各モジュールでの各分布

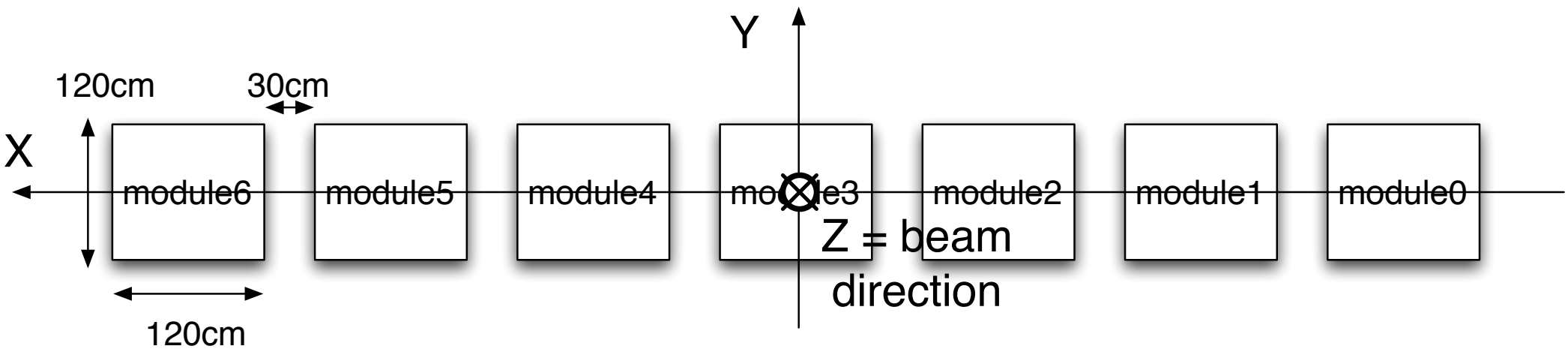
@ND3

- ND3の各モジュールでの”neutrino event selection”後の各分布をプロット
  - # of active plane
  - p.e. / layer
  - reconstructed vertex
  - reconstructed angle
  - p.e. of hit of reconstructed track

- ビームデータとMCデータを比較するために、各分布はその面積で規格化した。

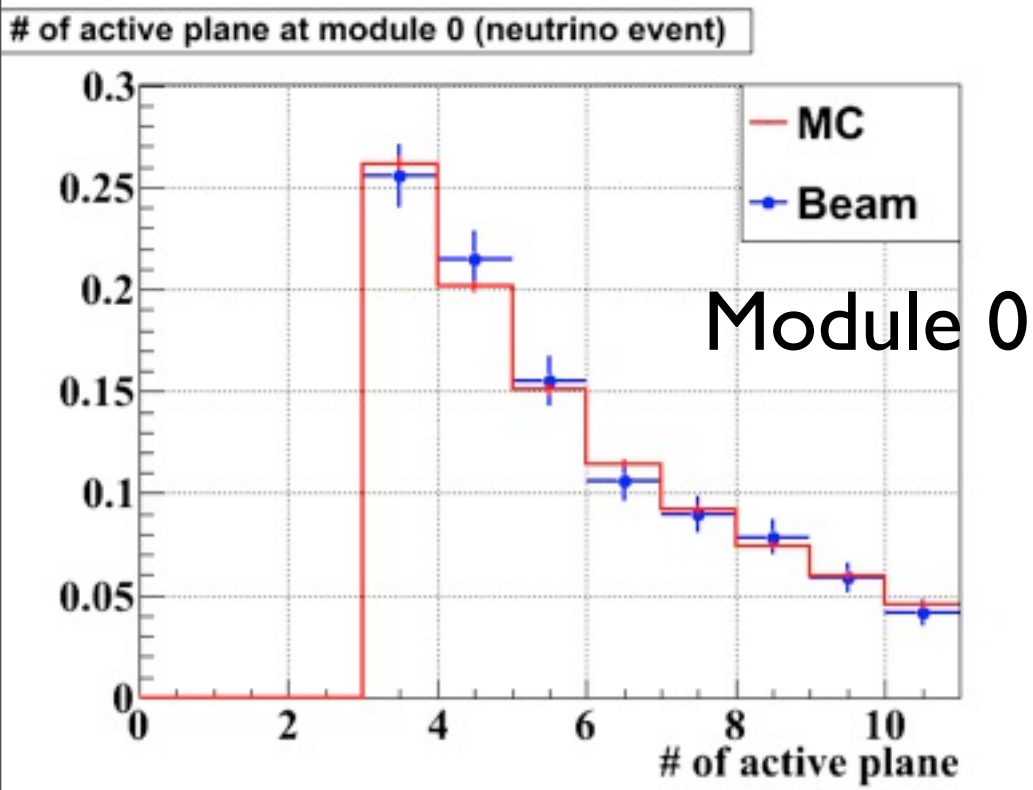
Module 位置

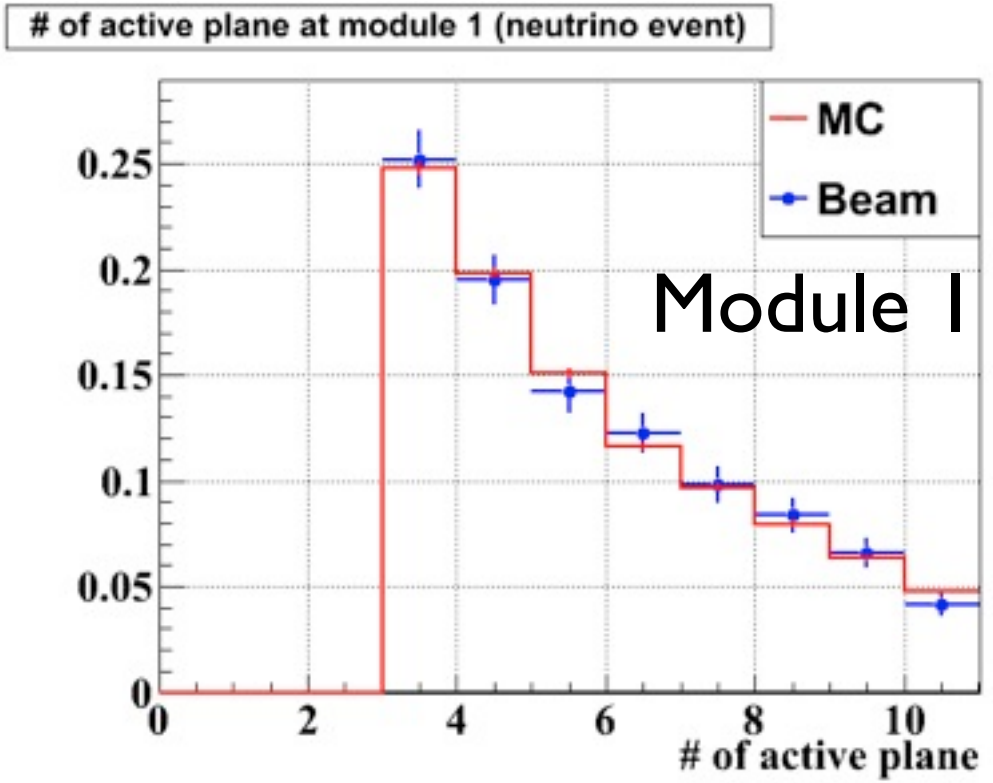
MCで設定している Geometry

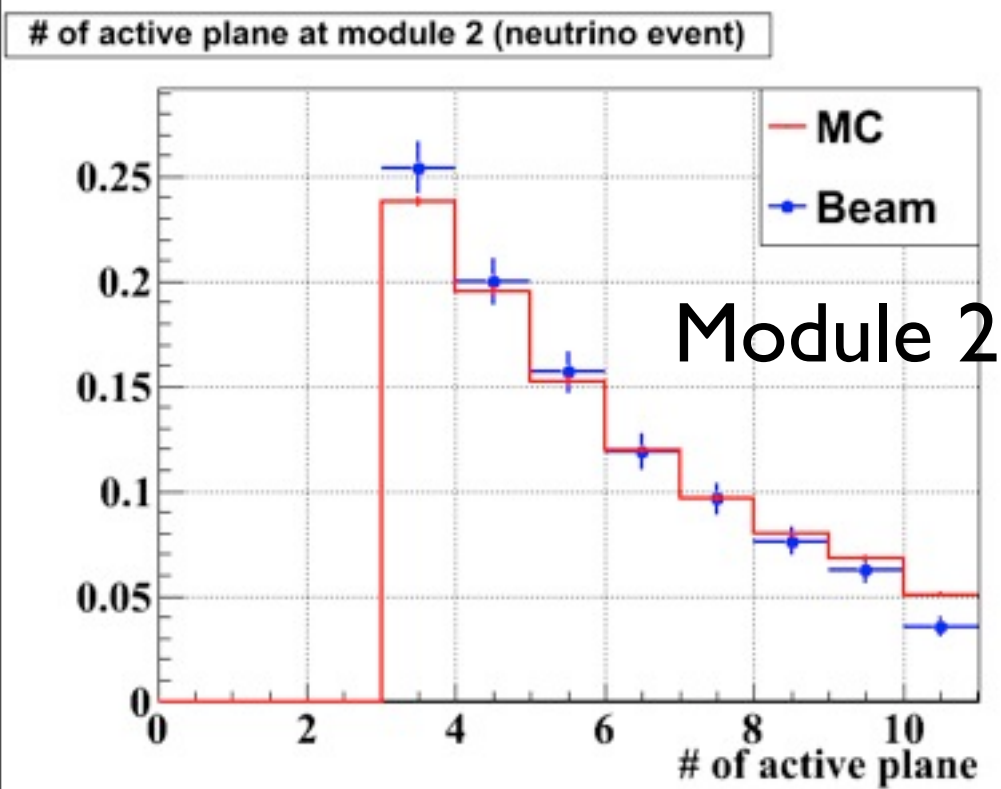


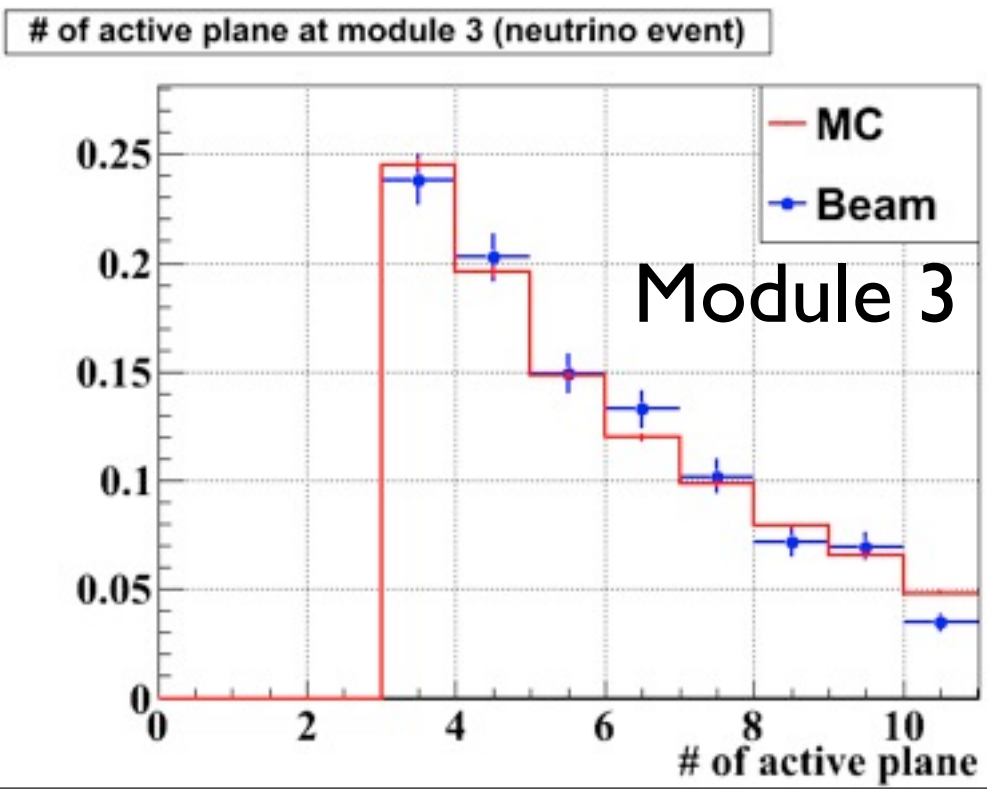
module 3 の中心がXYの中心

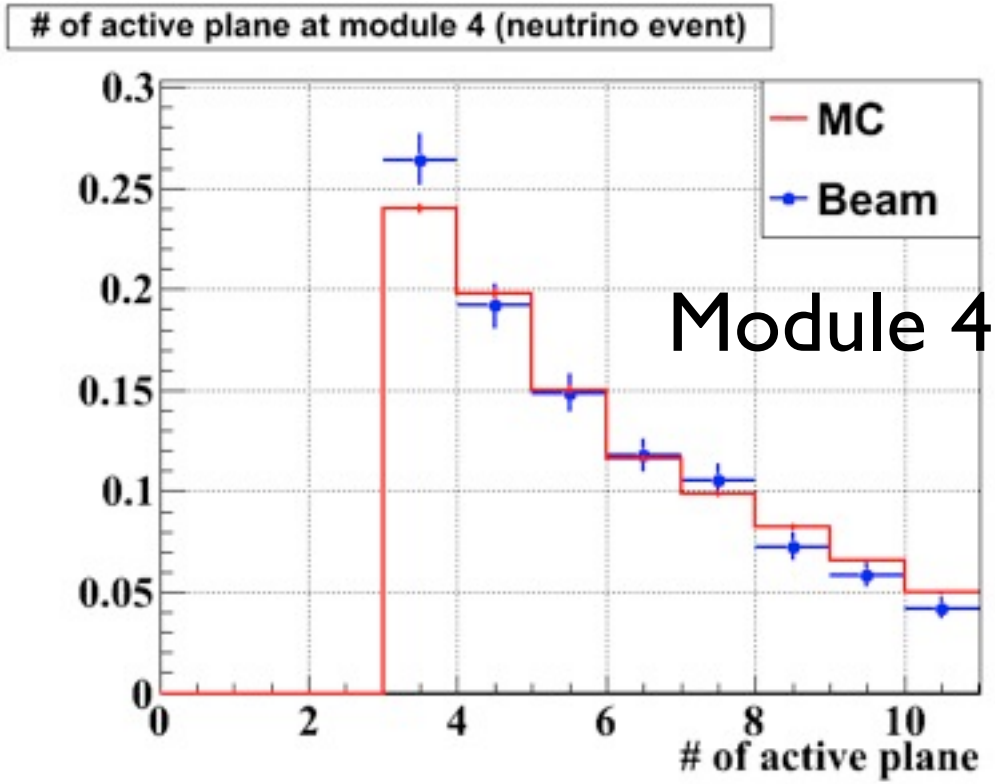
# of active plane

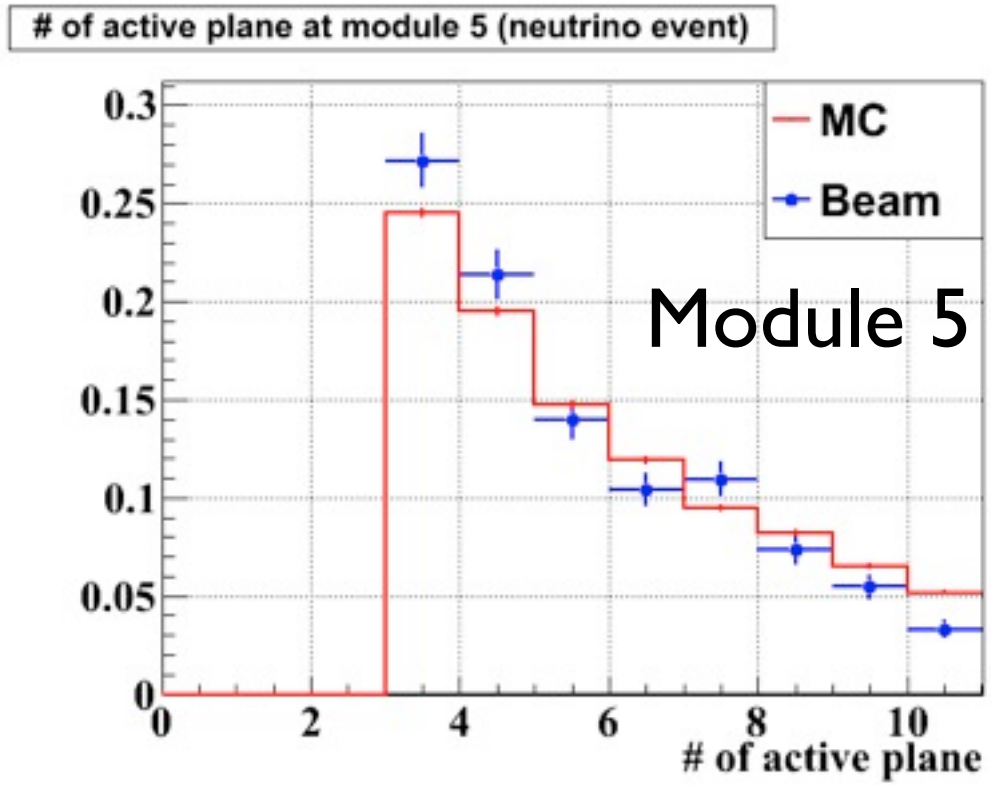

# of active plane at module 0 (neutrino event)
MC
Beam
Module 0
# of active plane

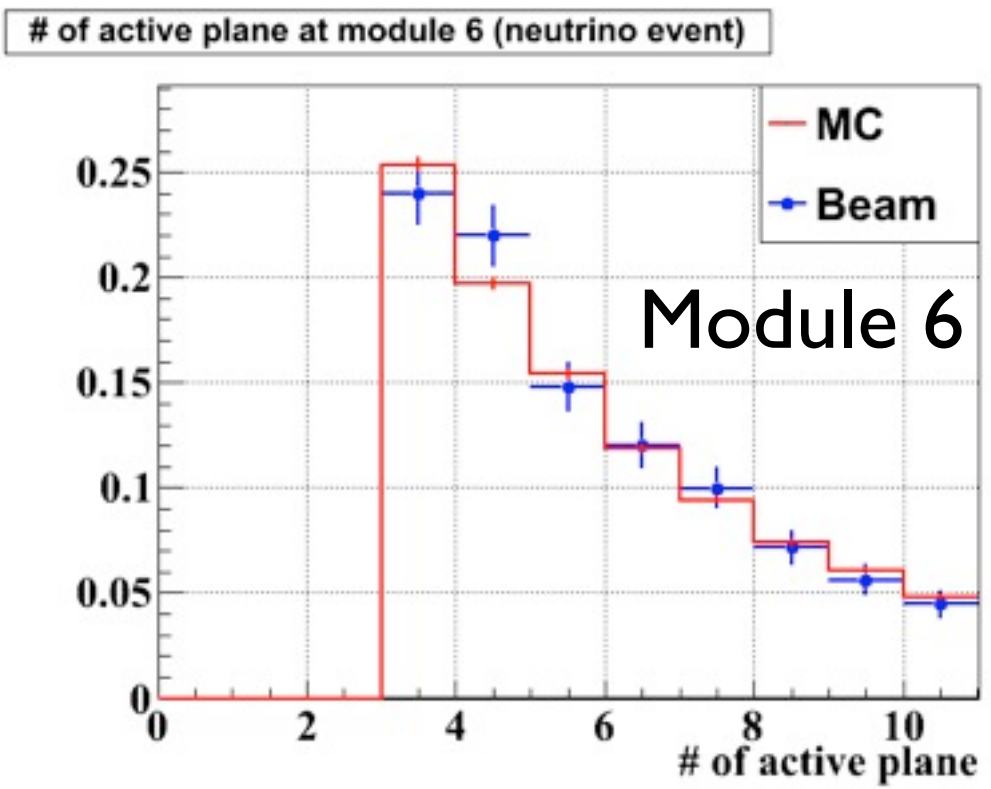

# of active plane at module 1 (neutrino event)
MC
Beam
Module 1
# of active plane


# of active plane at module 2 (neutrino event)
MC
Beam
Module 2
# of active plane


# of active plane at module 3 (neutrino event)
MC
Beam
Module 3
# of active plane

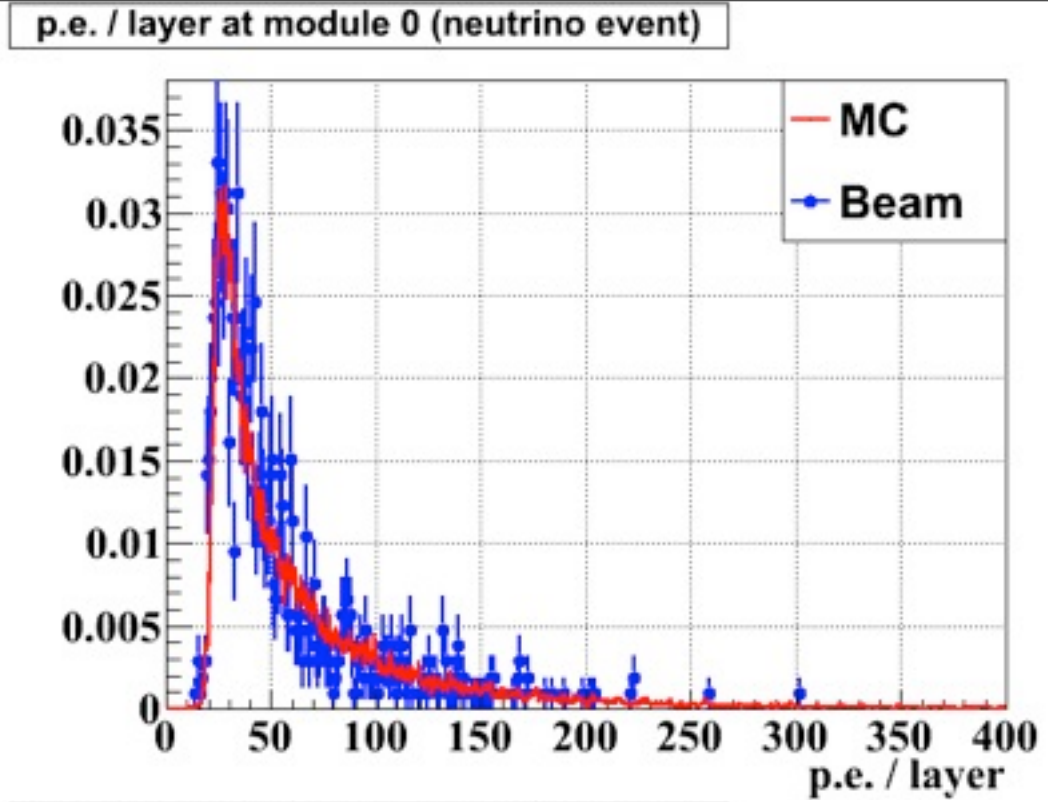

# of active plane at module 4 (neutrino event)
MC
Beam
Module 4
# of active plane

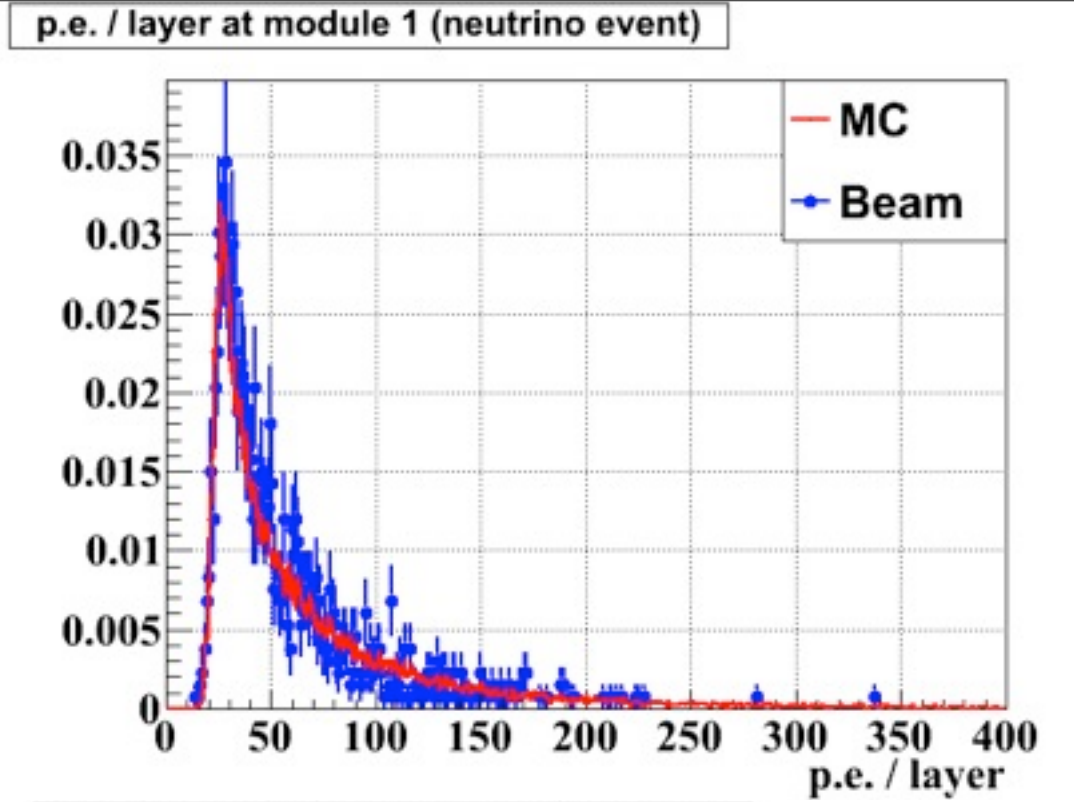

# of active plane at module 5 (neutrino event)
MC
Beam
Module 5
# of active plane

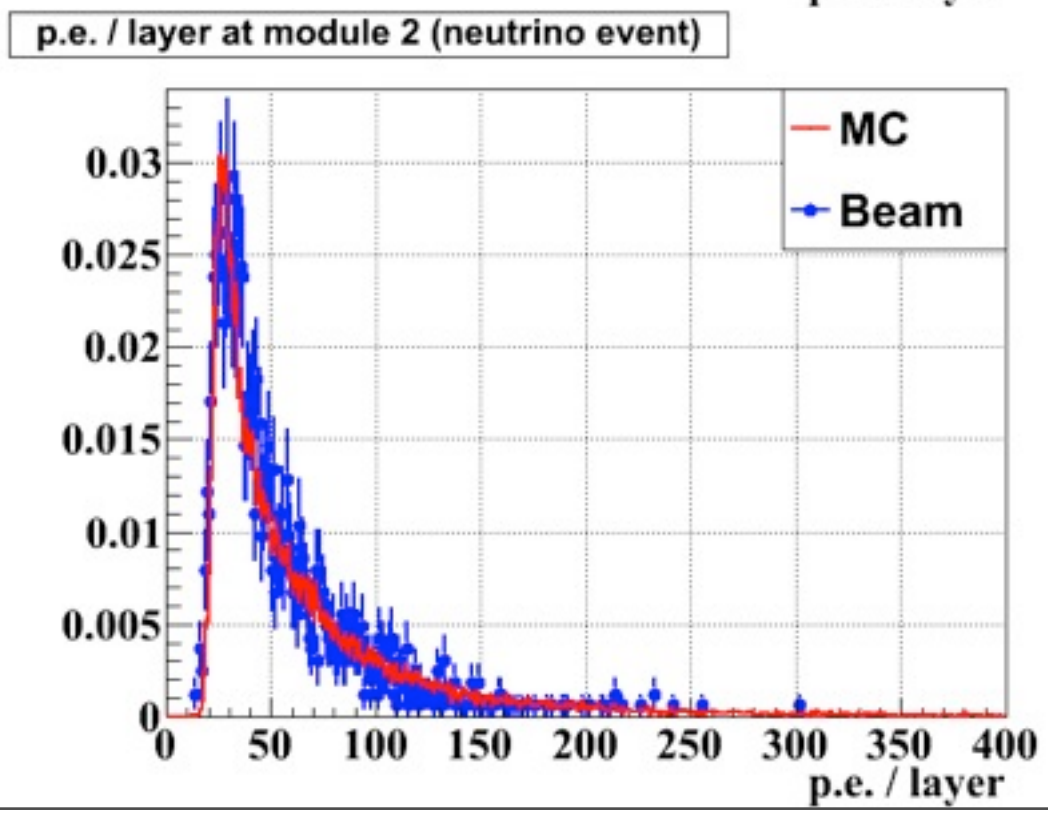

# of active plane at module 6 (neutrino event)
MC
Beam
Module 6
# of active plane

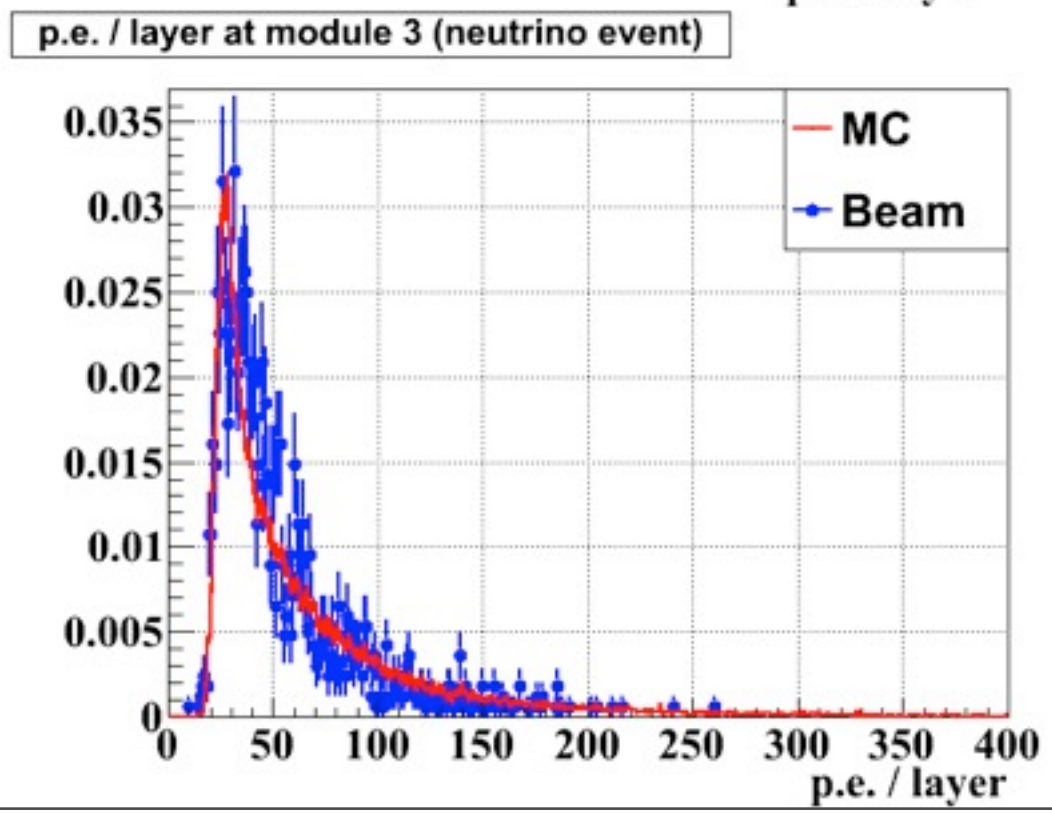
of p.e. / layer

- プロットは光量領域まで含めて作成したが、今回表示したのはピークp.e.付近のみ。
  - 今のカット(p.e./layer>6.5)で重要なのは低光量領域
  - プロットの規格化は全光量の領域で行った。

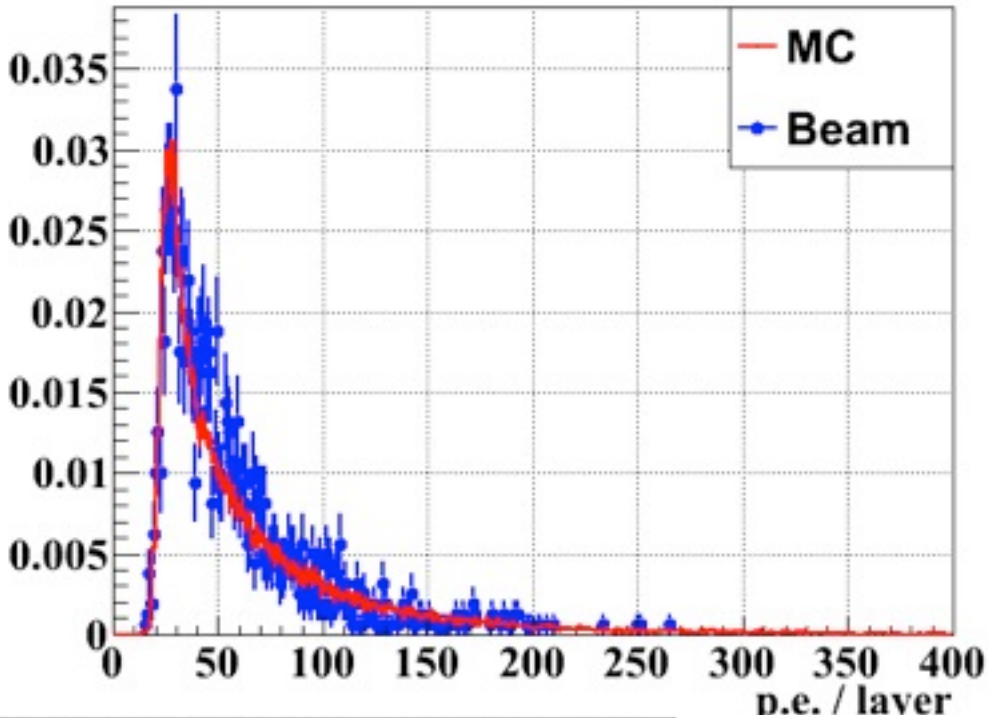

p.e. / layer at module 0 (neutrino event)
MC
Beam
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0 50 100 150 200 250 300 350 400
p.e. / layer


p.e. / layer at module 1 (neutrino event)
MC
Beam
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0 50 100 150 200 250 300 350 400
p.e. / layer

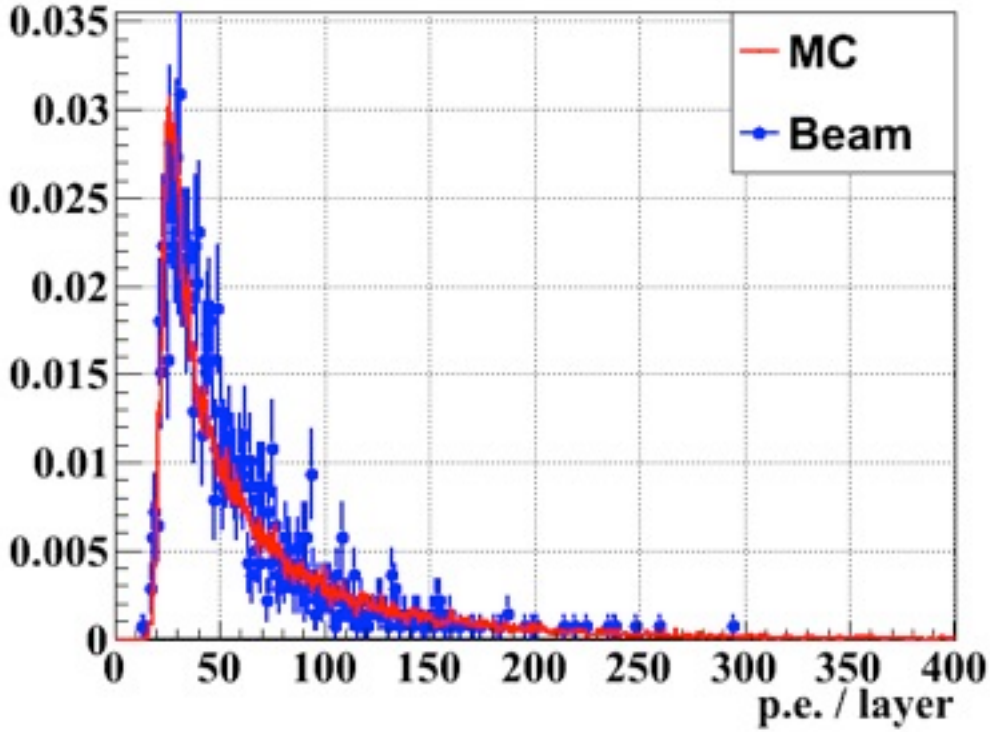

p.e. / layer at module 2 (neutrino event)
MC
Beam
0.03
0.025
0.02
0.015
0.01
0.005
0
0 50 100 150 200 250 300 350 400
p.e. / layer


p.e. / layer at module 3 (neutrino event)
MC
Beam
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0 50 100 150 200 250 300 350 400
p.e. / layer

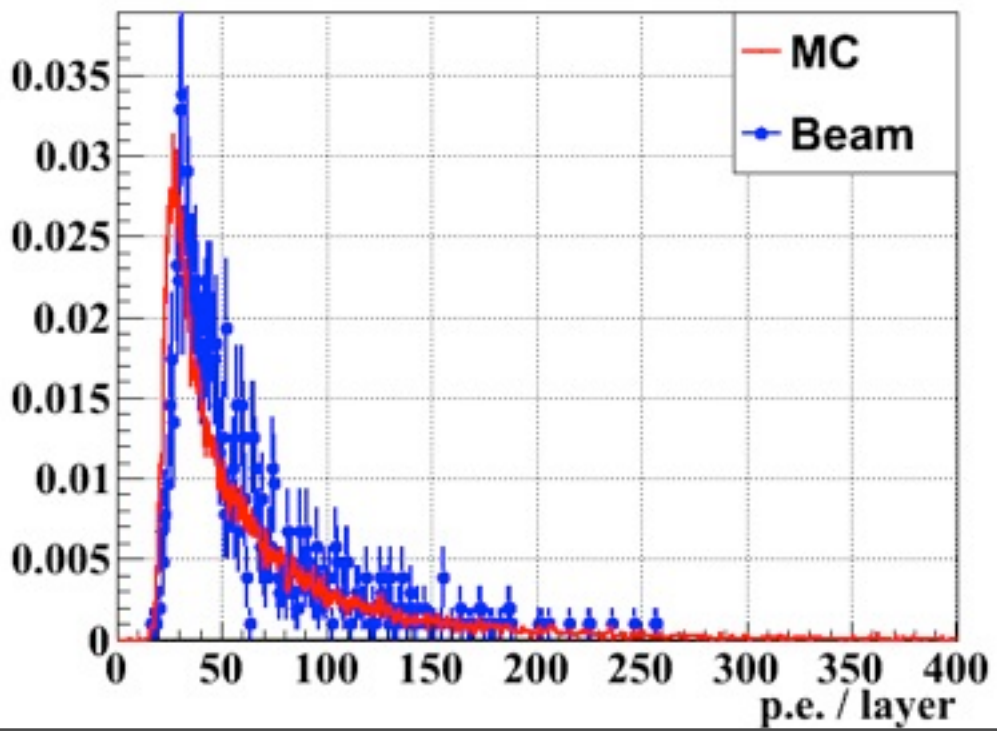
p.e. / layer at module 4 (neutrino event)



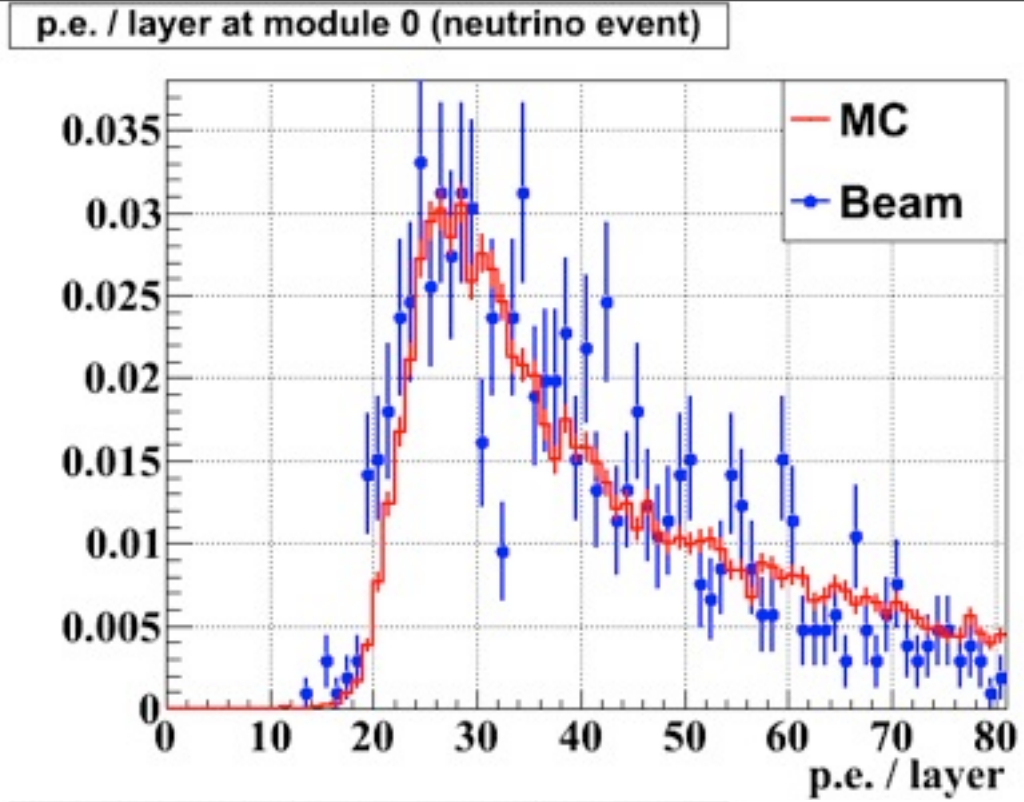
p.e. / layer at module 5 (neutrino event)

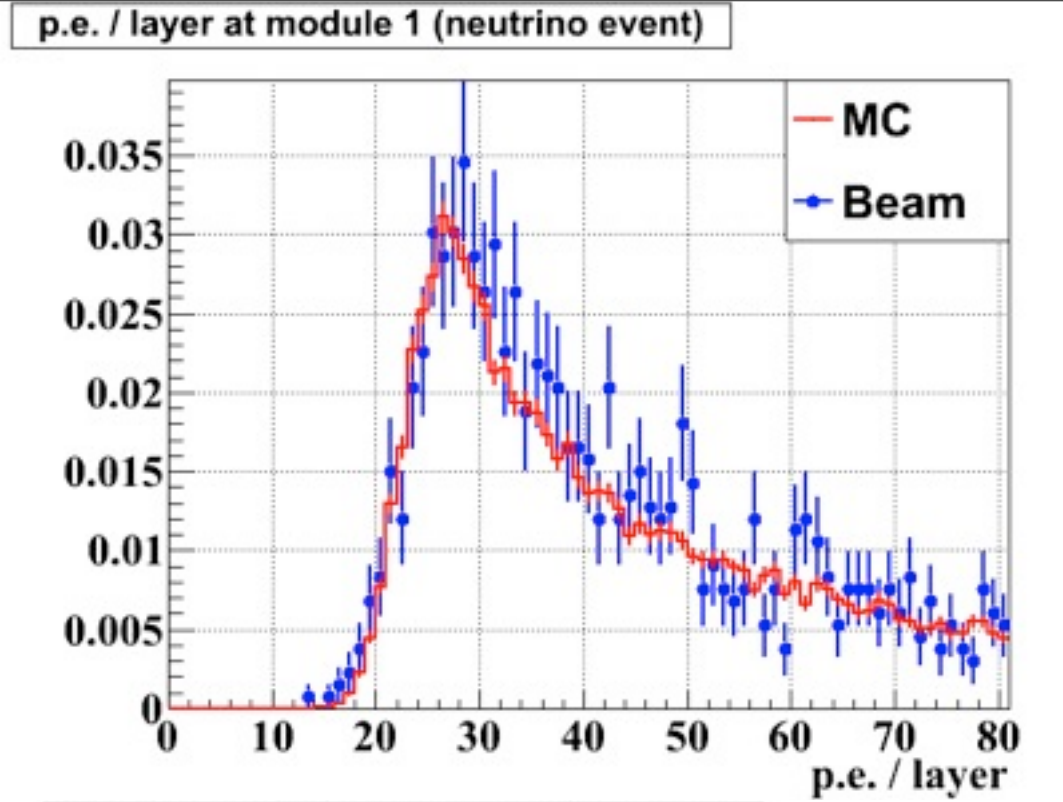


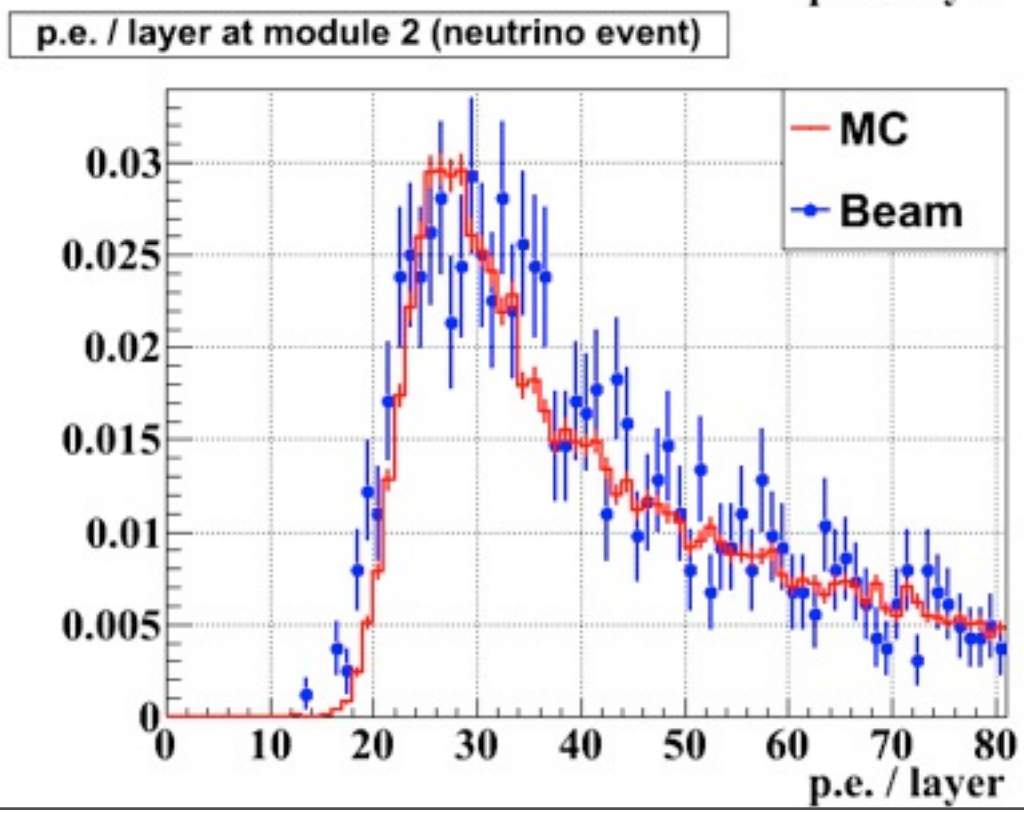
p.e. / layer at module 6 (neutrino event)

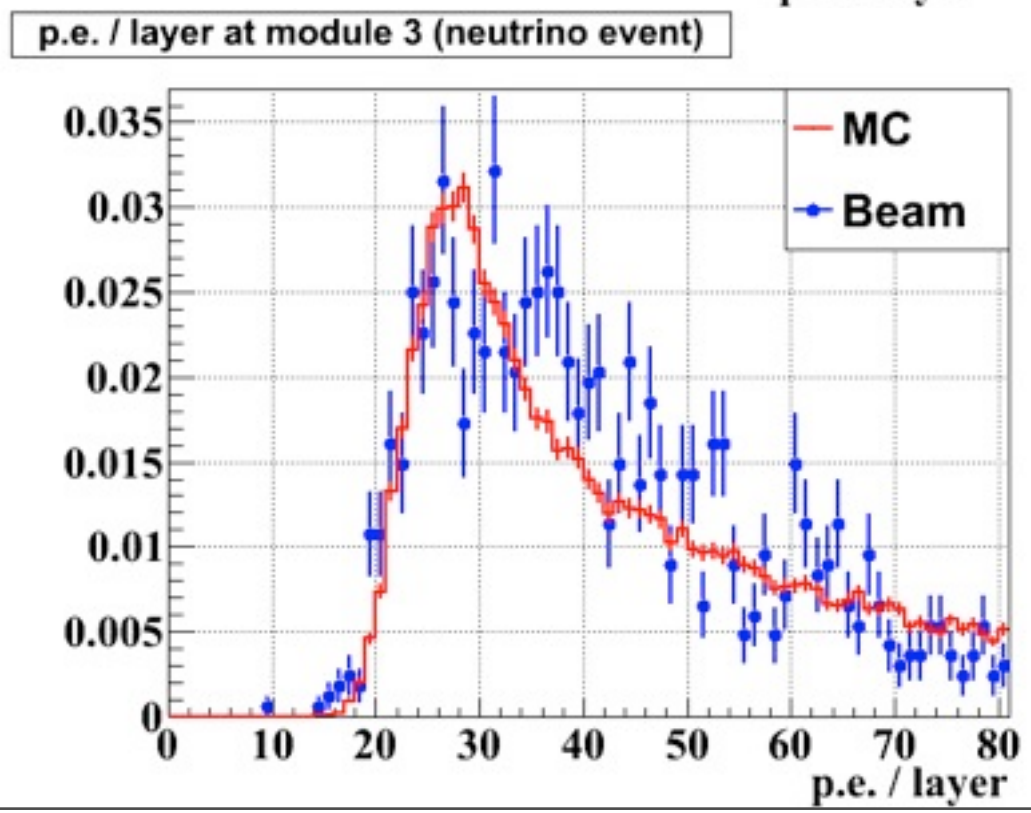


- 0 ~ 80 p.e. の領域を拡大表示

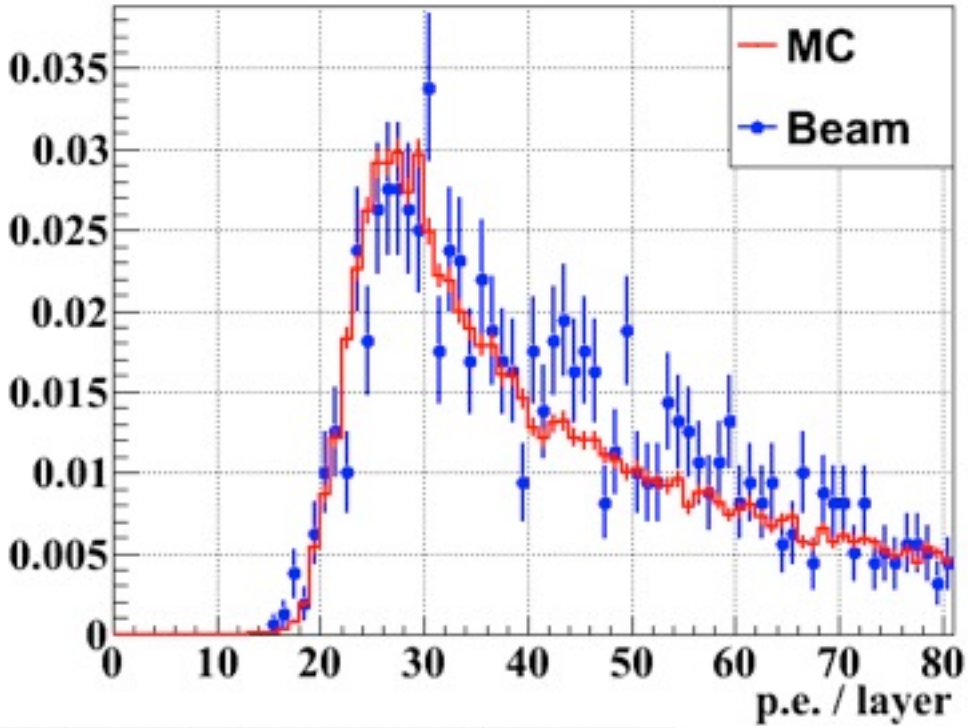

p.e. / layer at module 0 (neutrino event)
MC
Beam
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0 10 20 30 40 50 60 70 80
p.e. / layer


p.e. / layer at module 1 (neutrino event)
MC
Beam
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0 10 20 30 40 50 60 70 80
p.e. / layer

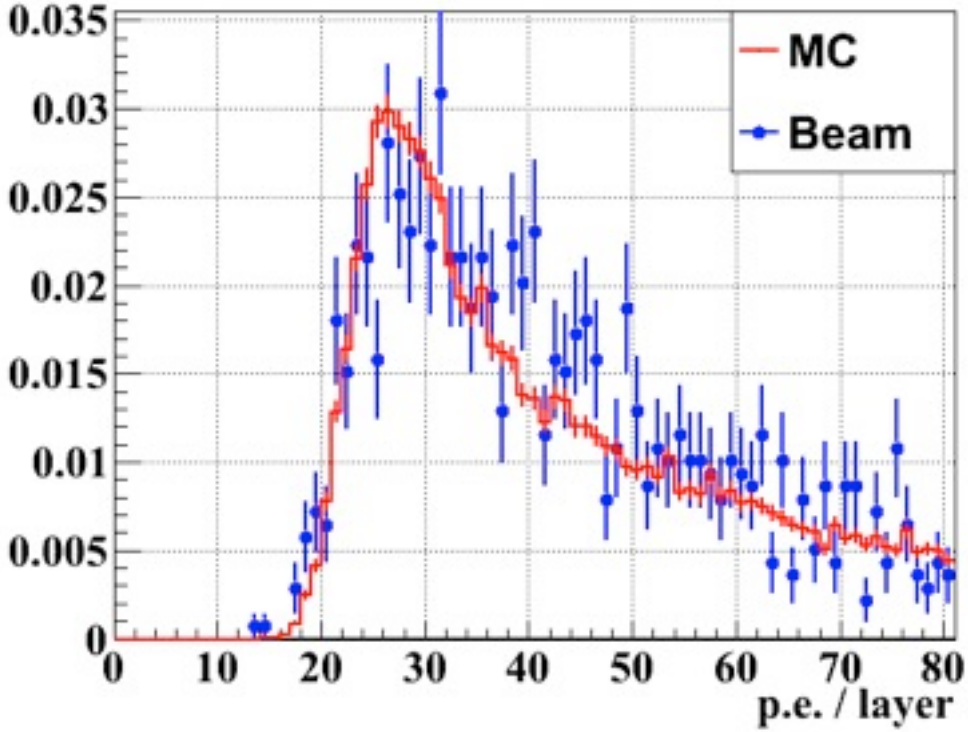

p.e. / layer at module 2 (neutrino event)
MC
Beam
0.03
0.025
0.02
0.015
0.01
0.005
0
0 10 20 30 40 50 60 70 80
p.e. / layer


p.e. / layer at module 3 (neutrino event)
MC
Beam
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0 10 20 30 40 50 60 70 80
p.e. / layer

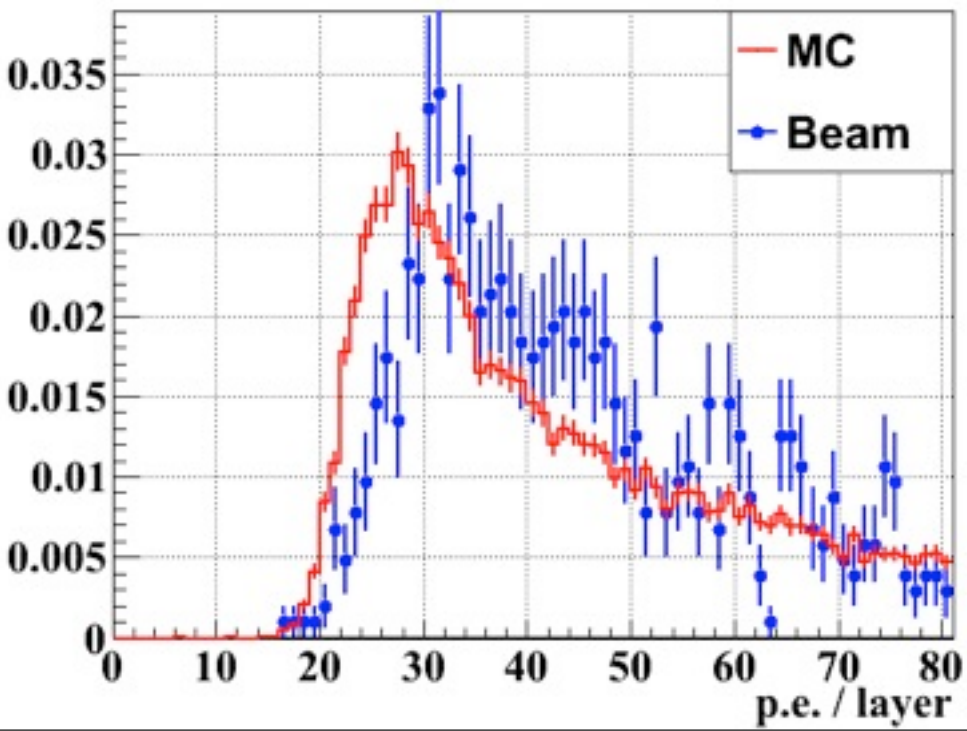
p.e. / layer at module 4 (neutrino event)



p.e. / layer at module 5 (neutrino event)



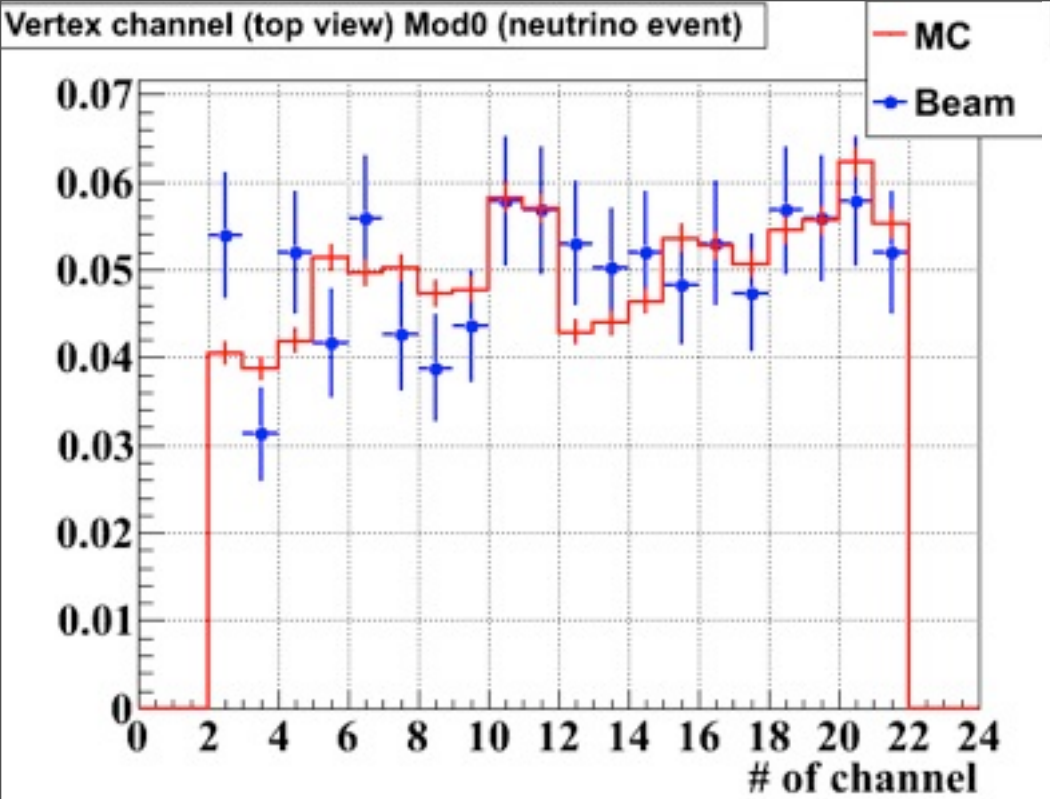
p.e. / layer at module 6 (neutrino event)

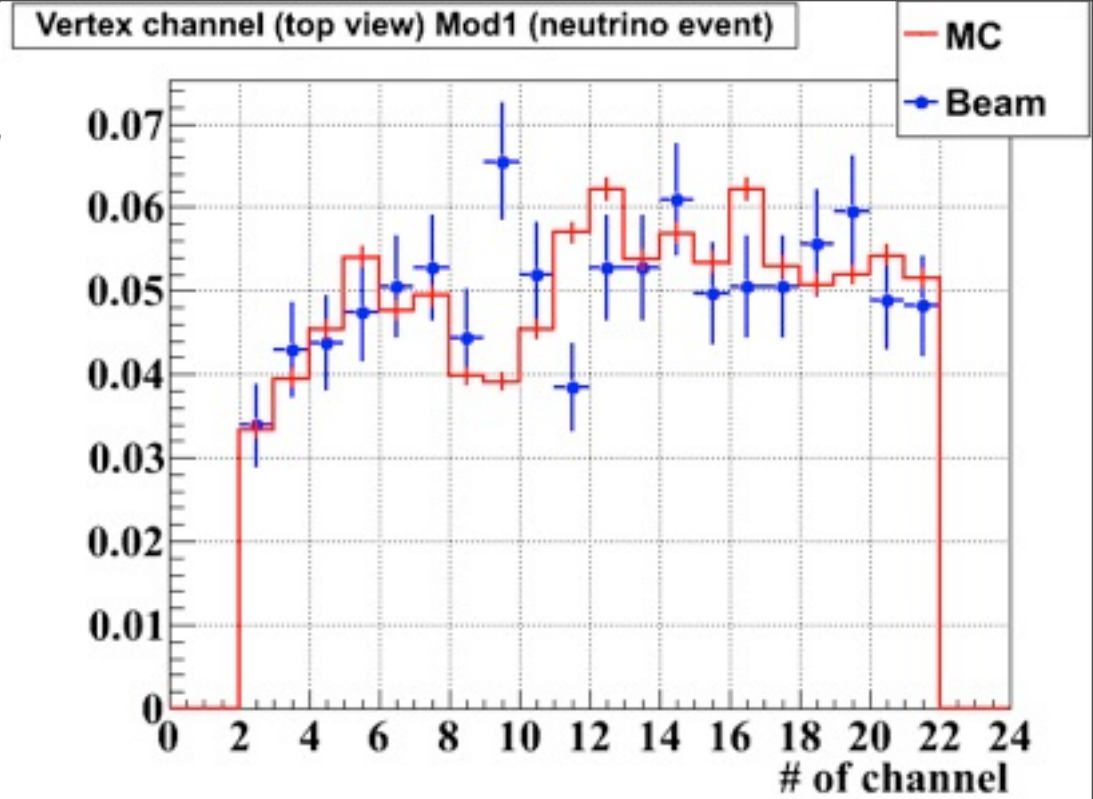


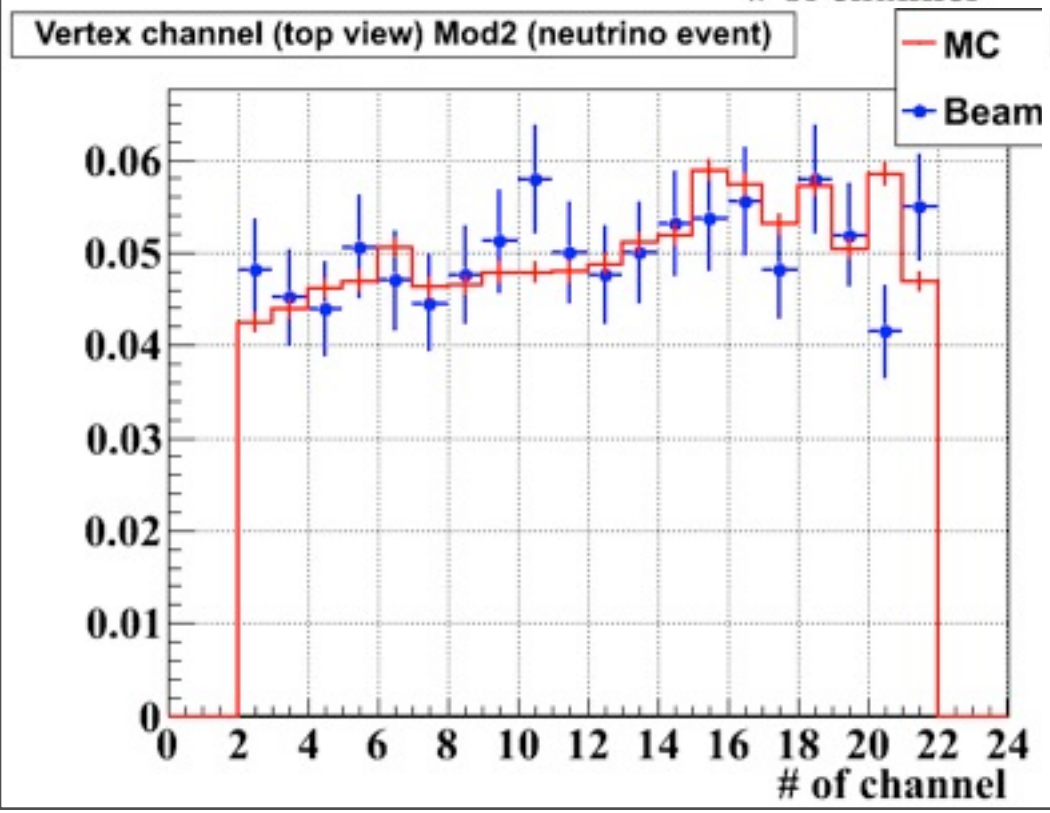
Vertex distribution

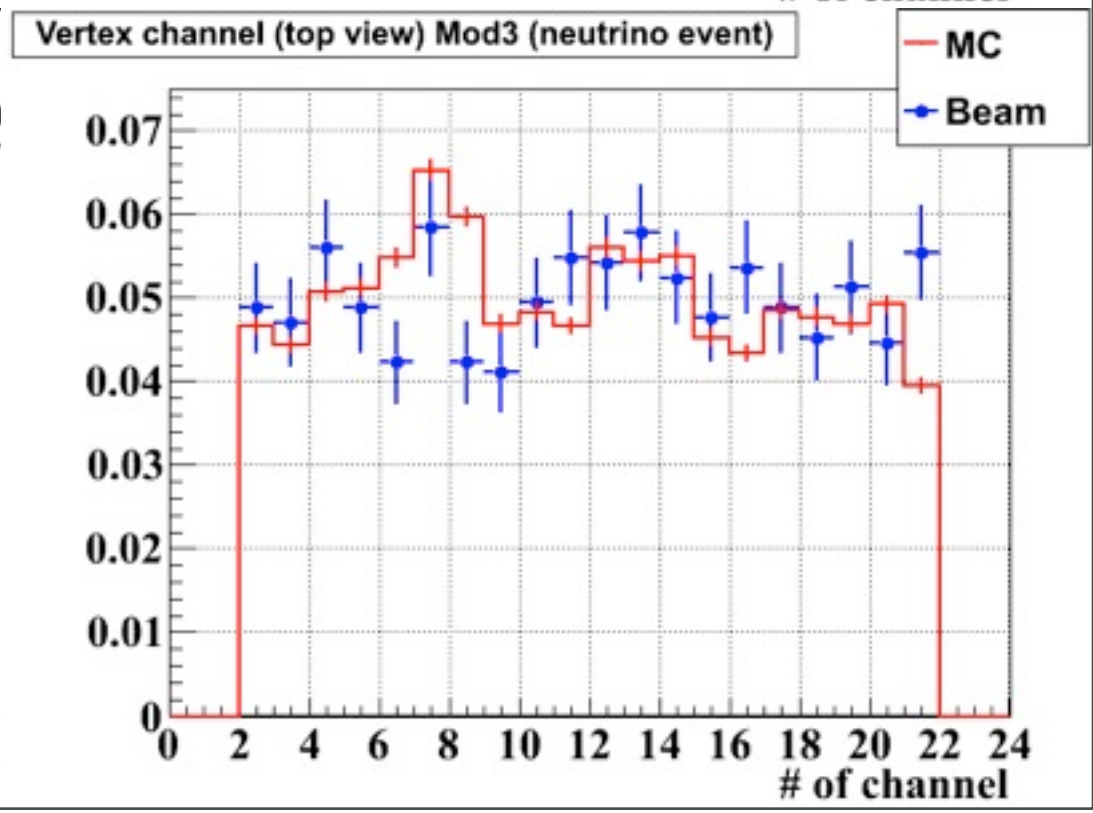
- 各モジュールでの再構成して得られたvertexのチャンネル番号、プレーン数
  - top view, side viewをわけてプロット

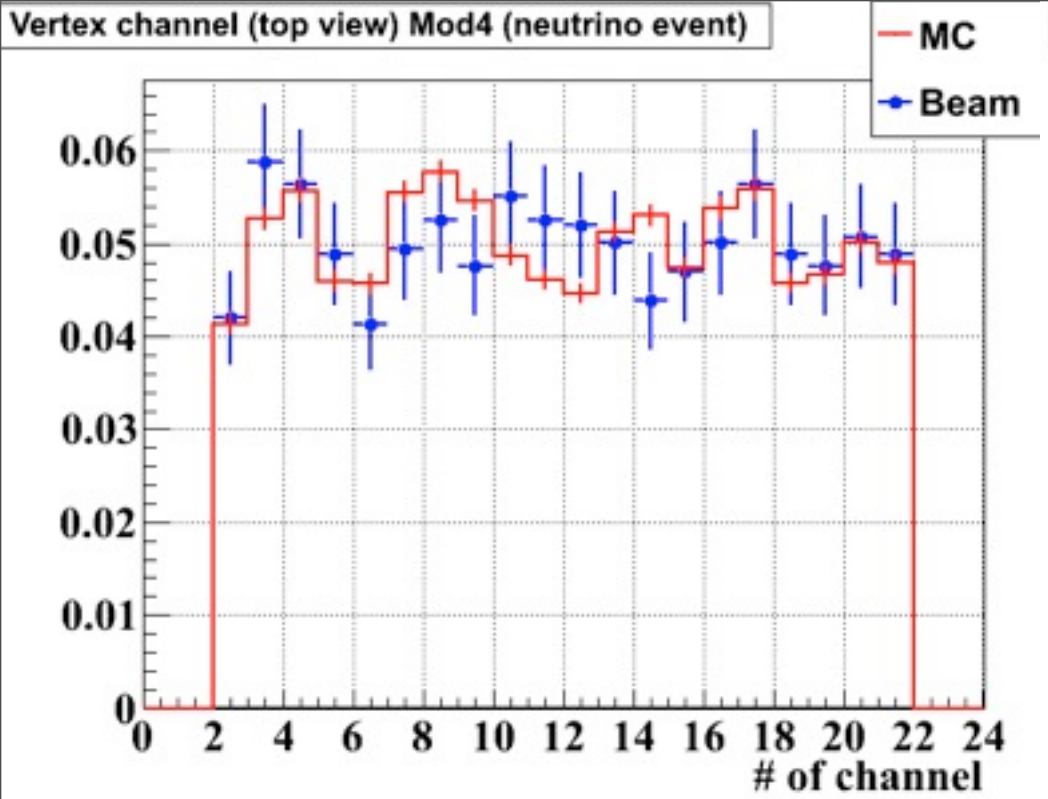
vertex channel
(top view)

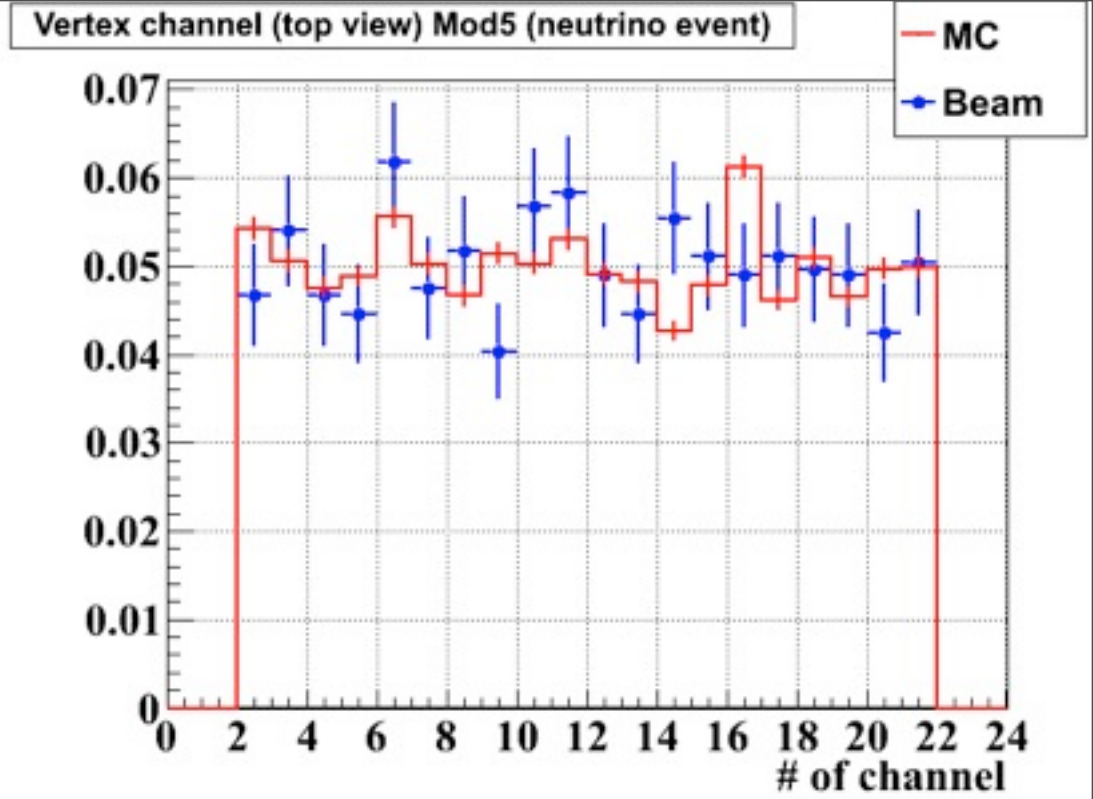

Vertex channel (top view) Mod0 (neutrino event)
MC
Beam
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel

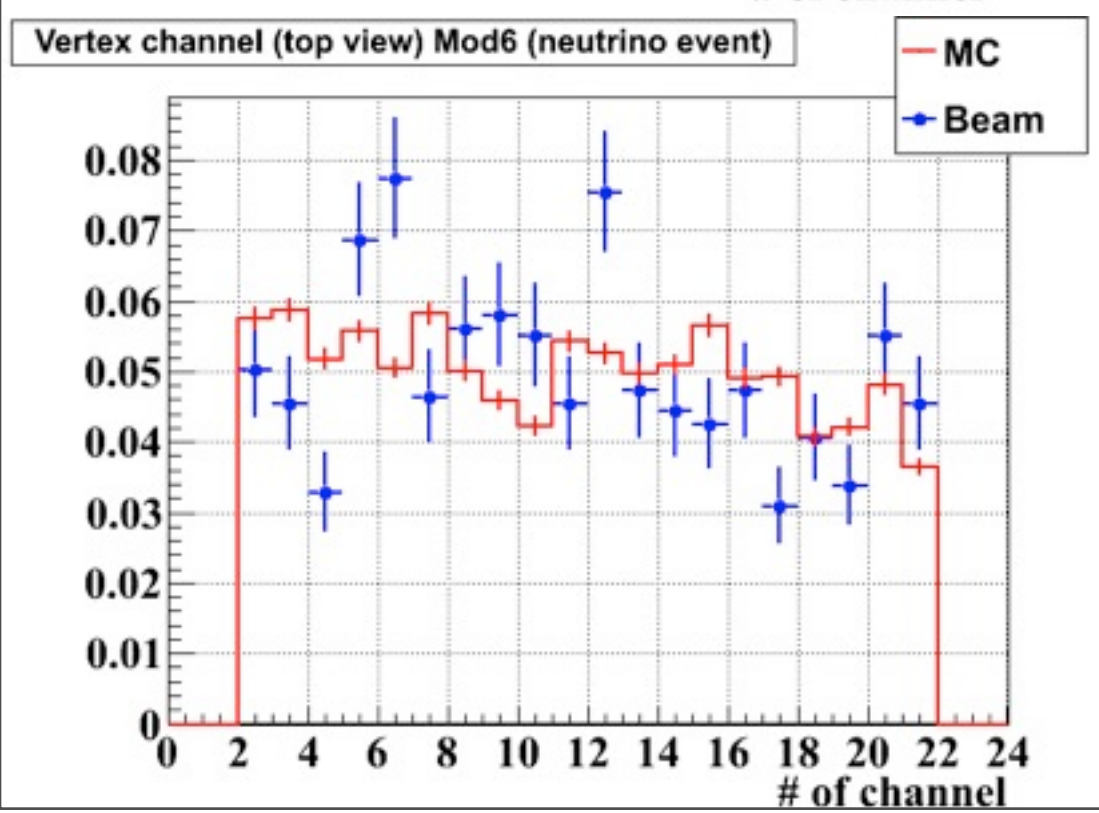

Vertex channel (top view) Mod1 (neutrino event)
MC
Beam
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel


Vertex channel (top view) Mod2 (neutrino event)
MC
Beam
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel

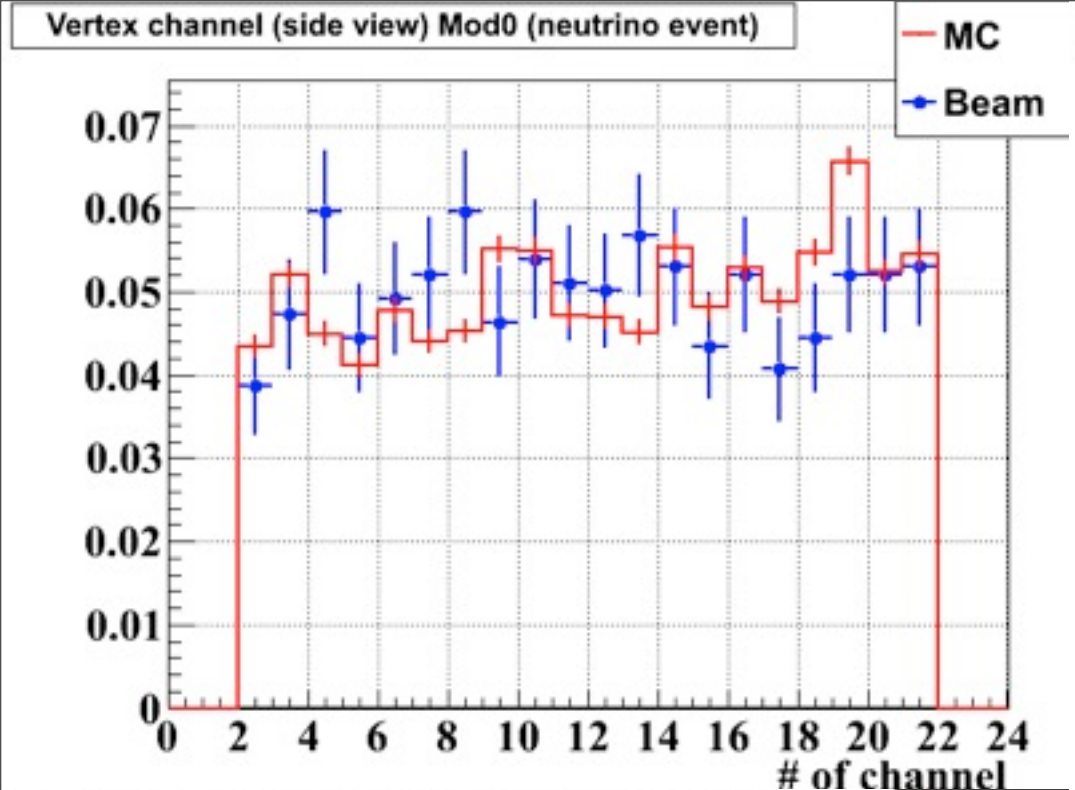

Vertex channel (top view) Mod3 (neutrino event)
MC
Beam
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel

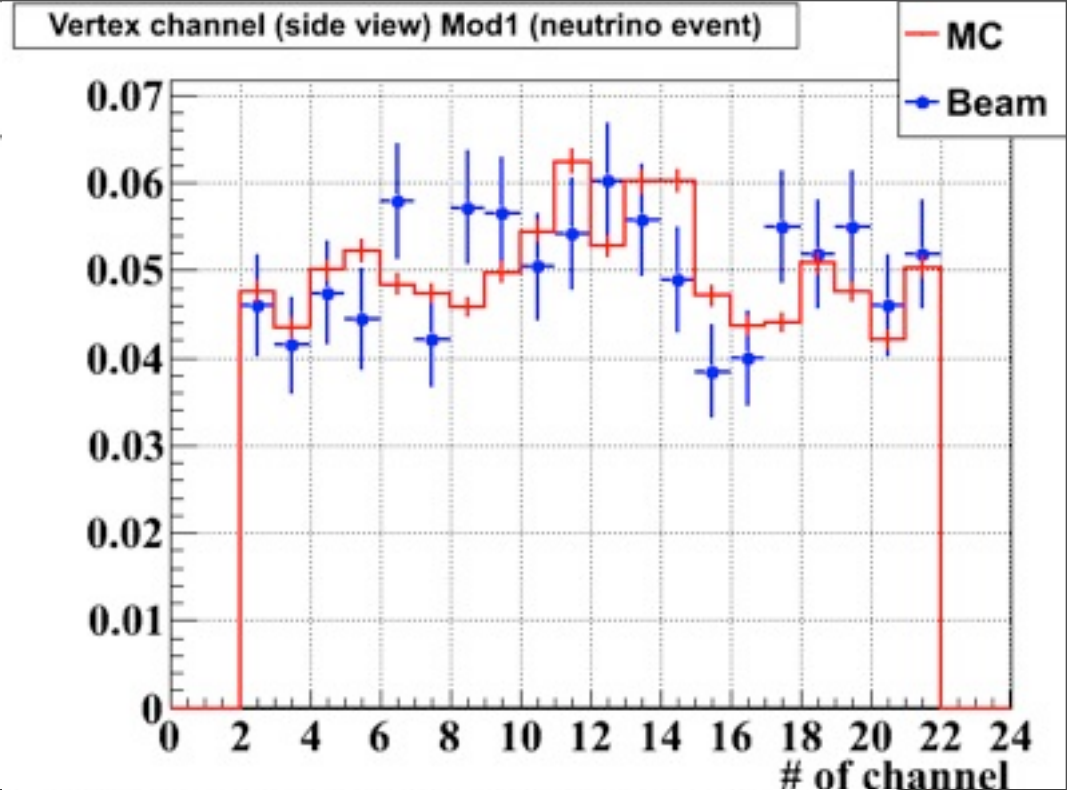

Vertex channel (top view) Mod4 (neutrino event)
MC
Beam
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel

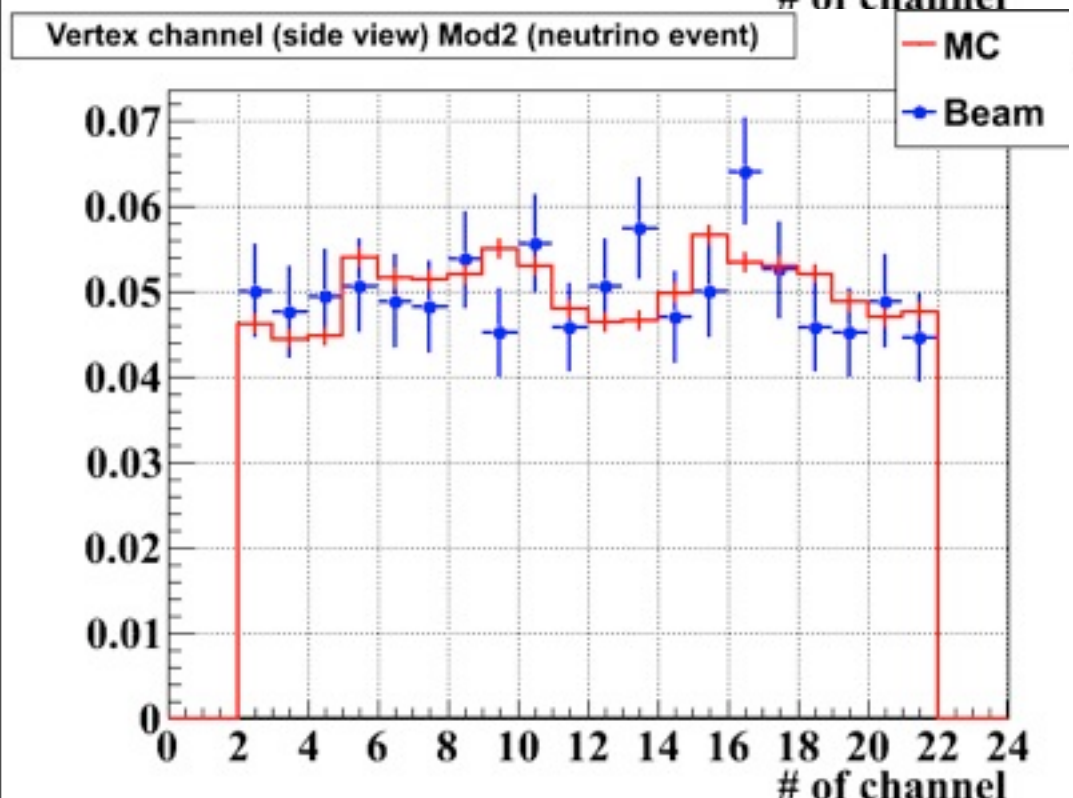

Vertex channel (top view) Mod5 (neutrino event)
MC
Beam
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel

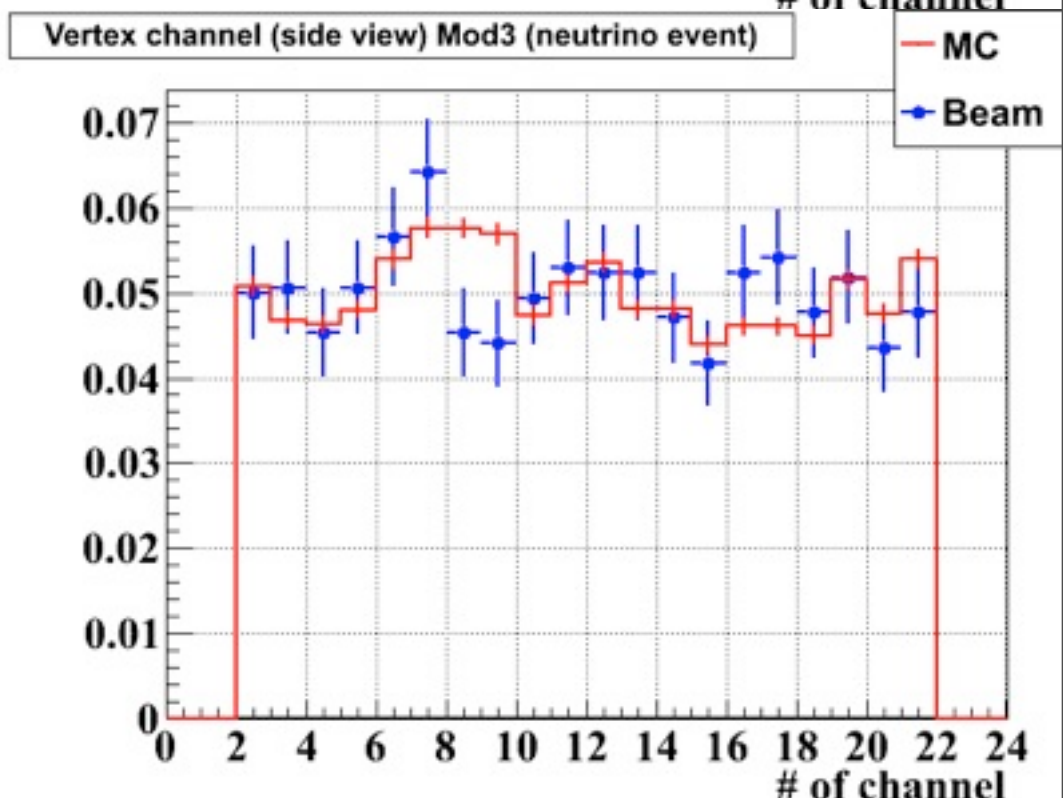

Vertex channel (top view) Mod6 (neutrino event)
MC
Beam
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel

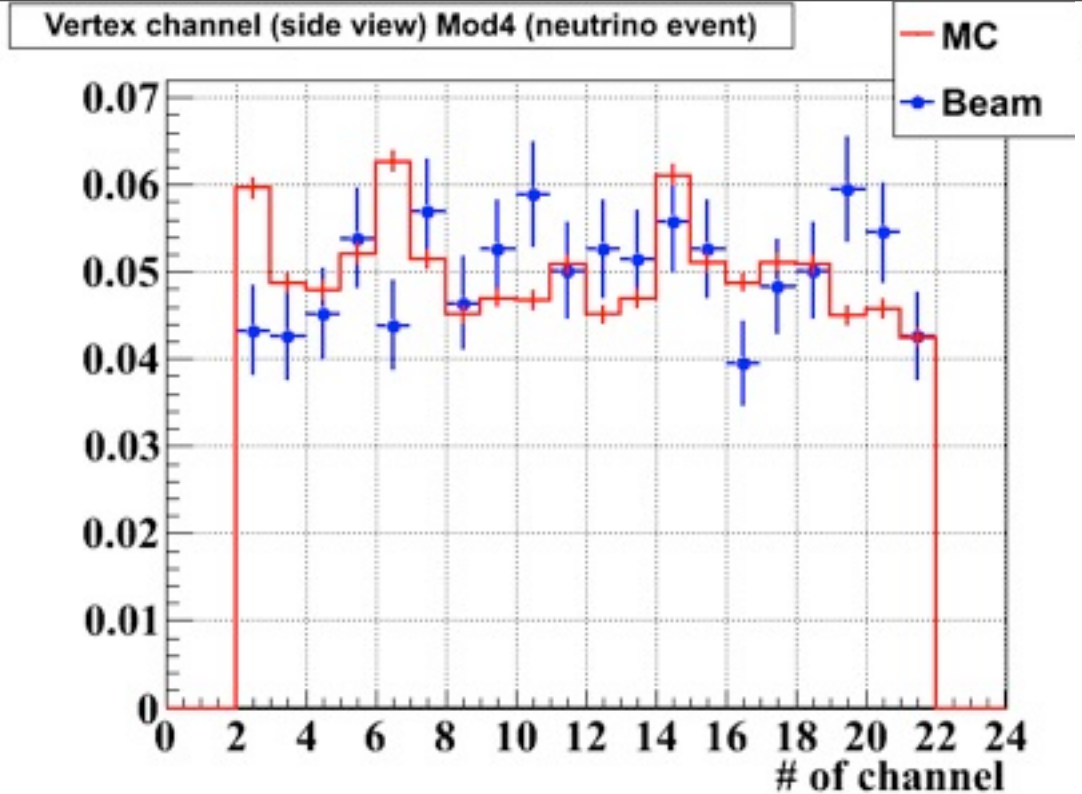
vertex channel (side view)

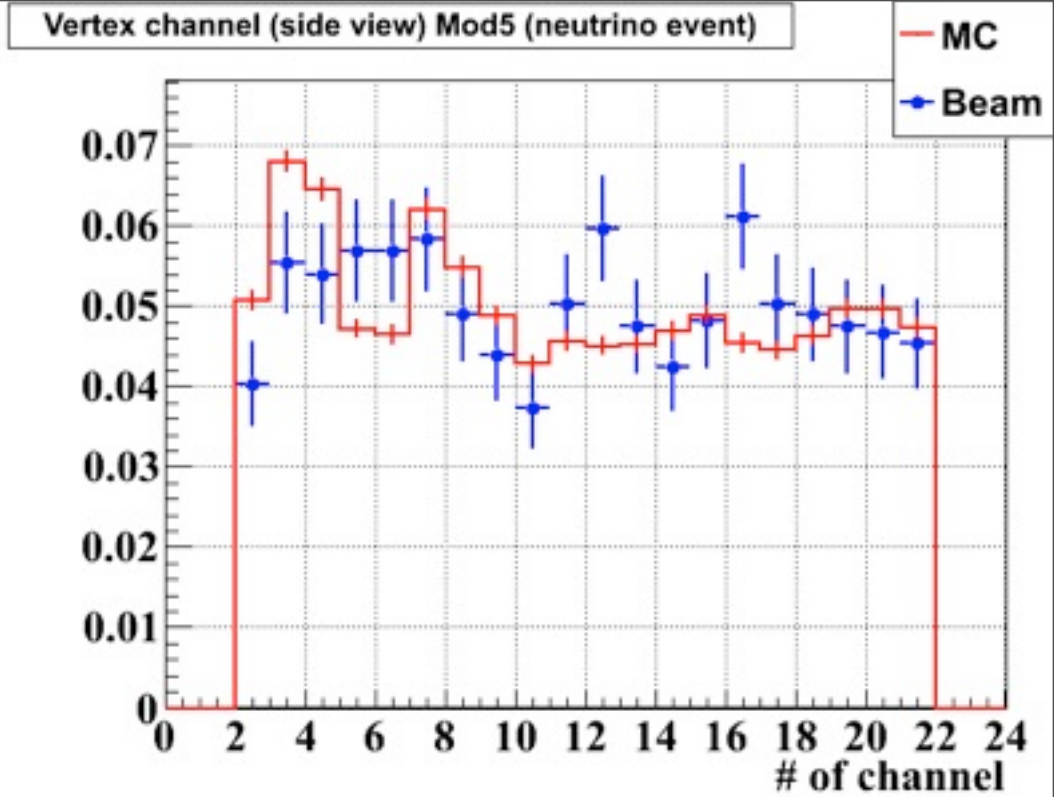

Vertex channel (side view) Mod0 (neutrino event)
MC
Beam
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel

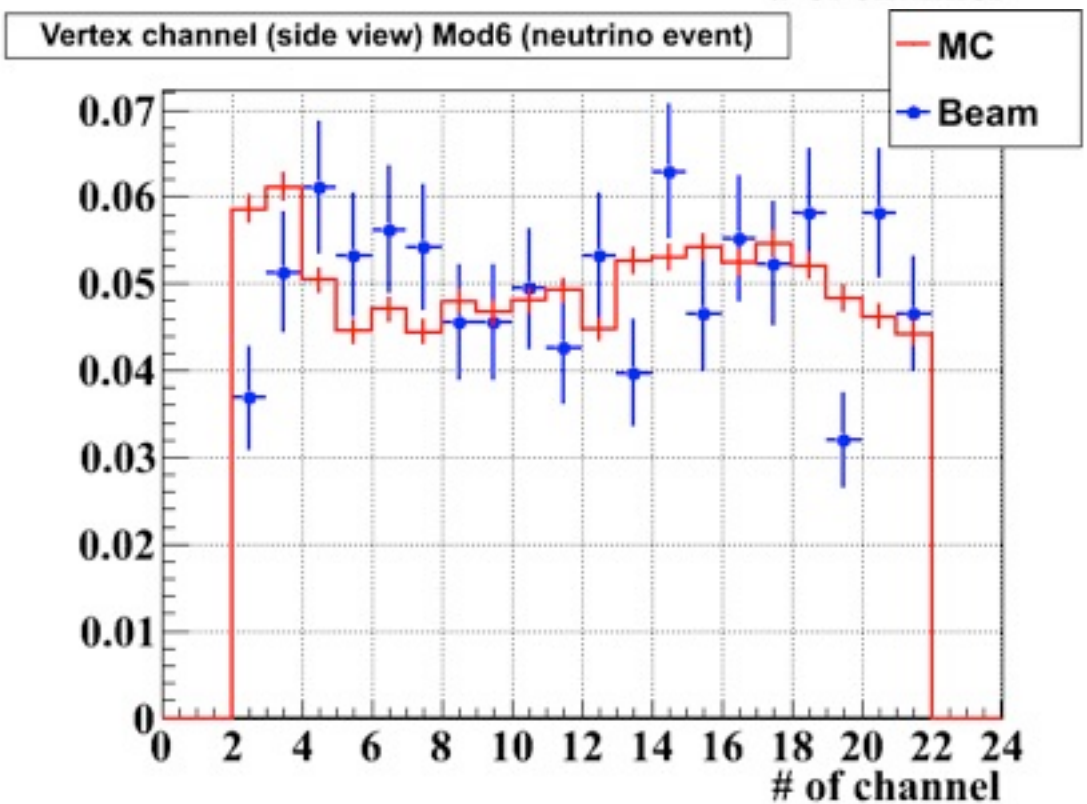

Vertex channel (side view) Mod1 (neutrino event)
MC
Beam
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel


Vertex channel (side view) Mod2 (neutrino event)
MC
Beam
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel

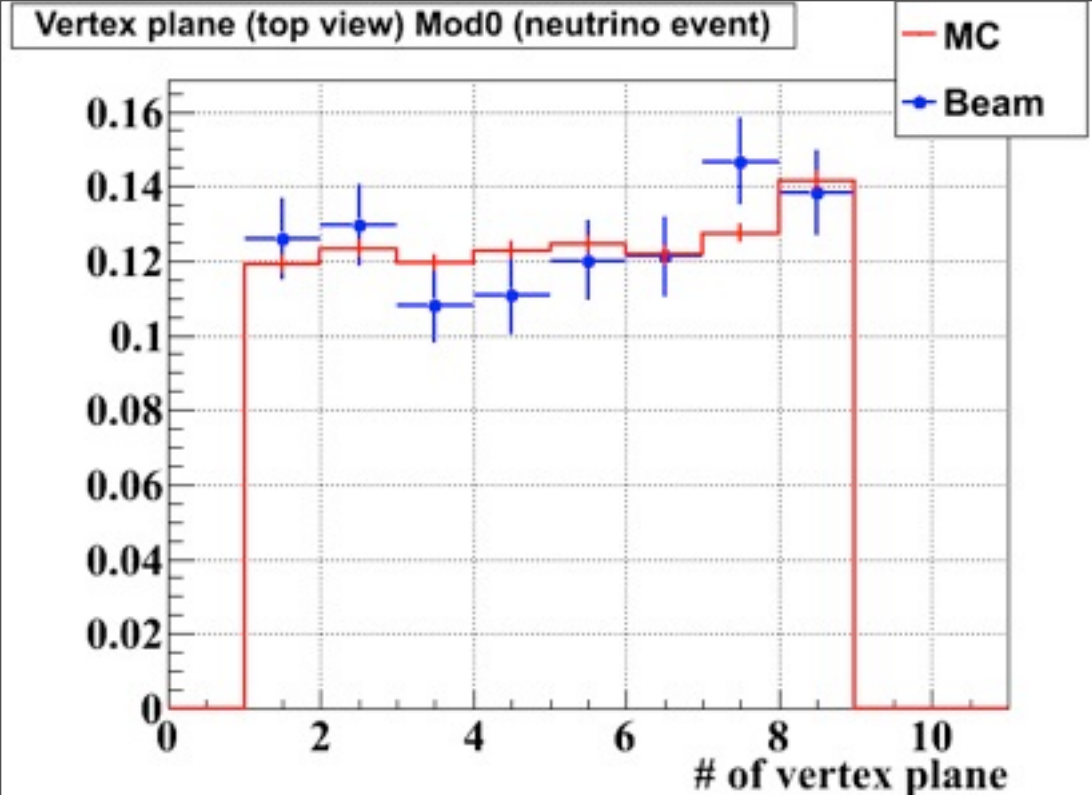

Vertex channel (side view) Mod3 (neutrino event)
MC
Beam
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel

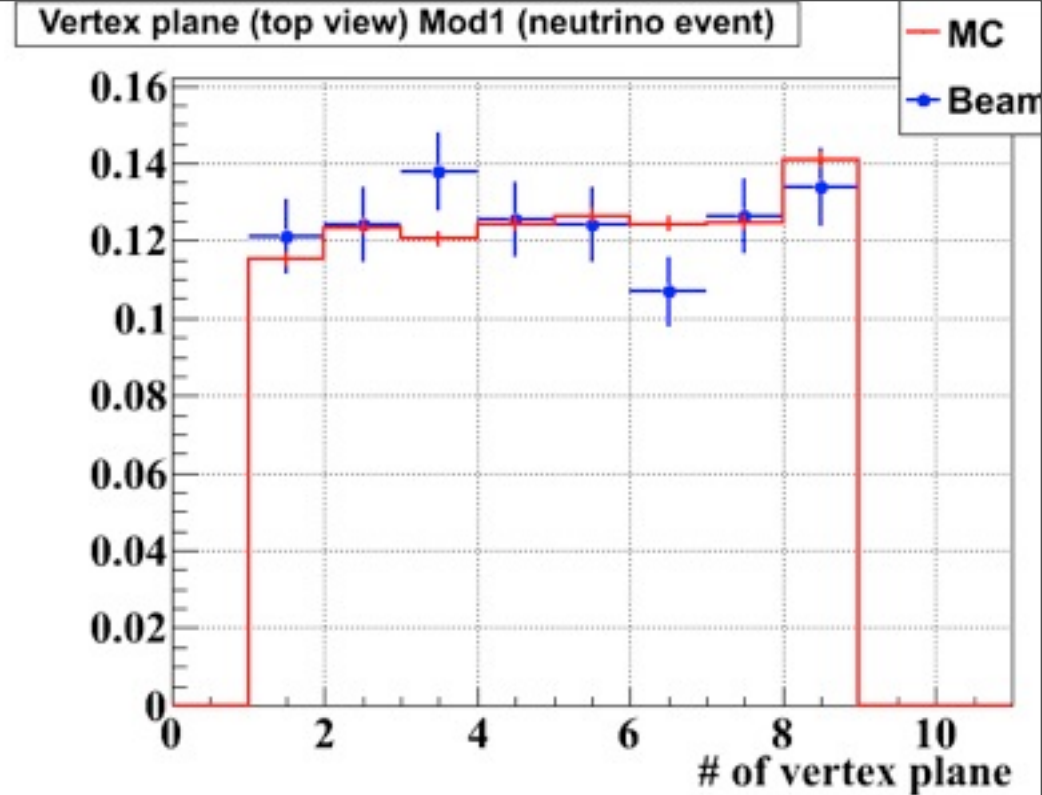

Vertex channel (side view) Mod4 (neutrino event)
MC
Beam
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel

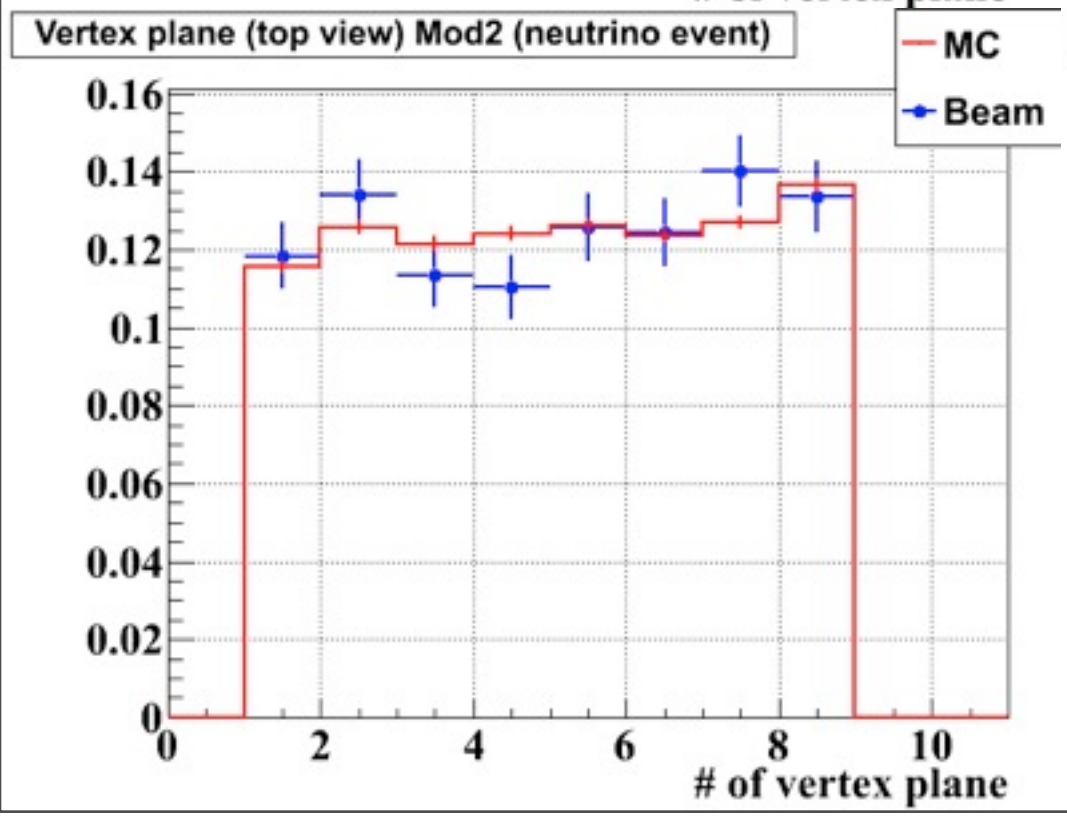

Vertex channel (side view) Mod5 (neutrino event)
MC
Beam
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel

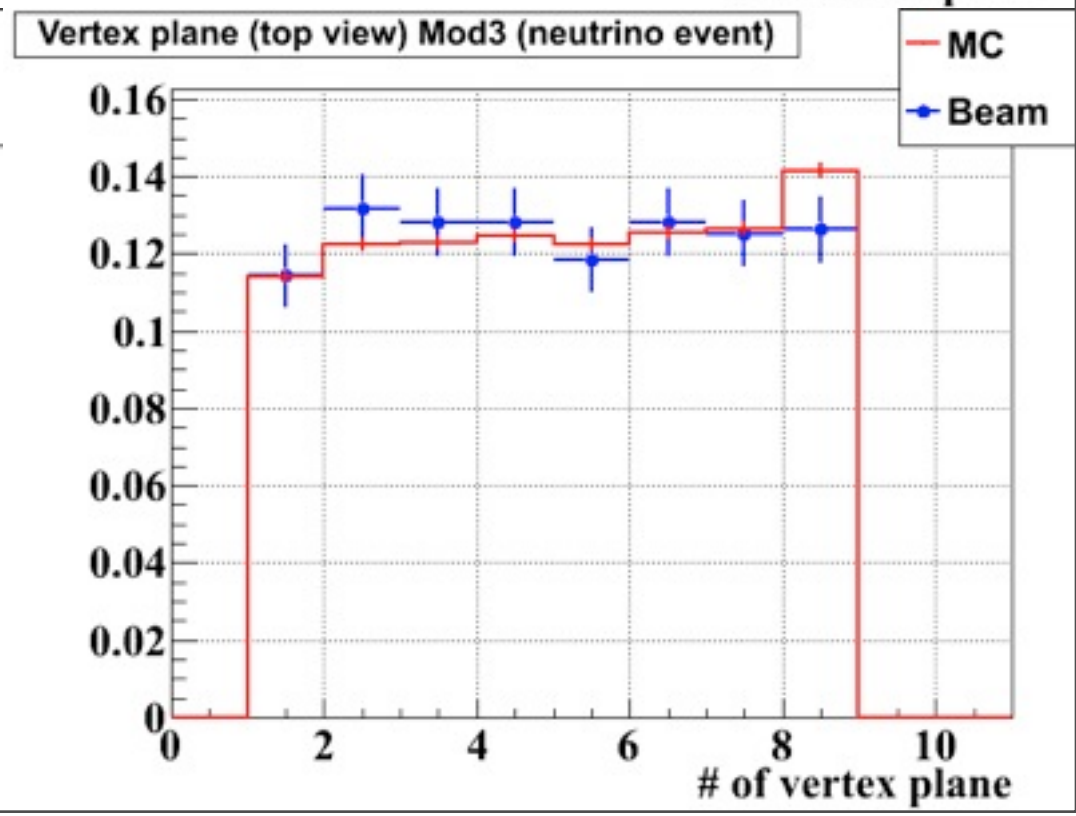

Vertex channel (side view) Mod6 (neutrino event)
MC
Beam
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 2 4 6 8 10 12 14 16 18 20 22 24
# of channel

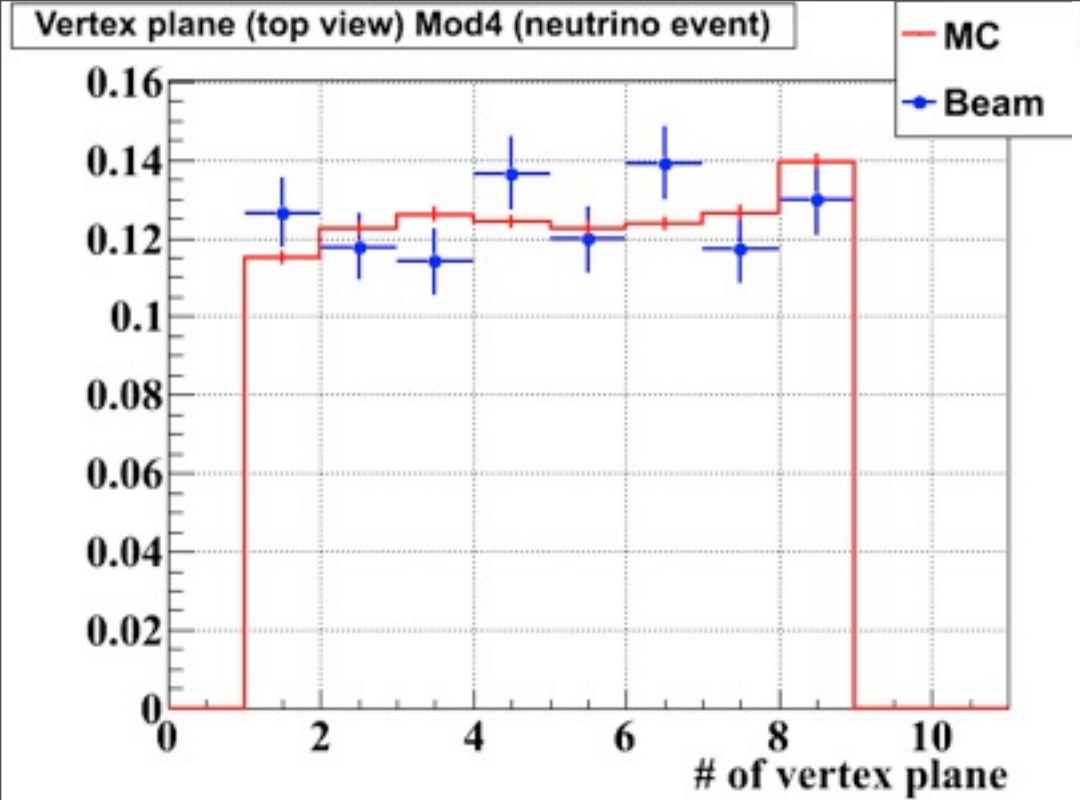
vertex plane
(top view)

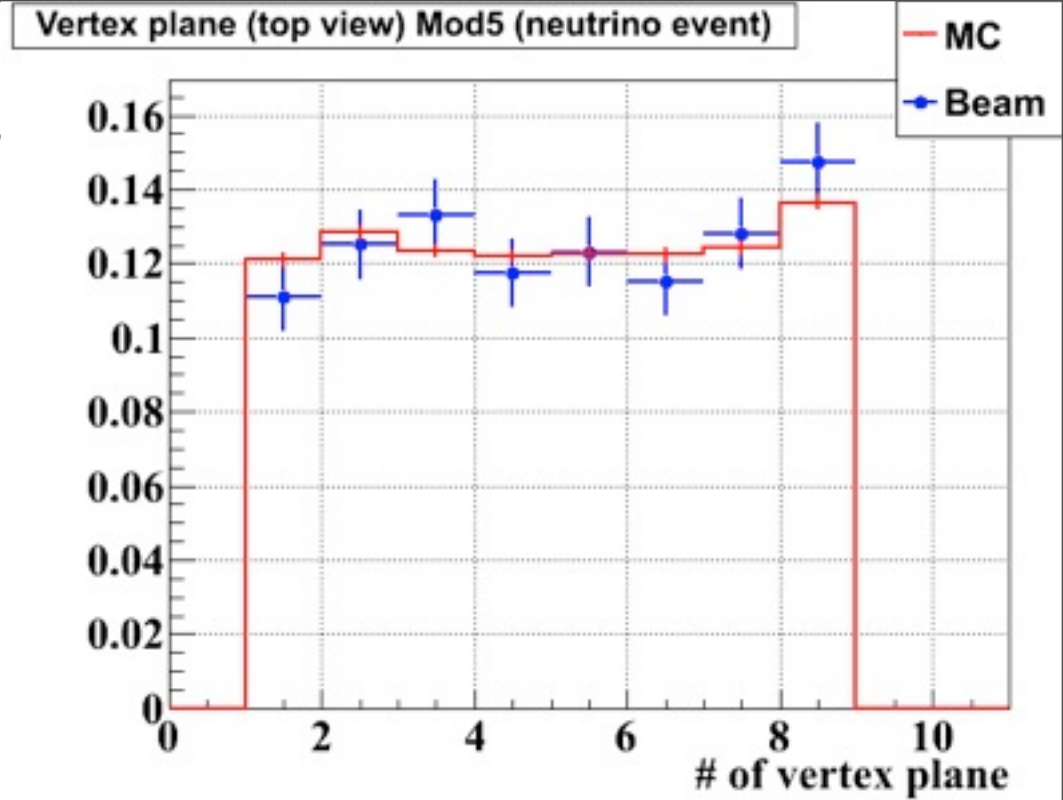

Vertex plane (top view) Mod0 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane

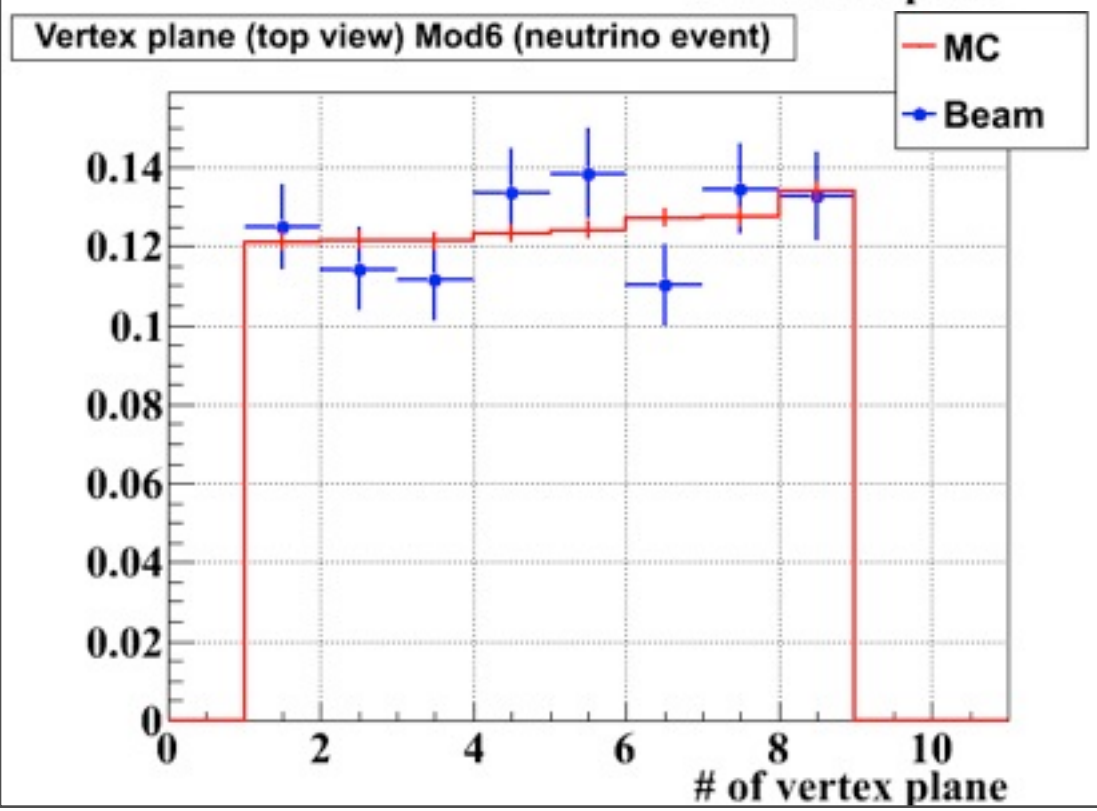

Vertex plane (top view) Mod1 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane


Vertex plane (top view) Mod2 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane

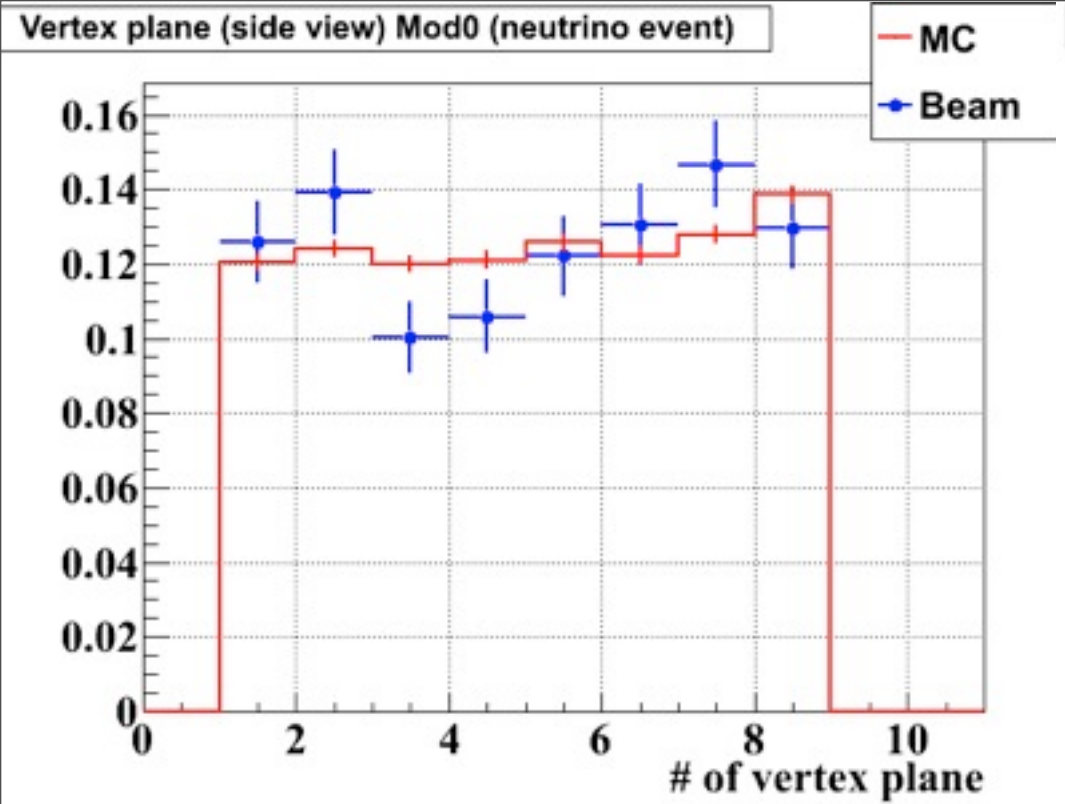

Vertex plane (top view) Mod3 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane

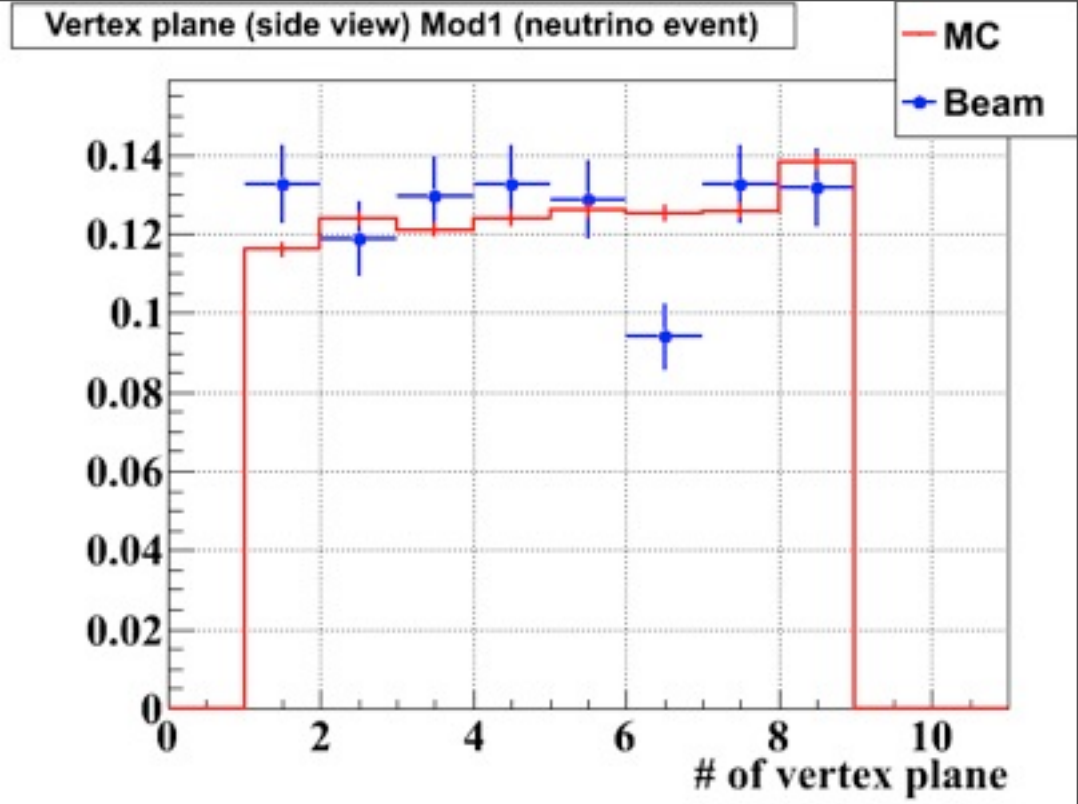

Vertex plane (top view) Mod4 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane

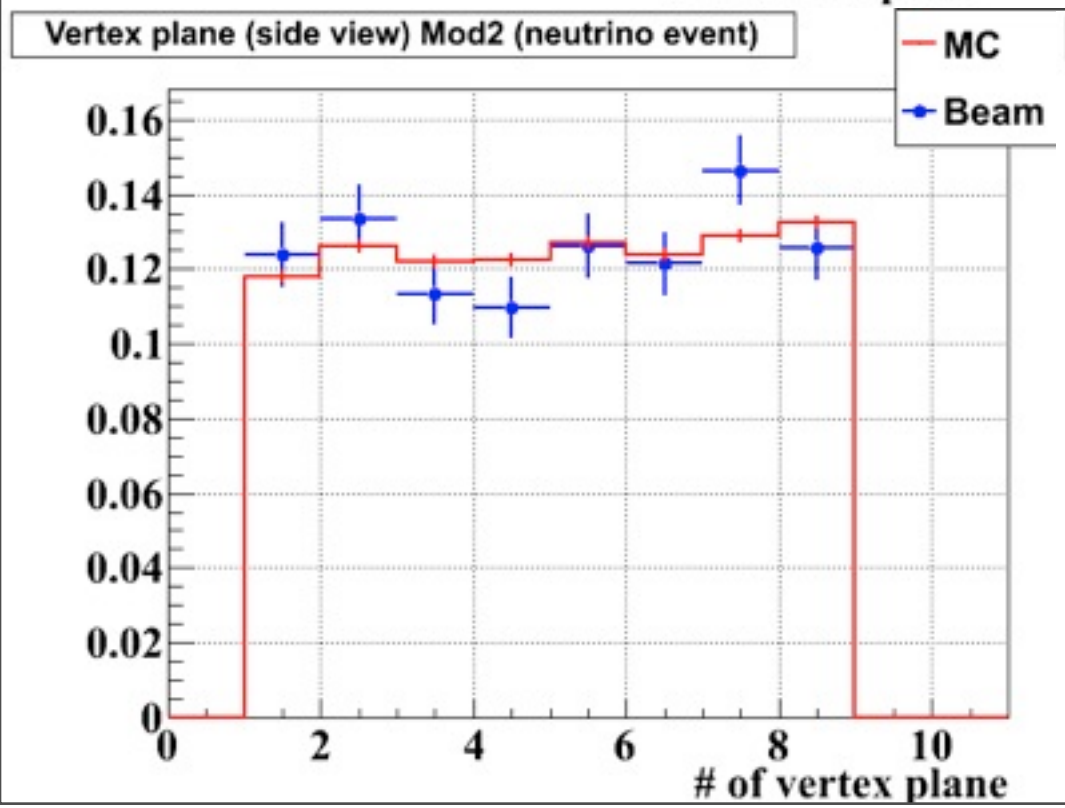

Vertex plane (top view) Mod5 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane

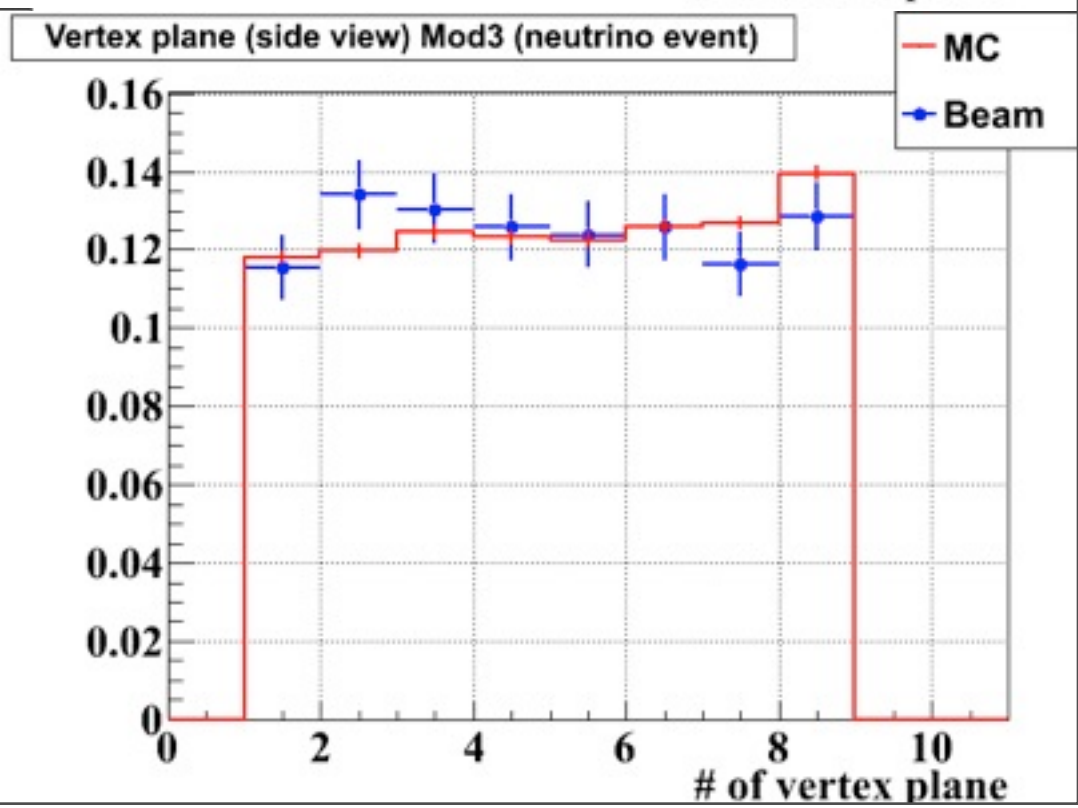

Vertex plane (top view) Mod6 (neutrino event)
MC
Beam
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane

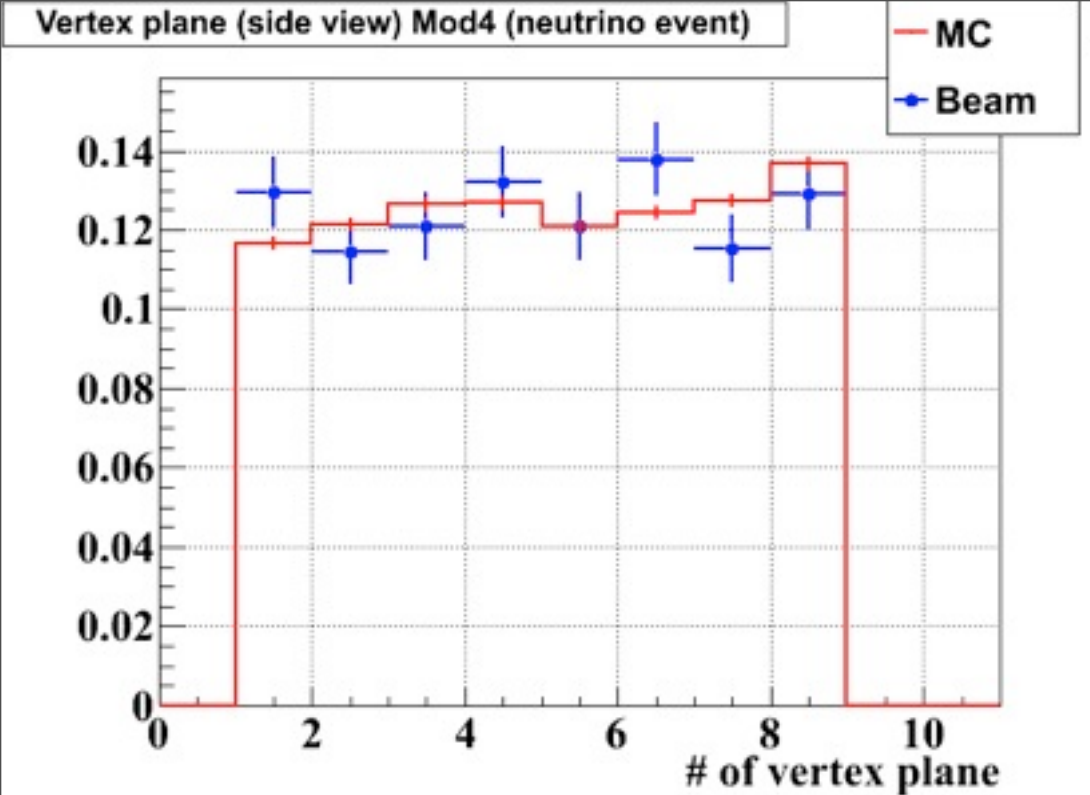
vertex plane
(side view)

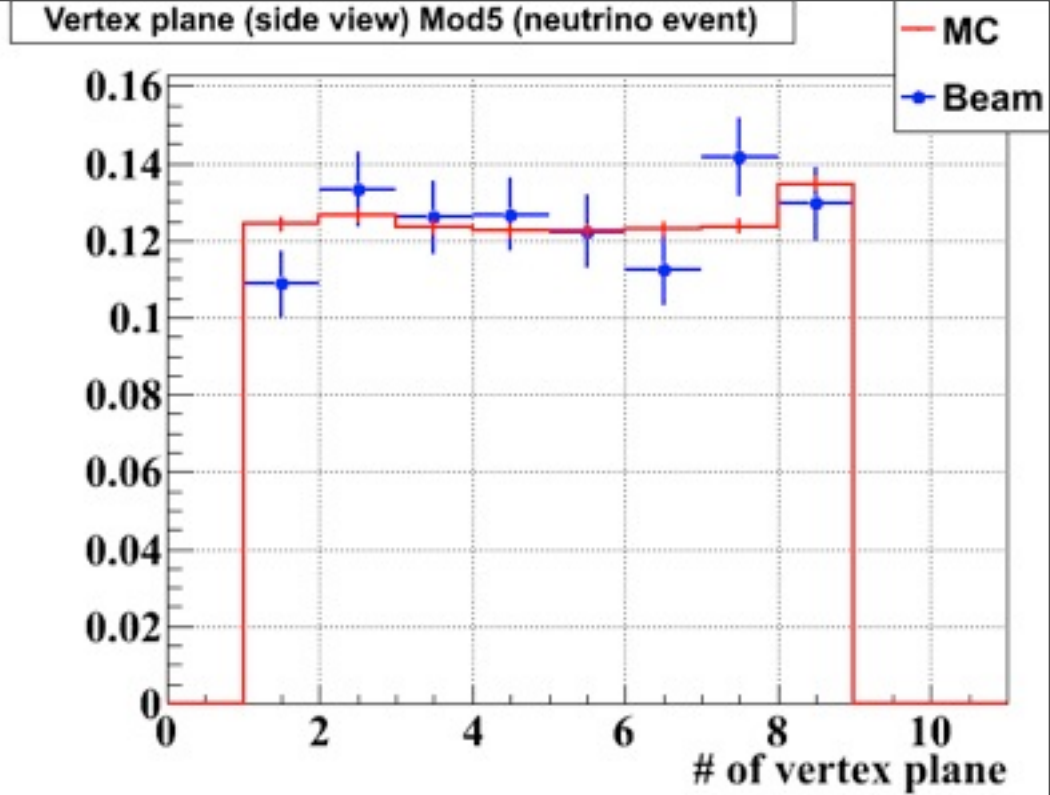

Vertex plane (side view) Mod0 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane

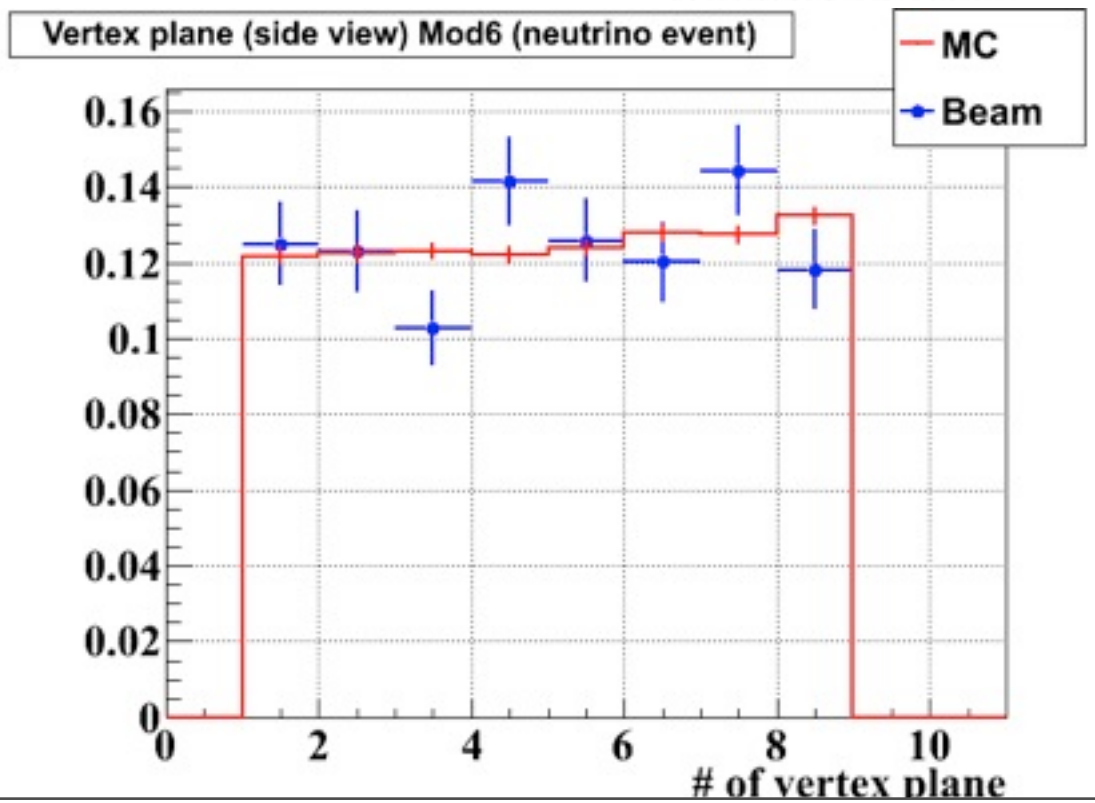

Vertex plane (side view) Mod1 (neutrino event)
MC
Beam
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane


Vertex plane (side view) Mod2 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane


Vertex plane (side view) Mod3 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane

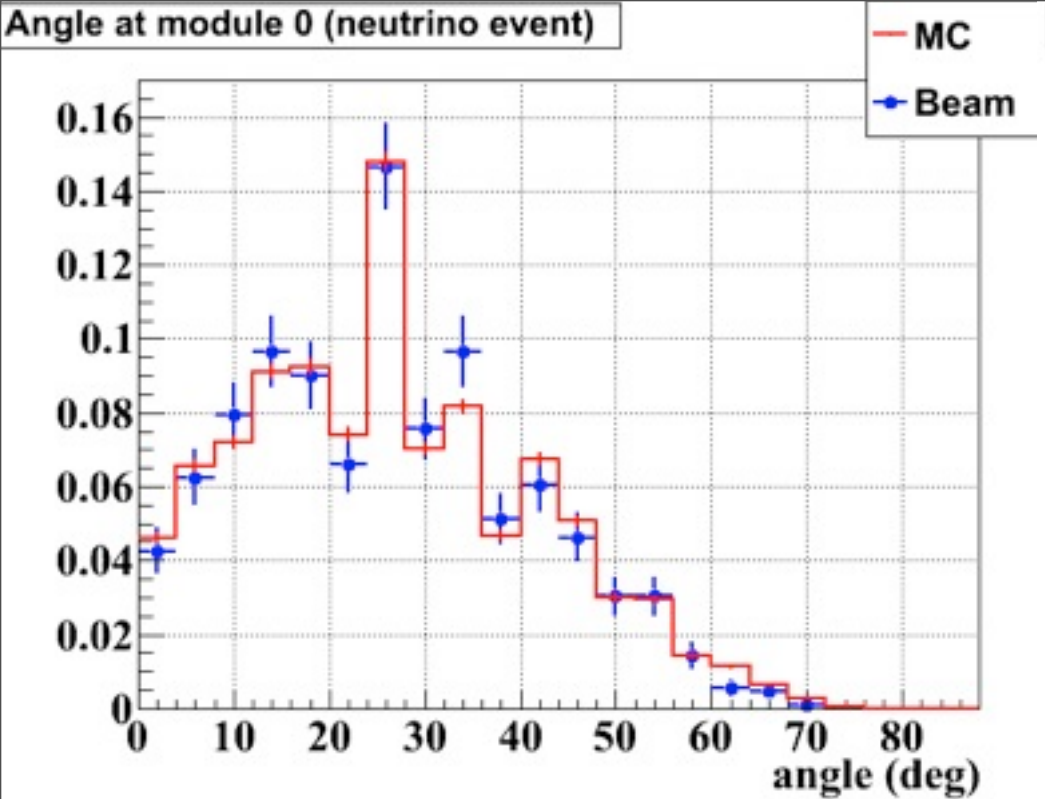

Vertex plane (side view) Mod4 (neutrino event)
MC
Beam
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane

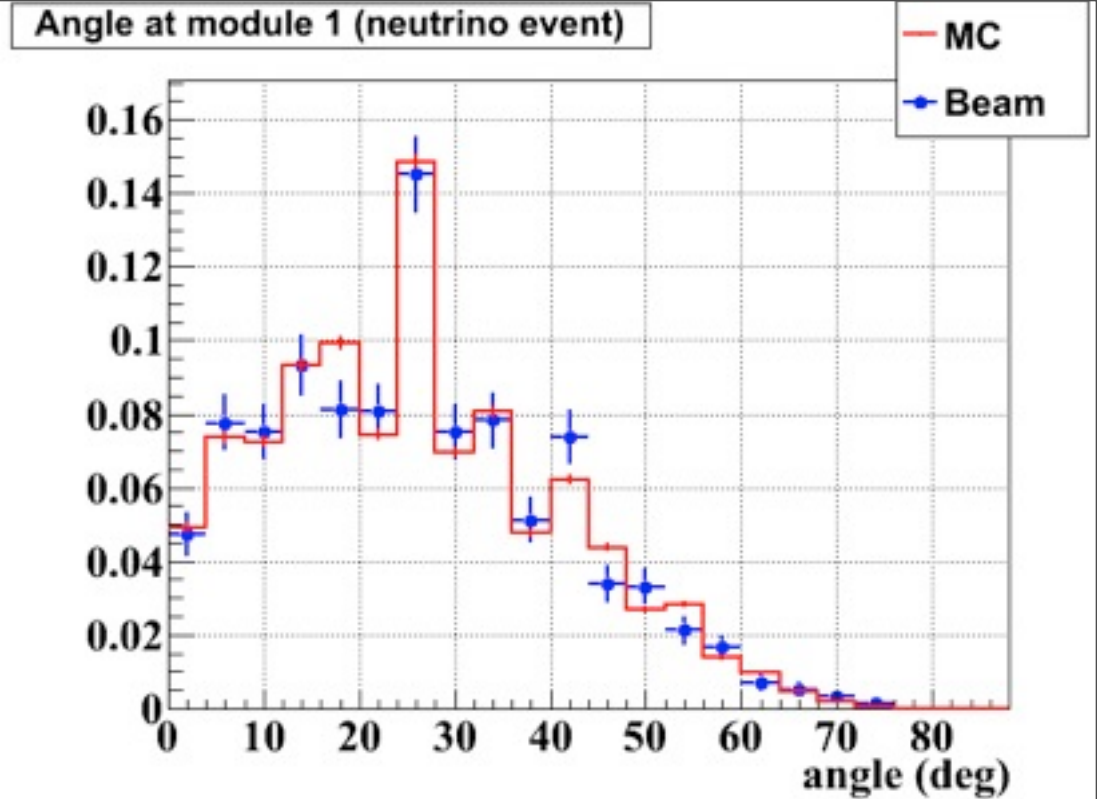

Vertex plane (side view) Mod5 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane

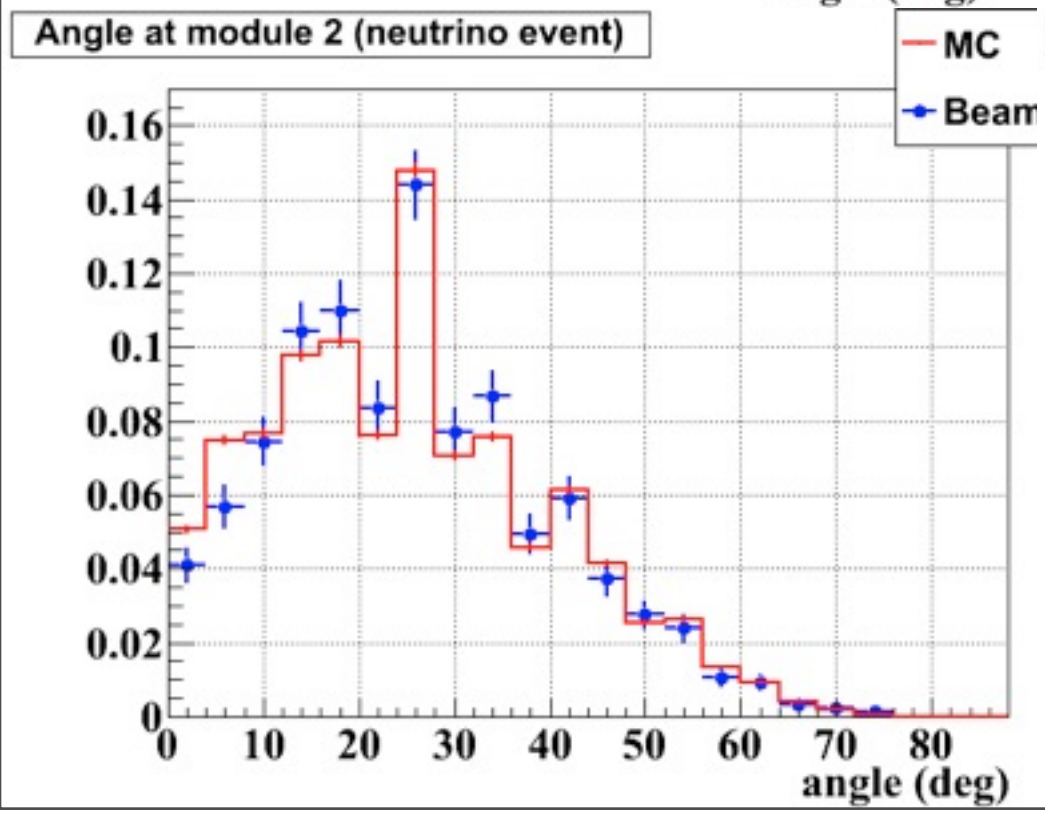

Vertex plane (side view) Mod6 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
2
4
6
8
10
# of vertex plane

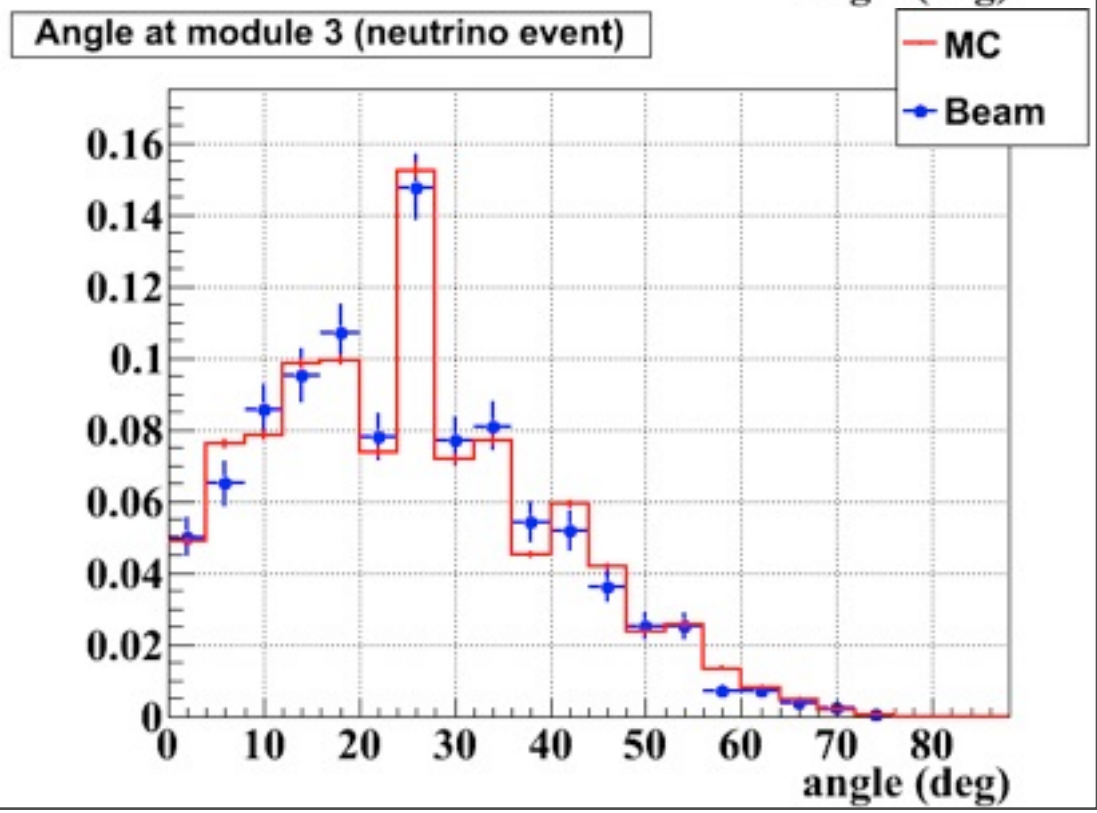
Reconstructed Angle

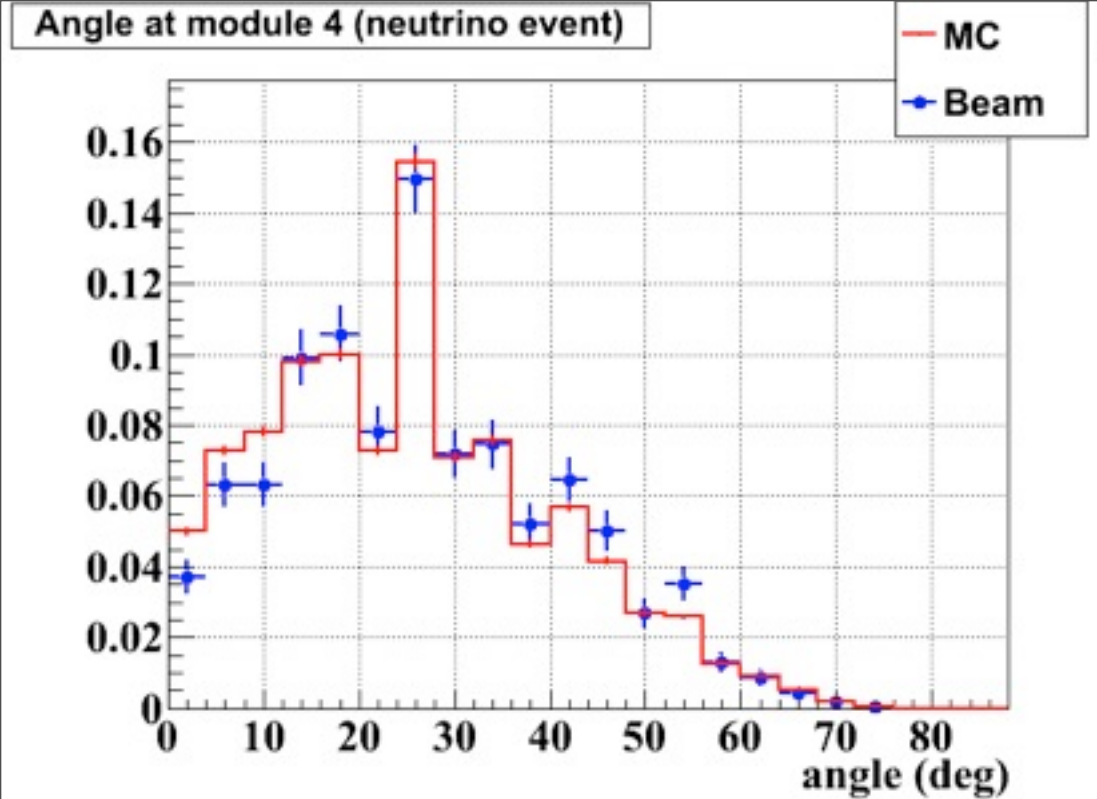
- トラッキングして得たビーム軸との角度
  - トラッキングの方法は普段、大谷さんが行っているビーム解析と同じ方法
- ビン幅は4°に設定

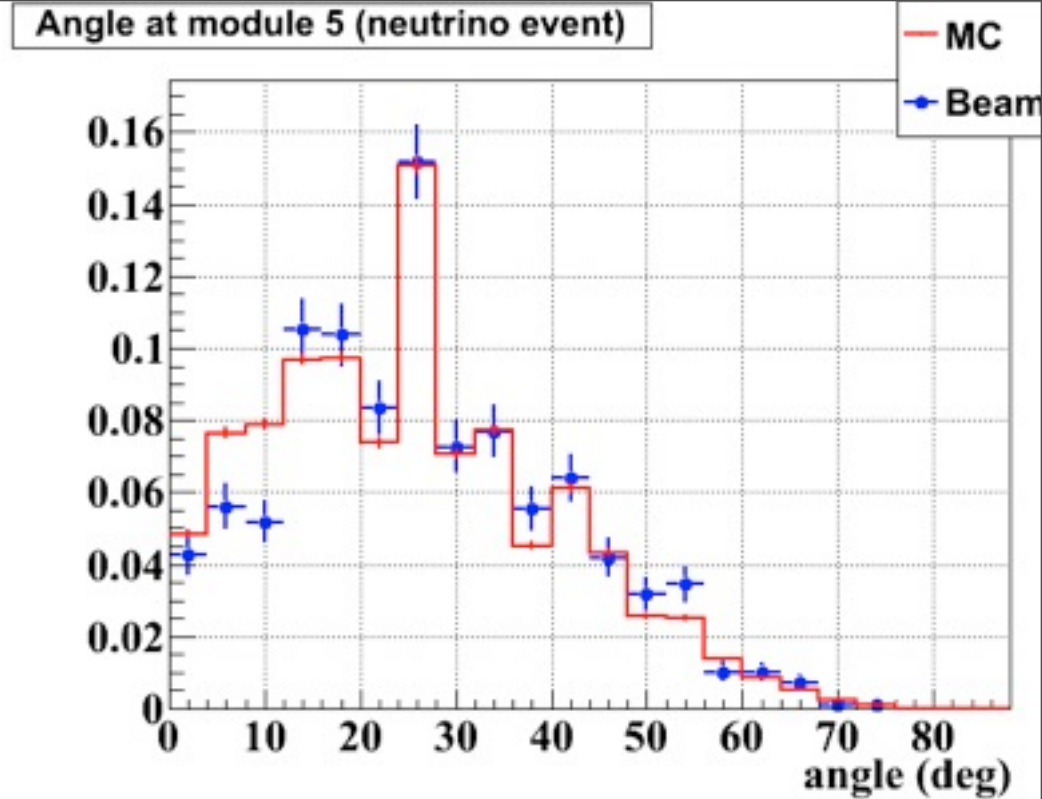

Angle at module 0 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 10 20 30 40 50 60 70 80
angle (deg)

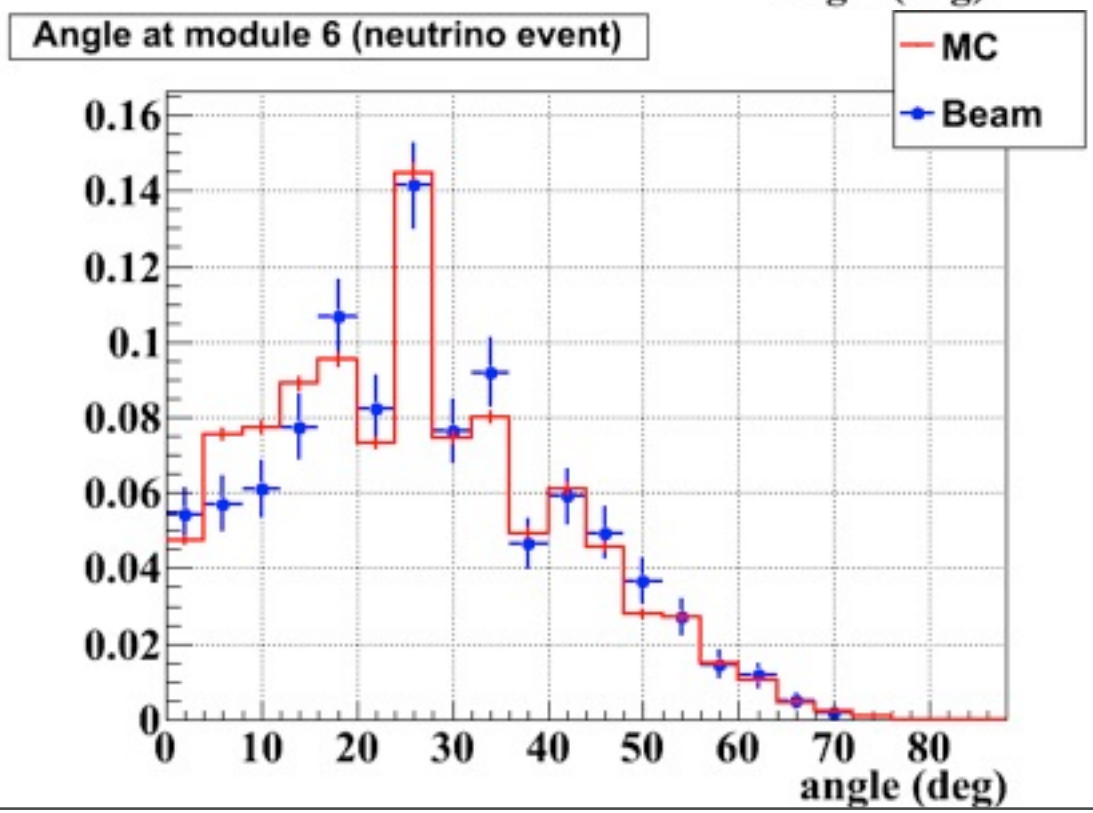

Angle at module 1 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 10 20 30 40 50 60 70 80
angle (deg)


Angle at module 2 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 10 20 30 40 50 60 70 80
angle (deg)


Angle at module 3 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 10 20 30 40 50 60 70 80
angle (deg)


Angle at module 4 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 10 20 30 40 50 60 70 80
angle (deg)

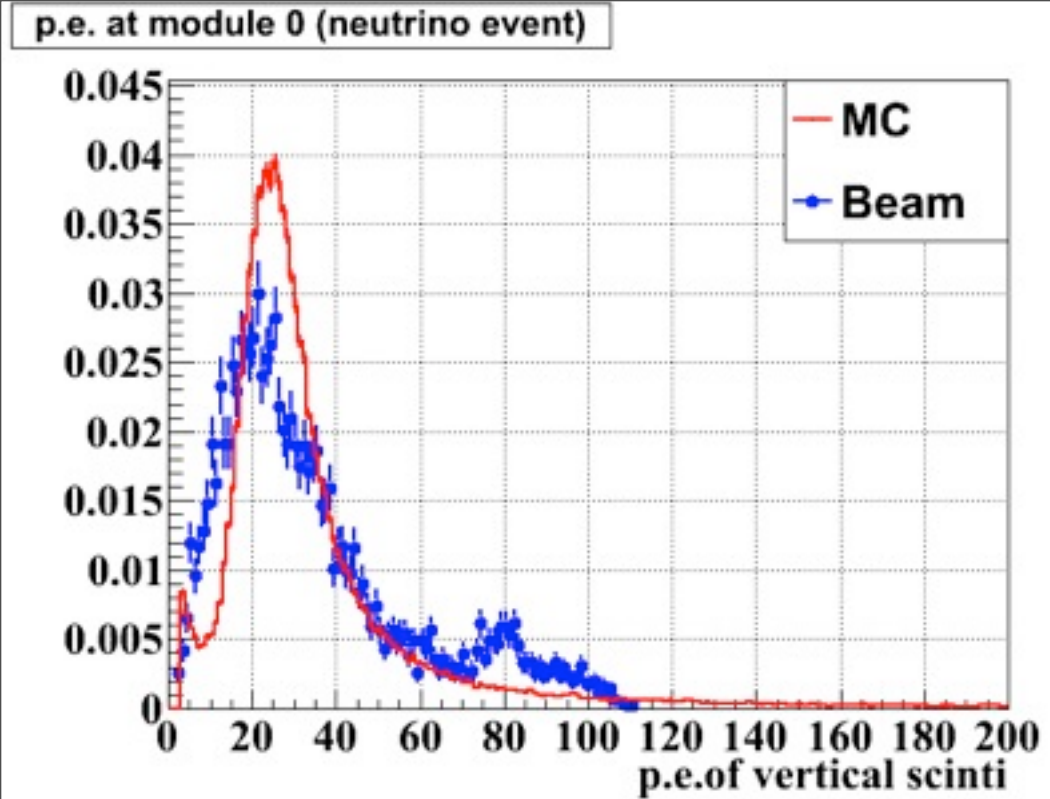

Angle at module 5 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 10 20 30 40 50 60 70 80
angle (deg)

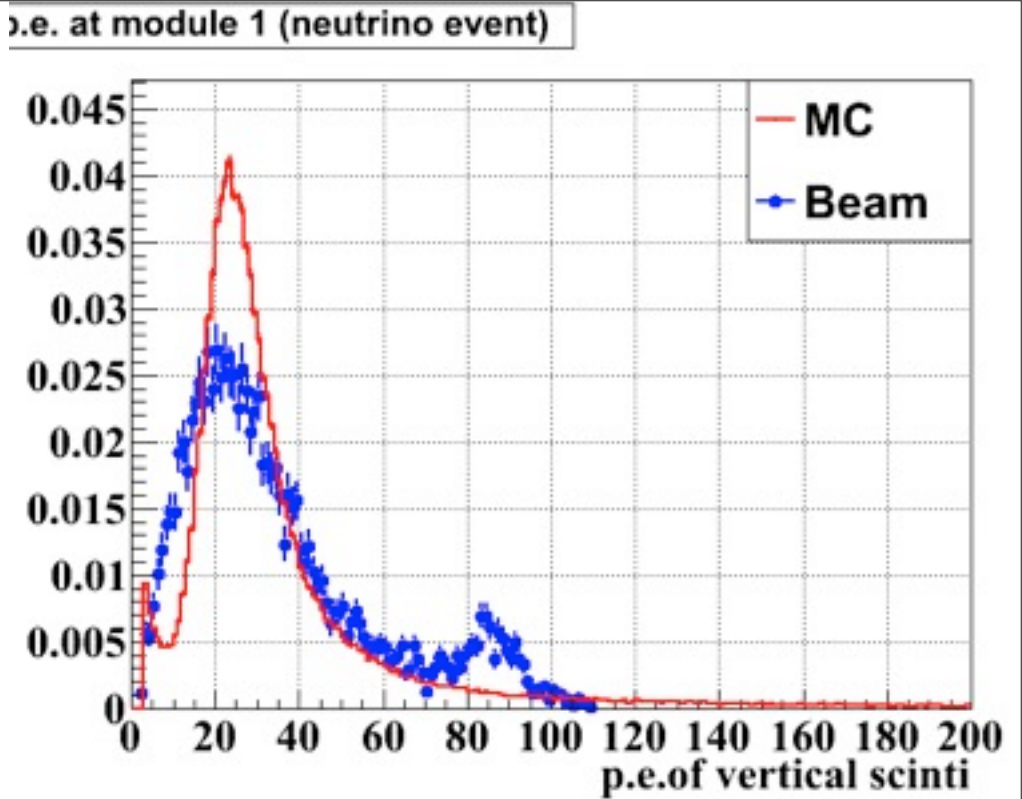

Angle at module 6 (neutrino event)
MC
Beam
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 10 20 30 40 50 60 70 80
angle (deg)

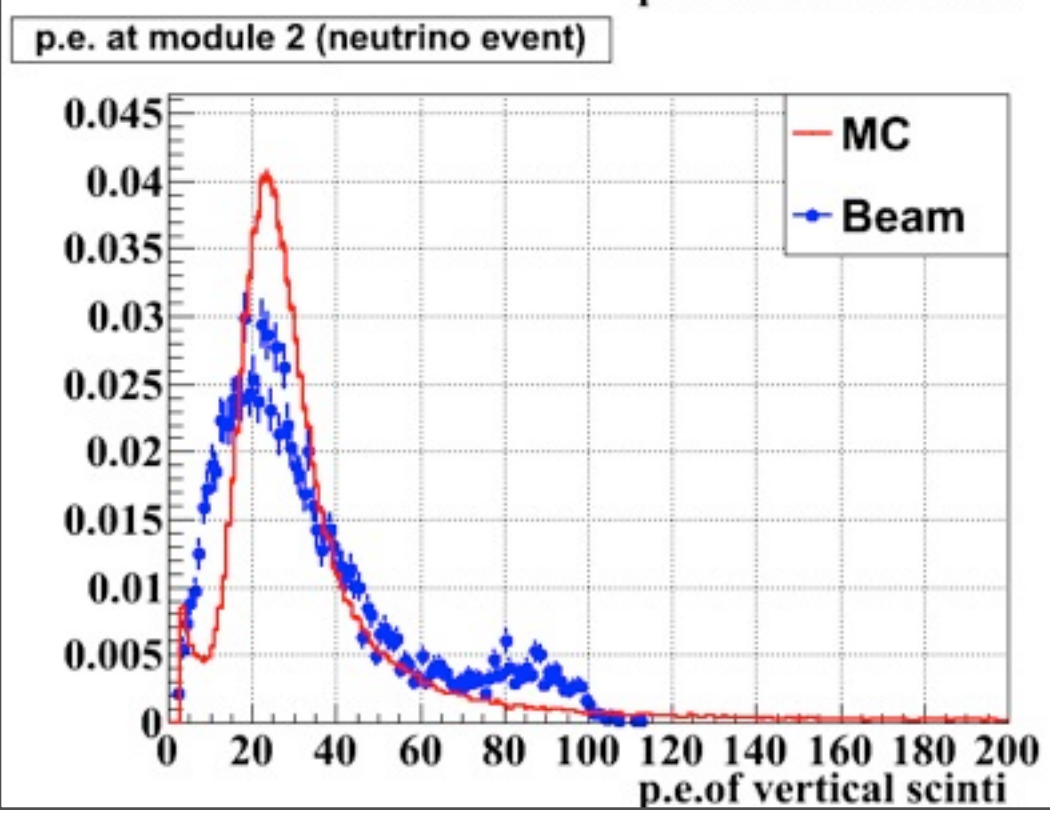
p.e. of hit of reconstructed track

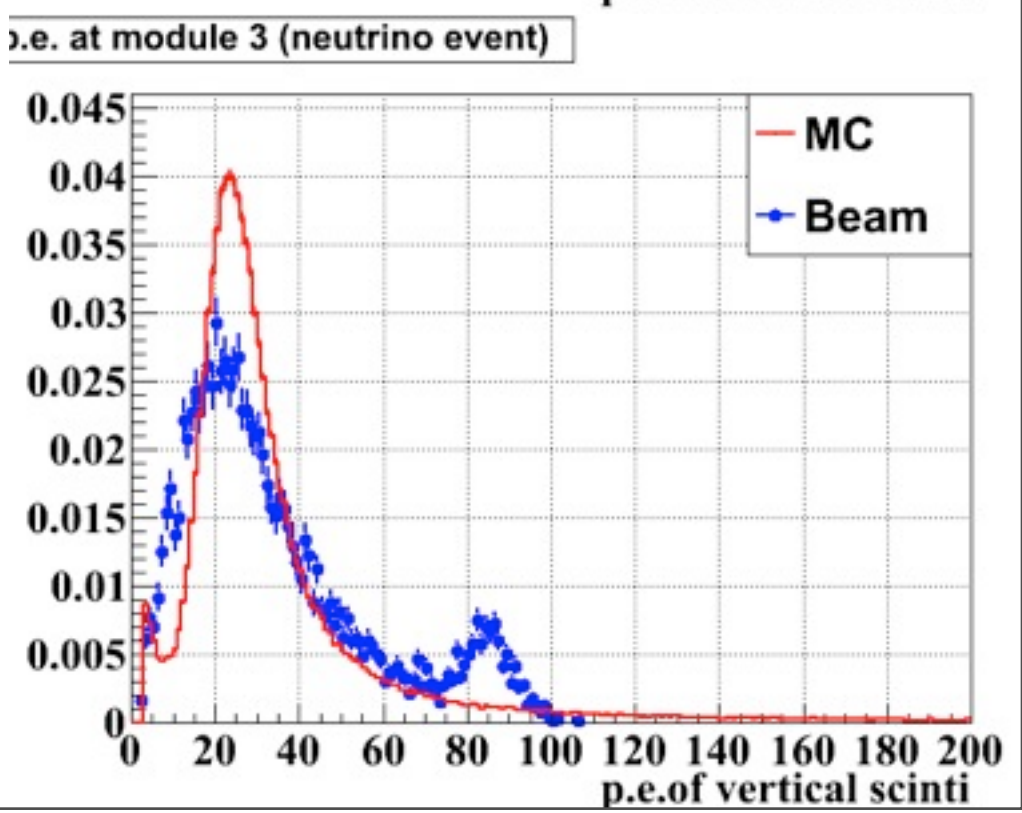
- トラッキングした際に用いたヒットの光量分布
  - つまり、トラックが残したヒットの光量をみたい。
- 今回用いたビームデータ(run31)では low gain の情報が使えなかったため、高い光量(80p.e. ~)は正しくADC値を光量に変換できていない。

p.e. of vertical scintillator (top view)

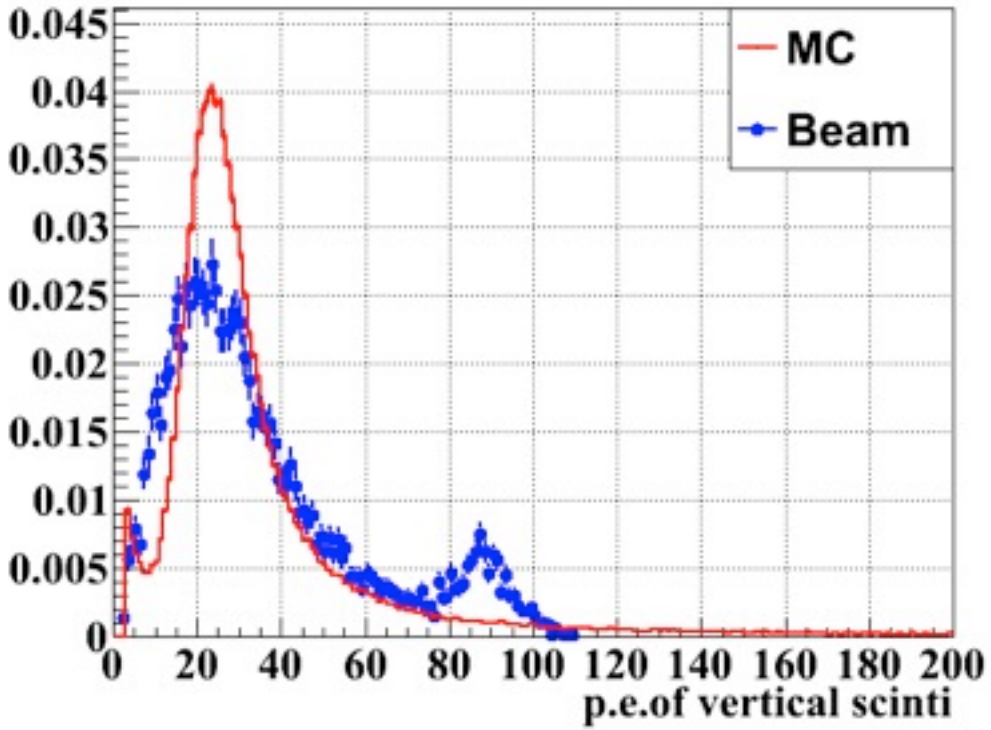

p.e. at module 0 (neutrino event)
MC
Beam
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0 20 40 60 80 100 120 140 160 180 200
p.e.of vertical scinti


.e. at module 1 (neutrino event)
MC
Beam
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0 20 40 60 80 100 120 140 160 180 200
p.e.of vertical scinti

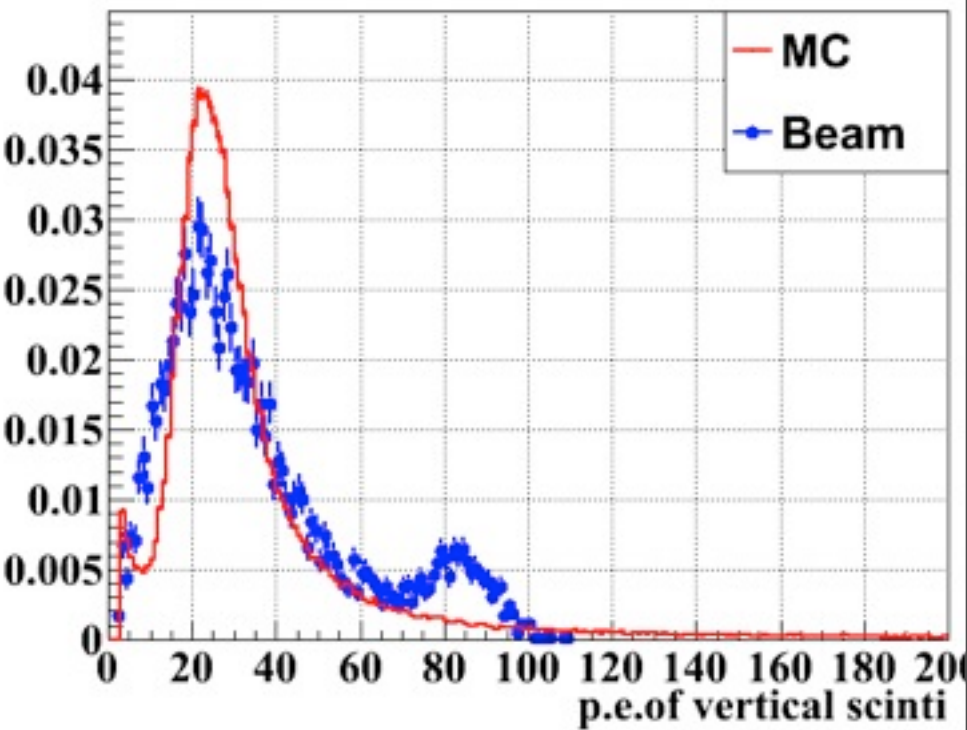

p.e. at module 2 (neutrino event)
MC
Beam
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0 20 40 60 80 100 120 140 160 180 200
p.e.of vertical scinti


.e. at module 3 (neutrino event)
MC
Beam
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0 20 40 60 80 100 120 140 160 180 200
p.e.of vertical scinti

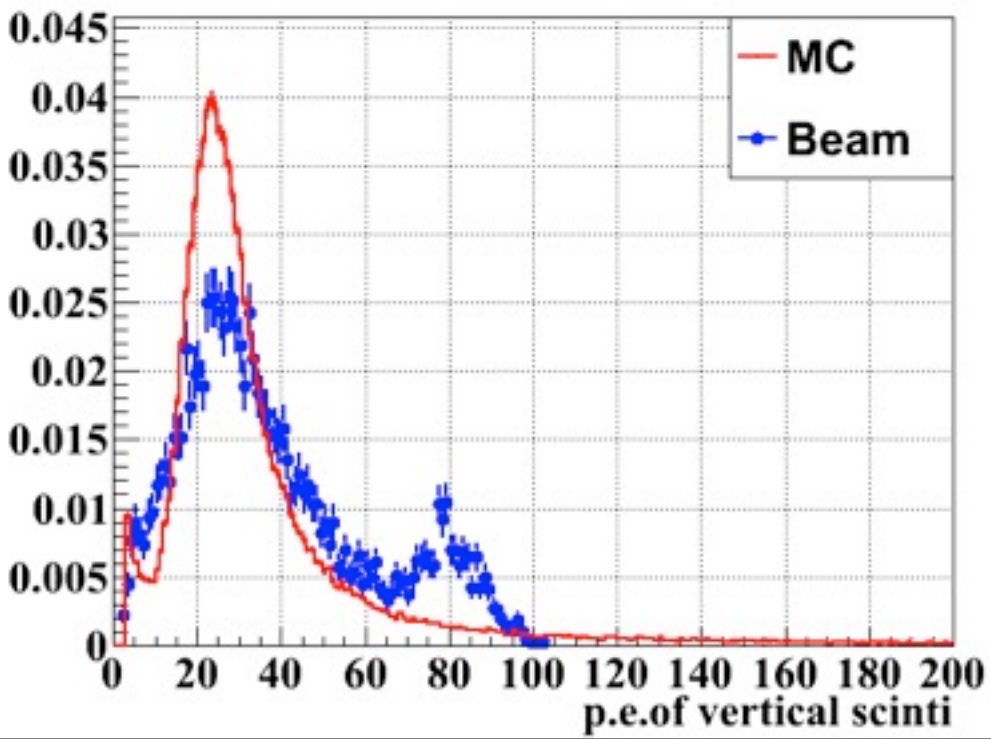
p.e. at module 4 (neutrino event)



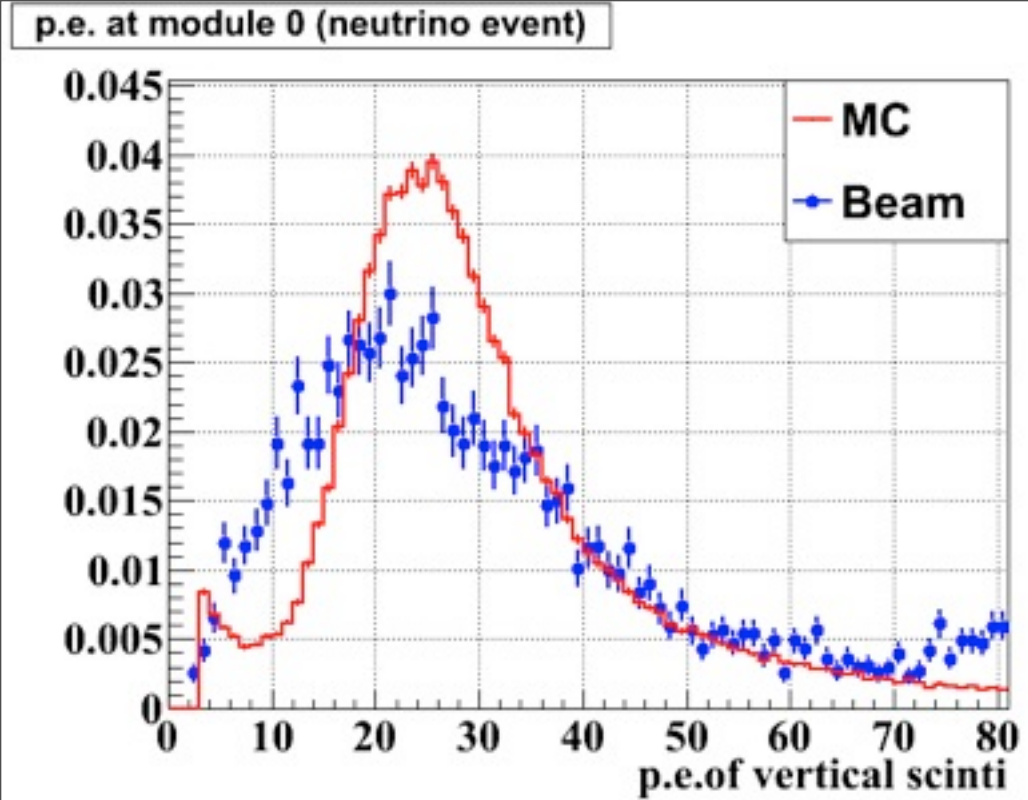
p.e. at module 5 (neutrino event)

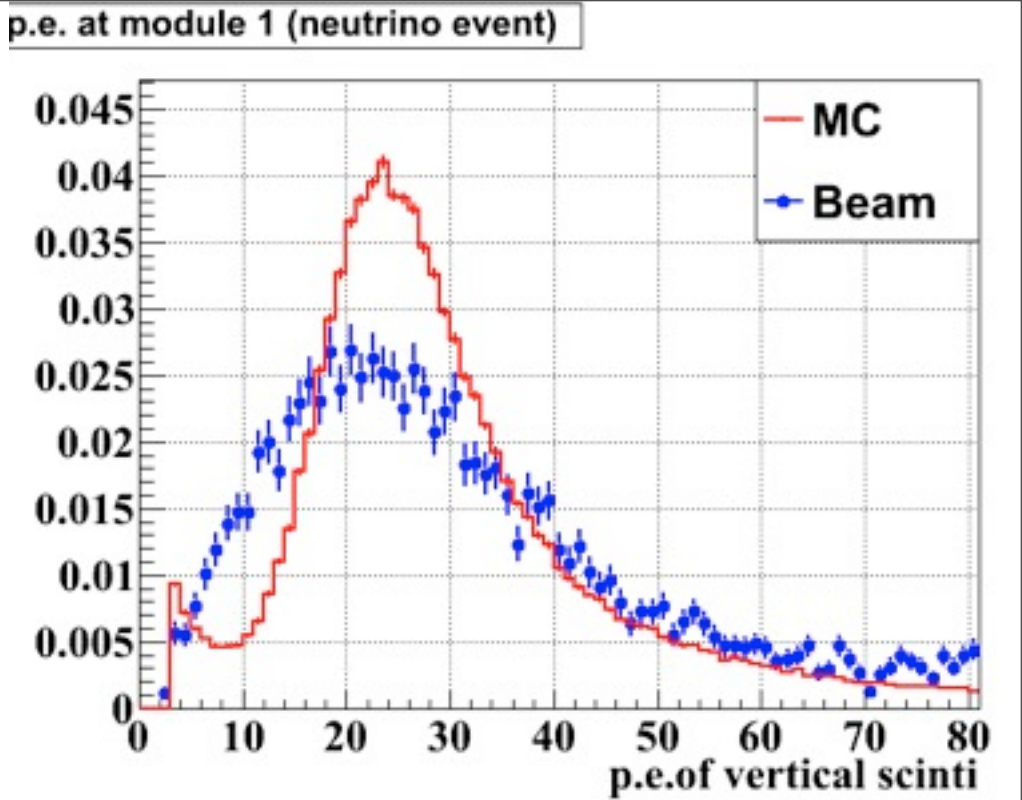


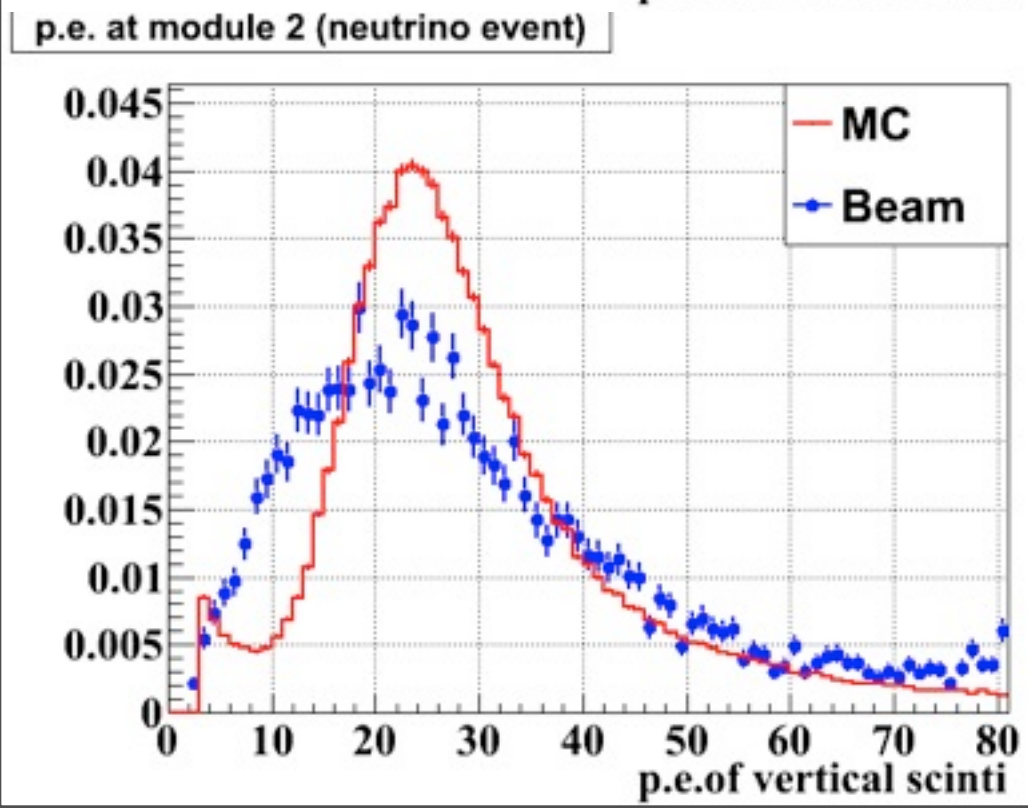
p.e. at module 6 (neutrino event)

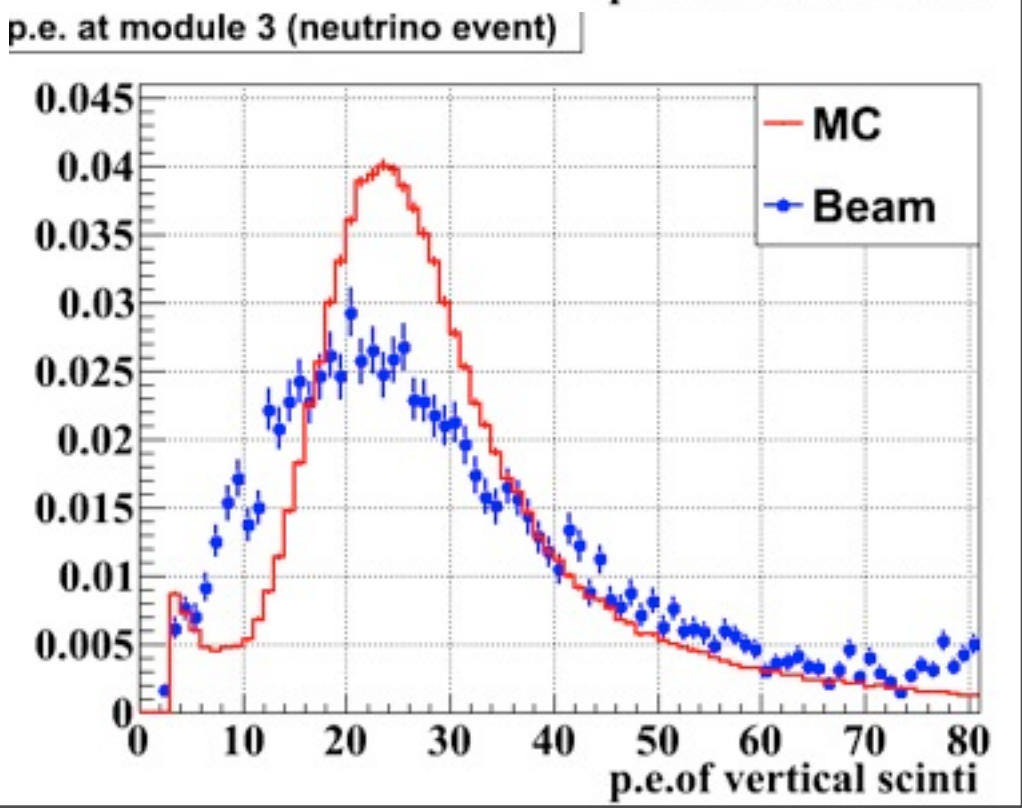


- 80 p.e. 領域を拡大表示

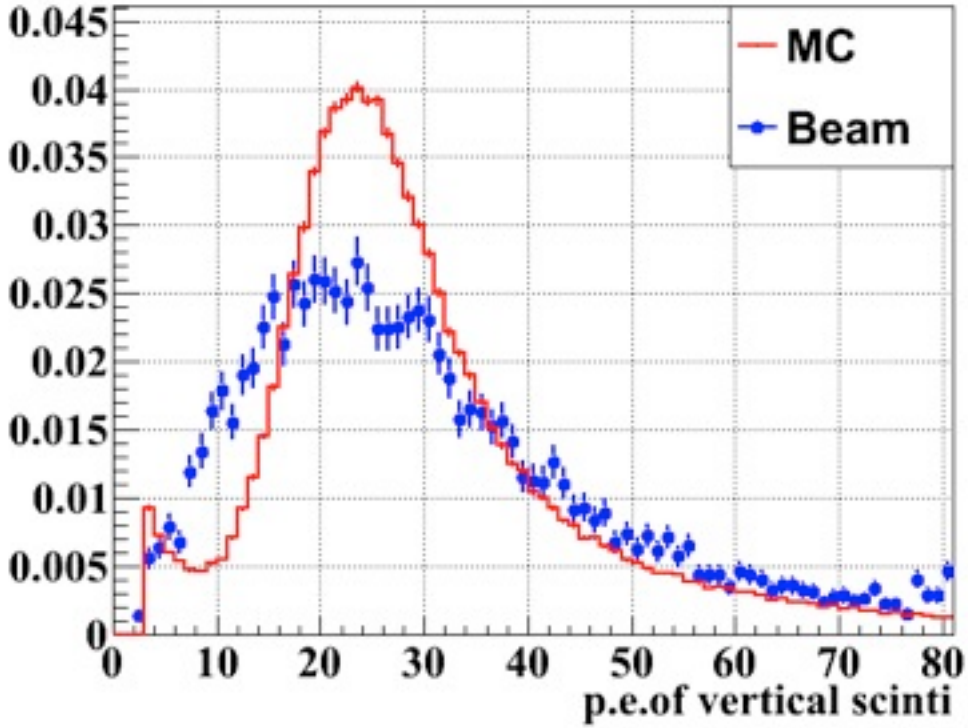

p.e. at module 0 (neutrino event)
MC
Beam
p.e.of vertical scinti


p.e. at module 1 (neutrino event)
MC
Beam
p.e.of vertical scinti

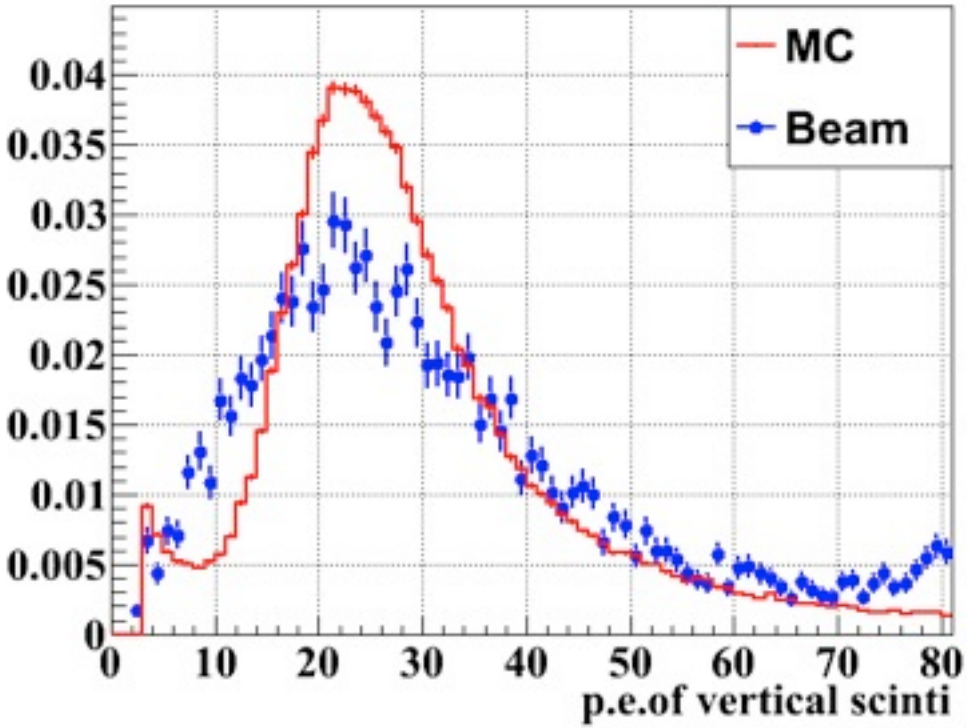

p.e. at module 2 (neutrino event)
MC
Beam
p.e.of vertical scinti


p.e. at module 3 (neutrino event)
MC
Beam
p.e.of vertical scinti

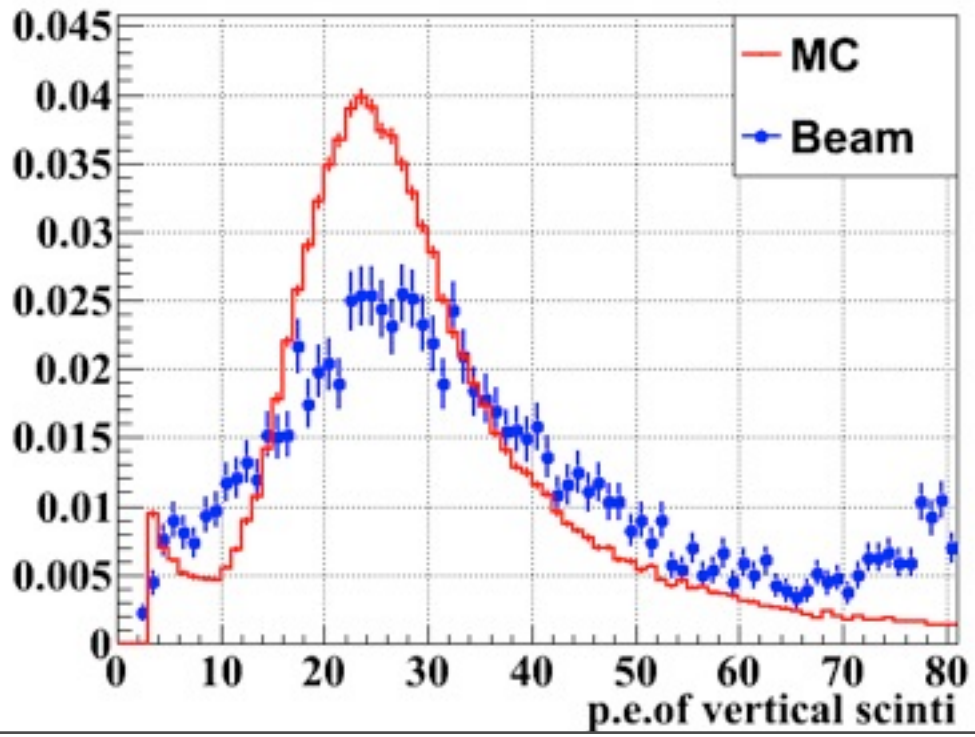
p.e. at module 4 (neutrino event)



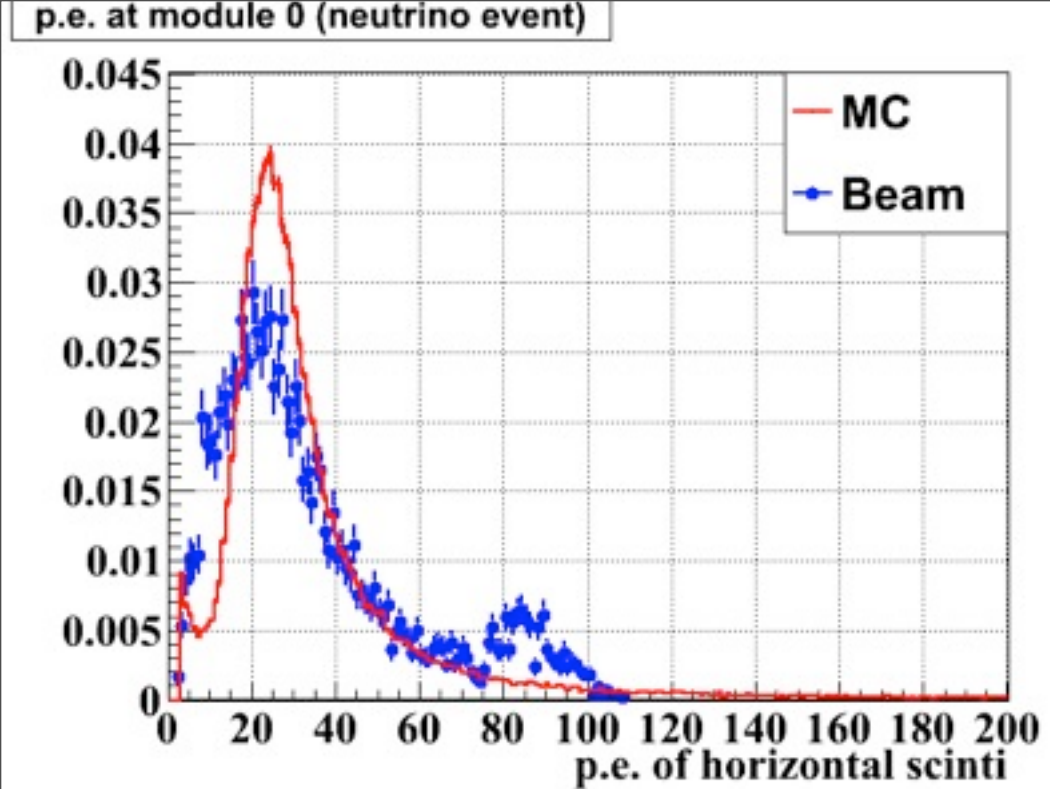
p.e. at module 5 (neutrino event)

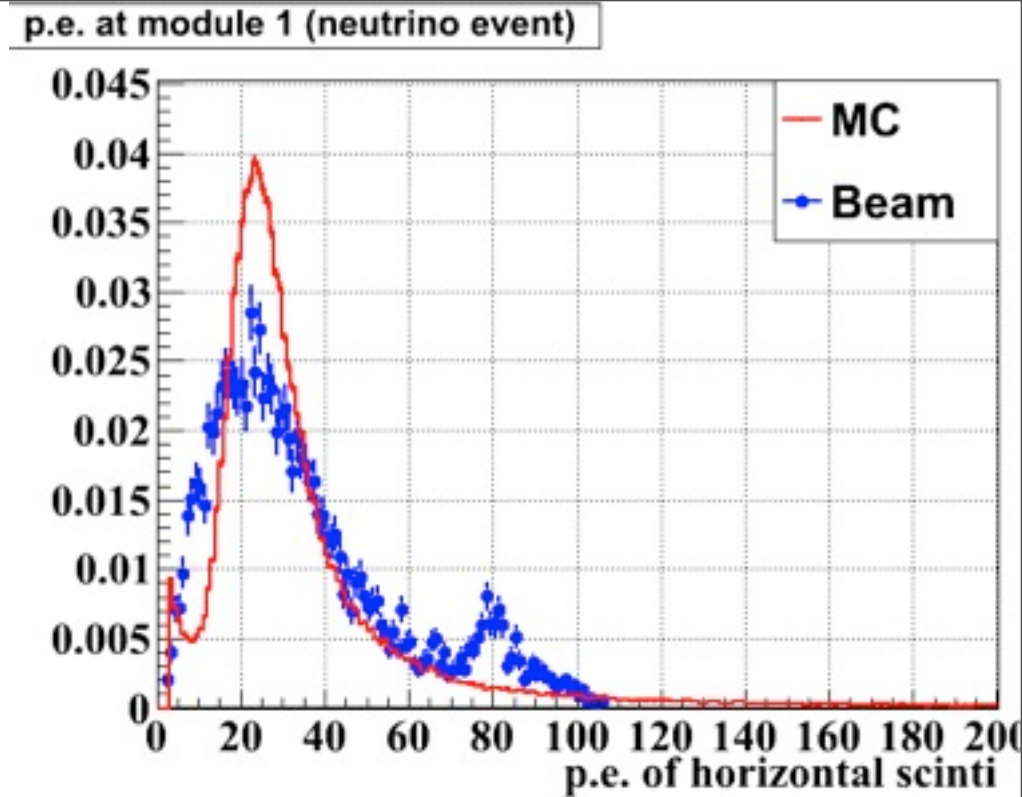


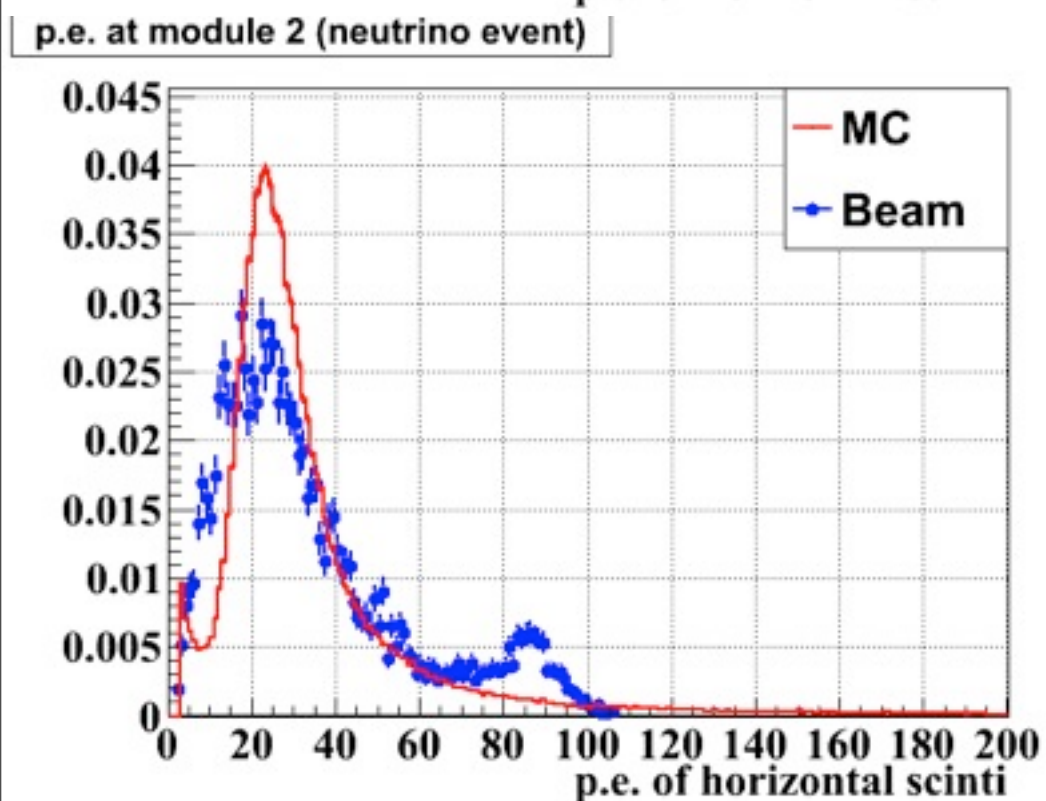
p.e. at module 6 (neutrino event)

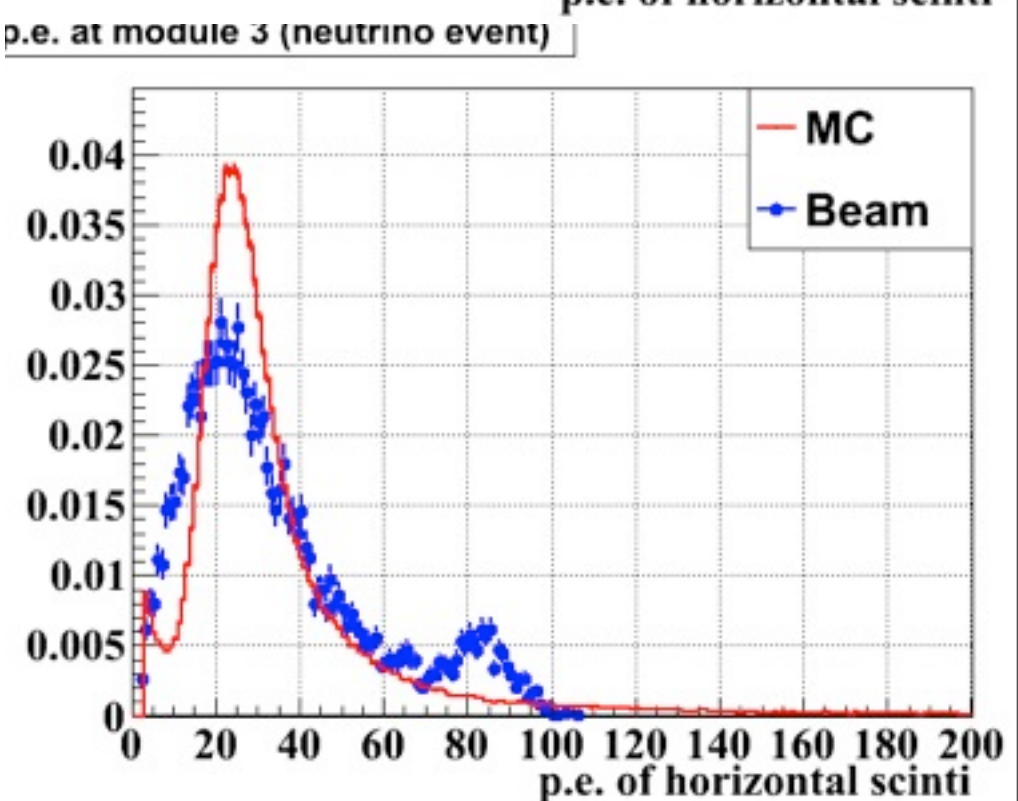


p.e. of horizontal scintillator (side view)

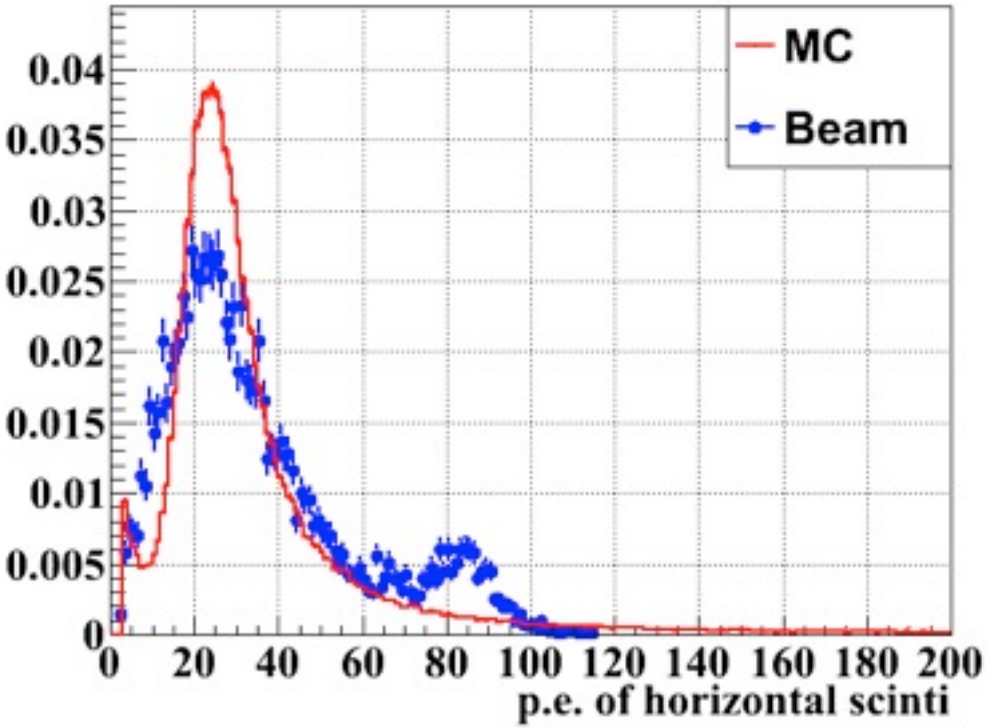

p.e. at module 0 (neutrino event)
MC
Beam
p.e. of horizontal scinti


p.e. at module 1 (neutrino event)
MC
Beam
p.e. of horizontal scinti

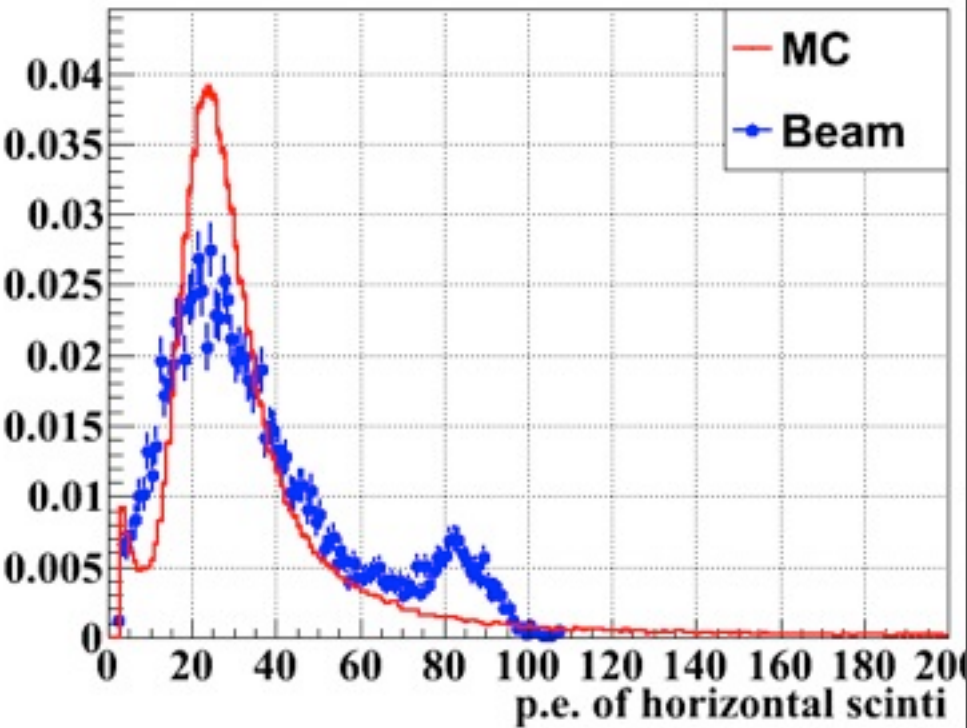

p.e. at module 2 (neutrino event)
MC
Beam
p.e. of horizontal scinti


p.e. at module 3 (neutrino event)
MC
Beam
p.e. of horizontal scinti

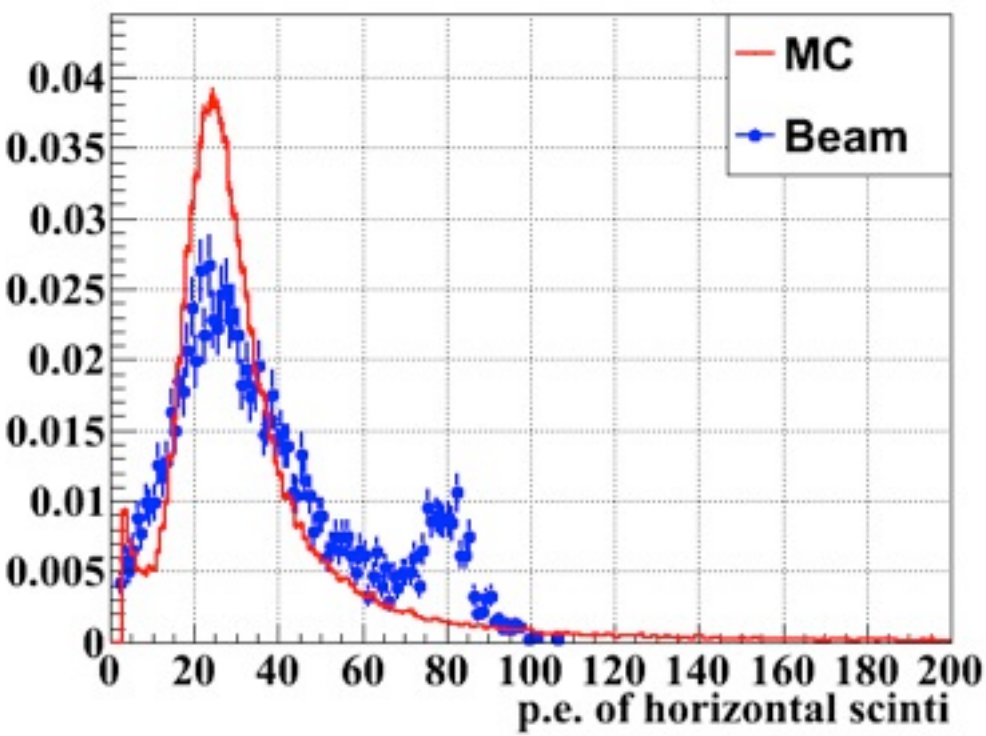
p.e. at module 4 (neutrino event)



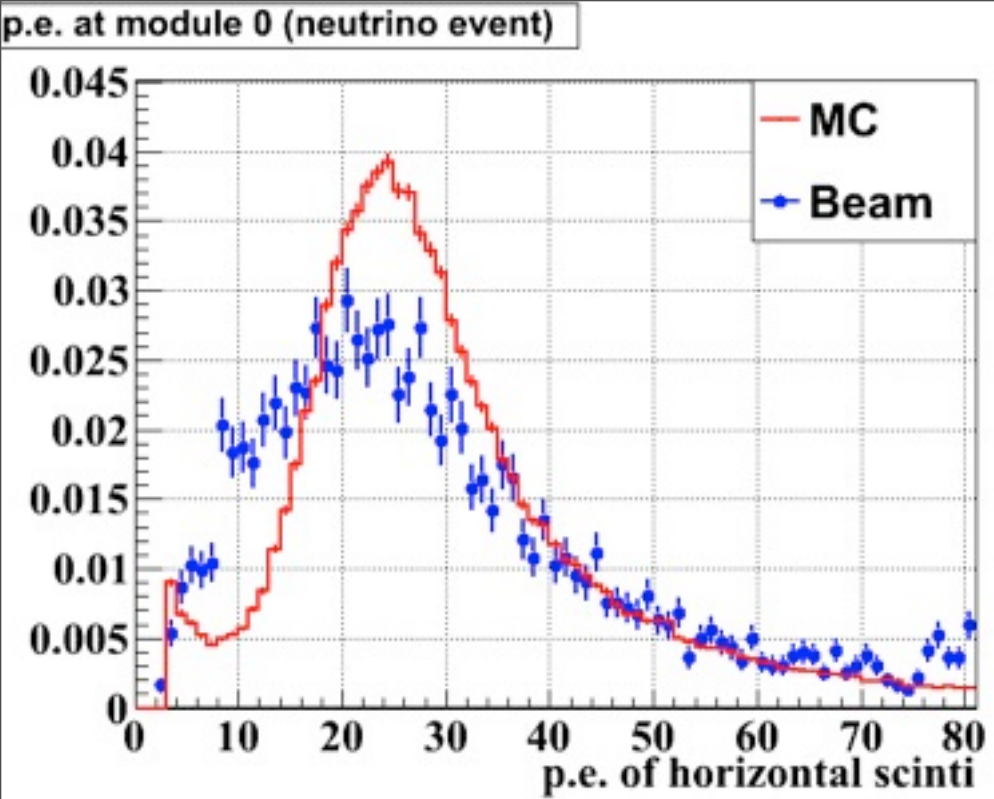
p.e. at module 5 (neutrino event)

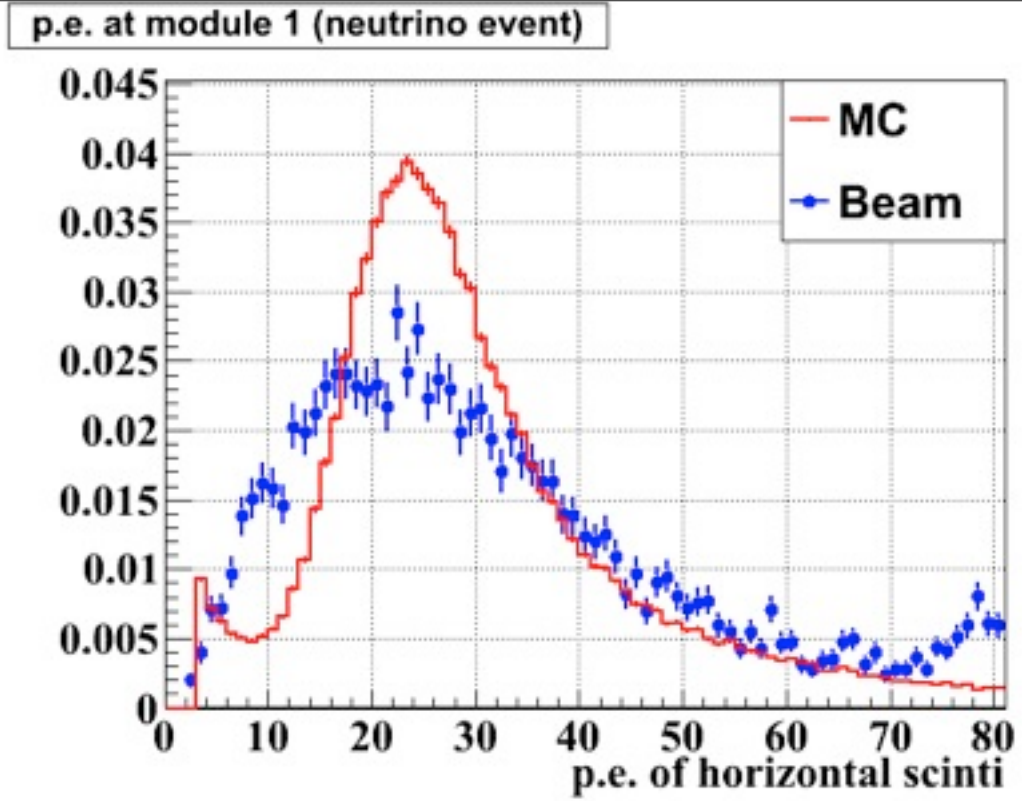


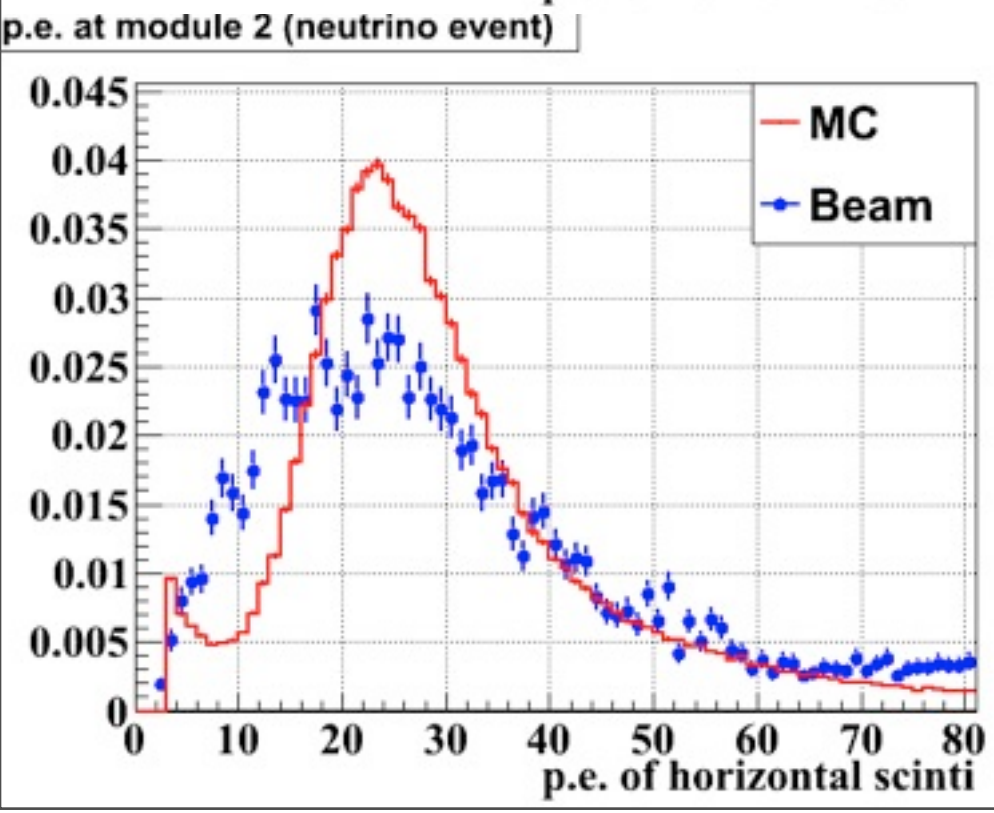
p.e. at module 6 (neutrino event)

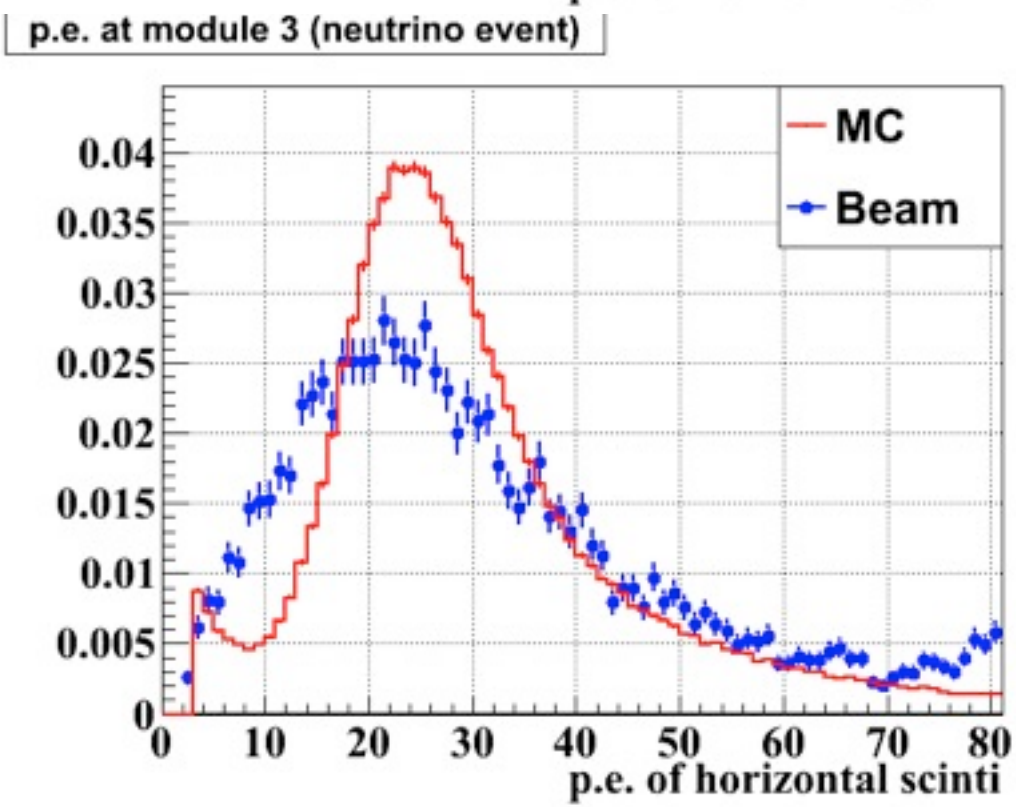


- 80 p.e. 領域を拡大表示

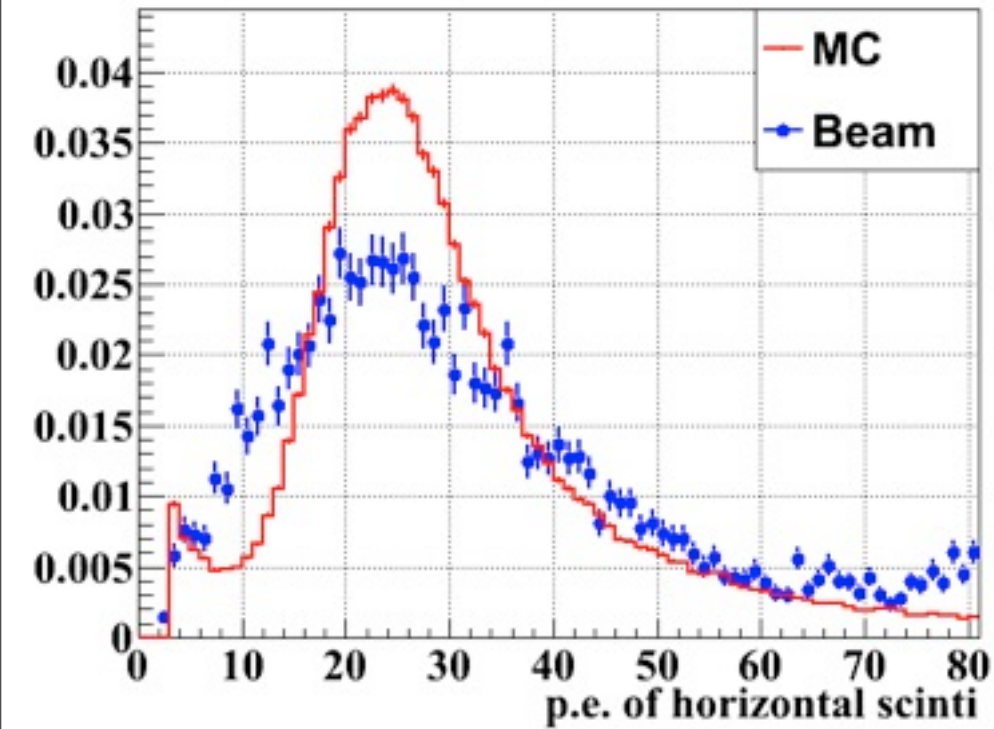

p.e. at module 0 (neutrino event)
MC
Beam
p.e. of horizontal scinti


p.e. at module 1 (neutrino event)
MC
Beam
p.e. of horizontal scinti

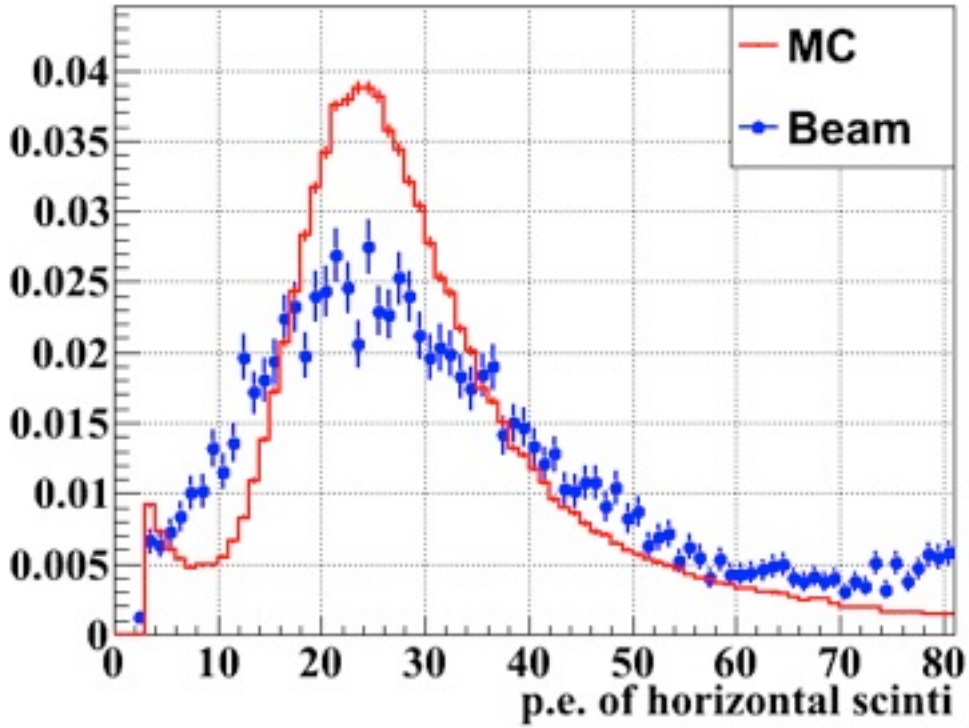

p.e. at module 2 (neutrino event)
MC
Beam
p.e. of horizontal scinti


p.e. at module 3 (neutrino event)
MC
Beam
p.e. of horizontal scinti

p.e. at module 4 (neutrino event)



p.e. at module 5 (neutrino event)



p.e. at module 6 (neutrino event)