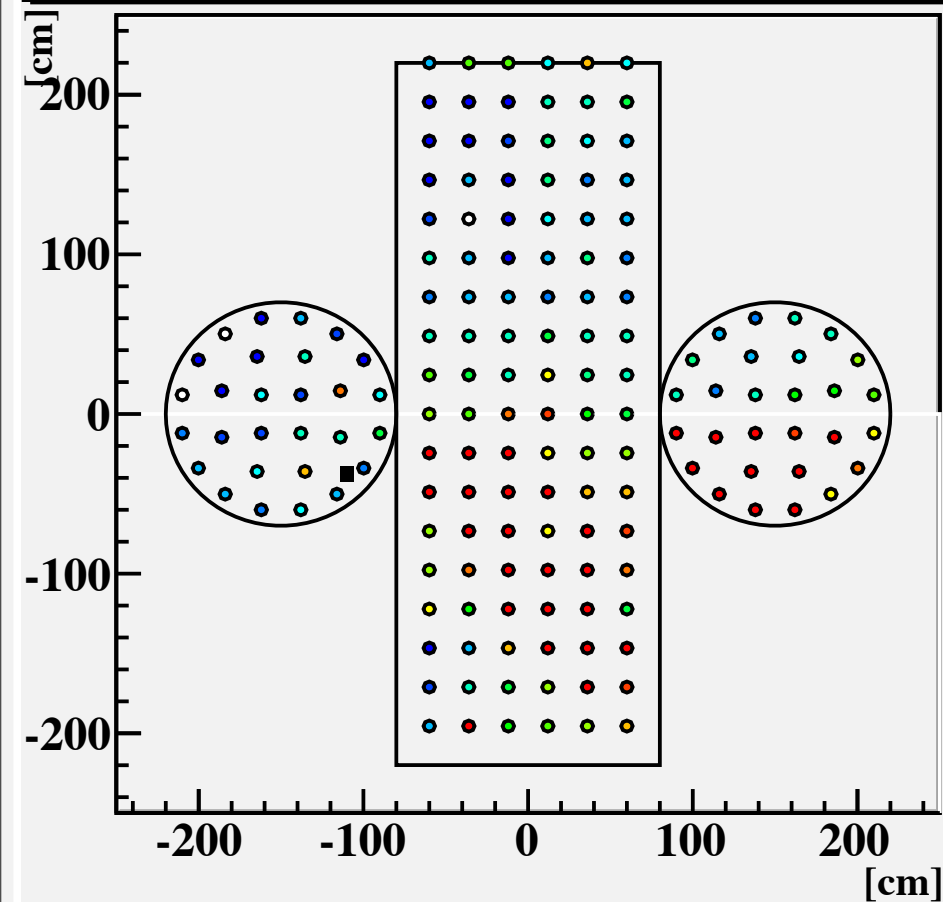
Interaction Mode : CCPis (21)

Vertex : {-20.2, 30.3, -34.6} [cm] (In FV)

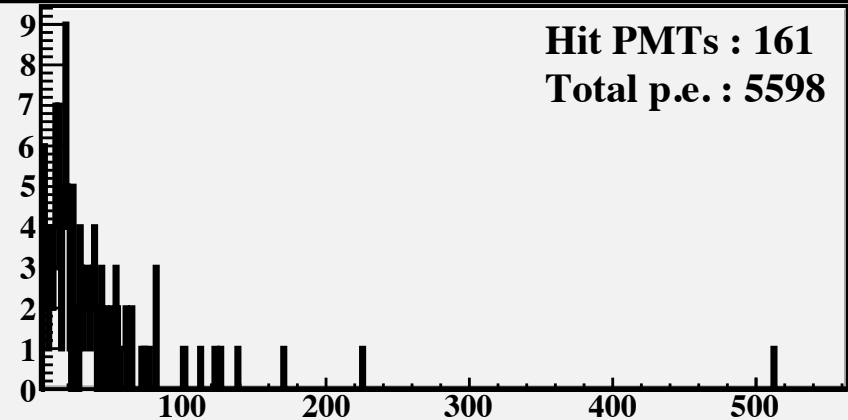
Total gen photon : 234463

Total gen p.e. : 44652

Event Display (Q)



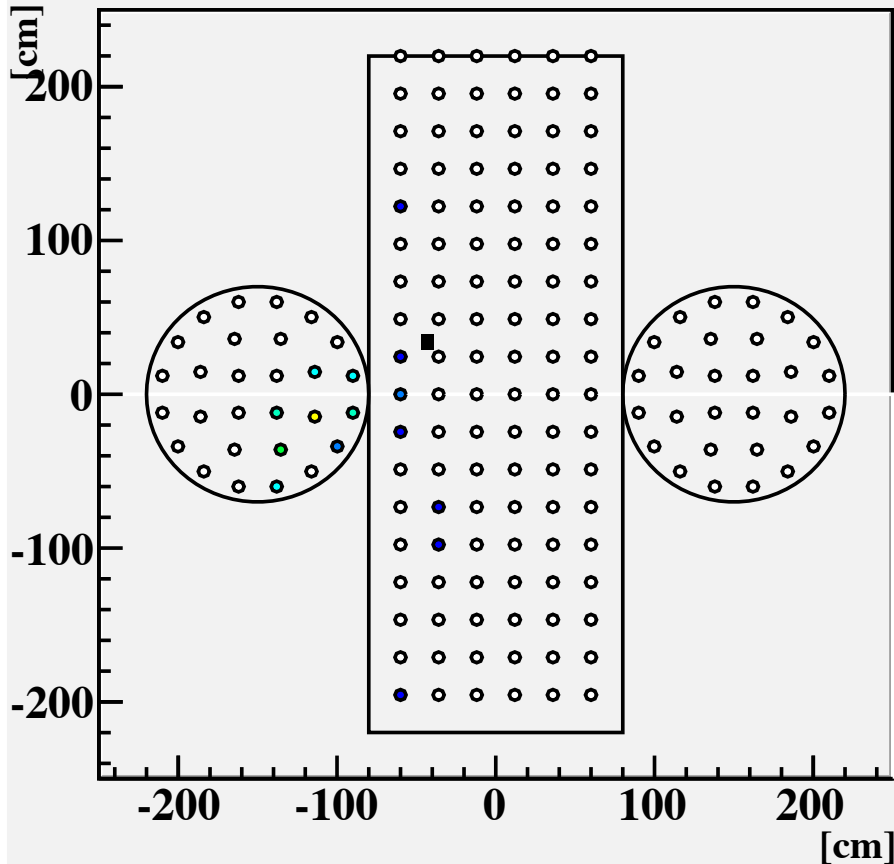
p.e. distribution



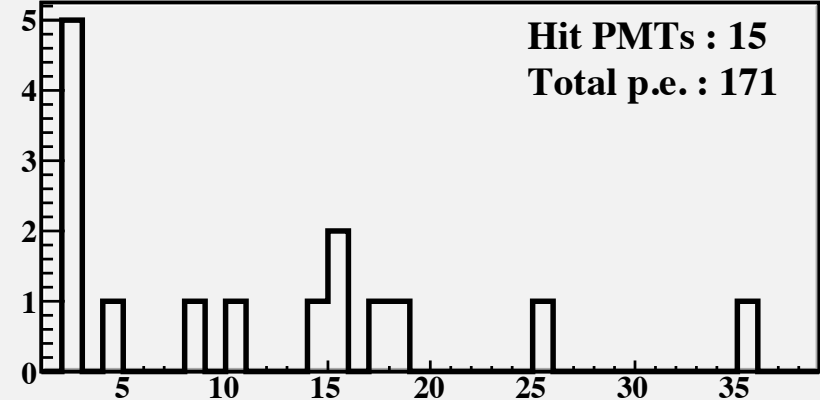
Neutrino Energy : 4.893 [GeV]
Interaction Mode : CCDis (26)
Vertex : {39.8, -37.9, -78.4} [cm] (In Outer)
Total gen photon : 349098
Total gen p.e. : 67014

NCI π

Event Display (Q)



p.e. distribution



Neutrino Energy : 1.302 [GeV]

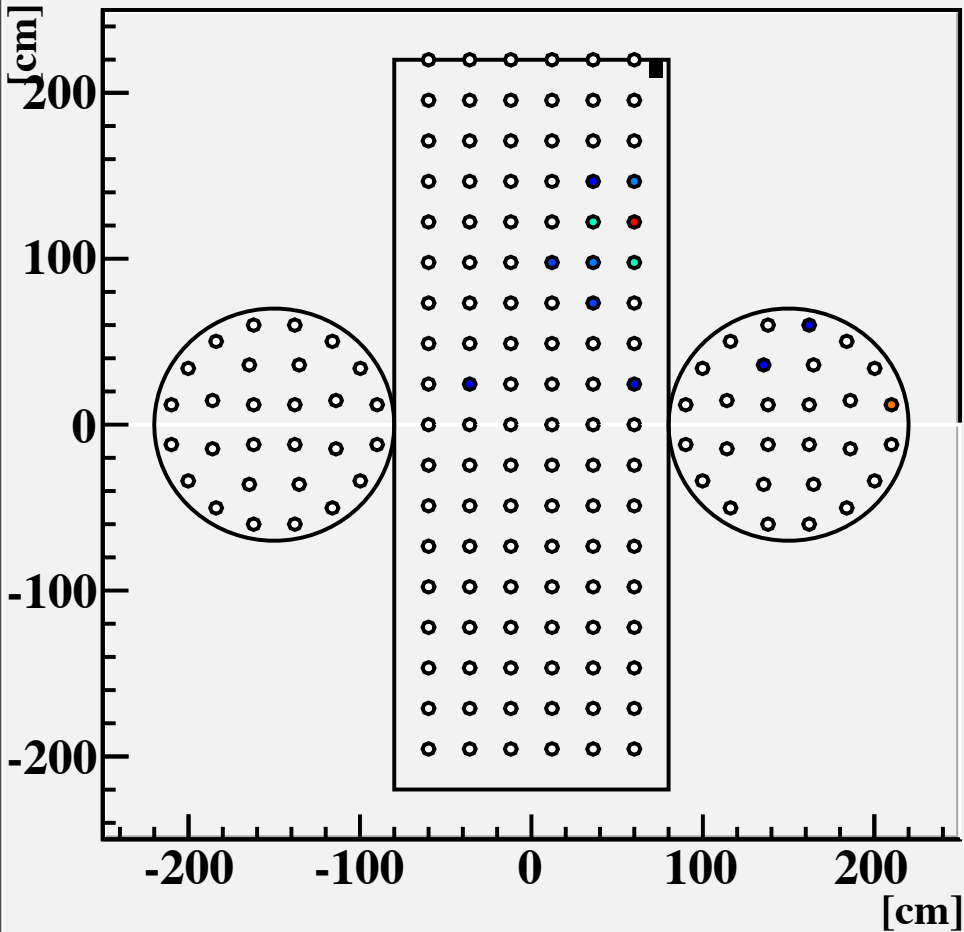
Interaction Mode : NC1Pi (32)

Vertex : {40.2, 21.3, -42.8} [cm] (In Outer)

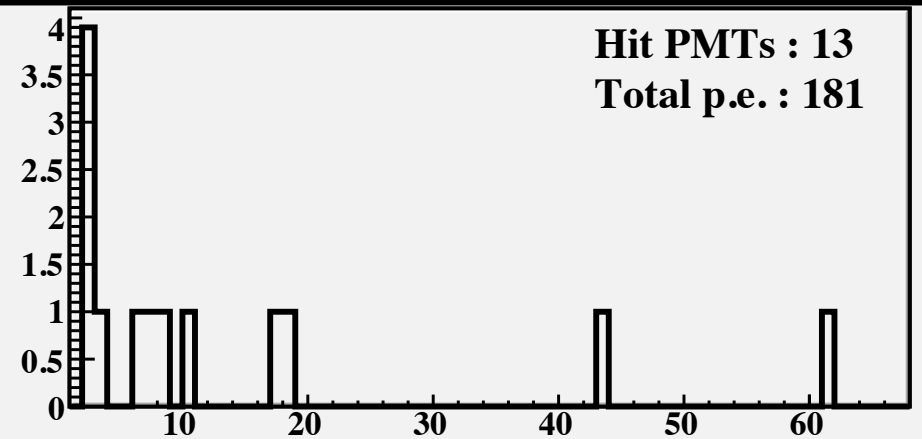
Total gen photon : 16268

Total gen p.e. : 3138

Event Display (Q)



p.e. distribution



Neutrino Energy : 3.296 [GeV]

Interaction Mode : NC1Pi (33)

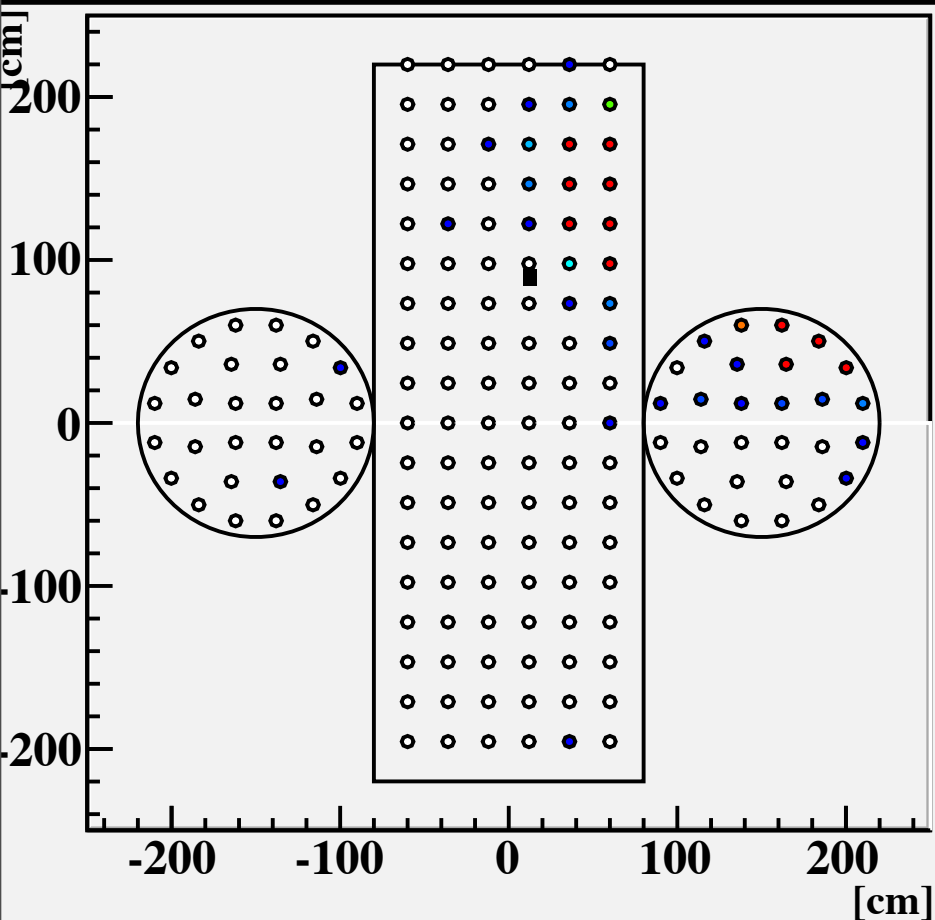
Vertex : {-62.4, 5.1, 72.8} [cm] (In Outer)

Total gen photon : 15772

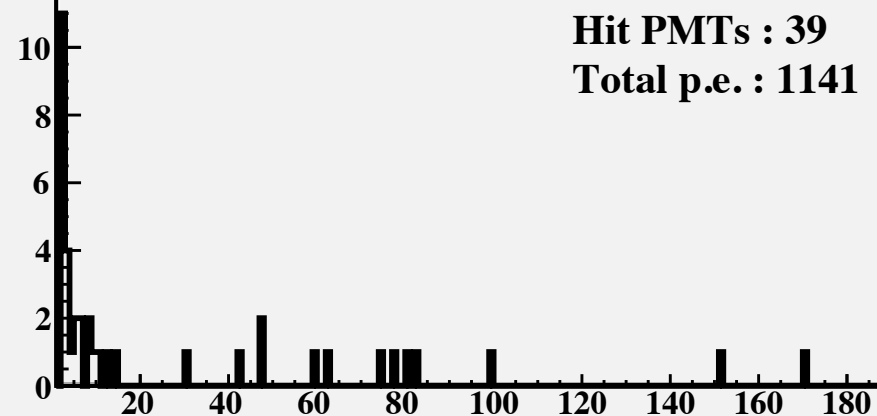
Total gen p.e. : 3065

NC π s

Event Display (Q)



p.e. distribution



Neutrino Energy : 3.064 [GeV]

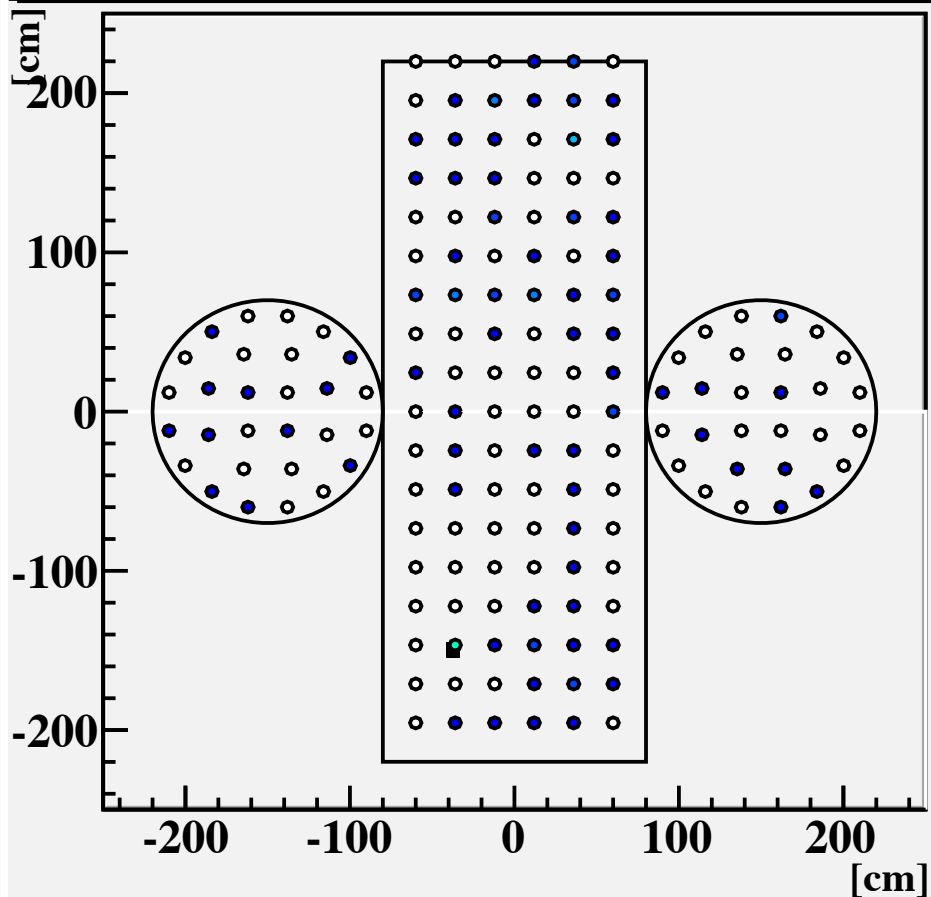
Interaction Mode : NCPis (41)

Vertex : {12.7, 42.3, 12.6} [cm] (In Outer)

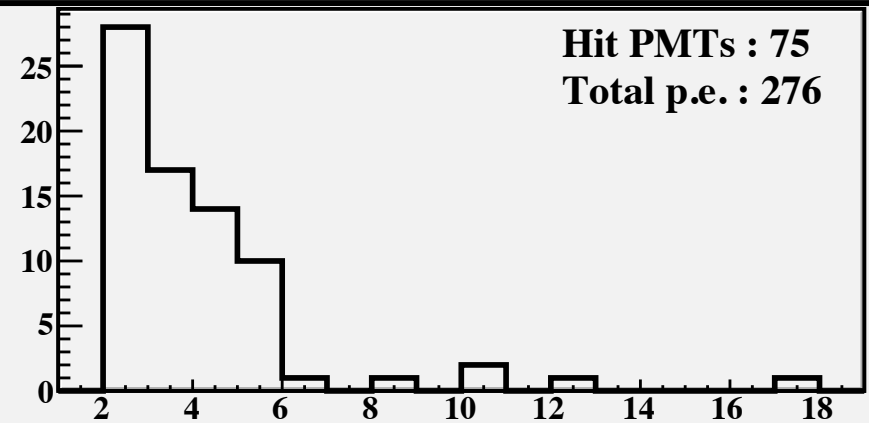
Total gen photon : 79916

Total gen p.e. : 15282

Event Display (Q)



p.e. distribution



Neutrino Energy : 3.827 [GeV]

Interaction Mode : NCPis (41)

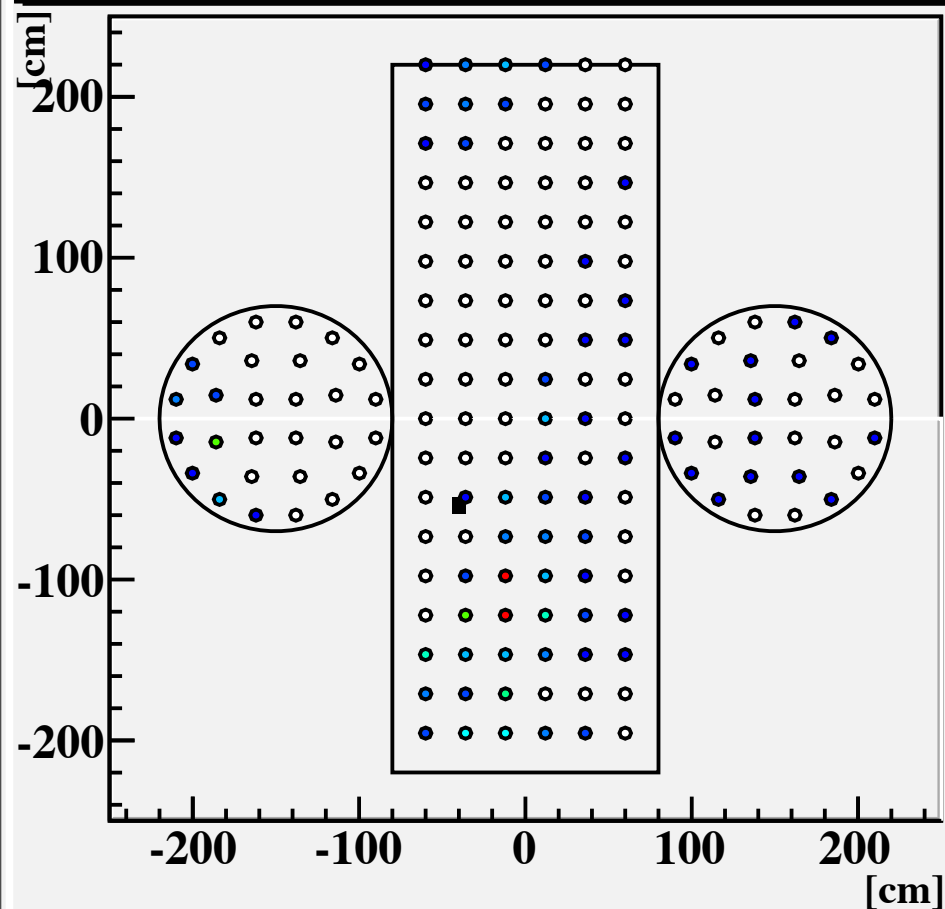
Vertex : {-11.3, -17.7, -37.6} [cm] (In FV)

Total gen photon : 27877

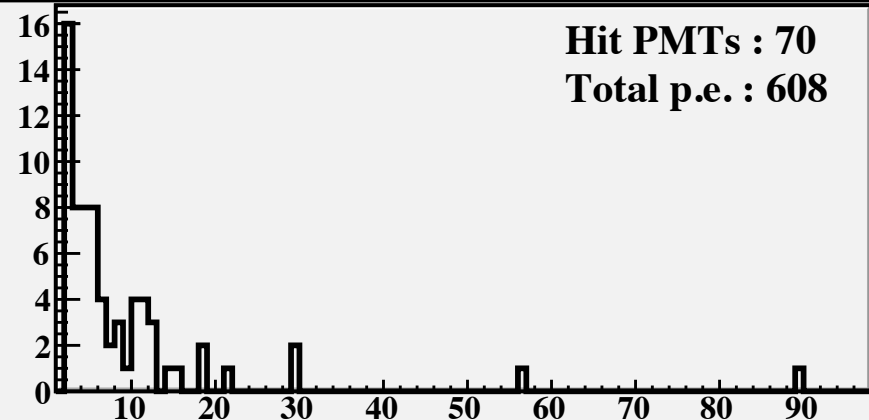
Total gen p.e. : 5459

NC DIS

Event Display (Q)



p.e. distribution



Neutrino Energy : 4.580 [GeV]

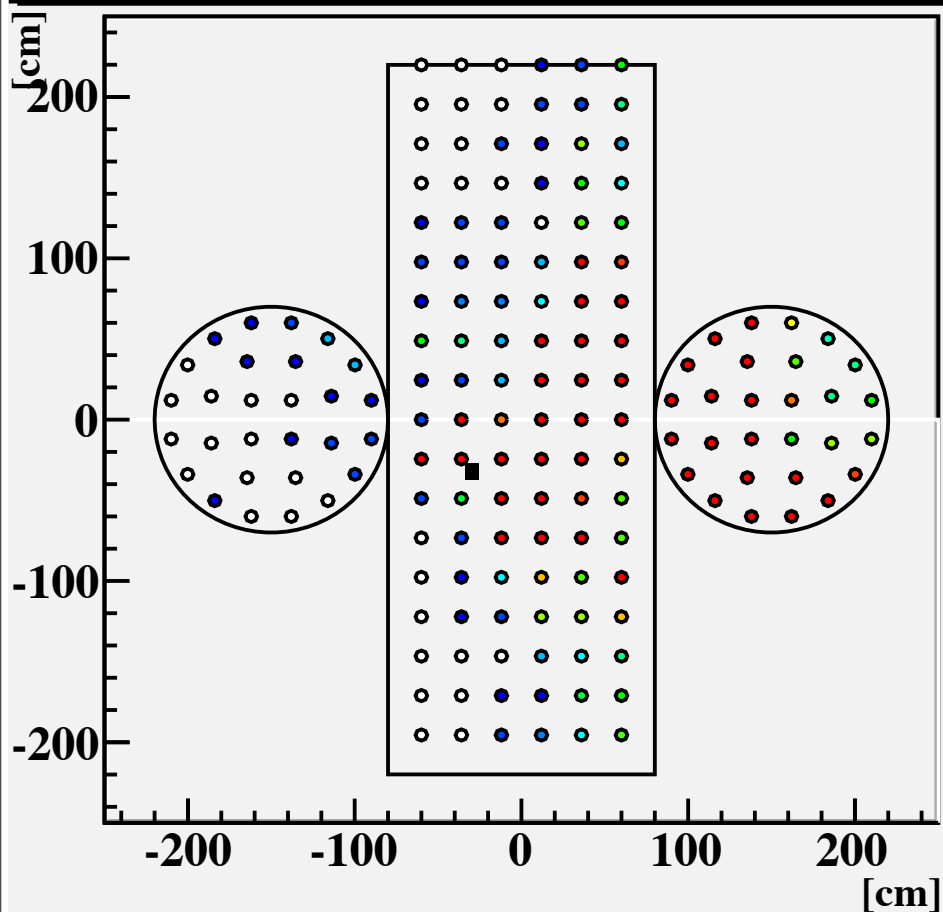
Interaction Mode : NCPis (41)

Vertex : {24.4, -23.7, -40.1} [cm] (In FV)

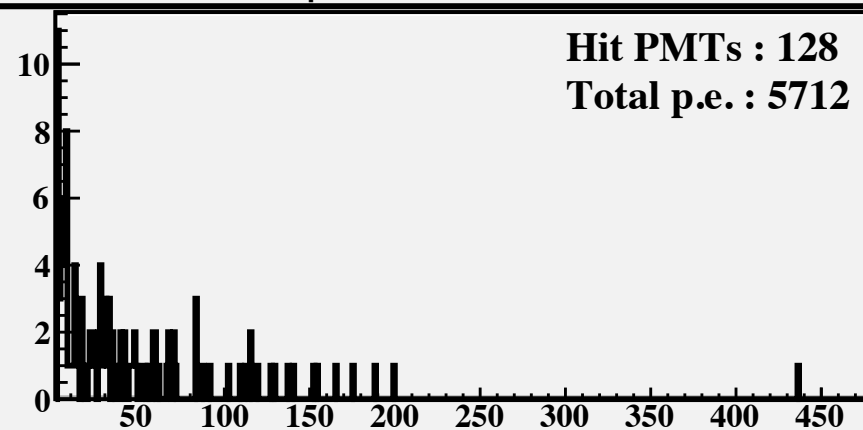
Total gen photon : 54640

Total gen p.e. : 10428

Event Display (Q)



p.e. distribution



Neutrino Energy : 8.247 [GeV]

Interaction Mode : NCDIs (46)

Vertex : {31.4, -15.5, -29.4} [cm] (In FV)

Total gen photon : 404880

Total gen p.e. : 77642

まとめ

- やはり、生成粒子の情報もないとあまりピンと来ない。
- イベント毎にカテゴリーする。
 - 光量カット後のシグナル、バックグラウンド
- ディスプレイのフォント見にくい。PMTの円が小さいので、もう少しわざと大きくして見やすくする。