

INGRID MC

Event Sample

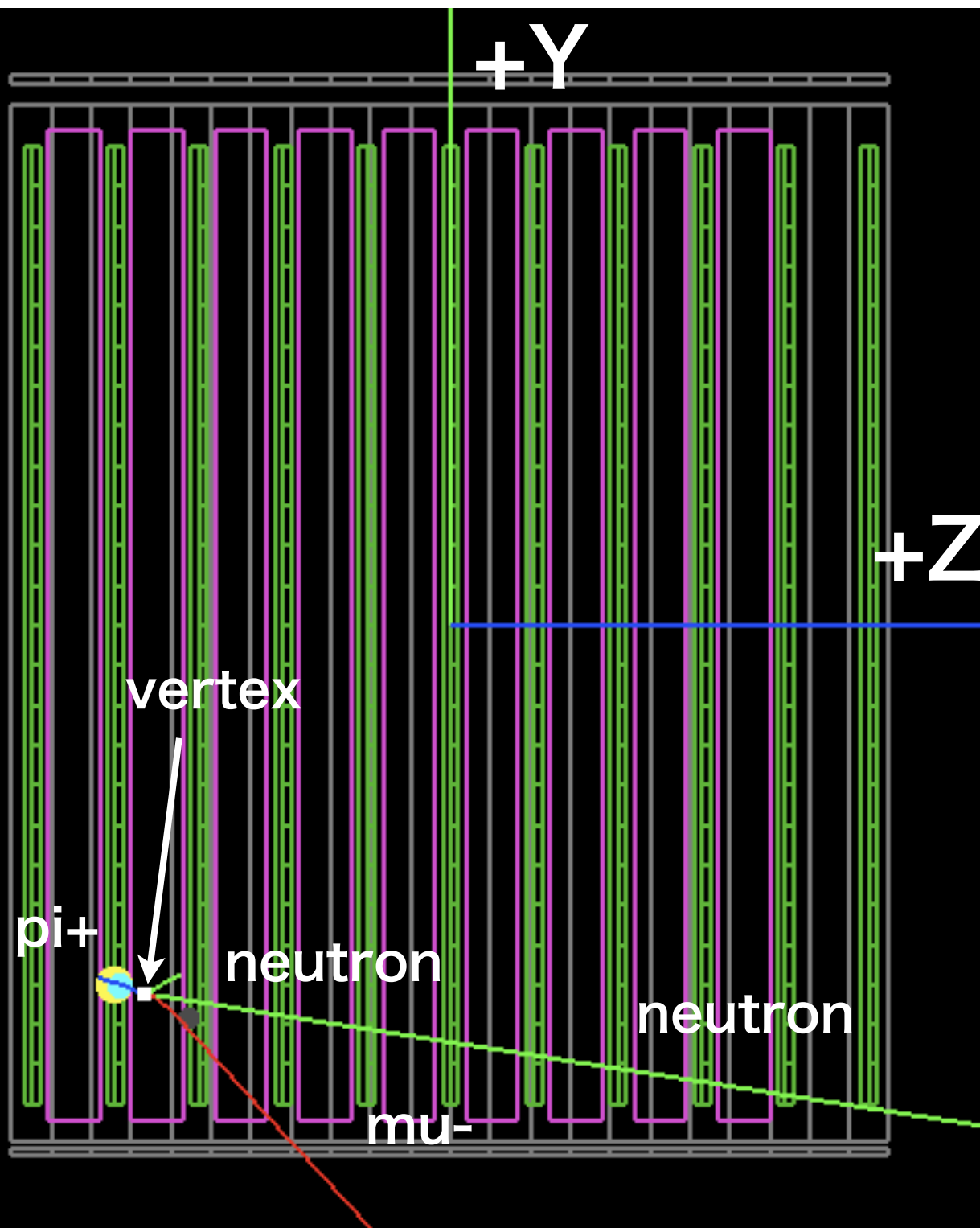
Akira Murakami

- とりあえず、1イベントずつNeut Fileから読み込み、INGRIDでニュートリノ反応をさせた際のイベントディスプレイを見ていき、その時の各種情報を単純にテキストにdumpしただけ。
- 今回のスライドにはまだ含まれていない反応もあり。
 - まだ見ていない種類のニュートリノ反応についても後日。

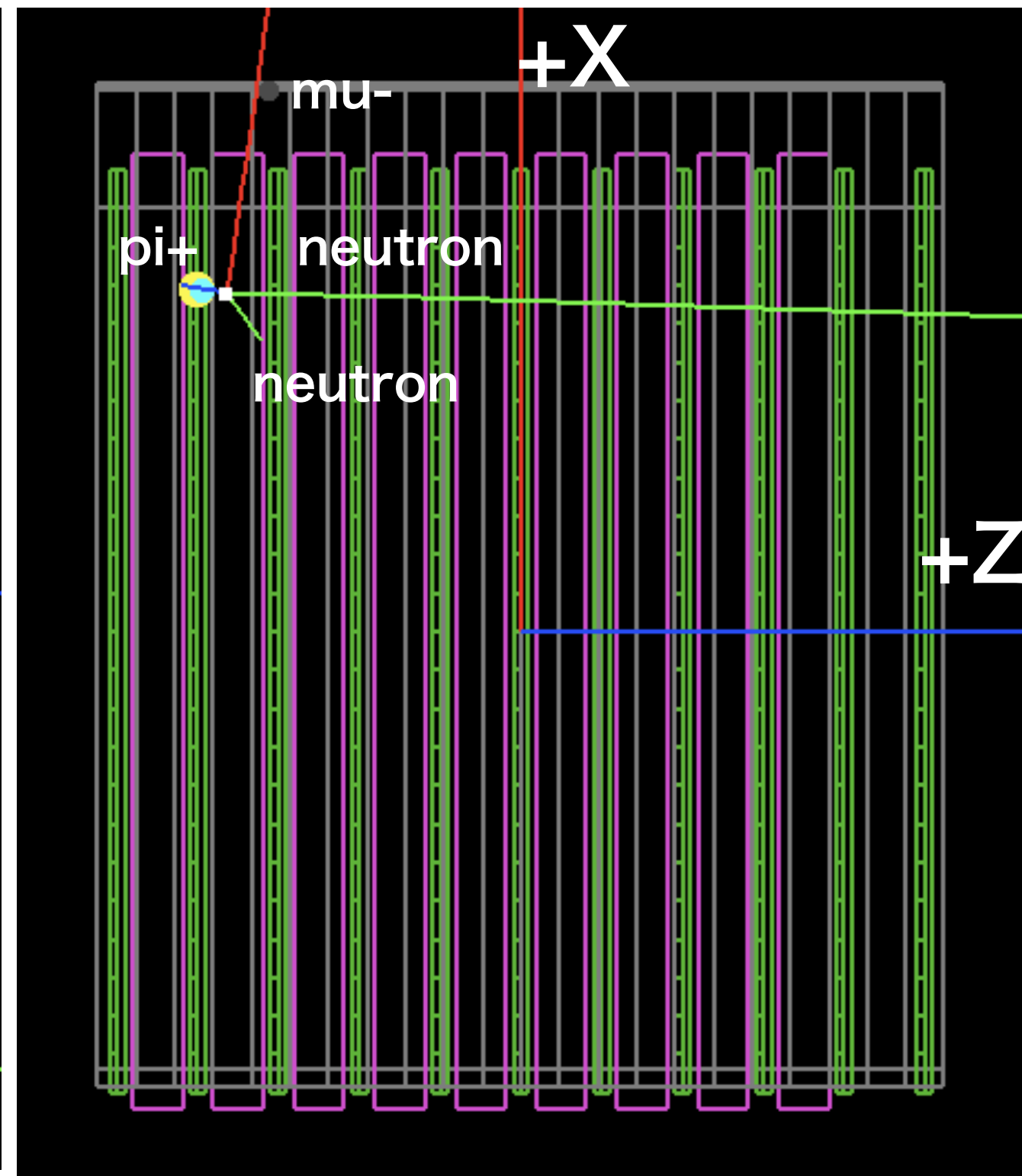
- 300keV以上のEnergy depositをヒットと見なす
- トラックはニュートリノ反応で出てきた粒子のトラックのみを描写。その他の2次粒子のトラックは書かず。
 - さらに細かく言うと、ニュートリノ反応後、さらに核内反応の結果出てくる粒子のトラックのみを描写。
- トラックの色 赤：負電荷, 青：正電荷, 緑：中性
- ヒットの色 黄色：XLayer Hit シアン色：YLayer Hit グレー：veto Hit
 - side view だろうが、top viewだろうが、X-Y Layer両方のHitを表示。
 - 各Hitは(x, y, z)の位置情報を持っているため可能
- 検出器の色 緑：シンチ 赤紫：鉄 グレー：vetoシンチ
- 座標軸 X軸：赤 Y軸：緑 Z軸：青
 - 線が伸びている方向が+方向にあたる。
- 白い四角でニュートリノ反応があったvertexを表示した。

$$\text{neut} + N = \mu + N + \text{Pi}^+$$

side view



top view



用いたニュートリノの情報

=== Neutrino Information ===

ParentID: 8 Neut Production Model: 11 Neut interaction Mode: 13

Energy: 2.765 GeV Direction: {0.002325,-0.06508,0.9979}

Vertex (cm): {44, -46.16, -38.23} Module: 3

- ParentIDとNeut Production Model : ニュートリノの親粒子とその反応
 - 11 : numu from pi+
 - 12 : numu from K+
 - 13 : numu from mu-
- Neut interaction Model : ニュートリノ反応の種類

ニュートリノ反応後, さらに原子核内での反応も 終わって、最終的に出てきた粒子

=== Shotted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum: 555.9 -11.4 87.73

Kinetic Energy: 467.1

Particle: 211 Index: 5 Parent Index: 4

Tracking Flag: 1 Interaction Code: 0

Momentum: 29.57 40.31 -136.7

Kinetic Energy: 62.08

Particle: 2112 Index: 6 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum: -55.49 -417 2610

Kinetic Energy: 1866

Particle: 2112 Index: 7 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum: -253.3 103.9 184.6

Kinetic Energy: 56.33

// **neutrino 14**

// **muon 13**

// **P 2212**

// **N 2112**

// **Pi0 111**

// **Pi+ 211**

// **Pi- -211**

// **Eta0 221**

// **K+ 321**

// **Lambda 3122**

// **omega 223**

エネルギー・運動量の単位は MeV

イベントディスプレイに書かれたヒットと トラックの詳細

=== hits in XLayer (yellow) ===

Mod:3 Plane:1 Ch:20 Edep:9.245 MeV PID:211 Track:2 pos(mm):{446.6, -447.7, -420}

=== hits in YLayer (cyan) ===

Mod:3 Pln:1 Ch:2 Edep:1.926 MeV PID:211 Track:2 pos(mm):{445.1, -451.2, -410}

Mod:3 Pln:1 Ch:3 Edep:4.217 MeV PID:211 Track:2 pos(mm):{445.5, -450, -413.3}

=== hits in veto (red) ===

Mod:3 Pln:12 Ch:4 Edep:1.899 MeV PID:13 track:1 pos(mm):704 -489.7 -325}

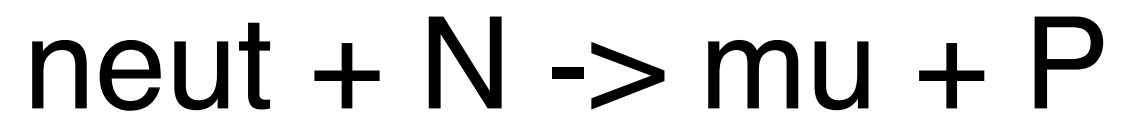
==== Track with Parent ID = 0 (means primary particle) ====

Track: 4 PID: neutron(2112) Init Mom: {-253.3, 103.9, 184.6} [MeV]

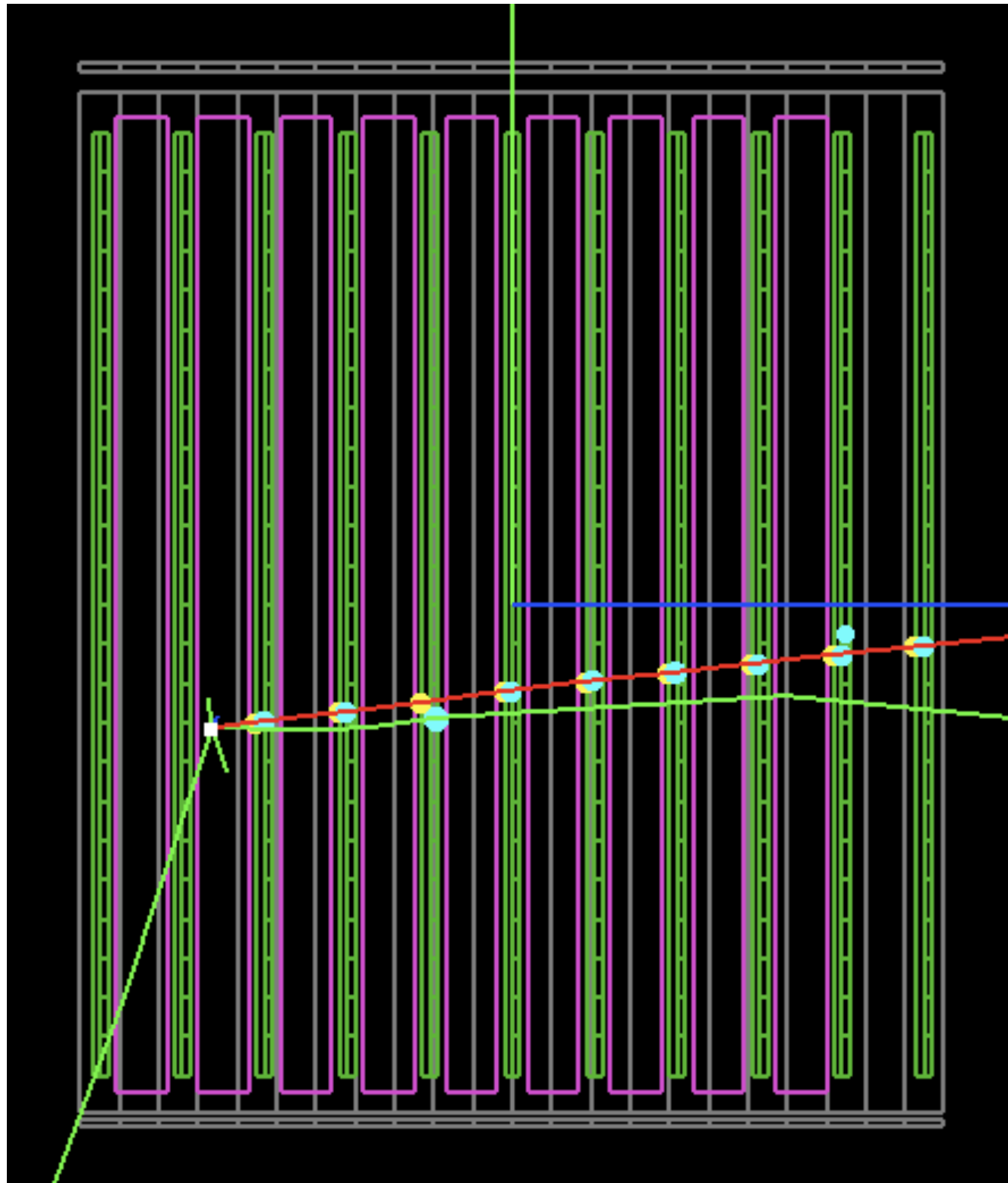
Track: 3 PID: neutron(2112) Init Mom: {-55.49, -417, 2610} [MeV]

Track: 2 PID: pi+(211) Init Mom: {29.57, 40.31, -136.7} [MeV]

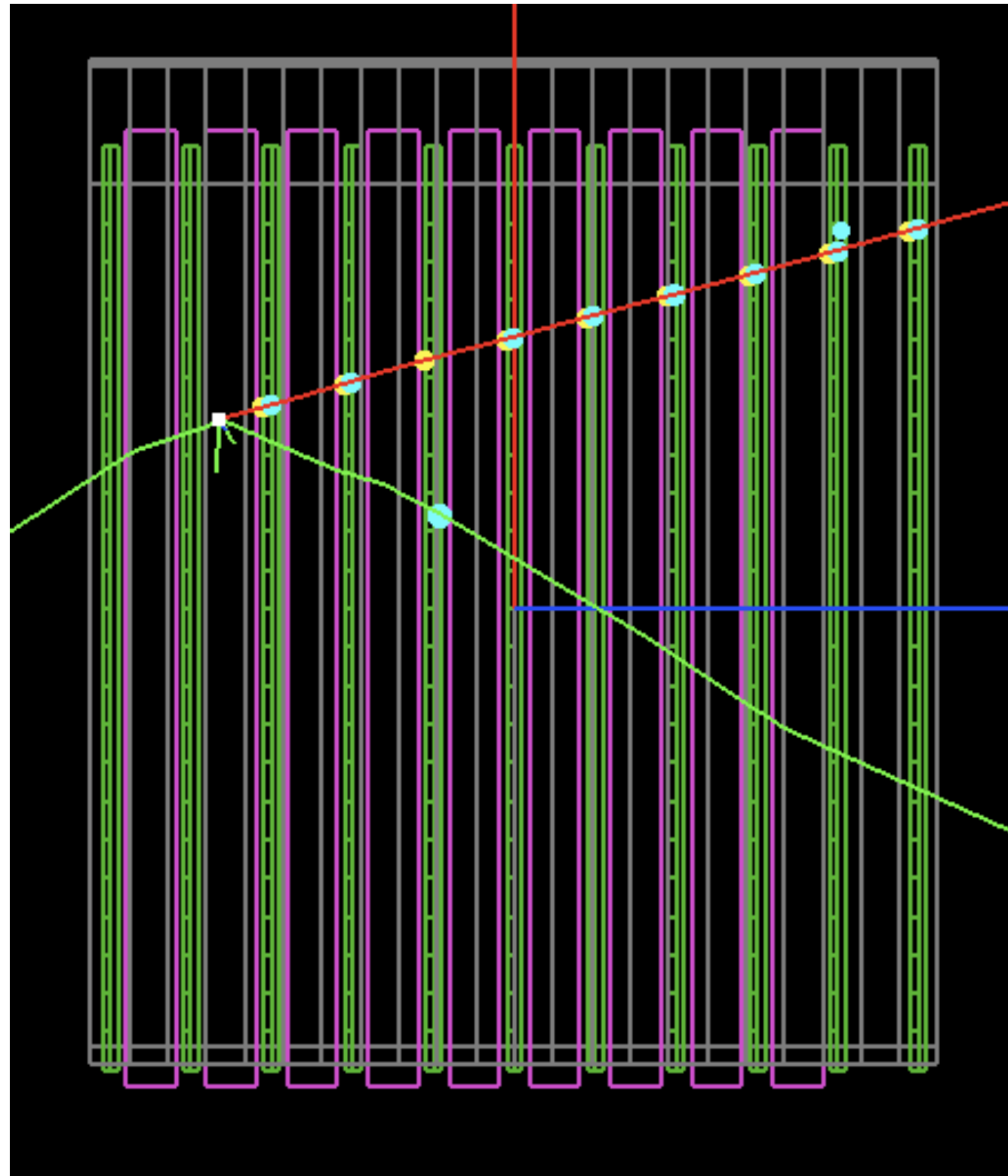
Track: 1 PID: mu-(13) Init Mom: {555.9, -11.4, 87.73} [MeV]



side view



top view



=== Neutrino Information from Jnubeam ===

ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 1

Energy: 1.95 Direction: {0.004307,-0.06829,0.9977}

Vertex (cm): {24.57, -15.64, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum:438 210.3 1553

Kinetic Energy: 1525

Particle: 2112 Index: 6 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum:-174.1 -6.906 396.9

Kinetic Energy: 95.18

Particle: 2212 Index: 4 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum:-346.7 356.6 128.9

Kinetic Energy: 131.4

Particle: 2112 Index: 7 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum:-67.17 -341.2 -110.8

Kinetic Energy: 68.4

Particle: 2112 Index: 5 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum:-143.7 -249.1 80.69

Kinetic Energy: 46.35

Particle: 2112 Index: 8 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum:-263.3 144.5 -21.38

Kinetic Energy: 47.06

==== Track with Parent ID = 0 (means primary particle) ===

Track: 6 PID: neutron(2112) Init Mom: {-263.3, 144.5, -21.38} [MeV]

Track: 5 PID: neutron(2112) Init Mom: {-67.17, -341.2, -110.8} [MeV]

Track: 4 PID: neutron(2112) Init Mom: {-174.1, -6.906, 396.9} [MeV]

Track: 3 PID: neutron(2112) Init Mom: {-143.7, -249.1, 80.69} [MeV]

Track: 2 PID: proton(2212) Init Mom: {-346.7, 356.6, 128.9} [MeV]

Track: 1 PID: mu-(13) Init Mom: {438, 210.3, 1553} [MeV]

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

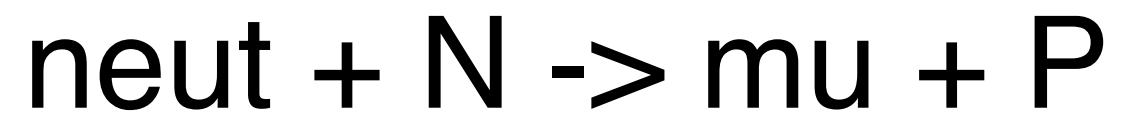
=== hits in XLayer (yellow) ===

Mod:3 Plane:2 Ch:17 Edep:1.957 MeV PID:13 Track:1 pos(mm):{261.8, -148.9, -325}
Mod:3 Plane:3 Ch:17 Edep:1.666 MeV PID:13 Track:1 pos(mm):{292.2, -136.8, -220}
Mod:3 Plane:4 Ch:18 Edep:2.353 MeV PID:13 Track:1 pos(mm):{322.7, -124, -115}
Mod:3 Plane:5 Ch:19 Edep:1.885 MeV PID:13 Track:1 pos(mm):{350.3, -109.8, -10}
Mod:3 Plane:6 Ch:19 Edep:1.604 MeV PID:13 Track:1 pos(mm):{378.7, -97.18, 95}
Mod:3 Plane:7 Ch:20 Edep:1.966 MeV PID:13 Track:1 pos(mm):{405.8, -86.54, 200}
Mod:3 Plane:8 Ch:20 Edep:1.632 MeV PID:13 Track:1 pos(mm):{433.9, -74.87, 305}
Mod:3 Plane:9 Ch:21 Edep:1.669 MeV PID:13 Track:1 pos(mm):{462.4, -63.21, 410}
Mod:3 Plane:10 Ch:21 Edep:1.882 MeV PID:13 Track:1 pos(mm):{491.5, -53.04, 515}

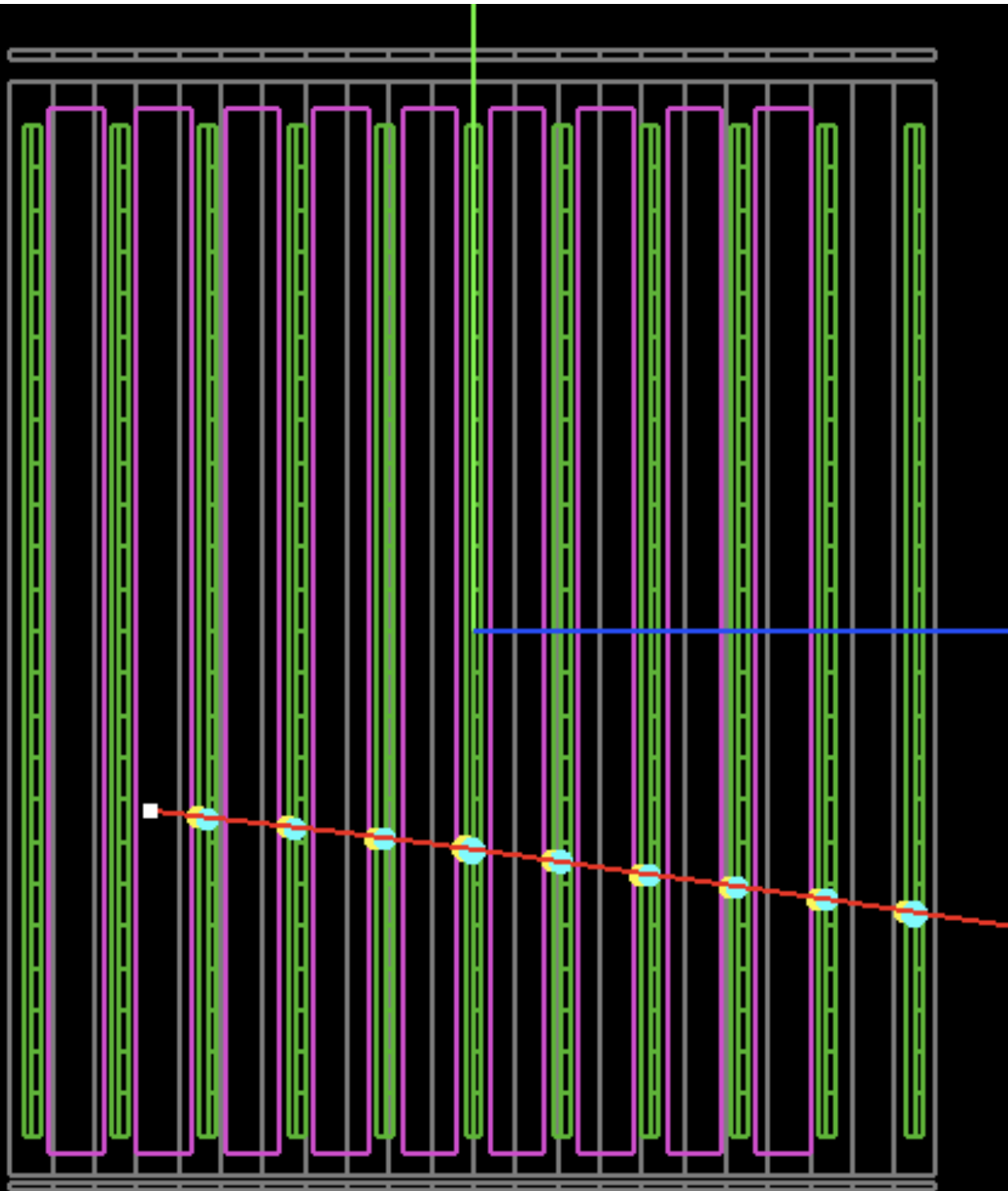
=== hits in YLayer (cyan) ===

Mod:3 Pln:4 Ch:9 Edep:4.182 MeV PID:1000060120 Track:14 pos(mm):{122.4, -143.8, -95.79}
Mod:3 Pln:2 Ch:9 Edep:2.091 MeV PID:13 Track:1 pos(mm):{264.5, -147.7, -315}
Mod:3 Pln:3 Ch:9 Edep:2.378 MeV PID:13 Track:1 pos(mm):{295.2, -135.7, -210}
Mod:3 Pln:5 Ch:9 Edep:2.171 MeV PID:13 Track:1 pos(mm):{352.9, -108.5, 0}
Mod:3 Pln:6 Ch:10 Edep:1.902 MeV PID:13 Track:1 pos(mm):{381.3, -96.16, 105}
Mod:3 Pln:7 Ch:10 Edep:2.525 MeV PID:13 Track:1 pos(mm):{408.4, -85.45, 210}
Mod:3 Pln:8 Ch:10 Edep:2.254 MeV PID:13 Track:1 pos(mm):{436.5, -73.73, 315}
Mod:3 Pln:9 Ch:10 Edep:1.849 MeV PID:13 Track:1 pos(mm):{465.1, -62.25, 420}
Mod:3 Pln:10 Ch:10 Edep:2.312 MeV PID:13 Track:1 pos(mm):{494.2, -52.07, 525}
Mod:3 Pln:9 Ch:11 Edep:652.3 keV PID:11 Track:158 pos(mm):{492.2, -35.08, 424.8}

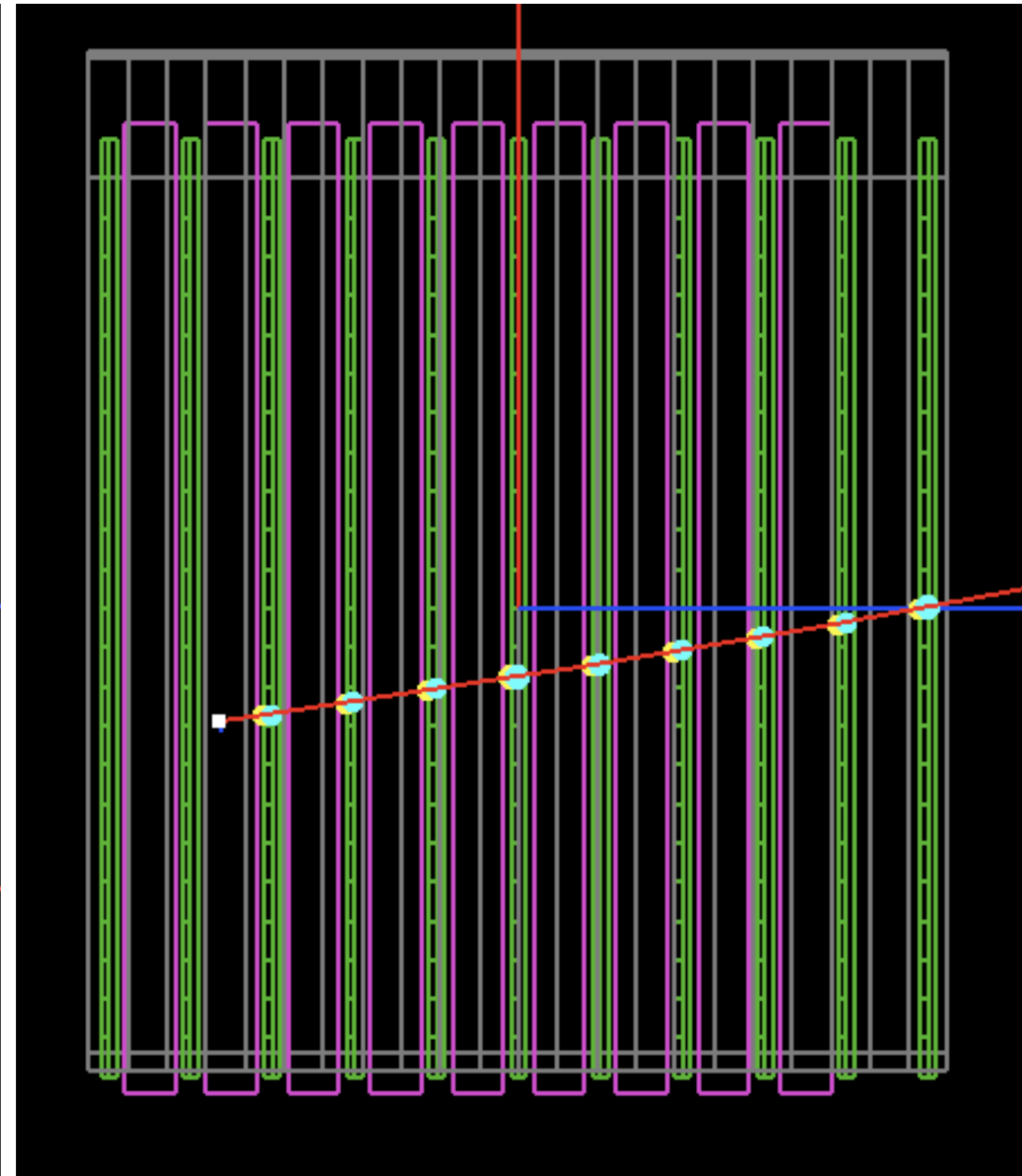
// neutrino 14
// muon 13
// P 2212
// N 2112
// Pi0 111
// Pi+ 211
// Pi- -211
// Eta0 221
// K+ 321
// Lambda 3122
// omega 223



side view



top view



=== Neutrino Information from Jnubeam ===

ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 1

Energy: 3.465 Direction: {-0.001991,-0.06507,0.9979}

Vertex (cm): {-14.43, -21.35, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum:470 -385 3281

Kinetic Energy: 3233

Particle: 2212 Index: 3 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:-428.7 201.8 3.892

Kinetic Energy: 112.9

==== Track with Parent ID = 0 (means primary particle) ===

Track: 2 PID: proton(2212) Init Mom: {-428.7, 201.8, 3.892} [MeV]

Track: 1 PID: mu-(13) Init Mom: {470, -385, 3281} [MeV]

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

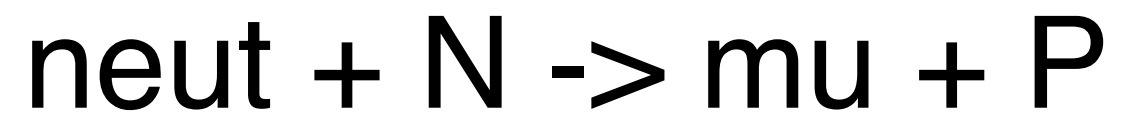
=== hits in XLayer (yellow) ===

Mod:3 Plane:2 Ch:9 Edep:1.861 MeV PID:13 Track:1 pos(mm):{-136, -220.2, -325}
Mod:3 Plane:3 Ch:9 Edep:1.528 MeV PID:13 Track:1 pos(mm):{-120.1, -232, -220}
Mod:3 Plane:4 Ch:9 Edep:2.403 MeV PID:13 Track:1 pos(mm):{-104.1, -244.3, -115}
Mod:3 Plane:5 Ch:10 Edep:3.557 MeV PID:13 Track:1 pos(mm):{-87.93, -258, -10}
Mod:3 Plane:6 Ch:10 Edep:1.683 MeV PID:13 Track:1 pos(mm):{-72.08, -272.6, 95}
Mod:3 Plane:7 Ch:10 Edep:1.808 MeV PID:13 Track:1 pos(mm):{-54.88, -287.5, 200}
Mod:3 Plane:8 Ch:11 Edep:1.583 MeV PID:13 Track:1 pos(mm):{-37.19, -302, 305}
Mod:3 Plane:9 Ch:11 Edep:2.185 MeV PID:13 Track:1 pos(mm):{-19.12, -317, 410}
Mod:3 Plane:10 Ch:12 Edep:2.341 MeV PID:13 Track:1 pos(mm):{0.3781, -332.5, 515}

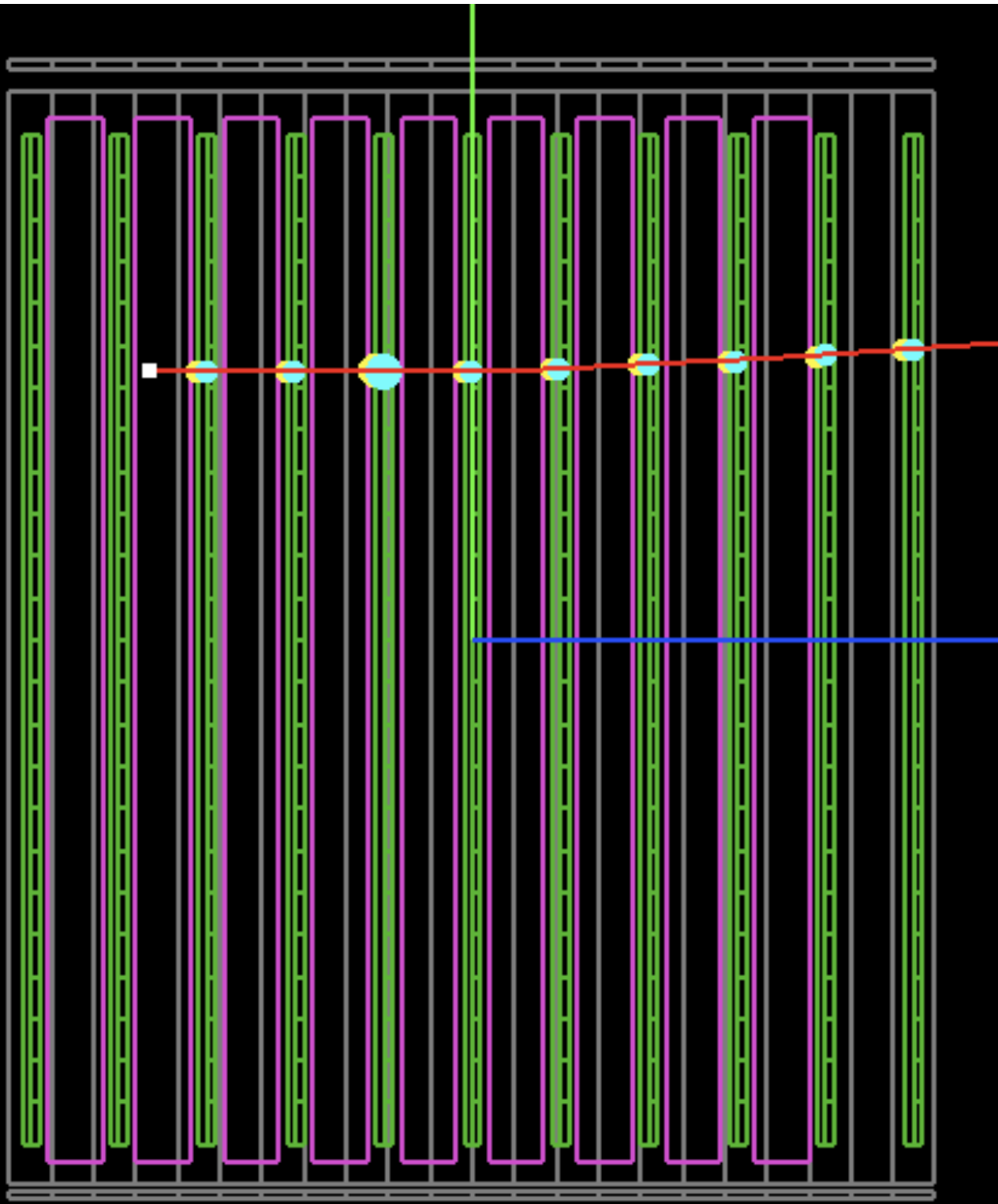
=== hits in YLayer (cyan) ===

Mod:3 Pln:2 Ch:7 Edep:1.659 MeV PID:13 Track:1 pos(mm):{-134.5, -221.3, -315}
Mod:3 Pln:3 Ch:7 Edep:1.67 MeV PID:13 Track:1 pos(mm):{-118.5, -233.1, -210}
Mod:3 Pln:4 Ch:7 Edep:1.802 MeV PID:13 Track:1 pos(mm):{-102.6, -245.6, -105}
Mod:3 Pln:5 Ch:6 Edep:3.517 MeV PID:13 Track:1 pos(mm):{-86.46, -259.3, 0}
Mod:3 Pln:6 Ch:6 Edep:2.946 MeV PID:13 Track:1 pos(mm):{-70.45, -274.1, 105}
Mod:3 Pln:7 Ch:6 Edep:1.809 MeV PID:13 Track:1 pos(mm):{-53.13, -288.9, 210}
Mod:3 Pln:8 Ch:5 Edep:1.56 MeV PID:13 Track:1 pos(mm):{-35.55, -303.4, 315}
Mod:3 Pln:9 Ch:5 Edep:2.157 MeV PID:13 Track:1 pos(mm):{-17.26, -318.5, 420}
Mod:3 Pln:10 Ch:5 Edep:4.086 MeV PID:13 Track:1 pos(mm):{2.239, -333.9, 525}

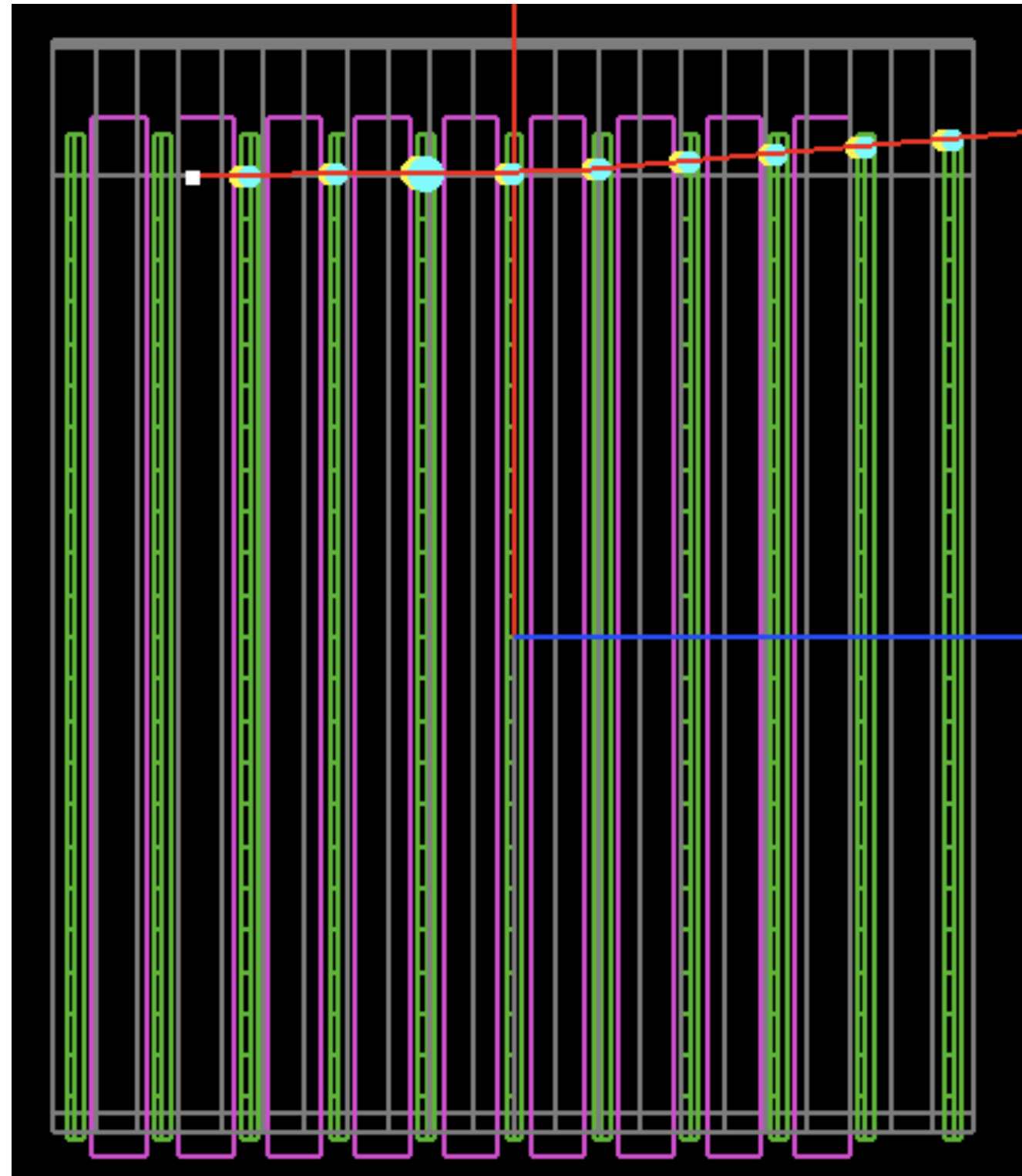
// neutrino 14
// muon 13
// P 2212
// N 2112
// Pi0 111
// Pi+ 211
// Pi- -211
// Eta0 221
// K+ 321
// Lambda 3122
// omega 223



side view



top view



=== Neutrino Information from Jnubeam ===

ParentID: 11 Neut Production Mode: 12 Neut interaction Mode: 1

Energy: 1.929 Direction: {0.001972,-0.06221,0.9981}

Vertex (cm): {55.05, 32.15, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum: 15.57 11.97 1869

Kinetic Energy: 1766

Particle: 2212 Index: 3 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum: -10.88 -276.2 -15.7

Kinetic Energy: 40

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

==== Track with Parent ID = 0 (means primary particle) ===

Track: 2 PID: proton(2212) Init Mom: {-10.88, -276.2, -15.7} [MeV]

Track: 1 PID: mu-(13) Init Mom: {15.57, 11.97, 1869} [MeV]

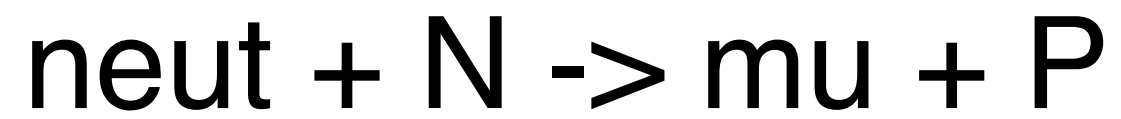
=== hits in XLayer (yellow) ===

Mod:3	Plane:2	Ch:23	Edep:1.603 MeV	PID:13	Track:1	pos(mm):{551.1, 321.6, -325}
Mod:3	Plane:3	Ch:23	Edep:2.333 MeV	PID:13	Track:1	pos(mm):{553.7, 321.2, -220}
Mod:3	Plane:4	Ch:23	Edep:7.363 MeV	PID:13	Track:1	pos(mm):{554.3, 320.6, -115}
Mod:3	Plane:5	Ch:23	Edep:1.755 MeV	PID:13	Track:1	pos(mm):{555.3, 320.8, -10}
Mod:3	Plane:6	Ch:23	Edep:1.845 MeV	PID:13	Track:1	pos(mm):{559, 322.3, 95}
Mod:3	Plane:7	Ch:23	Edep:2.014 MeV	PID:13	Track:1	pos(mm):{568, 328, 200}
Mod:3	Plane:8	Ch:23	Edep:1.533 MeV	PID:13	Track:1	pos(mm):{577.4, 332.7, 305}
Mod:3	Plane:9	Ch:23	Edep:1.726 MeV	PID:13	Track:1	pos(mm):{586.1, 338.9, 410}
Mod:3	Plane:10	Ch:23	Edep:1.688 MeV	PID:13	Track:1	pos(mm):{594.8, 345.8, 515}

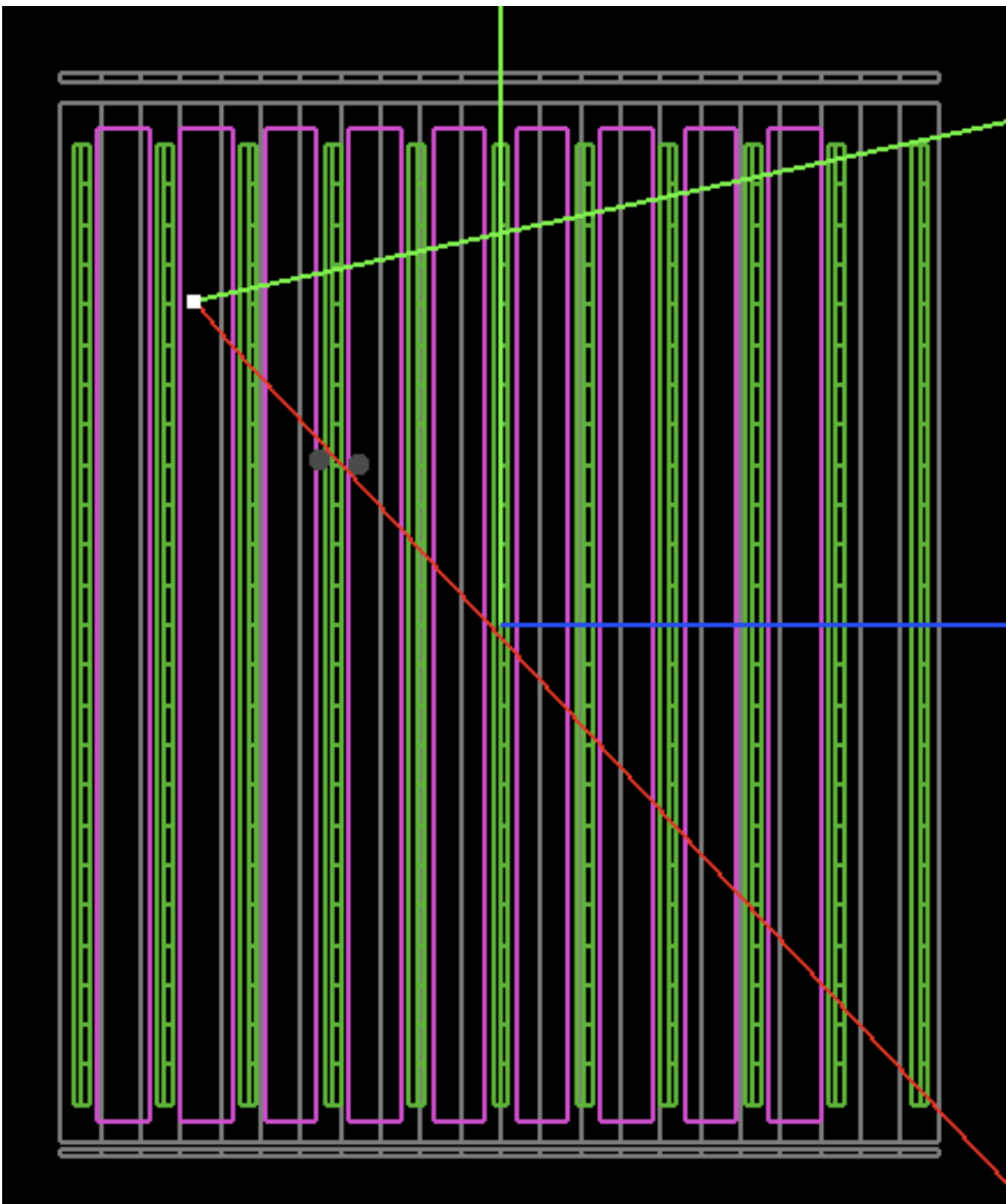
=== hits in YLayer (cyan) ===

Mod:3	Pln:2	Ch:18	Edep:1.548 MeV	PID:13	Track:1	pos(mm):{551.4, 321.5, -315}
Mod:3	Pln:3	Ch:18	Edep:1.997 MeV	PID:13	Track:1	pos(mm):{553.8, 321.2, -210}
Mod:3	Pln:4	Ch:18	Edep:8.271 MeV	PID:13	Track:1	pos(mm):{554.4, 320.6, -105}
Mod:3	Pln:5	Ch:18	Edep:1.791 MeV	PID:13	Track:1	pos(mm):{555.6, 320.8, 0}
Mod:3	Pln:6	Ch:18	Edep:1.805 MeV	PID:13	Track:1	pos(mm):{559.9, 322.8, 105}
Mod:3	Pln:7	Ch:18	Edep:1.866 MeV	PID:13	Track:1	pos(mm):{568.9, 328.5, 210}
Mod:3	Pln:8	Ch:18	Edep:1.751 MeV	PID:13	Track:1	pos(mm):{578.2, 333.3, 315}
Mod:3	Pln:9	Ch:18	Edep:1.701 MeV	PID:13	Track:1	pos(mm):{586.9, 339.6, 420}
Mod:3	Pln:10	Ch:18	Edep:1.866 MeV	PID:13	Track:1	pos(mm):{595.6, 346.4, 525}

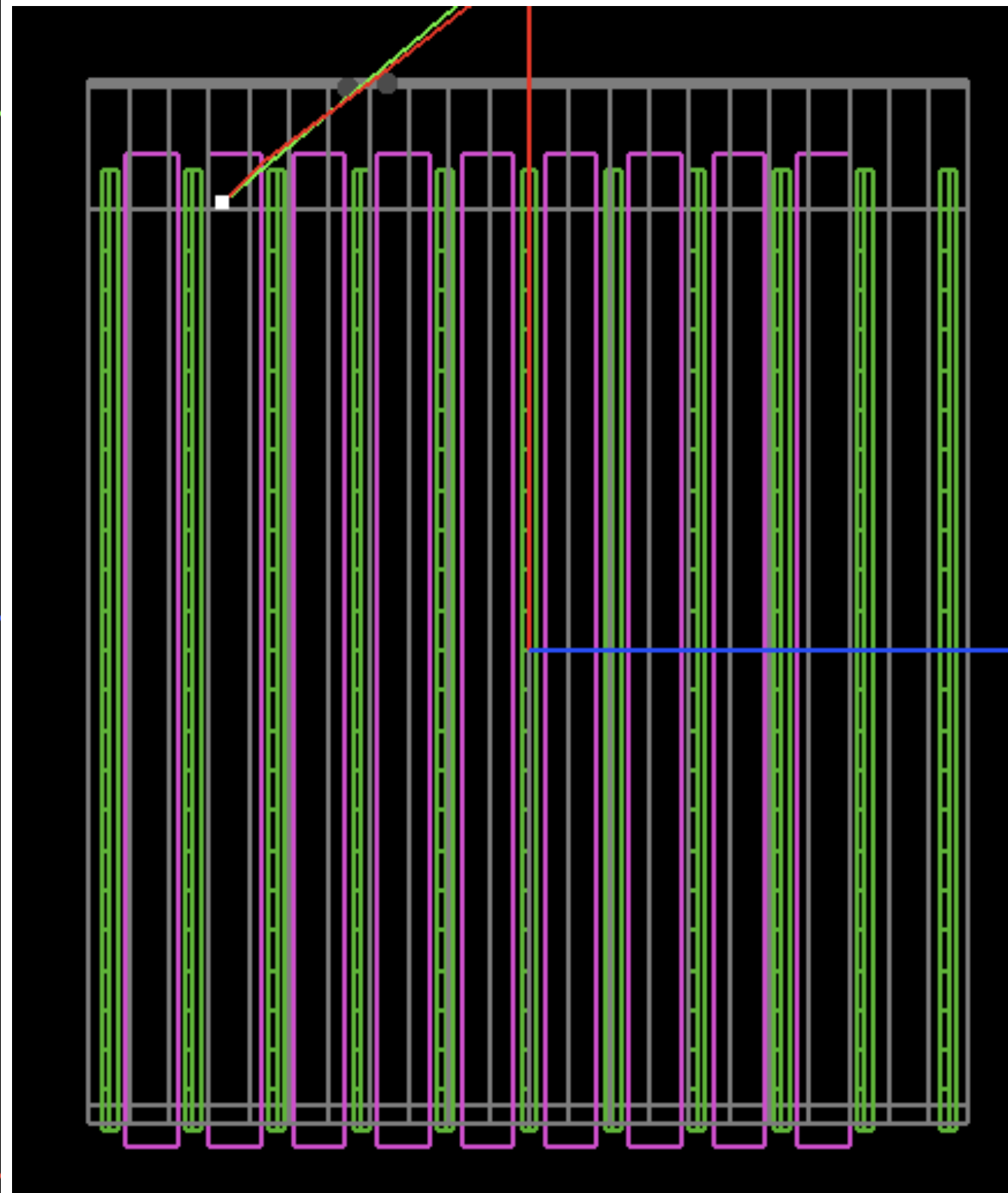
// neutrino 14
// muon 13
// P 2212
// N 2112
// Pi0 111
// Pi+ 211
// Pi- -211
// Eta0 221
// K+ 321
// Lambda 3122
// omega 223



side view



top view



=== Neutrino Information from Jnubeam ===

ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 1

Energy: 0.6654 Direction: {-0.004112,-0.07239,0.9974}

Vertex (cm): {56.03, 40.52, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum: 275.5 -310.6 257.8

Kinetic Energy: 394.3

Particle: 2212 Index: 4 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum: -261.2 183.4 38.2

Kinetic Energy: 53.54

Particle: 2212 Index: 5 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum: 117.1 253.5 2.983

Kinetic Energy: 40.68

Particle: 2112 Index: 6 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum: 253.2 66.33 301.2

Kinetic Energy: 81.23

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

=== hits in veto (red) ===

Mod:3 Pln:12 Ch:6 Edep:2.072 MeV PID:13 track:1 pos(mm):704 208.6 -225}

Mod:3 Pln:12 Ch:7 Edep:1.964 MeV PID:13 track:1 pos(mm):708.8 201.6 -175}

==== Track with Parent ID = 0 (means primary particle) ===

Track: 4 PID: neutron(2112) Init Mom: {253.2, 66.33, 301.2} [MeV]

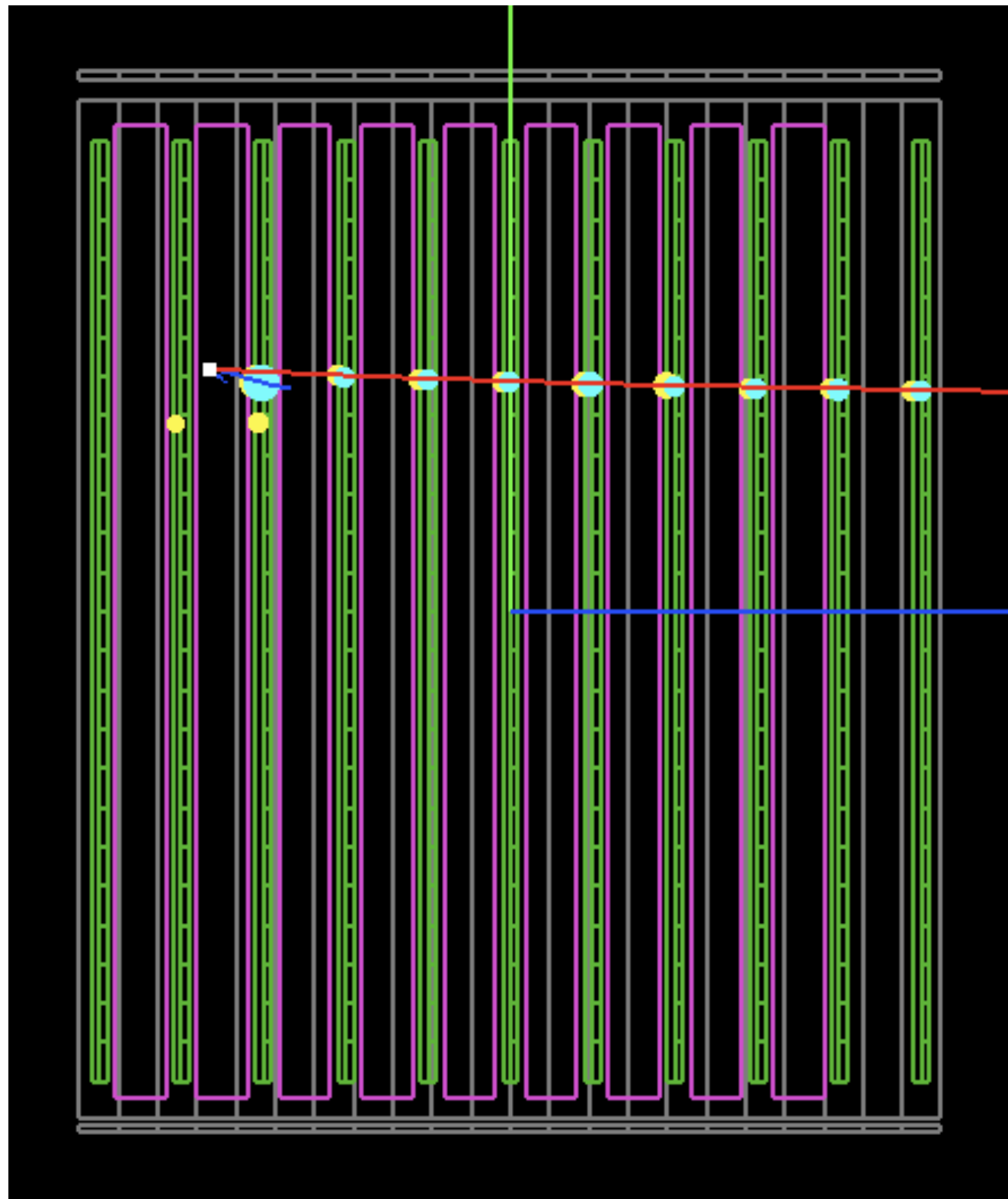
Track: 3 PID: proton(2212) Init Mom: {117.1, 253.5, 2.983} [MeV]

Track: 2 PID: proton(2212) Init Mom: {-261.2, 183.4, 38.2} [MeV]

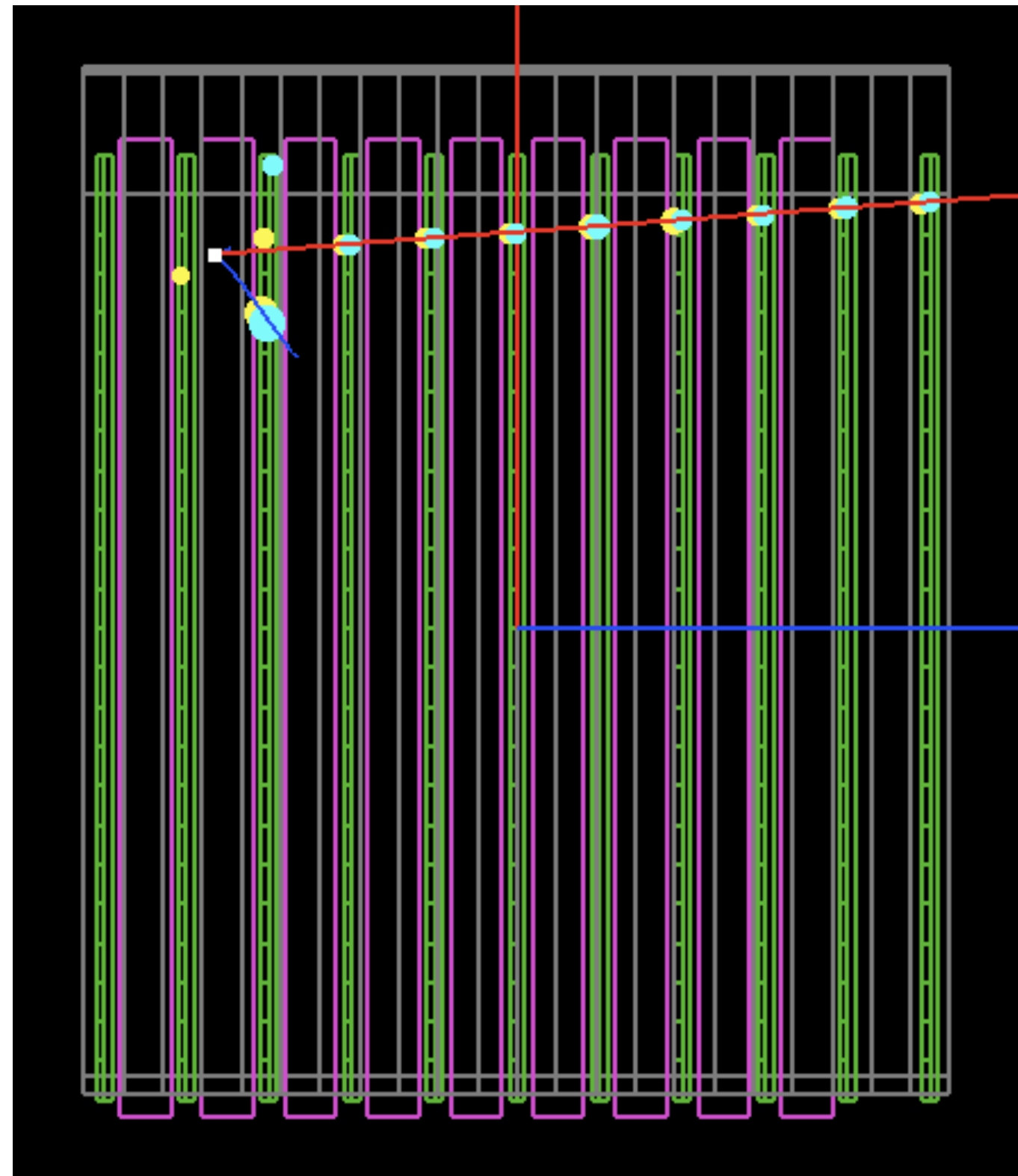
Track: 1 PID: mu-(13) Init Mom: {275.5, -310.6, 257.8} [MeV]

$$\text{neut} + \text{P} = \mu + \text{P} + \text{Pi}^+$$

side view



top view



=== Neutrino Information from Jnubeam ===

ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 11

Energy: 7.468 Direction: {0.001681,-0.06252,0.998}

Vertex (cm): {47.49, 30.93, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum: 519.7 -333.4 6911

Kinetic Energy: 6833

Particle: 2212 Index: 3 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum: -621.9 -95.83 565.6

Kinetic Energy: 325.1

Particle: 211 Index: 4 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum: 38.44 -105.7 130.2

Kinetic Energy: 81.97

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

==== Track with Parent ID = 0 (means primary particle) ===

Track: 3 PID: pi+(211) Init Mom: {38.44, -105.7, 130.2} [MeV]

Track: 2 PID: proton(2212) Init Mom: {-621.9, -95.83, 565.6} [MeV]

Track: 1 PID: mu-(13) Init Mom: {519.7, -333.4, 6911} [MeV]

=== hits in XLayer (yellow) ===

Mod:3 Plane:1 Ch:20 Edep:1.482 MeV PID:11 Track:86 pos(mm):{447.7, 242, -425.6}
Mod:3 Plane:2 Ch:21 Edep:2.203 MeV PID:11 Track:148 pos(mm):{497.4, 242.1, -320.5}
Mod:3 Plane:2 Ch:20 Edep:1.969 MeV PID:2212 Track:2 pos(mm):{403, 294.6, -325}
Mod:3 Plane:2 Ch:19 Edep:7.9 MeV PID:2212 Track:2 pos(mm):{400, 294.1, -322.8}
Mod:3 Plane:3 Ch:21 Edep:1.886 MeV PID:13 Track:1 pos(mm):{487.4, 301.9, -220}
Mod:3 Plane:4 Ch:21 Edep:2.099 MeV PID:13 Track:1 pos(mm):{495.1, 297.9, -115}
Mod:3 Plane:5 Ch:22 Edep:2.423 MeV PID:13 Track:1 pos(mm):{502.5, 294.6, -10}
Mod:3 Plane:6 Ch:22 Edep:3.551 MeV PID:13 Track:1 pos(mm):{509.9, 291.4, 95}
Mod:3 Plane:7 Ch:22 Edep:4.974 MeV PID:13 Track:1 pos(mm):{518, 288.9, 200}
Mod:3 Plane:8 Ch:22 Edep:2.138 MeV PID:13 Track:1 pos(mm):{525.8, 287, 305}
Mod:3 Plane:9 Ch:22 Edep:1.661 MeV PID:13 Track:1 pos(mm):{533.4, 285, 410}
Mod:3 Plane:10 Ch:22 Edep:1.884 MeV PID:13 Track:1 pos(mm):{541, 283, 515}

=== hits in YLayer (cyan) ===

Mod:3 Pln:2 Ch:18 Edep:2.485 MeV PID:11 Track:227 pos(mm):{589.5, 300.6, -308.6}
Mod:3 Pln:2 Ch:17 Edep:9.676 MeV PID:2212 Track:2 pos(mm):{389.3, 291.9, -315}
Mod:3 Pln:3 Ch:18 Edep:1.77 MeV PID:13 Track:1 pos(mm):{488.1, 301.5, -210}
Mod:3 Pln:4 Ch:17 Edep:1.635 MeV PID:13 Track:1 pos(mm):{495.8, 297.6, -105}
Mod:3 Pln:5 Ch:17 Edep:2.122 MeV PID:13 Track:1 pos(mm):{503.1, 294.3, 0}
Mod:3 Pln:6 Ch:17 Edep:4.371 MeV PID:13 Track:1 pos(mm):{510.7, 291.2, 105}
Mod:3 Pln:7 Ch:17 Edep:2.23 MeV PID:13 Track:1 pos(mm):{518.7, 288.7, 210}
Mod:3 Pln:8 Ch:17 Edep:1.571 MeV PID:13 Track:1 pos(mm):{526.6, 286.8, 315}
Mod:3 Pln:9 Ch:17 Edep:2.542 MeV PID:13 Track:1 pos(mm):{534.2, 284.8, 420}
Mod:3 Pln:10 Ch:17 Edep:2.074 MeV PID:13 Track:1 pos(mm):{541.7, 282.9, 525}

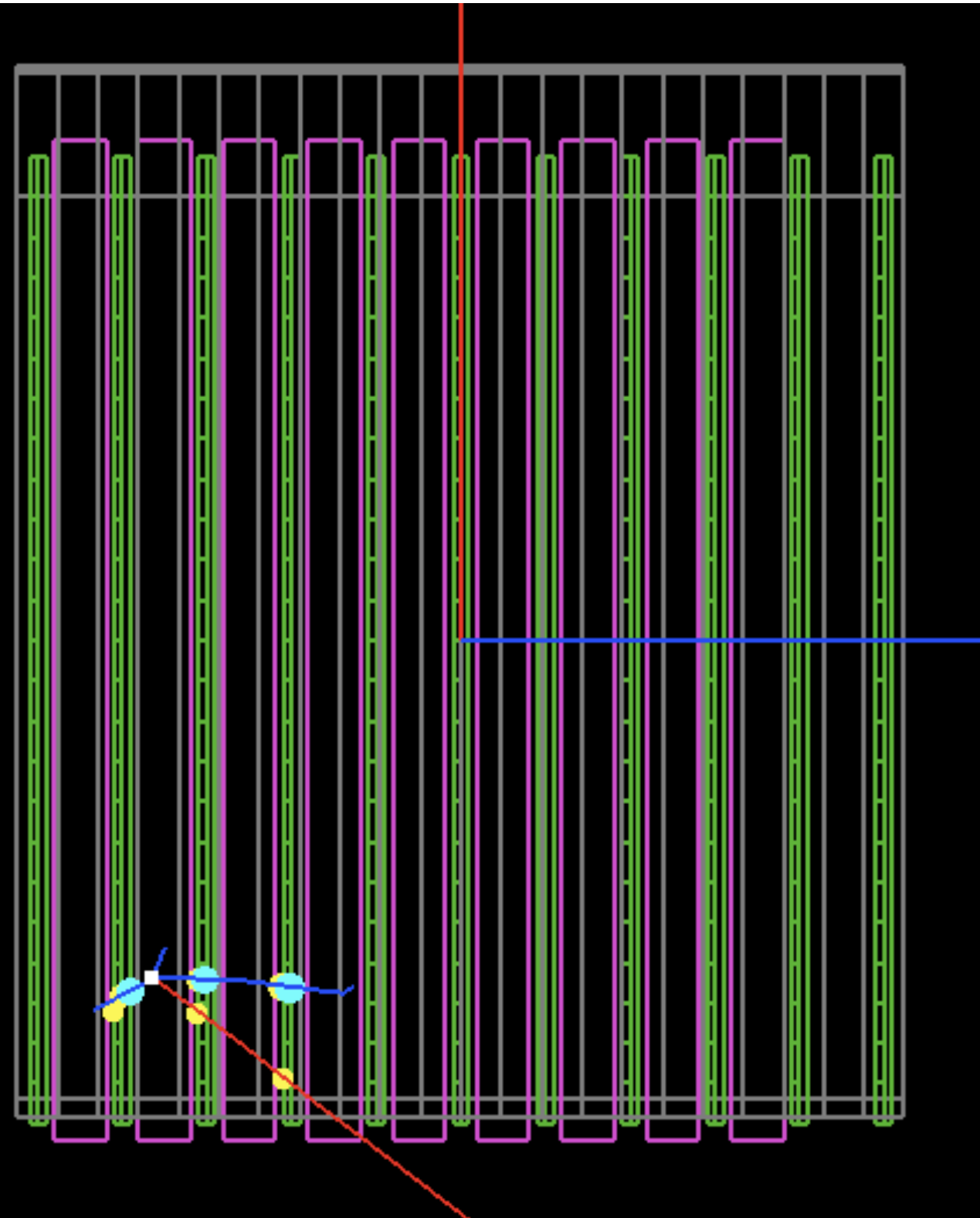
=== hits in veto (red) ===

// neutrino 14
// muon 13
// P 2212
// N 2112
// Pi0 111
// Pi+ 211
// Pi- -211
// Eta0 221
// K+ 321
// Lambda 3122
// omega 223

$$\text{neut} + \text{P} = \mu + \text{P} + \text{Pi}^+$$

side view

top view



=== Neutrino Information from Jnubeam ===

ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 11

Energy: 2.566 Direction: {-0.003322,-0.06539,0.9979}

Vertex (cm): {-41.87, -45.86, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum:-894.2 -226.5 1235

Kinetic Energy: 1439

Particle: 211 Index: 5 Parent Index: 4

Tracking Flag: 1 Interaction Code: 0

Momentum:-86.15 -110.4 -143.8

Kinetic Energy: 104.9

Particle: 2212 Index: 6 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum:577 -0.56 225.9

Kinetic Energy: 186.1

Particle: 2212 Index: 7 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum:-6.962 -155.9 1023

Kinetic Energy: 458.3

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

==== Track with Parent ID = 0 (means primary particle) ===

Track: 4 PID: proton(2212) Init Mom: {-6.962, -155.9, 1023} [MeV]

Track: 3 PID: proton(2212) Init Mom: {577, -0.56, 225.9} [MeV]

Track: 2 PID: pi+(211) Init Mom: {-86.15, -110.4, -143.8} [MeV]

Track: 1 PID: mu-(13) Init Mom: {-894.2, -226.5, 1235} [MeV]

=== hits in XLayer (yellow) ===

Mod:3 Plane:2 Ch:3 Edep:3.091 MeV PID:2212 Track:4 pos(mm):{-420.1, -467, -325}
Mod:3 Plane:3 Ch:3 Edep:4.804 MeV PID:2212 Track:4 pos(mm):{-428.7, -485.7, -220}
Mod:3 Plane:1 Ch:3 Edep:3.421 MeV PID:211 Track:2 pos(mm):{-439.7, -481.7, -420}
Mod:3 Plane:1 Ch:2 Edep:2.488 MeV PID:-11 Track:17 pos(mm):{-459, -501.8, -430}
Mod:3 Plane:2 Ch:2 Edep:2.362 MeV PID:13 Track:1 pos(mm):{-461, -469.7, -325}
Mod:3 Plane:3 Ch:1 Edep:2.355 MeV PID:13 Track:1 pos(mm):{-542.6, -493, -220}

=== hits in YLayer (cyan) ===

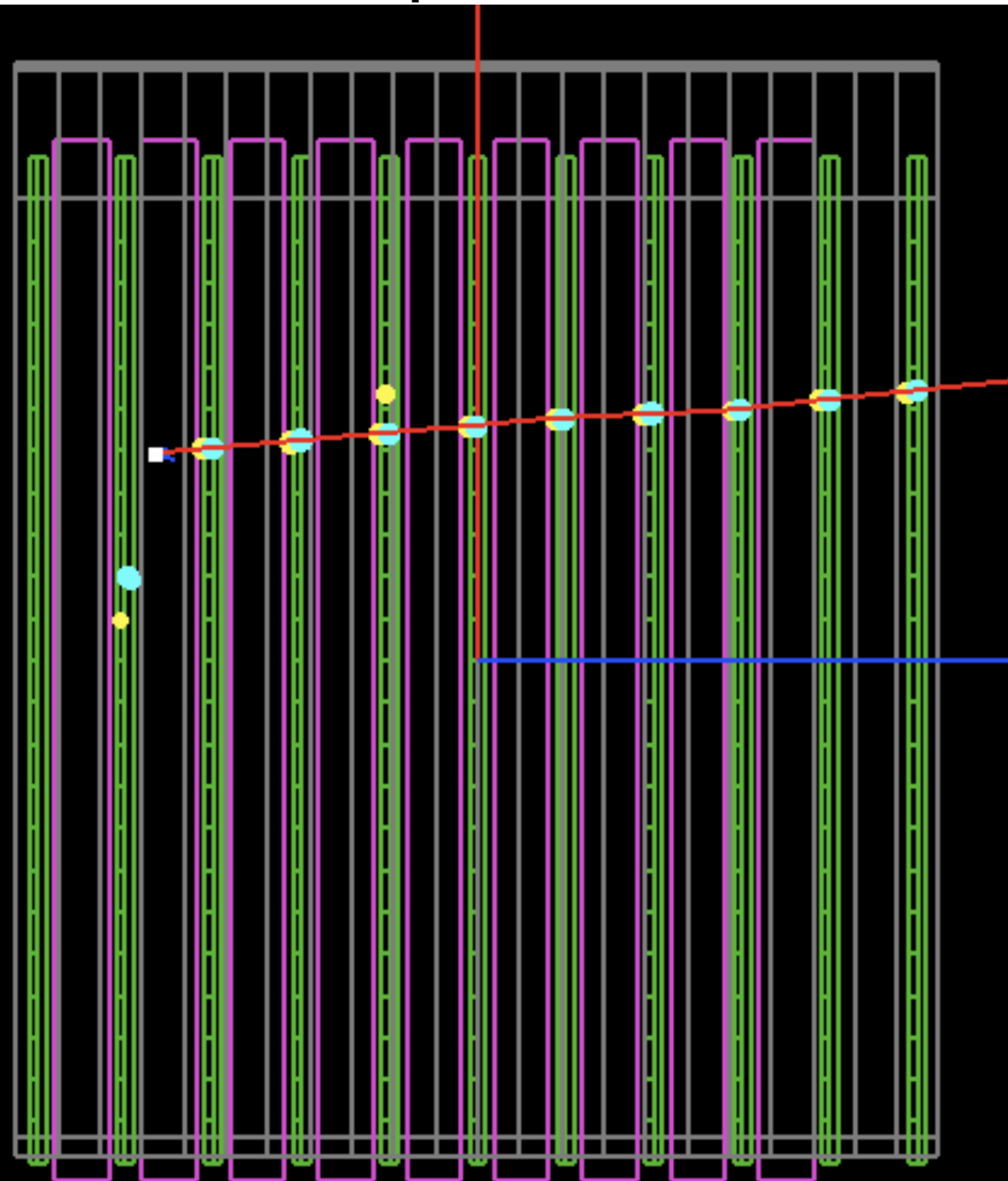
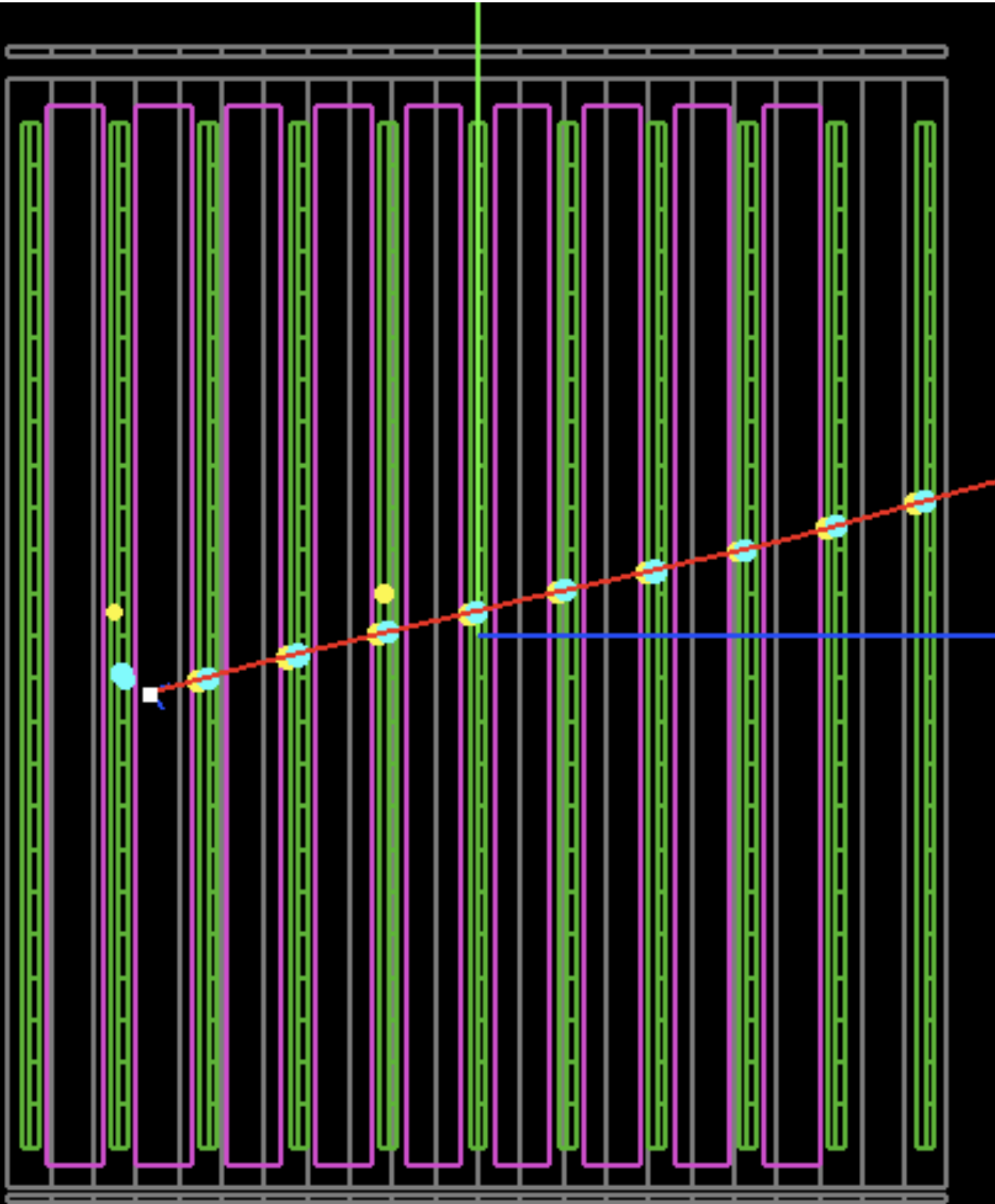
Mod:3 Pln:2 Ch:2 Edep:5.468 MeV PID:2212 Track:4 pos(mm):{-420.5, -468.8, -315}
Mod:3 Pln:3 Ch:2 Edep:6.104 MeV PID:2212 Track:4 pos(mm):{-430, -487.4, -210}
Mod:3 Pln:1 Ch:2 Edep:5.18 MeV PID:211 Track:2 pos(mm):{-434.4, -476.6, -410}

// neutrino 14
// muon 13
// P 2212
// N 2112
// Pi0 111
// Pi+ 211
// Pi- -211
// Eta0 221
// K+ 321
// Lambda 3122
// omega 223

$$\text{neut} + \text{P} = \mu + \text{P} + \text{Pi}^+$$

side view

top view



=== Neutrino Information from Jnubeam ===

ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 11

Energy: 2.496 Direction: {-0.000493,-0.06008,0.9982}

Vertex (cm): {24.78, -6.675, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum:149.1 407.6 1491

Kinetic Energy: 1450

Particle: 2212 Index: 3 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:-230.8 198 446.2

Kinetic Energy: 144.3

Particle: 211 Index: 4 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:107.9 -647.9 449.4

Kinetic Energy: 668.4

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

==== Track with Parent ID = 0 (means primary particle) ===

Track: 3 PID: pi+(211) Init Mom: {107.9, -647.9, 449.4} [MeV]

Track: 2 PID: proton(2212) Init Mom: {-230.8, 198, 446.2} [MeV]

Track: 1 PID: mu-(13) Init Mom: {149.1, 407.6, 1491} [MeV]

=== hits in XLayer (yellow) ===

Mod:3 Plane:1 Ch:12 Edep:441 keV PID:11 Track:217 pos(mm):{48.28, 29.46, -424.4}
Mod:3 Plane:2 Ch:17 Edep:1.781 MeV PID:13 Track:1 pos(mm):{253, -50.92, -325}
Mod:3 Plane:3 Ch:17 Edep:3.47 MeV PID:13 Track:1 pos(mm):{262, -23.38, -220}
Mod:3 Plane:4 Ch:17 Edep:2.072 MeV PID:13 Track:1 pos(mm):{271.2, 2.168, -115}
Mod:3 Plane:5 Ch:17 Edep:1.824 MeV PID:13 Track:1 pos(mm):{279.9, 26.88, -10}
Mod:3 Plane:6 Ch:17 Edep:1.731 MeV PID:13 Track:1 pos(mm):{288.9, 51.67, 95}
Mod:3 Plane:7 Ch:17 Edep:1.861 MeV PID:13 Track:1 pos(mm):{294.1, 75.4, 200}
Mod:3 Plane:8 Ch:17 Edep:619.9 keV PID:13 Track:1 pos(mm):{299.6, 99.34, 305}
Mod:3 Plane:8 Ch:18 Edep:1.043 MeV PID:13 Track:1 pos(mm):{300, 100.2, 308.9}
Mod:3 Plane:9 Ch:18 Edep:2.092 MeV PID:13 Track:1 pos(mm):{310.9, 125.9, 410}
Mod:3 Plane:10 Ch:18 Edep:2.119 MeV PID:13 Track:1 pos(mm):{321.4, 155.1, 515}
Mod:3 Plane:4 Ch:18 Edep:1.482 MeV PID:11 Track:573 pos(mm):{320, 51.48, -107.1}

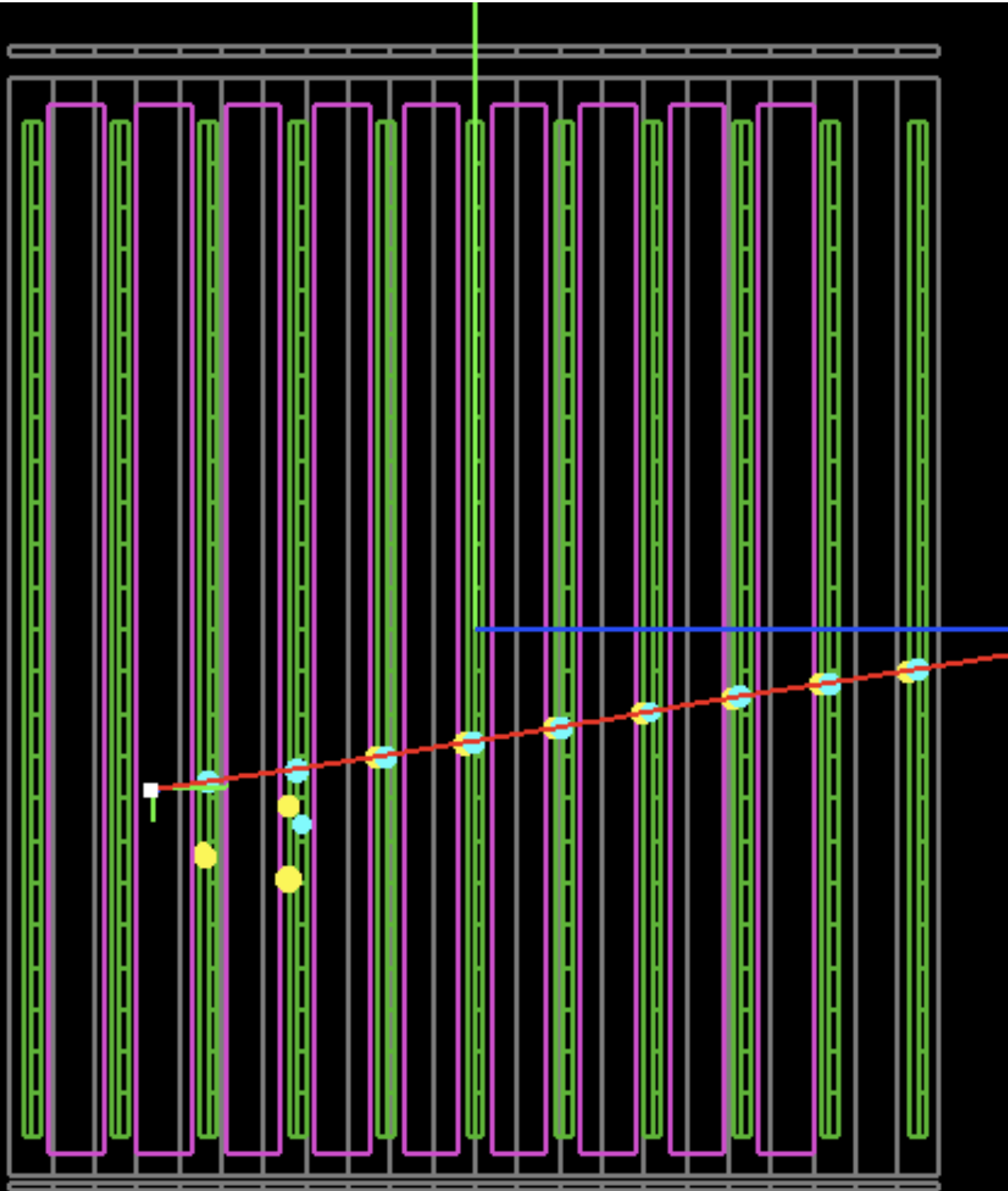
=== hits in YLayer (cyan) ===

Mod:3 Pln:1 Ch:11 Edep:2.055 MeV PID:11 Track:206 pos(mm):{100.6, -42.57, -416}
Mod:3 Pln:1 Ch:10 Edep:910.5 keV PID:11 Track:206 pos(mm):{96.35, -50, -411.5}
Mod:3 Pln:2 Ch:11 Edep:1.661 MeV PID:13 Track:1 pos(mm):{253.8, -48.17, -315}
Mod:3 Pln:3 Ch:11 Edep:2.657 MeV PID:13 Track:1 pos(mm):{262.8, -20.93, -210}
Mod:3 Pln:4 Ch:12 Edep:1.825 MeV PID:13 Track:1 pos(mm):{272, 4.523, -105}
Mod:3 Pln:5 Ch:12 Edep:1.75 MeV PID:13 Track:1 pos(mm):{280.8, 29.23, 0}
Mod:3 Pln:6 Ch:13 Edep:1.907 MeV PID:13 Track:1 pos(mm):{289.5, 53.86, 105}
Mod:3 Pln:7 Ch:13 Edep:2.657 MeV PID:13 Track:1 pos(mm):{294.4, 77.71, 210}
Mod:3 Pln:8 Ch:14 Edep:1.622 MeV PID:13 Track:1 pos(mm):{300.6, 101.6, 315}
Mod:3 Pln:9 Ch:14 Edep:1.783 MeV PID:13 Track:1 pos(mm):{311.9, 128.7, 420}
Mod:3 Pln:10 Ch:15 Edep:1.98 MeV PID:13 Track:1 pos(mm):{322.4, 157.9, 525}

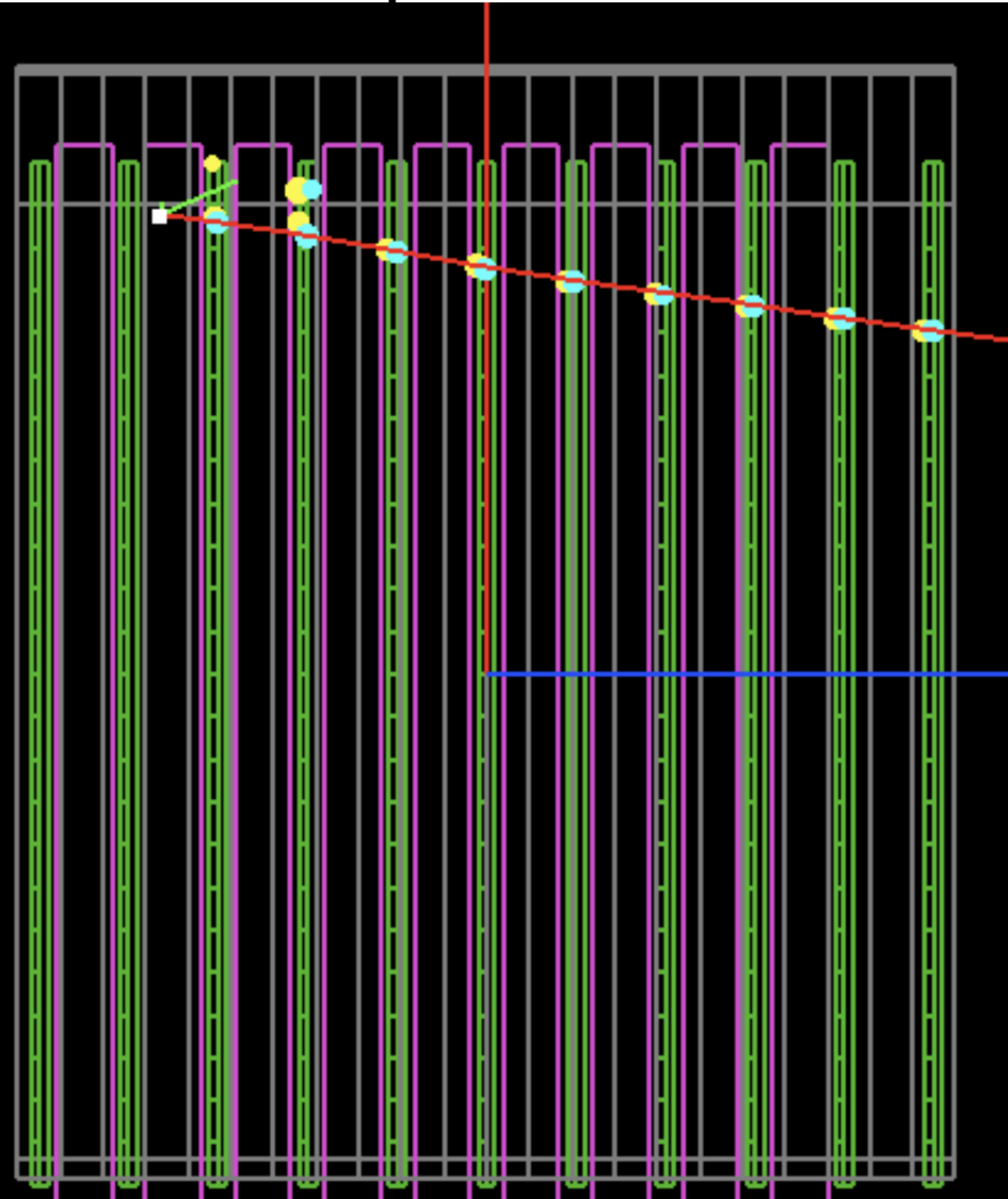
// neutrino 14
// muon 13
// P 2212
// N 2112
// Pi0 111
// Pi+ 211
// Pi- -211
// Eta0 221
// K+ 321
// Lambda 3122
// omega 223

$$\text{neut} + \text{N} = \mu + \text{N} + \text{Pi}^+$$

side view



top view



=== Neutrino Information from Jnubeam ===

ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 13

Energy: 3.145 Direction: {0.003717,-0.06271,0.998}

Vertex (cm): {53.91, -18.93, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum:-224.5 214.7 1762

Kinetic Energy: 1687

Particle: 2112 Index: 3 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:491.9 38.67 1112

Kinetic Energy: 597.5

Particle: 111 Index: 8 Parent Index: 6

Tracking Flag: 1 Interaction Code: 0

Momentum:72.56 13.04 -60.56

Kinetic Energy: 30.31

==== Track with Parent ID = 0 (means primary particle) ===

Track: 5 PID: proton(2212) Init Mom: {-142.1, -77.77, 357.4} [MeV]

Track: 4 PID: neutron(2112) Init Mom: {98.17, -248.2, -1.553} [MeV]

Track: 3 PID: pi0(111) Init Mom: {72.56, 13.04, -60.56} [MeV]

Track: 2 PID: neutron(2112) Init Mom: {491.9, 38.67, 1112} [MeV]

Track: 1 PID: mu-(13) Init Mom: {-224.5, 214.7, 1762} [MeV]

Particle: 2112 Index: 9 Parent Index: 5

Tracking Flag: 1 Interaction Code: 0

Momentum:98.17 -248.2 -1.553

Kinetic Energy: 37.17

Particle: 2212 Index: 10 Parent Index: 5

Tracking Flag: 1 Interaction Code: 0

Momentum:-142.1 -77.77 357.4

Kinetic Energy: 78.73

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

=== hits in XLayer (yellow) ===

Mod:3 Plane:3 Ch:23 Edep:4.498 MeV PID:11 Track:341 pos(mm):{569.3, -294.8, -218.6}
Mod:3 Plane:3 Ch:22 Edep:1.823 MeV PID:11 Track:418 pos(mm):{530.9, -209.1, -219.2}
Mod:3 Plane:2 Ch:23 Edep:341 keV PID:11 Track:531 pos(mm):{598.9, -260.2, -319.7}
Mod:3 Plane:2 Ch:22 Edep:1.87 MeV PID:11 Track:541 pos(mm):{538, -268.2, -319}
Mod:3 Plane:4 Ch:21 Edep:1.616 MeV PID:13 Track:1 pos(mm):{498, -150.4, -115}
Mod:3 Plane:5 Ch:21 Edep:3.06 MeV PID:13 Track:1 pos(mm):{479.2, -133.7, -10}
Mod:3 Plane:6 Ch:21 Edep:1.881 MeV PID:13 Track:1 pos(mm):{463.1, -116.7, 95}
Mod:3 Plane:7 Ch:20 Edep:1.592 MeV PID:13 Track:1 pos(mm):{448.7, -98.6, 200}
Mod:3 Plane:8 Ch:20 Edep:1.778 MeV PID:13 Track:1 pos(mm):{434.3, -80.76, 305}
Mod:3 Plane:9 Ch:20 Edep:2.245 MeV PID:13 Track:1 pos(mm):{418.8, -64.72, 410}
Mod:3 Plane:10 Ch:20 Edep:1.542 MeV PID:13 Track:1 pos(mm):{404.5, -48.51, 515}

=== hits in YLayer (cyan) ===

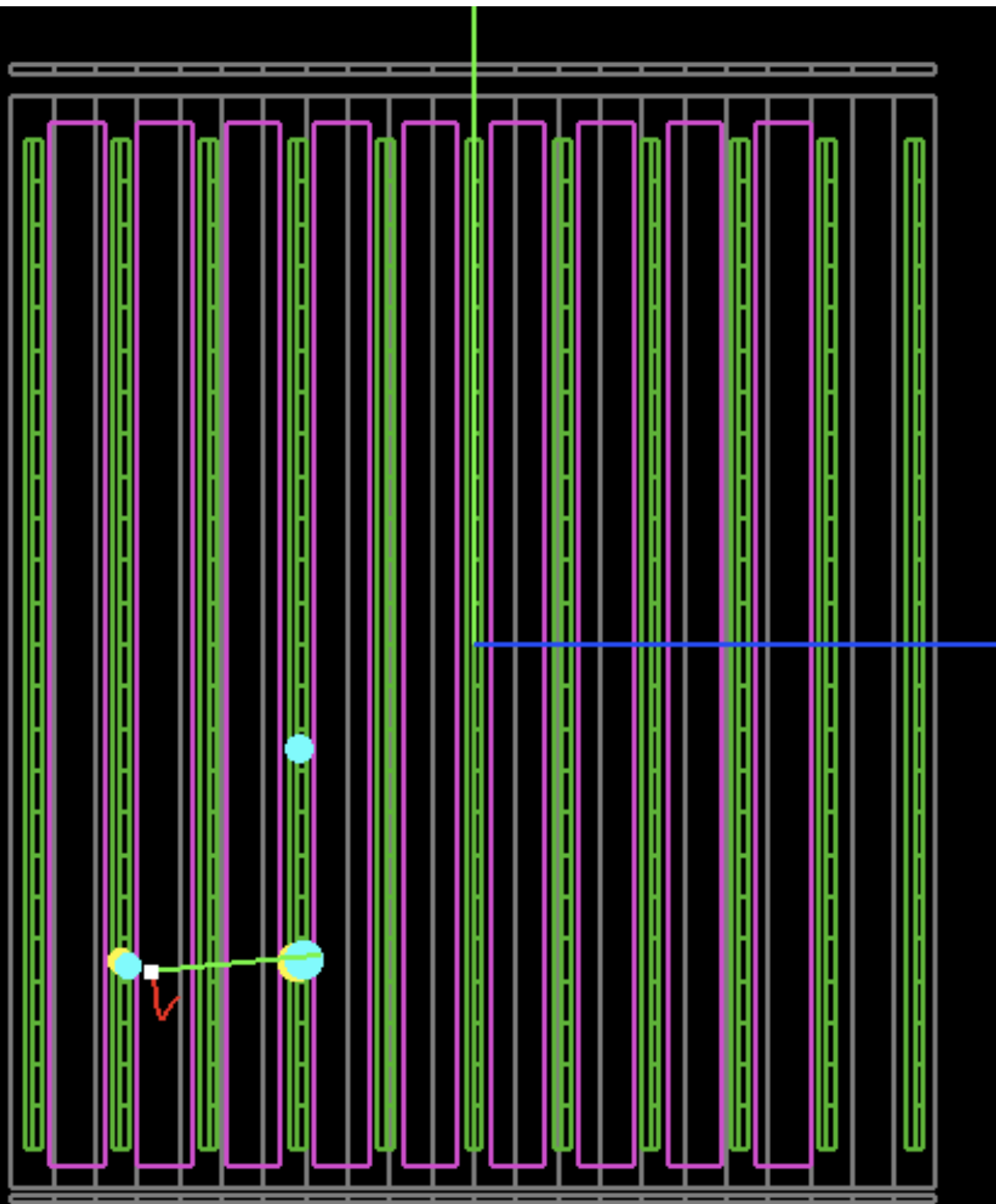
Mod:3 Pln:3 Ch:7 Edep:517.2 keV PID:11 Track:404 pos(mm):{569.9, -229.1, -202.5}
Mod:3 Pln:2 Ch:8 Edep:1.94 MeV PID:13 Track:1 pos(mm):{530, -179.9, -315}
Mod:3 Pln:3 Ch:8 Edep:2.697 MeV PID:13 Track:1 pos(mm):{514.1, -164.9, -210}
Mod:3 Pln:4 Ch:9 Edep:1.704 MeV PID:13 Track:1 pos(mm):{496.2, -148.9, -105}
Mod:3 Pln:5 Ch:9 Edep:2.022 MeV PID:13 Track:1 pos(mm):{477.6, -132.1, 0}
Mod:3 Pln:6 Ch:9 Edep:1.666 MeV PID:13 Track:1 pos(mm):{461.6, -115, 105}
Mod:3 Pln:7 Ch:10 Edep:1.486 MeV PID:13 Track:1 pos(mm):{447.3, -96.83, 210}
Mod:3 Pln:8 Ch:10 Edep:1.949 MeV PID:13 Track:1 pos(mm):{432.8, -79.11, 315}
Mod:3 Pln:9 Ch:10 Edep:2.242 MeV PID:13 Track:1 pos(mm):{417.5, -63.18, 420}
Mod:3 Pln:10 Ch:11 Edep:2.191 MeV PID:13 Track:1 pos(mm):{403.1, -46.97, 525}

=== hits in veto (red) ===

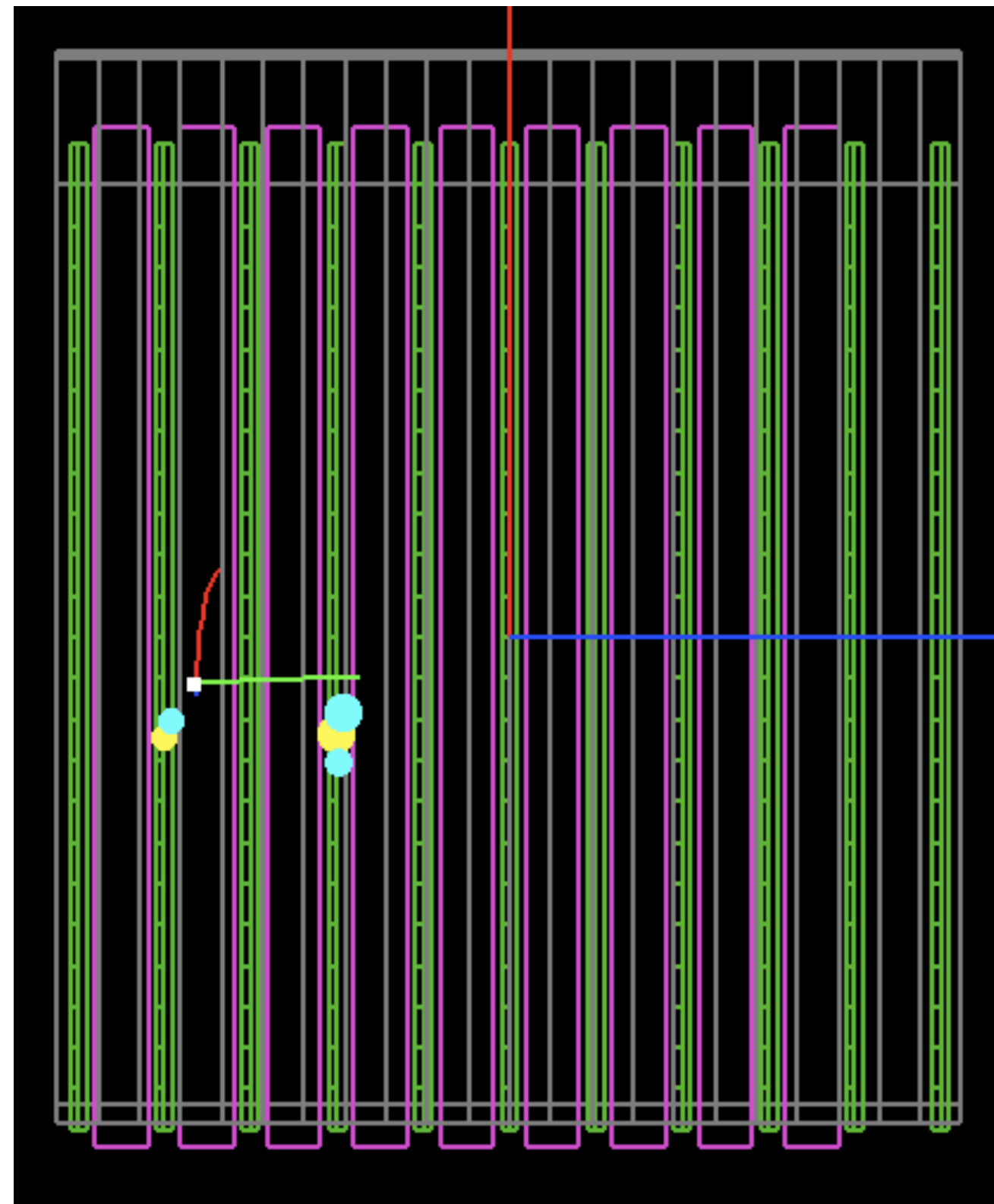
// neutrino 14
// muon 13
// P 2212
// N 2112
// Pi0 111
// Pi+ 211
// Pi- -211
// Eta0 221
// K+ 321
// Lambda 3122
// omega 223

$$\text{neut} + \text{N} = \mu + \text{N} + \text{Pi}^+$$

side view



top view



=== Neutrino Information from Jnubeam ===

ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 13

Energy: 1.274 Direction: {0.004712,-0.06626,0.9978}

Vertex (cm): {-5.533, -38.86, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum:262.3 -198 26.01

Kinetic Energy: 240.5

Particle: 2112 Index: 3 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:45.41 120.3 1250

Kinetic Energy: 629.2

Particle: 211 Index: 4 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:-263.7 17.63 29.79

Kinetic Energy: 160.8

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

=== hits in XLayer (yellow) ===

Mod:3 Plane:1 Ch:9 Edep:3.987 MeV PID:-11 Track:64 pos(mm):{-120, -376.1, -420}

Mod:3 Plane:3 Ch:9 Edep:26.2 MeV PID:2212 Track:253 pos(mm):{-115.8, -376.1, -210}

=== hits in YLayer (cyan) ===

Mod:3 Pln:1 Ch:4 Edep:3.603 MeV PID:-11 Track:64 pos(mm):{-102.2, -381.1, -410}

Mod:3 Pln:3 Ch:4 Edep:15.15 MeV PID:2212 Track:253 pos(mm):{-91.9, -373.7, -200}

Mod:3 Pln:3 Ch:9 Edep:5.265 MeV PID:2212 Track:265 pos(mm):{-150.3, -122.4, -206.6}

=== Track with Parent ID = 0 (means primary particle) ===

Track: 3 PID: pi+(211) Init Mom: {-263.7, 17.63, 29.79} [MeV]

Track: 2 PID: neutron(2112) Init Mom: {45.41, 120.3, 1250} [MeV]

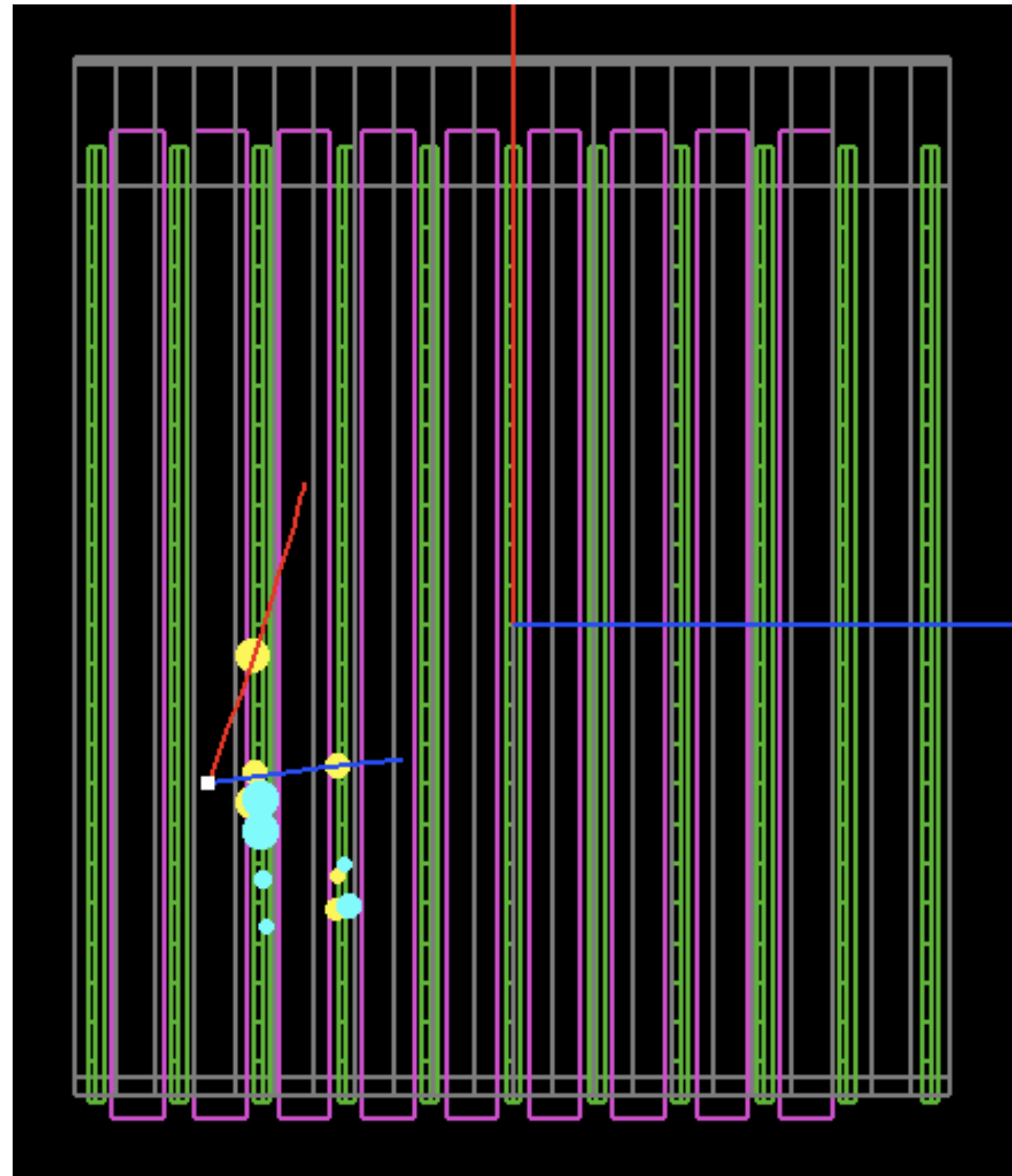
Track: 1 PID: mu-(13) Init Mom: {262.3, -198, 26.01} [MeV]

$$\text{neut} + \text{N} = \mu + \text{P} + \text{Pi}^0$$

side view



top view



=== Neutrino Information from Jnubeam ===

ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 12

Energy: 1.671 Direction: {-0.001658,-0.06262,0.998}

Vertex (cm): {-19.92, 41.98, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum: 405.1 -148.2 147.6

Kinetic Energy: 362.4

Particle: 2212 Index: 3 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum: 163.2 139.5 990.8

Kinetic Energy: 443

Particle: 111 Index: 4 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum: -494.8 -92.46 557.9

Kinetic Energy: 628.4

==== Track with Parent ID = 0 (means primary particle) ===

Track: 3 PID: pi0(111) Init Mom: {-494.8, -92.46, 557.9} [MeV]

Track: 2 PID: proton(2212) Init Mom: {163.2, 139.5, 990.8} [MeV]

Track: 1 PID: mu-(13) Init Mom: {405.1, -148.2, 147.6} [MeV]

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

=== hits in XLayer (yellow) ===

Mod:3 Plane:2 Ch:7 Edep:7.648 MeV PID:-11 Track:7 pos(mm):{-223.7, 397.5, -325}
Mod:3 Plane:3 Ch:5 Edep:381.4 keV PID:11 Track:70 pos(mm):{-314.5, 342.3, -219.9}
Mod:3 Plane:3 Ch:4 Edep:3.039 MeV PID:11 Track:100 pos(mm):{-357.6, 368.7, -219.7}
Mod:3 Plane:2 Ch:6 Edep:4.582 MeV PID:-11 Track:327 pos(mm):{-258.5, 408.9, -315.8}
Mod:3 Plane:2 Ch:8 Edep:3.585 MeV PID:11 Track:510 pos(mm):{-185.1, 420.3, -323.5}
Mod:3 Plane:3 Ch:8 Edep:4.167 MeV PID:2212 Track:2 pos(mm):{-177.6, 441.4, -220}
Mod:3 Plane:2 Ch:11 Edep:7.825 MeV PID:13 Track:1 pos(mm):{-38.4, 370.9, -325}

=== hits in YLayer (cyan) ===

Mod:3 Pln:2 Ch:19 Edep:12.22 MeV PID:-11 Track:7 pos(mm):{-218.5, 384, -315}
Mod:3 Pln:3 Ch:19 Edep:358.5 keV PID:11 Track:227 pos(mm):{-300.8, 384.1, -209.6}
Mod:3 Pln:2 Ch:20 Edep:14.41 MeV PID:-11 Track:327 pos(mm):{-259.2, 408.7, -315}
Mod:3 Pln:3 Ch:20 Edep:4.488 MeV PID:11 Track:412 pos(mm):{-353.2, 407.5, -205}
Mod:3 Pln:2 Ch:21 Edep:311.9 keV PID:11 Track:597 pos(mm):{-378.2, 471, -309.7}
Mod:3 Pln:2 Ch:18 Edep:1.059 MeV PID:11 Track:729 pos(mm):{-319.4, 341.8, -313.9}

==== Track with Parent ID = 0 (means primary particle) ===

Track: 3 PID: pi0(111) Init Mom: {-494.8, -92.46, 557.9} [MeV]
Track: 2 PID: proton(2212) Init Mom: {163.2, 139.5, 990.8} [MeV]
Track: 1 PID: mu-(13) Init Mom: {405.1, -148.2, 147.6} [MeV]

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

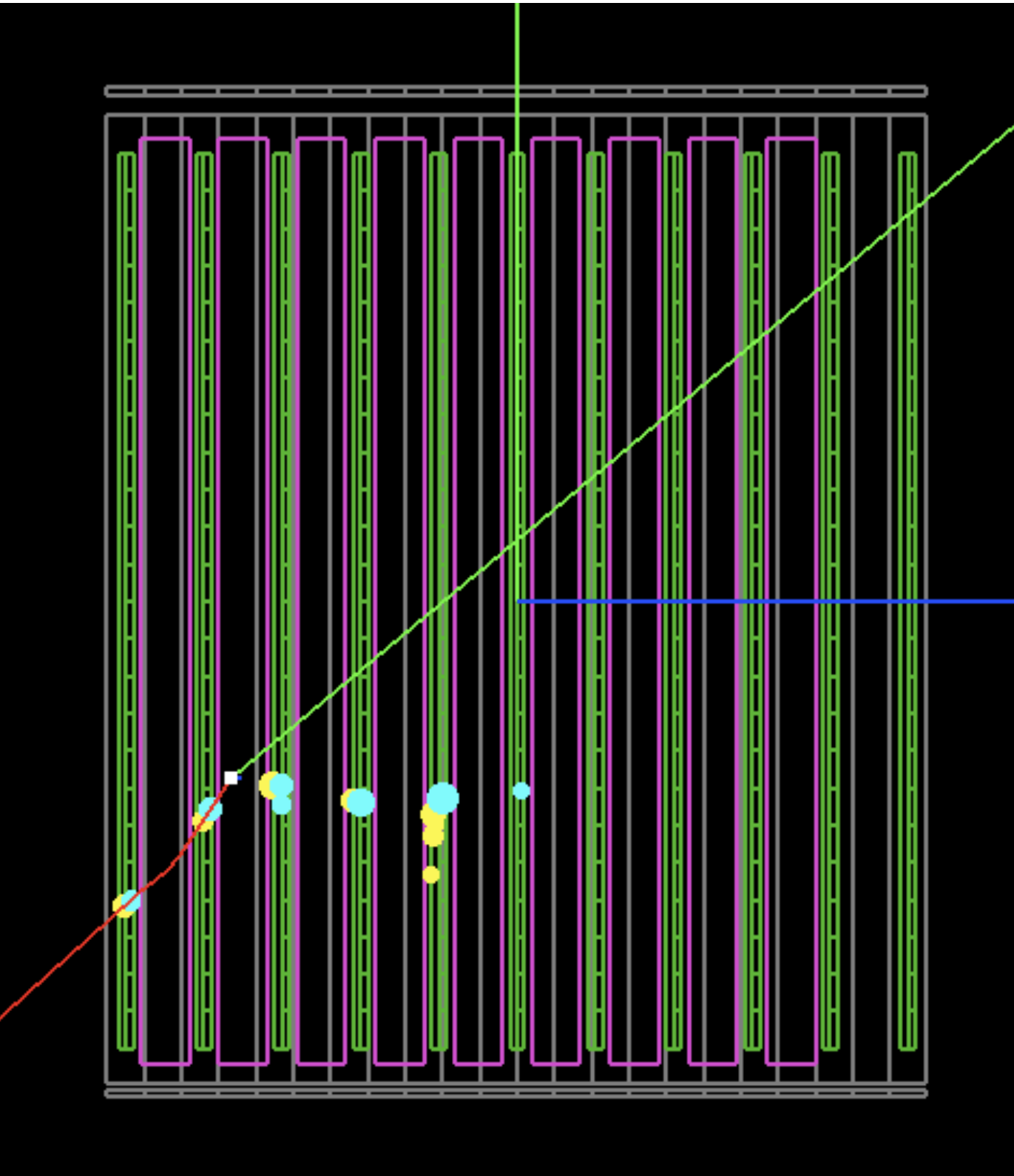
// K+ 321

// Lambda 3122

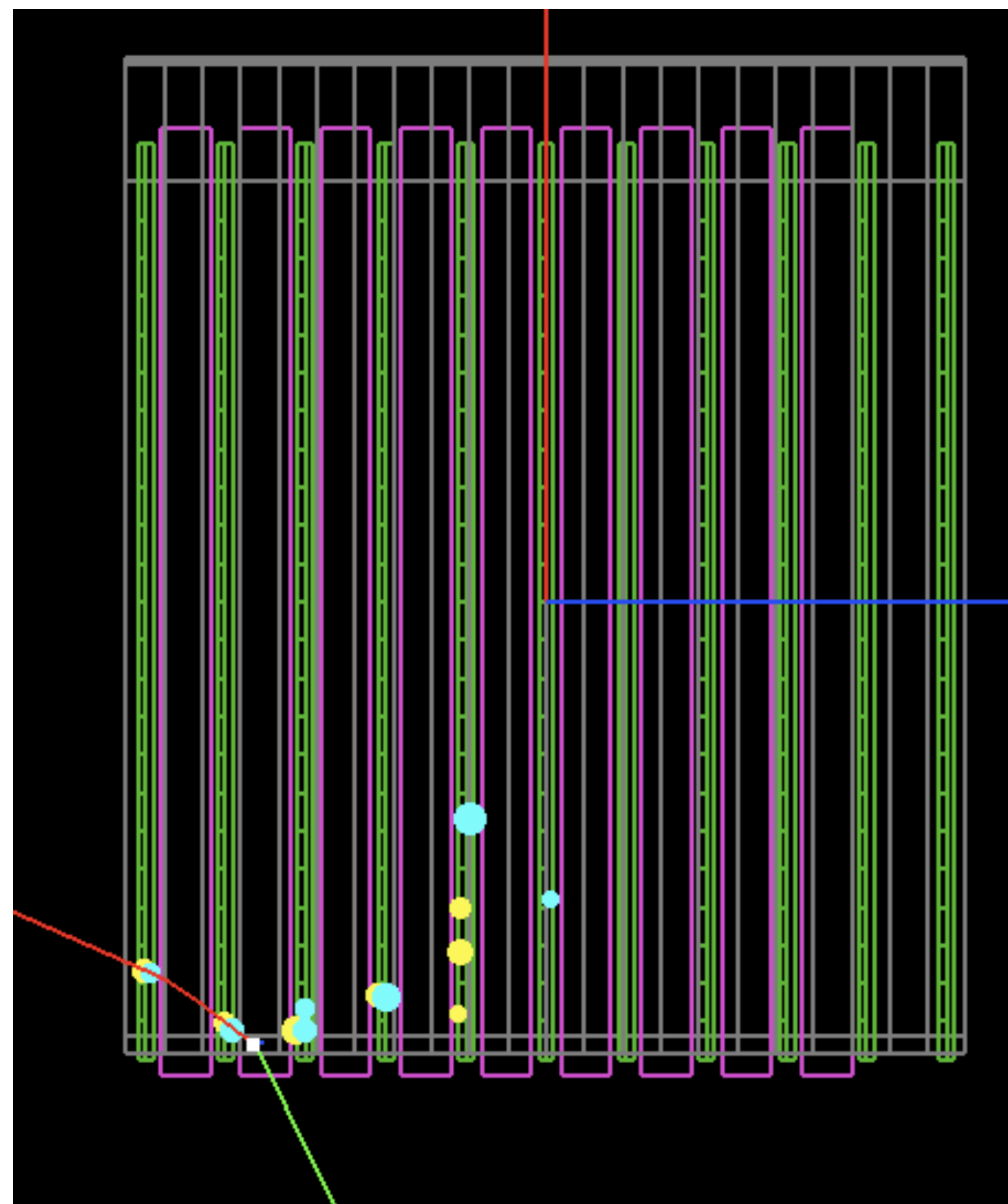
// omega 223

$$\text{neut} + \text{N} = \mu + \text{P} + \text{Eta0}$$

side view



top view



=== Neutrino Information from Jnubeam ===

ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 22

Energy: 2.014 Direction: {-0.00174,-0.06426,0.9979}

Vertex (cm): {-57.8, -23.62, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum:97.92 -261.9 -169.2

Kinetic Energy: 237.8

Particle: 221 Index: 4 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:275.8 -26.08 1147

Kinetic Energy: 753.4

Particle: 2212 Index: 6 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum:12.13 -9.897 425.8

Kinetic Energy: 92.21

==== Track with Parent ID = 0 (means primary particle) ===

Track: 5 PID: neutron(2112) Init Mom: {-217.6, 89.14, 107.1} [MeV]

Track: 4 PID: neutron(2112) Init Mom: {-193.4, 69.46, 263.2} [MeV]

Track: 3 PID: proton(2212) Init Mom: {12.13, -9.897, 425.8} [MeV]

Track: 2 PID: eta(221) Init Mom: {275.8, -26.08, 1147} [MeV]

Track: 1 PID: mu-(13) Init Mom: {97.92, -261.9, -169.2} [MeV]

Particle: 2112 Index: 7 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum:-193.4 69.46 263.2

Kinetic Energy: 57.58

Particle: 2112 Index: 8 Parent Index: 3

Tracking Flag: 1 Interaction Code: 0

Momentum:-217.6 89.14 107.1

Kinetic Energy: 34.88

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

=== hits in XLayer (yellow) ===

Mod:3 Plane:2 Ch:0 Edep:5.935 MeV PID:-11 Track:331 pos(mm):{-560.3, -245, -325}
Mod:3 Plane:4 Ch:2 Edep:5.188 MeV PID:11 Track:536 pos(mm):{-456.8, -283.3, -110}
Mod:3 Plane:3 Ch:1 Edep:4.415 MeV PID:-11 Track:702 pos(mm):{-513.8, -265.4, -220}
Mod:3 Plane:4 Ch:1 Edep:745.2 keV PID:11 Track:765 pos(mm):{-539.5, -365, -113}
Mod:3 Plane:4 Ch:3 Edep:1.505 MeV PID:11 Track:943 pos(mm):{-401.1, -298.6, -107.7}
Mod:3 Plane:4 Ch:4 Edep:2.921 MeV PID:11 Track:2027 pos(mm):{-400, -312.4, -111.7}
Mod:3 Plane:1 Ch:0 Edep:514.4 keV PID:13 Track:1 pos(mm):{-551, -292.3, -420}
Mod:3 Plane:1 Ch:1 Edep:3.081 MeV PID:13 Track:1 pos(mm):{-550, -294.3, -421.3}
Mod:3 Plane:0 Ch:2 Edep:3.866 MeV PID:13 Track:1 pos(mm):{-482.9, -407, -525}

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

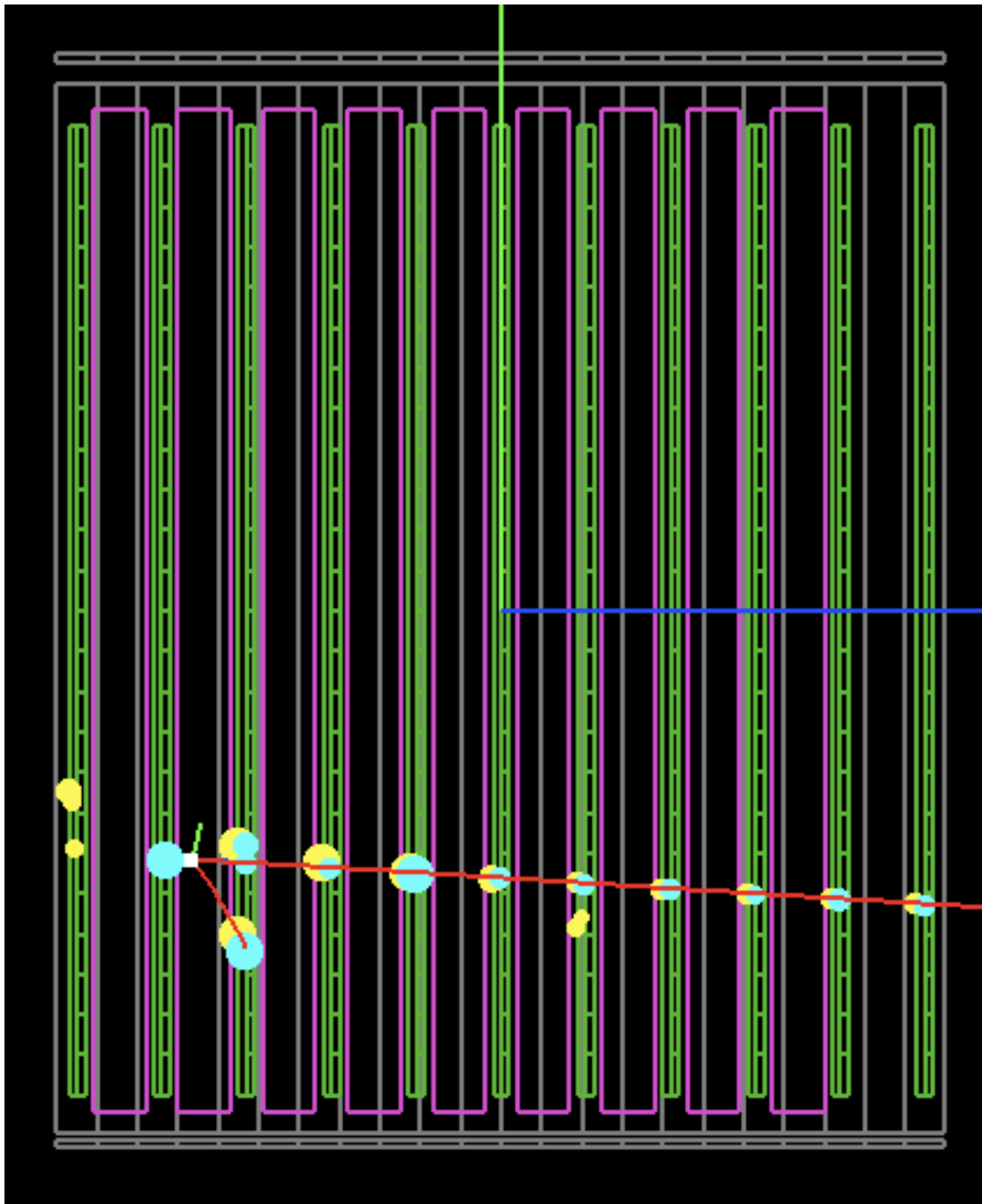
// omega 223

=== hits in YLayer (cyan) ===

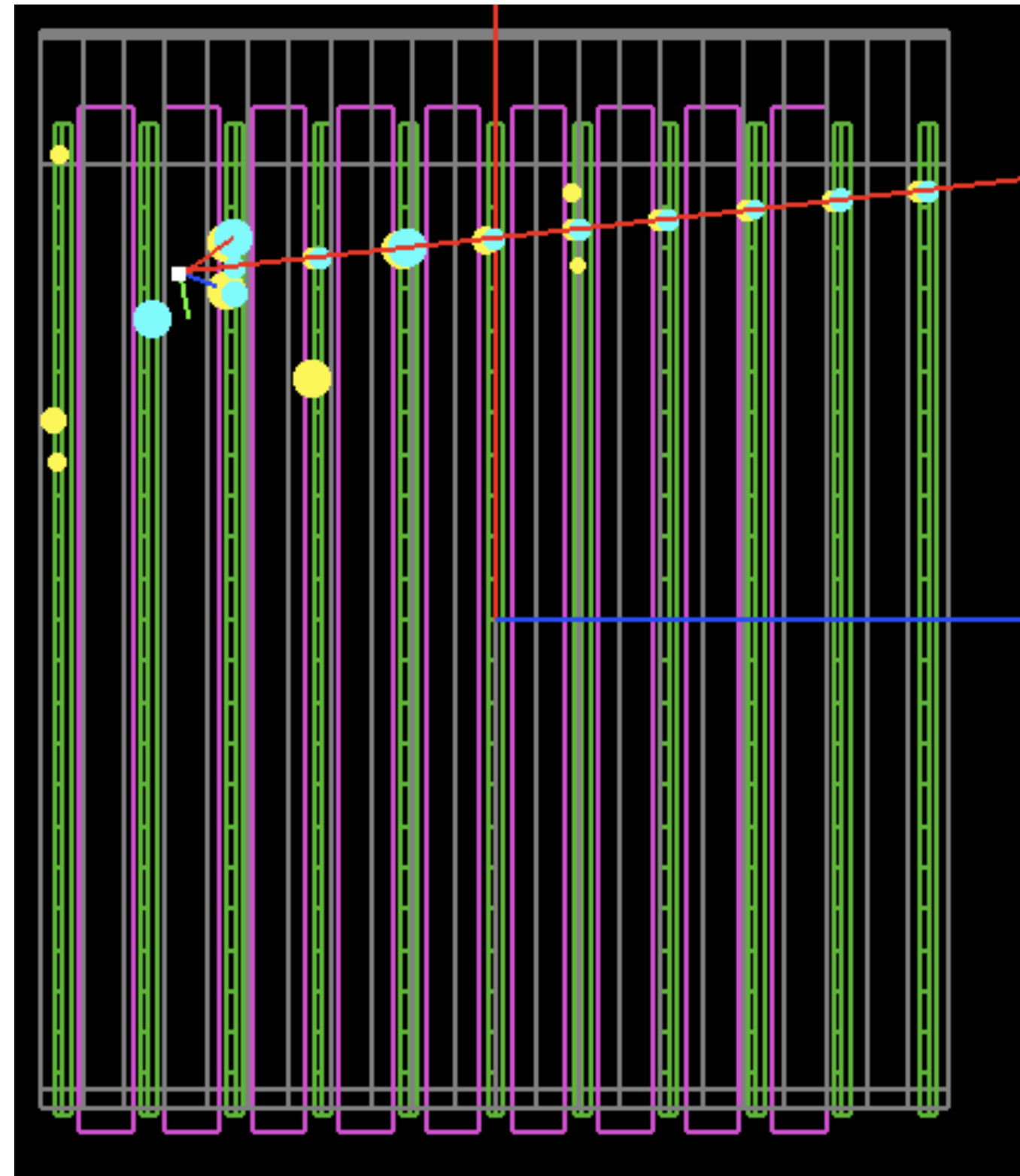
Mod:3 Pln:2 Ch:7 Edep:3.593 MeV PID:-11 Track:331 pos(mm):{-559.3, -245.9, -315}
Mod:3 Pln:2 Ch:6 Edep:2.294 MeV PID:11 Track:397 pos(mm):{-531.9, -270.5, -314.5}
Mod:3 Pln:4 Ch:6 Edep:7.764 MeV PID:-11 Track:458 pos(mm):{-284.4, -264, -99.68}
Mod:3 Pln:3 Ch:6 Edep:5.848 MeV PID:11 Track:540 pos(mm):{-517, -269.8, -208.9}
Mod:3 Pln:5 Ch:6 Edep:1.059 MeV PID:11 Track:1191 pos(mm):{-388.9, -251.8, 8.54}
Mod:3 Pln:1 Ch:6 Edep:3.621 MeV PID:13 Track:1 pos(mm):{-558.9, -277, -410}
Mod:3 Pln:0 Ch:4 Edep:709.9 keV PID:13 Track:1 pos(mm):{-487.4, -397.9, -515}
Mod:3 Pln:0 Ch:3 Edep:2.508 MeV PID:13 Track:1 pos(mm):{-486.3, -400, -517.4}

$$\text{neut} + \text{N/P} = \mu + \text{N/P} + \{\text{Pis}\}$$

side view



top view



=== Neutrino Information from Jnubeam ===

ParentID: 11 Neut Production Mode: 12 Neut interaction Mode: 21

Energy: 9.991 Direction: {0.002767,-0.06692,0.9978}

Vertex (cm): {42.11, -30.84, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum:870.1 -435.9 8263

Kinetic Energy: 8215

Particle: 2212 Index: 3 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:-393.5 -50.55 1023

Kinetic Energy: 505.2

Particle: -211 Index: 6 Parent Index: 4

Tracking Flag: 1 Interaction Code: 0

Momentum:54.63 -201.3 161.2

Kinetic Energy: 158.7

==== Track with Parent ID = 0 (means primary particle) ===

Track: 5 PID: pi0(111) Init Mom: {-29.21, 149.3, 217.6} [MeV]

Track: 4 PID: neutron(2112) Init Mom: {-192.1, 147.6, 34.56} [MeV]

Track: 3 PID: pi-(-211) Init Mom: {54.63, -201.3, 161.2} [MeV]

Track: 2 PID: proton(2212) Init Mom: {-393.5, -50.55, 1023} [MeV]

Track: 1 PID: mu-(13) Init Mom: {870.1, -435.9, 8263} [MeV]

Particle: 2112 Index: 7 Parent Index: 5

Tracking Flag: 1 Interaction Code: 0

Momentum:-192.1 147.6 34.56

Kinetic Energy: 31.34

Particle: 111 Index: 10 Parent Index: 9

Tracking Flag: 1 Interaction Code: 0

Momentum:-29.21 149.3 217.6

Kinetic Energy: 162.8

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

=== hits in XLayer (yellow) ===

Mod:3 Plane:2 Ch:20 Edep:1.548 MeV PID:-11 Track:9 pos(mm):{400, -289, -325}	
Mod:3 Plane:2 Ch:19 Edep:20.66 MeV PID:-11 Track:9 pos(mm):{400, -289, -325}	
Mod:3 Plane:2 Ch:21 Edep:46.29 MeV PID:-211 Track:3 pos(mm):{456.7, -399.5, -325}	
Mod:3 Plane:0 Ch:16 Edep:3.61 MeV PID:2212 Track:1611 pos(mm):{243, -222.5, -533.3}	
Mod:3 Plane:0 Ch:15 Edep:1.453 MeV PID:2212 Track:1613 pos(mm):{191.2, -234.1, -528.7}	
Mod:3 Plane:3 Ch:17 Edep:21.14 MeV PID:2212 Track:1642 pos(mm):{293.7, -309.6, -220}	
Mod:3 Plane:0 Ch:23 Edep:1.25 MeV PID:1000060120 Track:1662 pos(mm):{564.7, -292.7, -525.7}	
Mod:3 Plane:3 Ch:20 Edep:2.107 MeV PID:13 Track:1 pos(mm):{438.6, -317.1, -220}	
Mod:3 Plane:4 Ch:20 Edep:8.021 MeV PID:13 Track:1 pos(mm):{449.7, -323.1, -115}	
Mod:3 Plane:4 Ch:21 Edep:9.52 MeV PID:13 Track:1 pos(mm):{450, -323.3, -112.6}	
Mod:3 Plane:5 Ch:21 Edep:4.945 MeV PID:13 Track:1 pos(mm):{461.1, -329.7, -10}	
Mod:3 Plane:6 Ch:21 Edep:1.878 MeV PID:13 Track:1 pos(mm):{472.6, -336.4, 95}	// neutrino 14 // muon 13 // P 2212 // N 2112 // Pi0 111 // Pi+ 211 // Pi- -211 // Eta0 221 // K+ 321 // Lambda 3122 // omega 223
Mod:3 Plane:7 Ch:21 Edep:1.929 MeV PID:13 Track:1 pos(mm):{484.1, -343, 200}	
Mod:3 Plane:8 Ch:21 Edep:1.925 MeV PID:13 Track:1 pos(mm):{495.7, -349.3, 305}	
Mod:3 Plane:9 Ch:22 Edep:1.91 MeV PID:13 Track:1 pos(mm):{507.4, -355.7, 410}	
Mod:3 Plane:10 Ch:22 Edep:1.712 MeV PID:13 Track:1 pos(mm):{519.3, -362, 515}	
Mod:3 Plane:6 Ch:20 Edep:509.3 keV PID:11 Track:2412 pos(mm):{429.4, -378.6, 99.55}	
Mod:3 Plane:6 Ch:22 Edep:582 keV PID:11 Track:2707 pos(mm):{518.5, -389.9, 95}	

=== hits in YLayer (cyan) ===

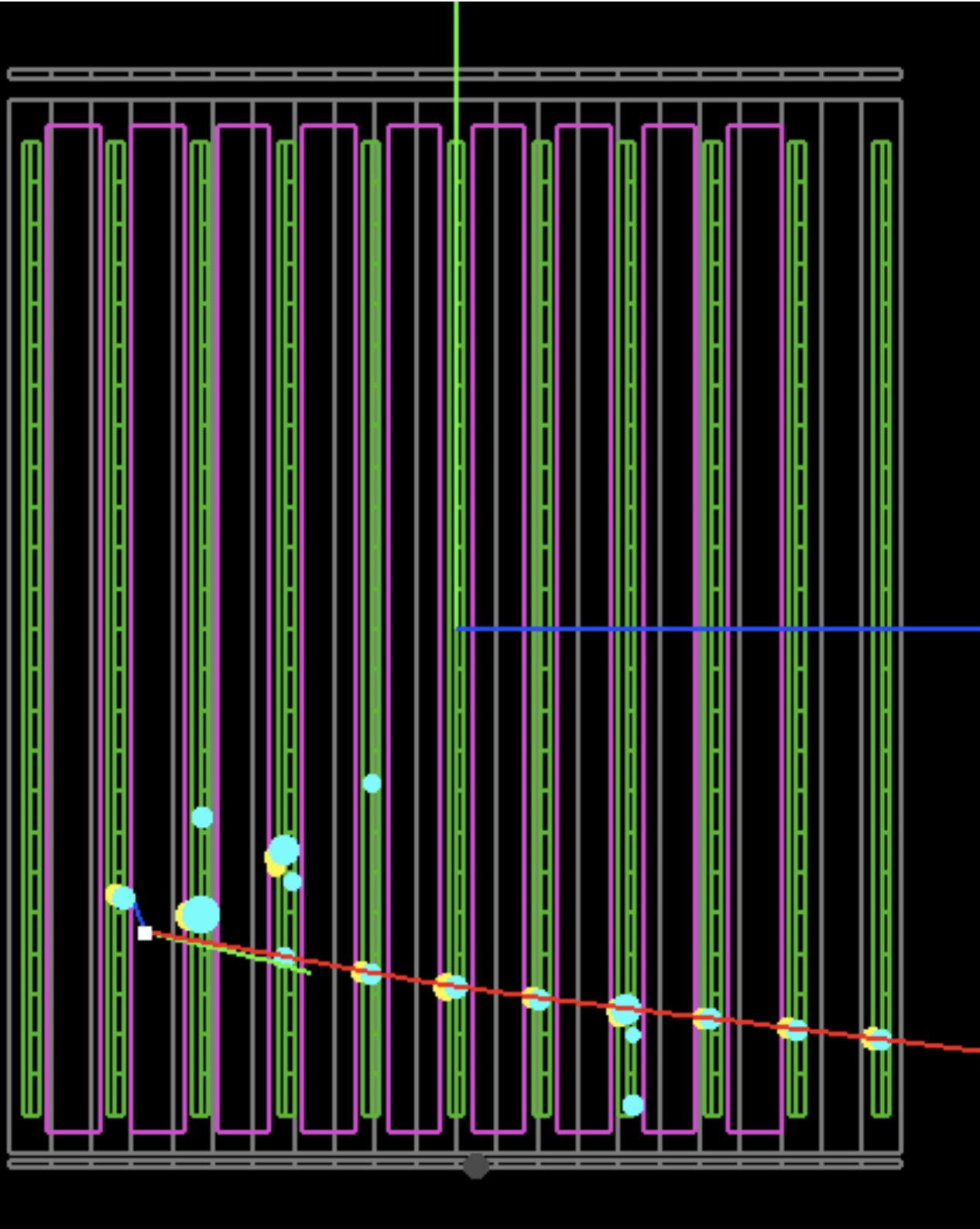
Mod:3 Pln:2 Ch:6 Edep:4.413 MeV PID:-11 Track:9 pos(mm):{395.4, -288.7, -315}
Mod:3 Pln:2 Ch:3 Edep:22.71 MeV PID:2212 Track:555 pos(mm):{462.3, -419.7, -315}
Mod:3 Pln:1 Ch:5 Edep:11.57 MeV PID:2212 Track:1608 pos(mm):{365.8, -307.9, -414.2}
Mod:3 Pln:2 Ch:5 Edep:1.829 MeV PID:13 Track:1 pos(mm):{428.3, -311.9, -315}
Mod:3 Pln:3 Ch:5 Edep:2.383 MeV PID:13 Track:1 pos(mm):{439.7, -317.6, -210}
Mod:3 Pln:4 Ch:5 Edep:14.22 MeV PID:13 Track:1 pos(mm):{450.8, -323.8, -105}
Mod:3 Pln:5 Ch:5 Edep:2.482 MeV PID:13 Track:1 pos(mm):{462.2, -330.4, 0}
Mod:3 Pln:6 Ch:5 Edep:1.659 MeV PID:13 Track:1 pos(mm):{473.7, -337, 105}
Mod:3 Pln:7 Ch:5 Edep:1.887 MeV PID:13 Track:1 pos(mm):{485.2, -343.6, 210}
Mod:3 Pln:8 Ch:5 Edep:361.5 keV PID:13 Track:1 pos(mm):{496.8, -349.9, 315}
Mod:3 Pln:8 Ch:4 Edep:1.477 MeV PID:13 Track:1 pos(mm):{497, -350, 317}
Mod:3 Pln:9 Ch:4 Edep:3.011 MeV PID:13 Track:1 pos(mm):{508.5, -356.3, 420}
Mod:3 Pln:10 Ch:4 Edep:1.794 MeV PID:13 Track:1 pos(mm):{520.4, -362.6, 525}

=== hits in veto (red) ===

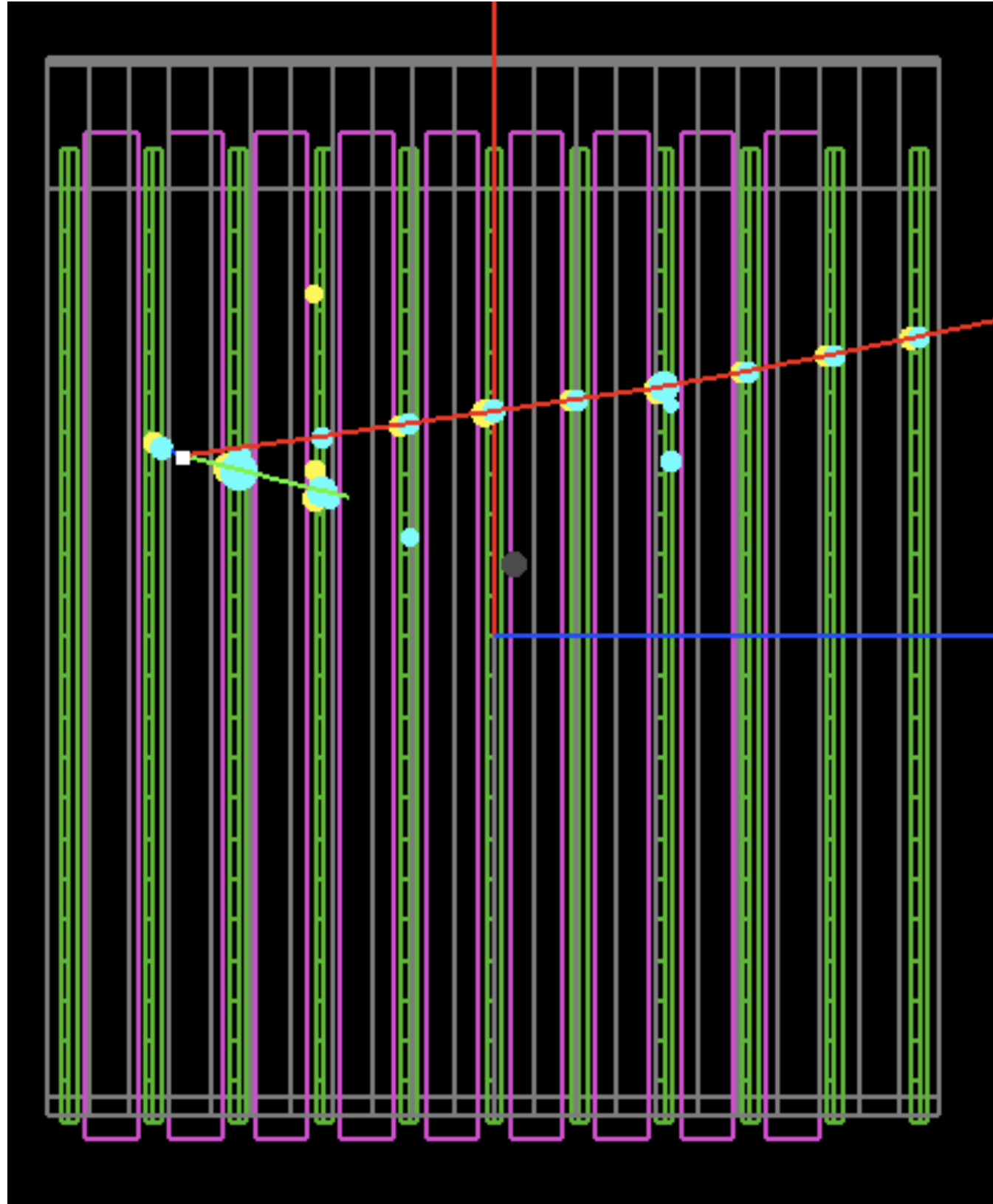
// neutrino 14
// muon 13
// P 2212
// N 2112
// Pi0 111
// Pi+ 211
// Pi- -211
// Eta0 221
// K+ 321
// Lambda 3122
// omega 223

$$\text{neut} + \text{N/P} = \mu + \text{N/P} + \{\text{Pis}\}$$

side view



top view



=== Neutrino Information from Jnubeam ===

ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 21

Energy: 3.485 Direction: {0.0007737,-0.06479,0.9979}

Vertex (cm): {22.21, -37.37, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum:288.8 -346.7 1931

Kinetic Energy: 1880

Particle: 211 Index: 4 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:19.6 163.5 -73.72

Kinetic Energy: 88.56

Particle: 2112 Index: 3 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:-308.3 -282.8 1201

Kinetic Energy: 641.6

Particle: 111 Index: 5 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:-103.8 265.8 562.3

Kinetic Energy: 509.9

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

==== Track with Parent ID = 0 (means primary particle) ===

Track: 4 PID: pi0(111) Init Mom: {-103.8, 265.8, 562.3} [MeV]

Track: 3 PID: pi+(211) Init Mom: {19.6, 163.5, -73.72} [MeV]

Track: 2 PID: neutron(2112) Init Mom: {-308.3, -282.8, 1201} [MeV]

Track: 1 PID: mu-(13) Init Mom: {288.8, -346.7, 1931} [MeV]

=== hits in XLayer (yellow) ===

Mod:3 Plane:2 Ch:16 Edep:6.162 MeV PID:-11 Track:8 pos(mm):{207.1, -352.8, -325}
Mod:3 Plane:3 Ch:16 Edep:1.774 MeV PID:11 Track:93 pos(mm):{205.9, -280.9, -218.2}
Mod:3 Plane:3 Ch:15 Edep:3.72 MeV PID:11 Track:749 pos(mm):{169.1, -281.3, -220}
Mod:3 Plane:3 Ch:20 Edep:860.5 keV PID:11 Track:830 pos(mm):{423.3, -293.9, -220}
Mod:3 Plane:1 Ch:16 Edep:1.792 MeV PID:-11 Track:1173 pos(mm):{238.1, -327, -420}
Mod:3 Plane:4 Ch:17 Edep:1.915 MeV PID:13 Track:1 pos(mm):{260.5, -421.8, -115}
Mod:3 Plane:5 Ch:17 Edep:4.913 MeV PID:13 Track:1 pos(mm):{275.7, -439.3, -10}
Mod:3 Plane:6 Ch:17 Edep:2.016 MeV PID:13 Track:1 pos(mm):{290.9, -453.8, 95}
Mod:3 Plane:7 Ch:18 Edep:2.334 MeV PID:13 Track:1 pos(mm):{306, -466.5, 200}
Mod:3 Plane:8 Ch:18 Edep:1.646 MeV PID:13 Track:1 pos(mm):{325.2, -479.3, 305}
Mod:3 Plane:9 Ch:18 Edep:1.734 MeV PID:13 Track:1 pos(mm):{345.6, -492.1, 410}
Mod:3 Plane:10 Ch:19 Edep:3.259 MeV PID:13 Track:1 pos(mm):{367.3, -504.7, 515}
Mod:3 Plane:7 Ch:17 Edep:1.813 MeV PID:11 Track:1318 pos(mm):{300, -476.8, 202.6}

// neutrino 14
// muon 13
// P 2212
// N 2112
// Pi0 111
// Pi+ 211
// Pi- -211
// Eta0 221
// K+ 321
// Lambda 3122
// omega 223

=== hits in YLayer (cyan) ===

Mod:3 Pln:2 Ch:4 Edep:2.112 MeV PID:-11 Track:8 pos(mm):{204.3, -350.1, -315}
Mod:3 Pln:2 Ch:5 Edep:8.708 MeV PID:-11 Track:8 pos(mm):{204.2, -350, -314.5}
Mod:3 Pln:3 Ch:5 Edep:933.1 keV PID:11 Track:96 pos(mm):{169.9, -311.8, -201.6}
Mod:3 Pln:3 Ch:6 Edep:5.759 MeV PID:11 Track:308 pos(mm):{177.9, -270.3, -209.8}
Mod:3 Pln:4 Ch:8 Edep:954.2 keV PID:11 Track:583 pos(mm):{122, -189.2, -101.6}
Mod:3 Pln:2 Ch:7 Edep:1.532 MeV PID:11 Track:1044 pos(mm):{223.6, -230.1, -313.2}
Mod:3 Pln:1 Ch:5 Edep:2.745 MeV PID:-11 Track:1173 pos(mm):{233.3, -331.6, -410}
Mod:3 Pln:7 Ch:0 Edep:2.139 MeV PID:2212 Track:1272 pos(mm):{215.4, -586.4, 218.8}
Mod:3 Pln:3 Ch:3 Edep:1.549 MeV PID:13 Track:1 pos(mm):{246.3, -404.1, -210}
Mod:3 Pln:4 Ch:3 Edep:1.646 MeV PID:13 Track:1 pos(mm):{262, -423.6, -105}
Mod:3 Pln:5 Ch:3 Edep:2.885 MeV PID:13 Track:1 pos(mm):{277.1, -440.8, 0}
Mod:3 Pln:6 Ch:2 Edep:1.771 MeV PID:13 Track:1 pos(mm):{292.2, -455.2, 105}
Mod:3 Pln:7 Ch:2 Edep:5.917 MeV PID:13 Track:1 pos(mm):{307.8, -467.8, 210}
Mod:3 Pln:8 Ch:2 Edep:2.463 MeV PID:13 Track:1 pos(mm):{327.2, -480.4, 315}
Mod:3 Pln:9 Ch:2 Edep:2.097 MeV PID:13 Track:1 pos(mm):{347.7, -493.3, 420}
Mod:3 Pln:10 Ch:1 Edep:1.89 MeV PID:13 Track:1 pos(mm):{369.4, -505.9, 525}
Mod:3 Pln:7 Ch:1 Edep:431 keV PID:11 Track:1318 pos(mm):{285, -500, 217.9}

=== hits in veto (red) ===

Mod:3 Pln:13 Ch:11 Edep:4.092 MeV PID:2212 track:1270 pos(mm):89.51 -662.3 25}

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

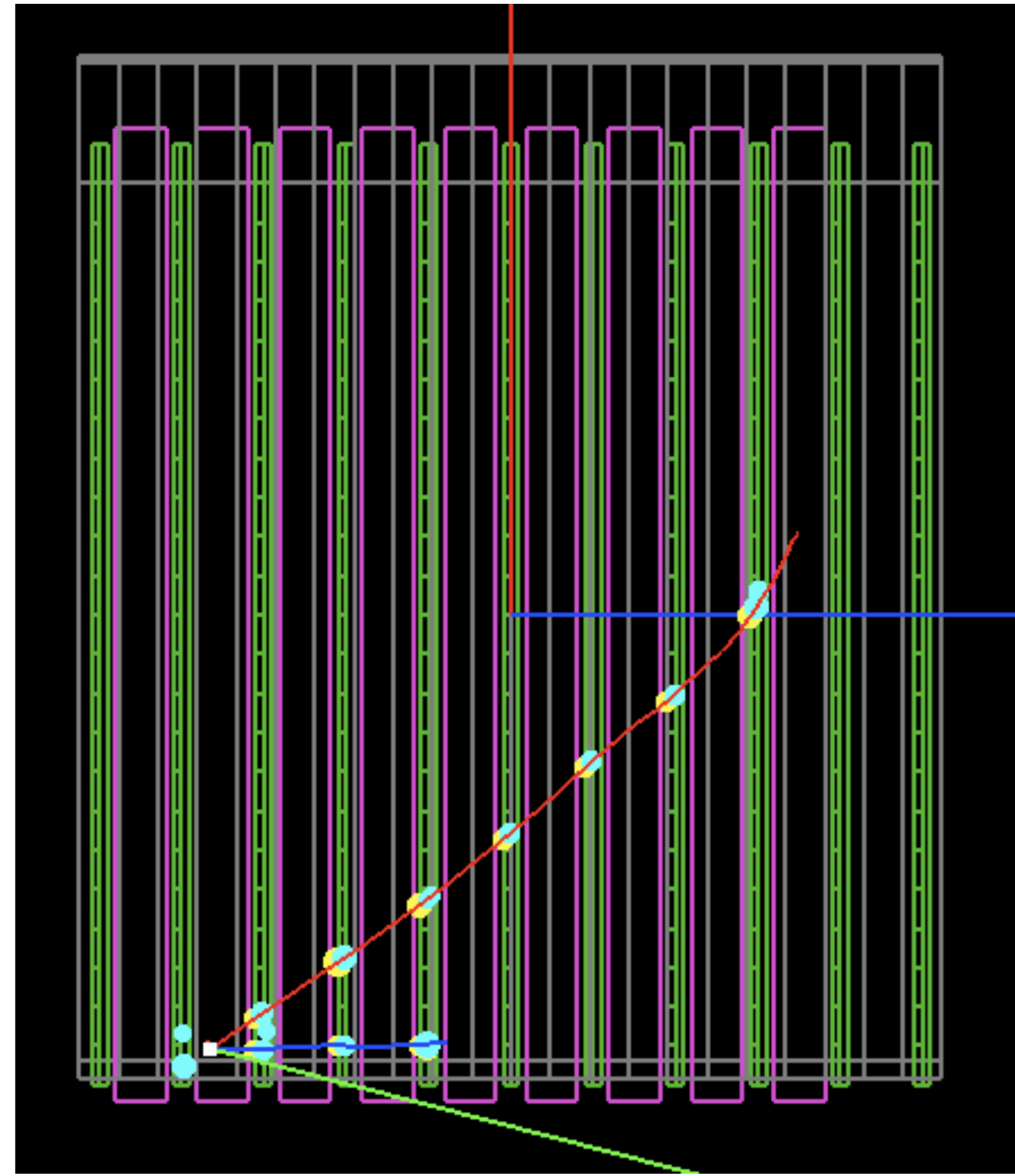
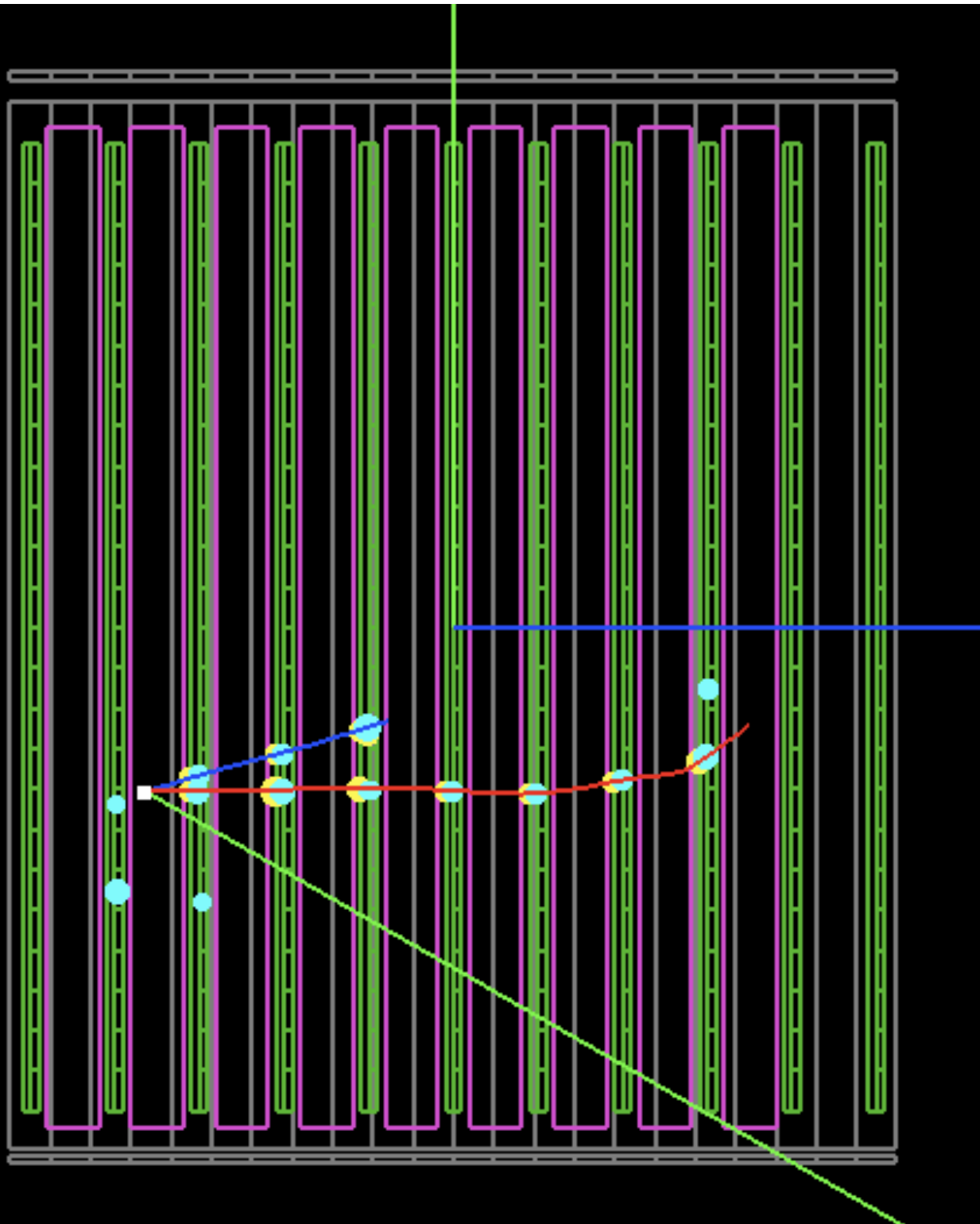
// Lambda 3122

// omega 223

$$\text{neut} + \text{N/P} = \mu + \text{N/P} + \{\text{Pis}\}$$

side view

top view



=== Neutrino Information from Jnubeam ===
ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 21
Energy: 3.189 GeV Direction: {-0.001898,-0.06424,0.9979}
Vertex (cm): {-55.38, -20.32, -38.23} Module: 3

=== Shoted Particle information ===
Particle: 13 Index: 2 Parent Index: 0
Tracking Flag: 1 Interaction Code: 0
Momentum:547.2 12.91 767.3
Kinetic Energy: 842.7

Particle: 2112 Index: 3 Parent Index: 1
Tracking Flag: 1 Interaction Code: 0
Momentum:-274.4 -607.3 1059
Kinetic Energy: 625.2

Particle: 211 Index: 5 Parent Index: 1
Tracking Flag: 1 Interaction Code: 0
Momentum:1.461 172 634
Kinetic Energy: 532

Particle: -211 Index: 7 Parent Index: 6
Tracking Flag: 1 Interaction Code: 0
Momentum:182.1 -182.2 -92.87
Kinetic Energy: 167.8

// neutrino 14
// muon 13
// P 2212
// N 2112
// Pi0 111
// Pi+ 211
// Pi- -211
// Eta0 221
// K+ 321
// Lambda 3122
// omega 223

==== Track with Parent ID = 0 (means primary particle) ====
Track: 4 PID: pi-(-211) Init Mom: {182.1, -182.2, -92.87} [MeV]
Track: 3 PID: pi+(211) Init Mom: {1.461, 172, 634} [MeV]
Track: 2 PID: neutron(2112) Init Mom: {-274.4, -607.3, 1059} [MeV]
Track: 1 PID: mu-(13) Init Mom: {547.2, 12.91, 767.3} [MeV]

=== hits in XLayer (yellow) ===

Mod:3 Plane:2 Ch:0 Edep:1.985 MeV PID:211 Track:3 pos(mm):{-553.4, -186.2, -325}
Mod:3 Plane:3 Ch:1 Edep:1.846 MeV PID:211 Track:3 pos(mm):{-549.9, -157.2, -220}
Mod:3 Plane:4 Ch:1 Edep:1.902 MeV PID:211 Track:3 pos(mm):{-547.5, -126.5, -115}
Mod:3 Plane:4 Ch:0 Edep:2.602 MeV PID:-11 Track:82 pos(mm):{-552.9, -130.5, -105}
Mod:3 Plane:2 Ch:1 Edep:2.424 MeV PID:13 Track:1 pos(mm):{-513.7, -202.6, -325}
Mod:3 Plane:3 Ch:3 Edep:5.773 MeV PID:13 Track:1 pos(mm):{-442.8, -201.2, -220}
Mod:3 Plane:4 Ch:4 Edep:3.518 MeV PID:13 Track:1 pos(mm):{-369.3, -199.8, -115}
Mod:3 Plane:5 Ch:6 Edep:2.225 MeV PID:13 Track:1 pos(mm):{-286.4, -201.6, -10}
Mod:3 Plane:6 Ch:8 Edep:2.096 MeV PID:13 Track:1 pos(mm):{-194.5, -205.9, 95}
Mod:3 Plane:7 Ch:9 Edep:2.49 MeV PID:13 Track:1 pos(mm):{-109.2, -190.8, 200}
Mod:3 Plane:8 Ch:11 Edep:580.1 keV PID:13 Track:1 pos(mm):{-2.271, -166.3, 305}
Mod:3 Plane:8 Ch:12 Edep:4.2 MeV PID:13 Track:1 pos(mm):{6.106e-16, -165.2, 306.5}

// neutrino 14
// muon 13
// P 2212
// N 2112
// Pi0 111
// Pi+ 211
// Pi- -211
// Eta0 221
// K+ 321
// Lambda 3122
// omega 223

=== hits in YLayer (cyan) ===

Mod:3 Pln:2 Ch:5 Edep:1.356 MeV PID:2212 Track:47 pos(mm):{-530.8, -339.1, -310.3}
Mod:3 Pln:1 Ch:5 Edep:3.668 MeV PID:2212 Track:60 pos(mm):{-574, -326.3, -415.6}
Mod:3 Pln:1 Ch:7 Edep:603.6 keV PID:2212 Track:61 pos(mm):{-533.5, -216.7, -417.7}
Mod:3 Pln:2 Ch:8 Edep:2.047 MeV PID:211 Track:3 pos(mm):{-553.2, -183.3, -315}
Mod:3 Pln:3 Ch:8 Edep:1.74 MeV PID:211 Track:3 pos(mm):{-550, -154.6, -210}
Mod:3 Pln:4 Ch:9 Edep:4.638 MeV PID:211 Track:3 pos(mm):{-547, -123.3, -105}
Mod:3 Pln:2 Ch:7 Edep:2.609 MeV PID:13 Track:1 pos(mm):{-507, -202.5, -315}
Mod:3 Pln:3 Ch:7 Edep:3.851 MeV PID:13 Track:1 pos(mm):{-436.1, -201, -210}
Mod:3 Pln:4 Ch:8 Edep:1.466 MeV PID:13 Track:1 pos(mm):{-361.9, -199.9, -105}
Mod:3 Pln:4 Ch:7 Edep:997.8 keV PID:13 Track:1 pos(mm):{-358, -200, -99.77}
Mod:3 Pln:5 Ch:7 Edep:2.365 MeV PID:13 Track:1 pos(mm):{-278.1, -202.2, 0}
Mod:3 Pln:6 Ch:7 Edep:2.014 MeV PID:13 Track:1 pos(mm):{-185.7, -205.2, 105}
Mod:3 Pln:7 Ch:8 Edep:2.355 MeV PID:13 Track:1 pos(mm):{-100.1, -189.1, 210}
Mod:3 Pln:8 Ch:8 Edep:4.121 MeV PID:13 Track:1 pos(mm):{12.7, -159.2, 315}
Mod:3 Pln:8 Ch:10 Edep:1.616 MeV PID:11 Track:223 pos(mm):{30.86, -75.3, 318.5}

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

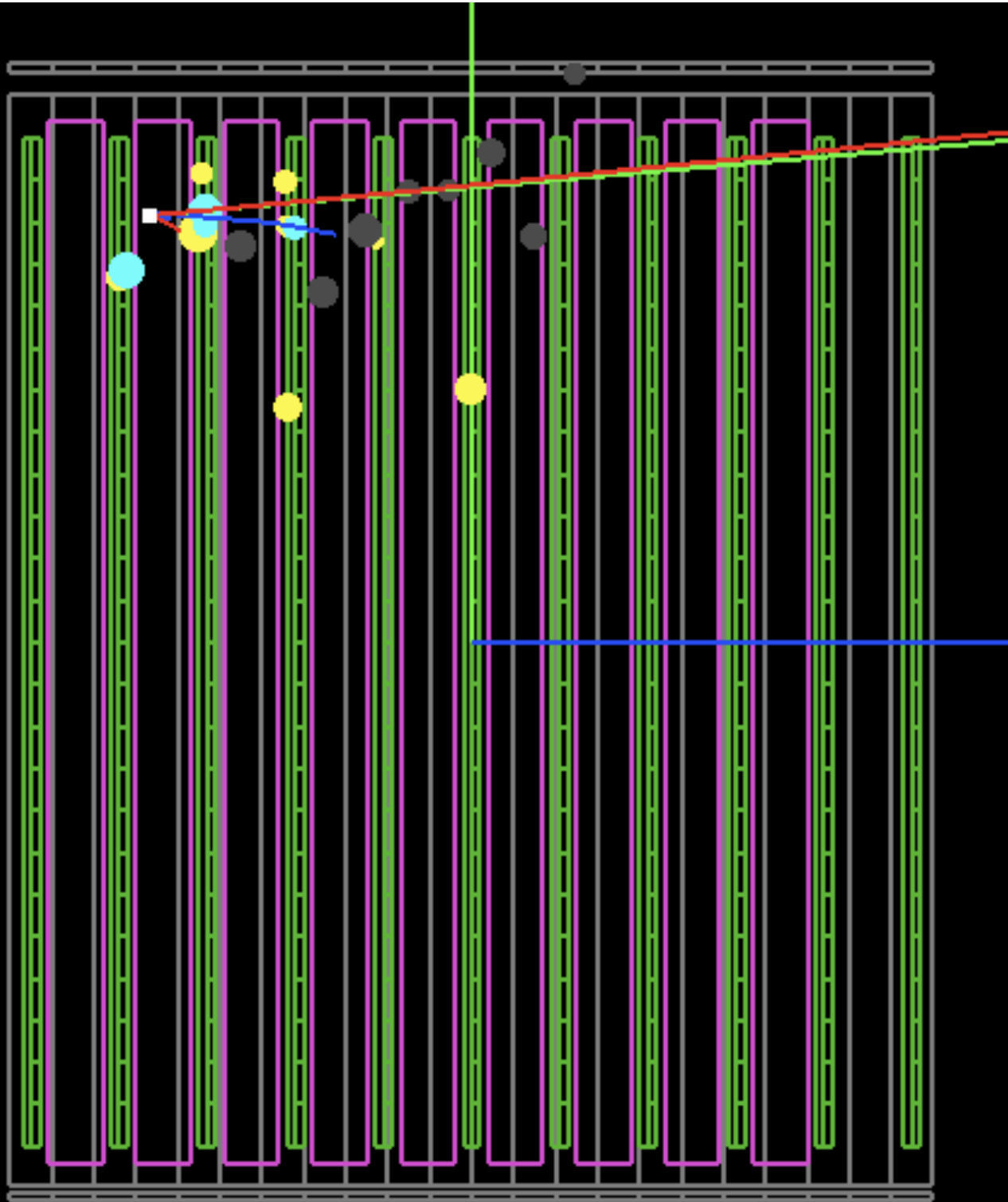
// K+ 321

// Lambda 3122

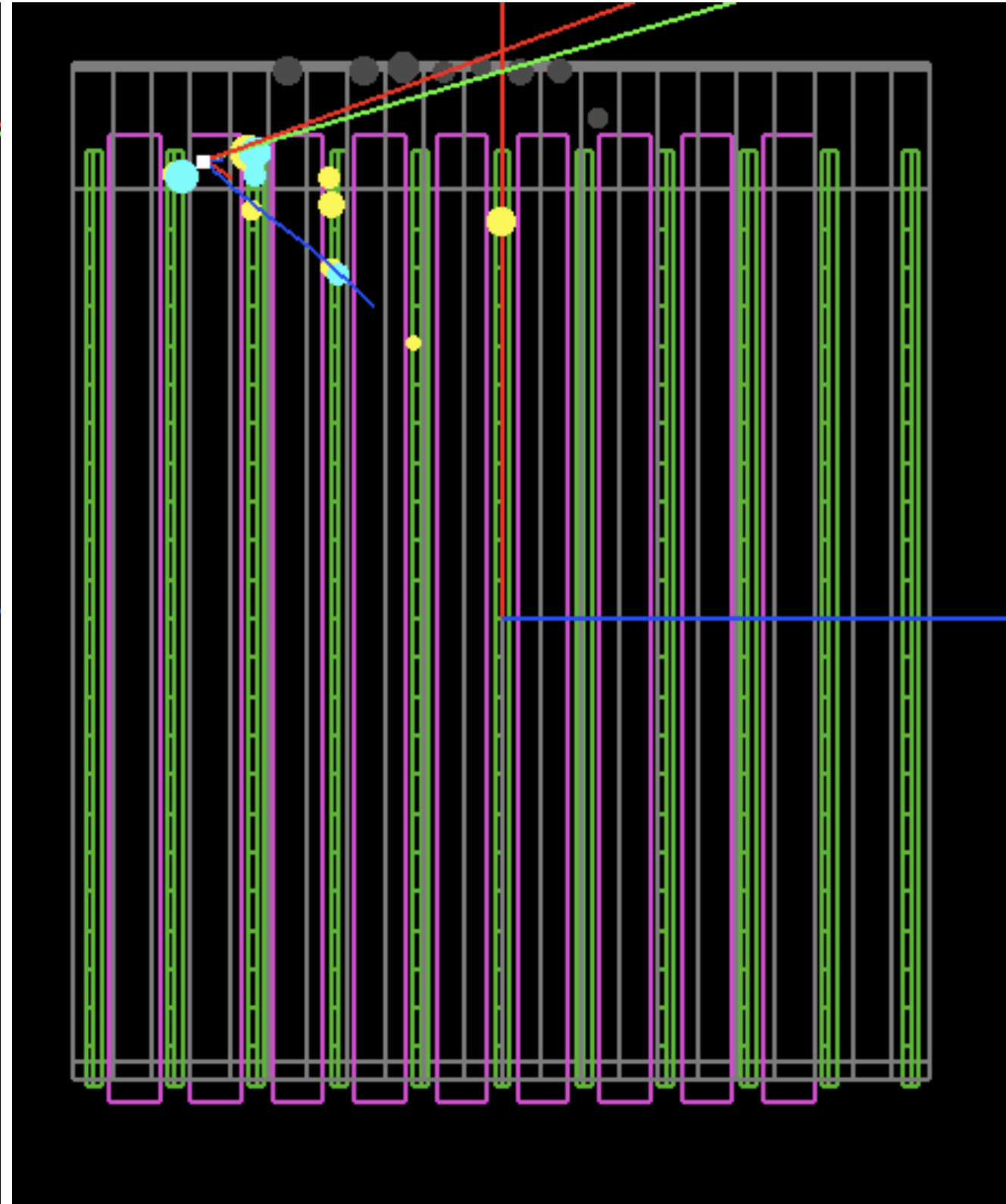
// omega 223

$$\text{neut} + \text{N/P} = \mu + \text{N/P} + \{\text{Mesons}\}$$

side view



top view



=== Neutrino Information from Jnubeam ===

ParentID: 8 Neut Production Mode: 11 Neut interaction Mode: 26

Energy: 5.603 Direction: {0.00165,-0.06309,0.998}

Vertex (cm): {58.8, 50.87, -38.23} Module: 3

=== Shoted Particle information ===

Particle: 13 Index: 2 Parent Index: 0

Tracking Flag: 1 Interaction Code: 0

Momentum:635.1 174.7 1945

Kinetic Energy: 1951

Particle: 2112 Index: 3 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:136 39.49 454.5

Kinetic Energy: 113.7

Particle: 211 Index: 4 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:-379.2 95.71 335

Kinetic Energy: 394

Particle: -211 Index: 5 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:-403 -327.8 609.4

Kinetic Energy: 673.2

Particle: 211 Index: 6 Parent Index: 1

Tracking Flag: 1 Interaction Code: 0

Momentum:-42.22 -400.9 2065

Kinetic Energy: 1969

// neutrino 14

// muon 13

// P 2212

// N 2112

// Pi0 111

// Pi+ 211

// Pi- -211

// Eta0 221

// K+ 321

// Lambda 3122

// omega 223

==== Track with Parent ID = 0 (means primary particle) ===

Track: 5 PID: pi+(211) Init Mom: {-42.22, -400.9, 2065} [MeV]

Track: 4 PID: pi-(-211) Init Mom: {-403, -327.8, 609.4} [MeV]

Track: 3 PID: pi+(211) Init Mom: {-379.2, 95.71, 335} [MeV]

Track: 2 PID: neutron(2112) Init Mom: {136, 39.49, 454.5} [MeV]

Track: 1 PID: mu-(13) Init Mom: {635.1, 174.7, 1945} [MeV]

=== hits in XLayer (yellow) ===

Mod:3 Plane:2 Ch:23 Edep:9.046 MeV PID:211 Track:20 pos(mm):{598.6, 488.6, -325}
Mod:3 Plane:3 Ch:22 Edep:5.124 MeV PID:11 Track:509 pos(mm):{533.5, 282, -217.3}
Mod:3 Plane:3 Ch:23 Edep:3.493 MeV PID:11 Track:671 pos(mm):{568.2, 549.3, -220}
Mod:3 Plane:2 Ch:22 Edep:2.495 MeV PID:11 Track:1207 pos(mm):{524.6, 561.3, -321.3}
Mod:3 Plane:5 Ch:22 Edep:5.673 MeV PID:2212 Track:1256 pos(mm):{511.3, 301.9, -0.8915}
Mod:3 Plane:1 Ch:23 Edep:4.191 MeV PID:2212 Track:1186 pos(mm):{570.1, 436.1, -420}
Mod:3 Plane:3 Ch:21 Edep:639.7 keV PID:211 Track:3 pos(mm):{452.6, 496.6, -220}
Mod:3 Plane:3 Ch:20 Edep:1.891 MeV PID:211 Track:3 pos(mm):{450, 496.1, -217.2}
Mod:3 Plane:4 Ch:19 Edep:428.4 keV PID:11 Track:1478 pos(mm):{355, 478.1, -112.6}

=== hits in YLayer (cyan) ===

Mod:3 Pln:2 Ch:22 Edep:6.709 MeV PID:11 Track:601 pos(mm):{597.9, 515.6, -315}
Mod:3 Pln:2 Ch:21 Edep:3.495 MeV PID:-211 Track:1188 pos(mm):{569.7, 496.6, -315}
Mod:3 Pln:1 Ch:20 Edep:8.258 MeV PID:2212 Track:1186 pos(mm):{569.1, 443.1, -410}
Mod:3 Pln:3 Ch:21 Edep:2.67 MeV PID:211 Track:3 pos(mm):{443.3, 494.9, -210}

=== hits in veto (red) ===

Mod:3 Pln:12 Ch:7 Edep:6.286 MeV PID:211 track:26 pos(mm):704 417.8 -175}
Mod:3 Pln:12 Ch:5 Edep:5.697 MeV PID:-11 track:179 pos(mm):704 473.4 -275}
Mod:3 Pln:12 Ch:12 Edep:4.007 MeV PID:11 track:672 pos(mm):704 485.7 75}
Mod:3 Pln:12 Ch:8 Edep:6.56 MeV PID:-11 track:949 pos(mm):707.9 492 -125}
Mod:3 Pln:12 Ch:9 Edep:3.296 MeV PID:13 track:1 pos(mm):704 538 -75}
Mod:3 Pln:12 Ch:10 Edep:2.122 MeV PID:13 track:1 pos(mm):709.9 539.5 -25}
Mod:3 Pln:12 Ch:11 Edep:5.083 MeV PID:-11 track:1836 pos(mm):704 583.5 25}
Mod:3 Pln:14 Ch:13 Edep:2.476 MeV PID:11 track:1835 pos(mm):643.5 679 125}

// neutrino 14
// muon 13
// P 2212
// N 2112
// Pi0 111
// Pi+ 211
// Pi- -211
// Eta0 221
// K+ 321
// Lambda 3122
// omega 223