MizuChe MC

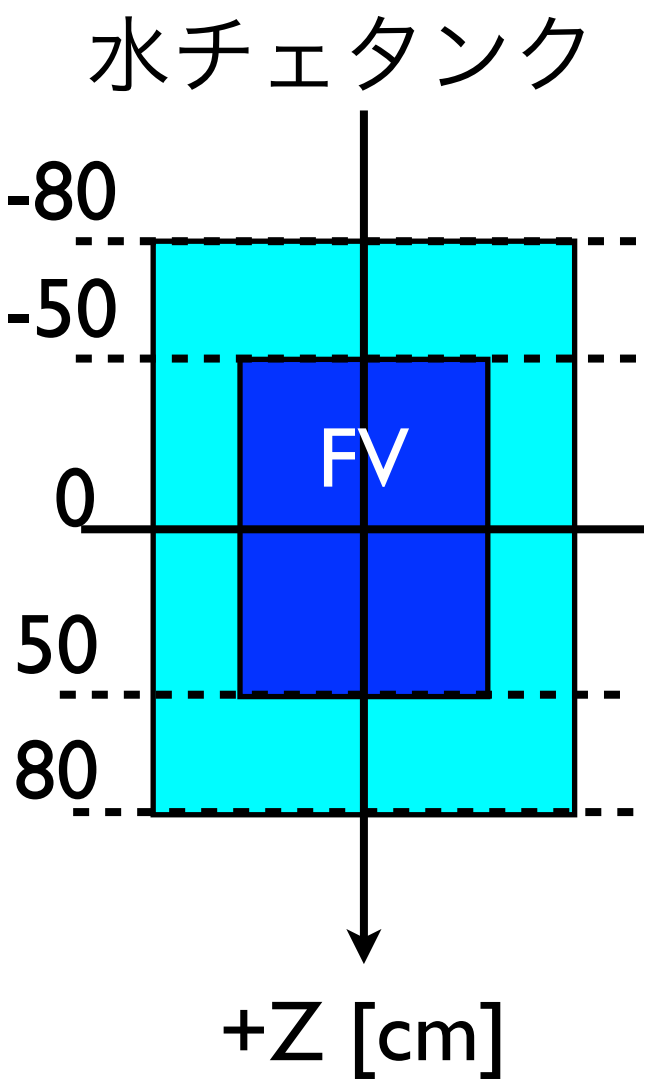
A.Murakami

Show Event display

- ビーム軸上で、照射位置をビーム上流から下流へ変えていった際にどういうイベントとして観測されるか。
  - ビーム上流から発射されたミューオンによるチェレンコフはタンク全体に広がって観測され、ビーム下流の場合はタンクの底の狭い範囲にとどまる、それがどう観測されるか。

MC setting

- Tank : 160cm × Φ140cm (FV : 100cm × Φ80cm)
- PMT : 181
- PMT window の材質 : アクリル
  - PMT window に入ってくる光電子を数える.
- Muon
  - Kinetic energy : 200MeV, 400MeV
  - Direction : (0, 0, 1) （ビーム方向を+z)
  - Vertex position : z = -70, -60, -30, -10, 10, 30, 60, 70 [cm]

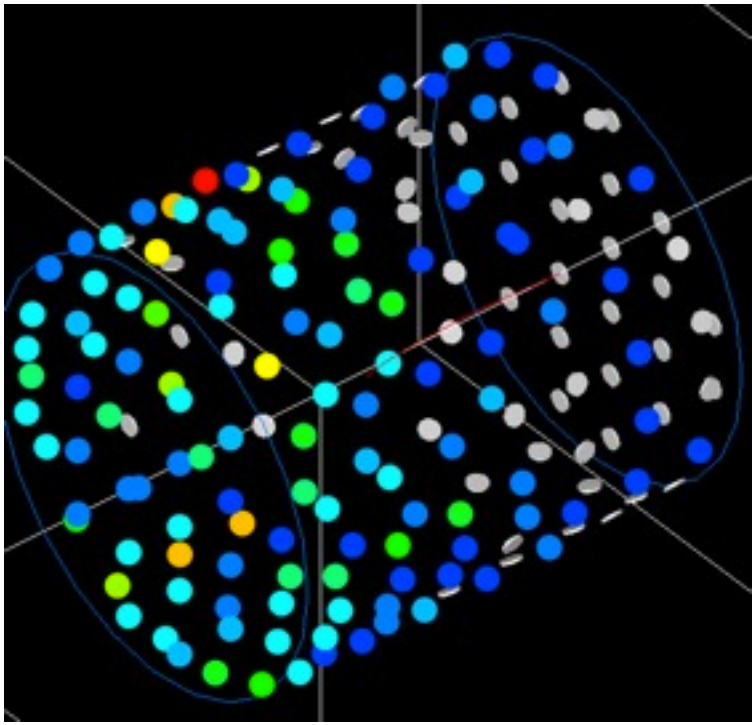


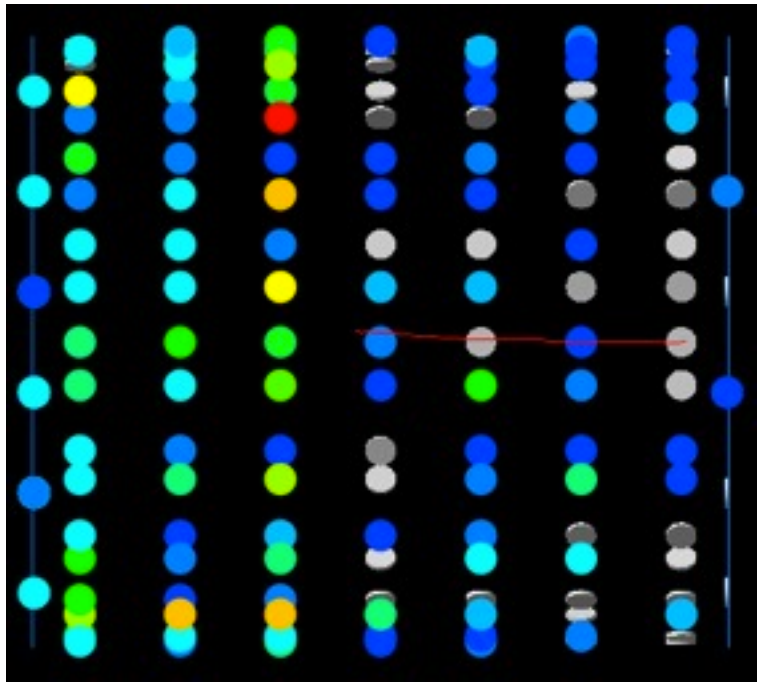
ヒットがあったPMTの色

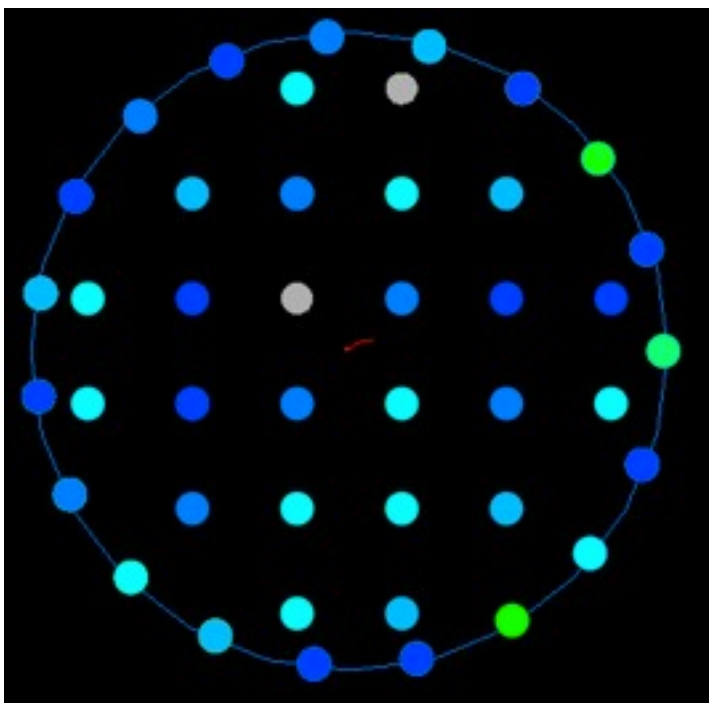
- ヒットがあったPMTは灰色以外の色になるが、光電子数に応じて色が変化する。
  - 色の変化は 1p.e. 毎に、青色→水色→緑色→黄色→黄土色→赤色まで七色に変化
  - 16p.e. 以上は全て赤色になる。

Muon Energy = 200MeV

Z = -70cm

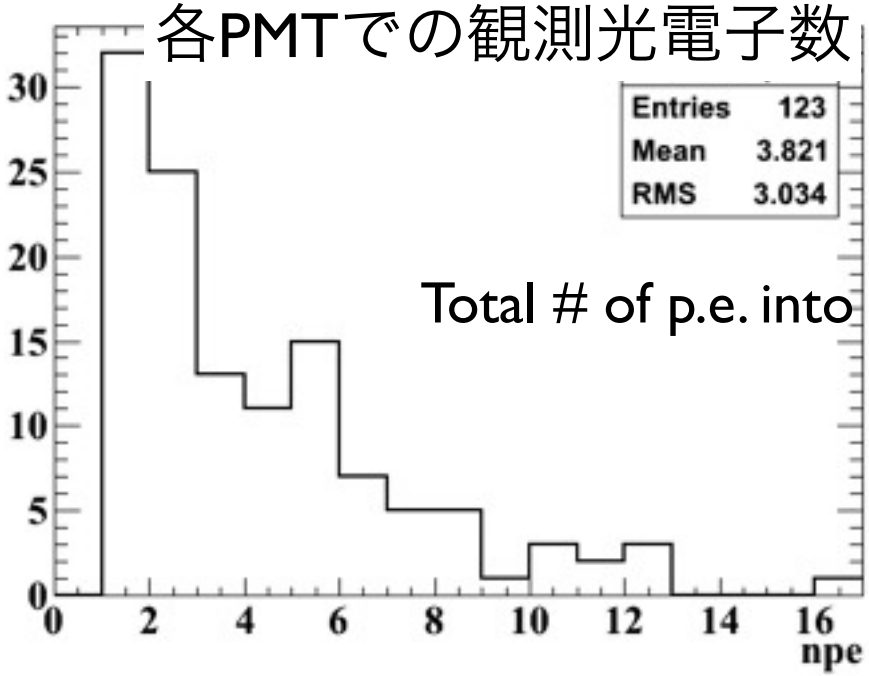






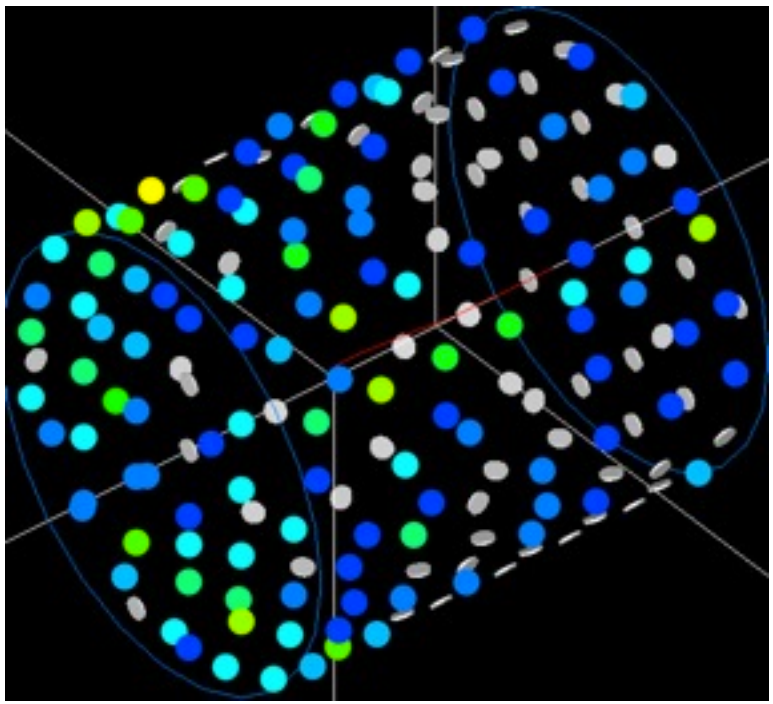
# of optical photons produced in this event : 29018
# of photo-electrons produced in this event : 5453

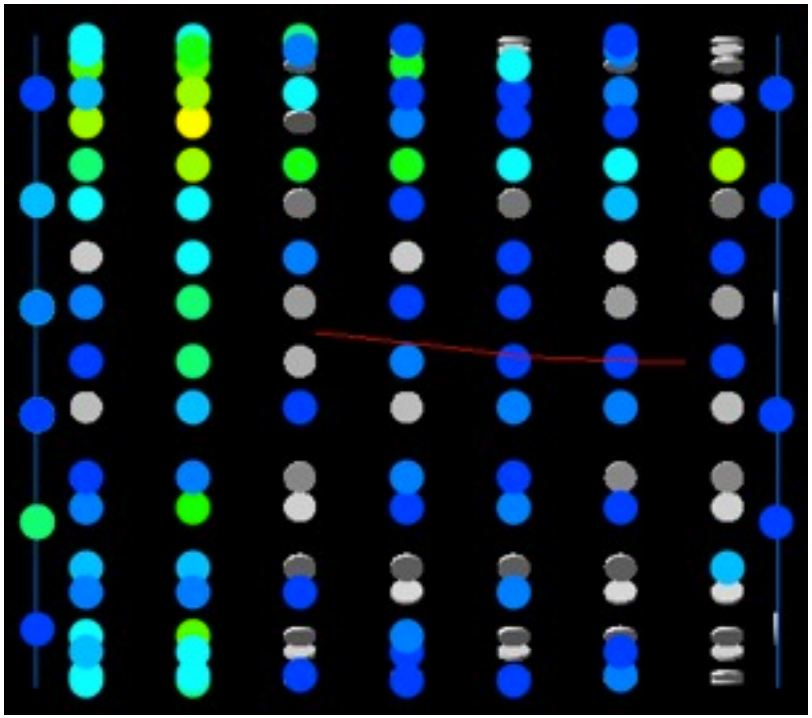
各PMTでの観測光電子数

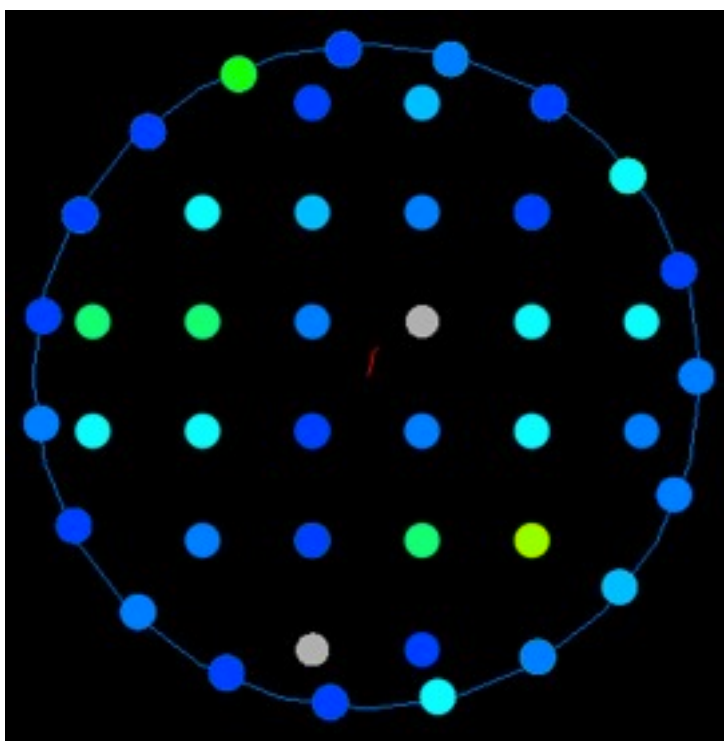


Total # of p.e. into PMTs 470

Z = -60cm

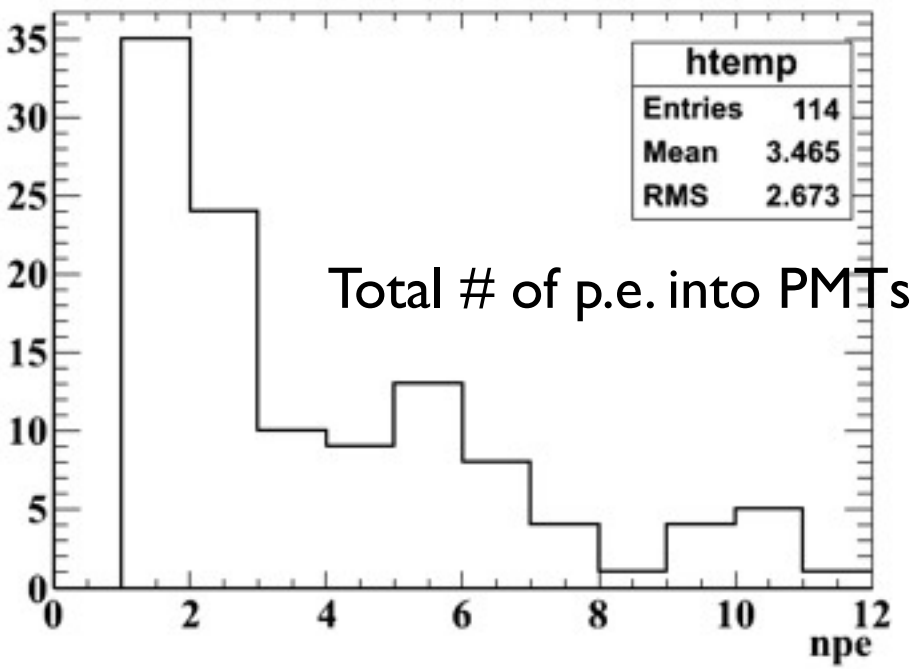






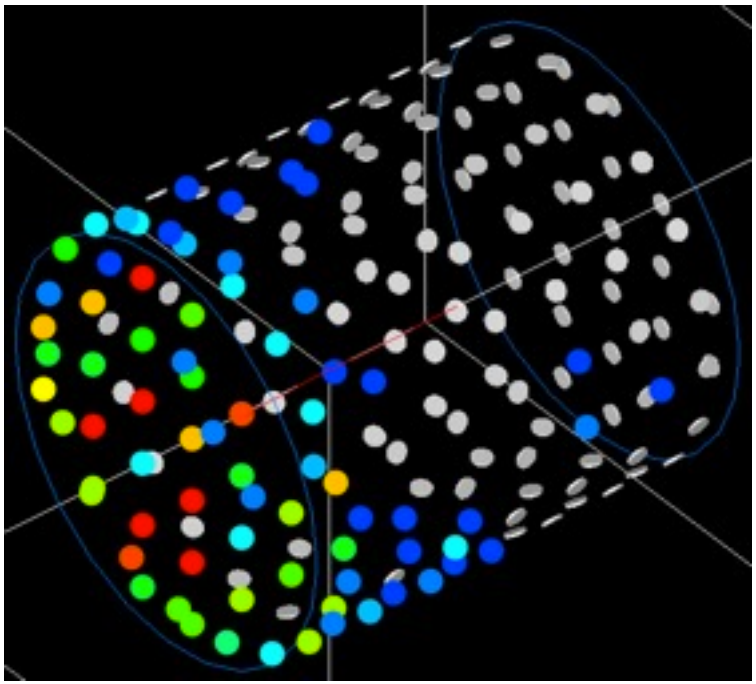
# of optical photons produced in this event : 28633

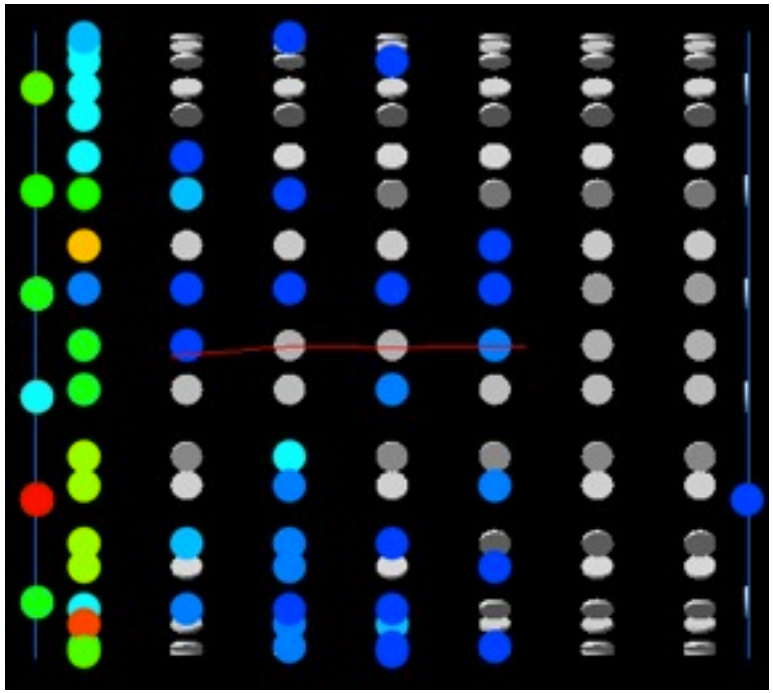
# of photo-electrons produced in this event : 5383

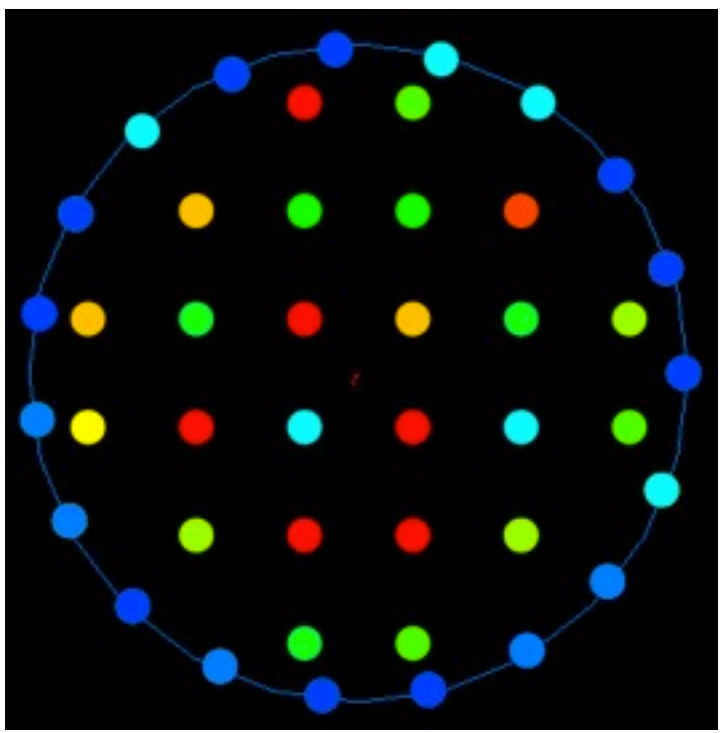


Total # of p.e. into PMTs 395

Z = -30cm

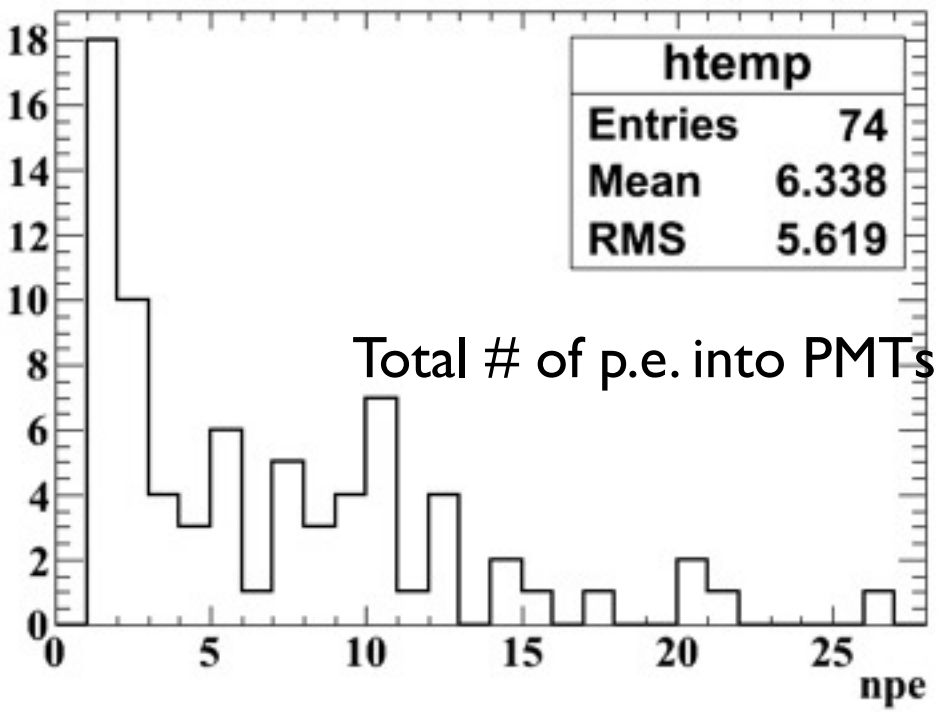






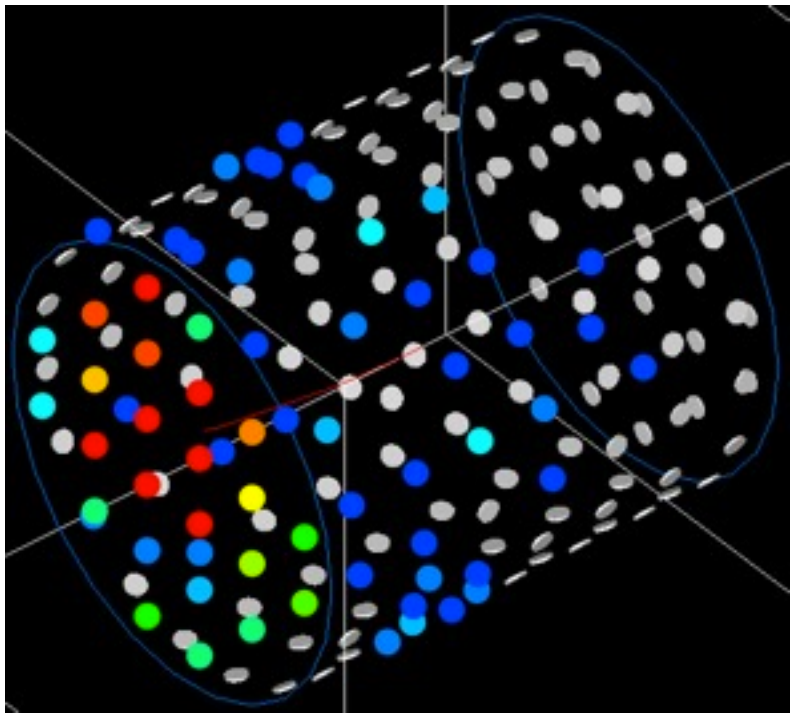
# of optical photons produced in this event : 28674

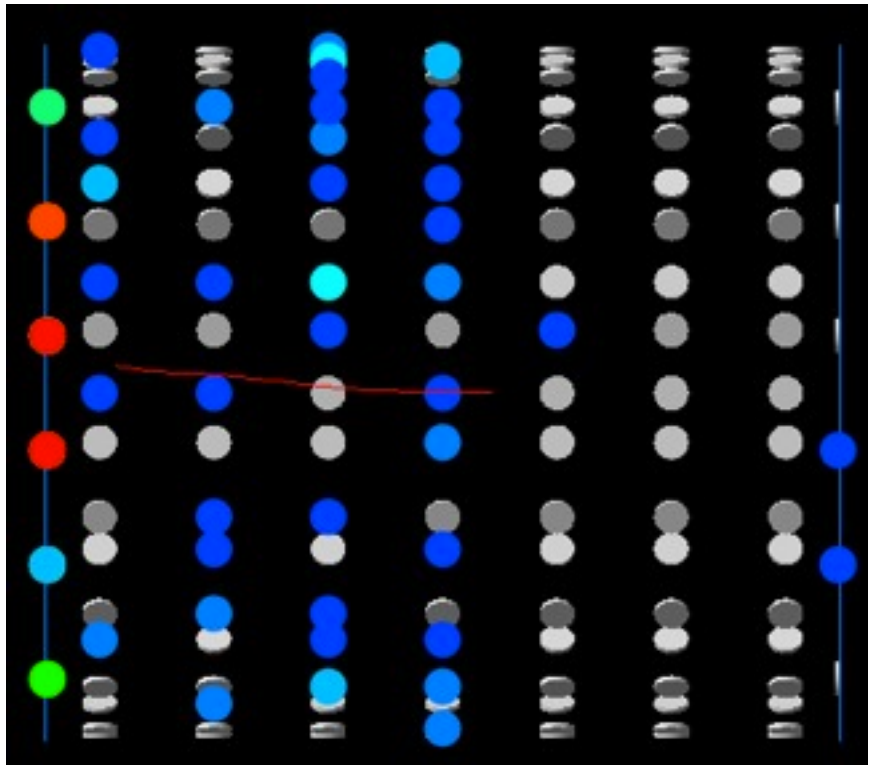
# of photo-electrons produced in this event : 5512

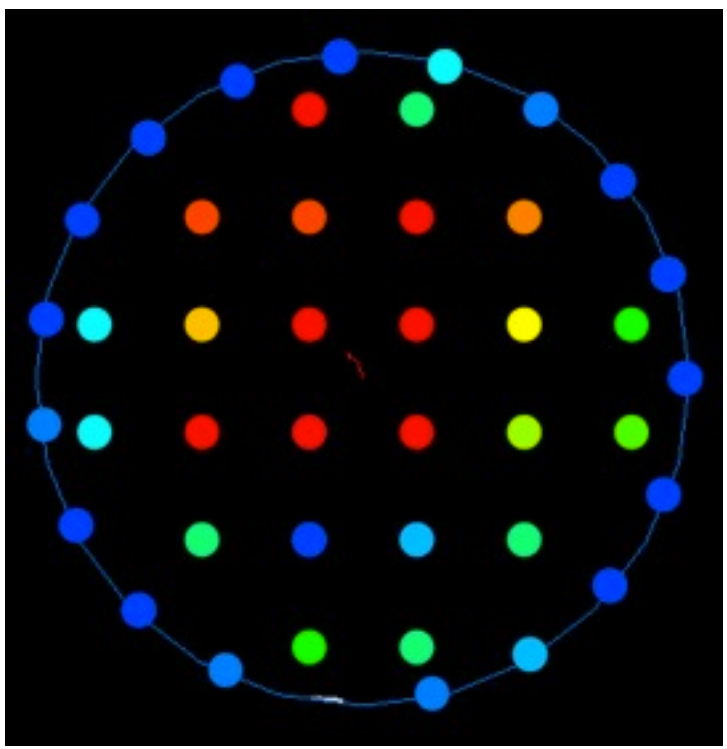


Total # of p.e. into PMTs 469

Z = -10cm

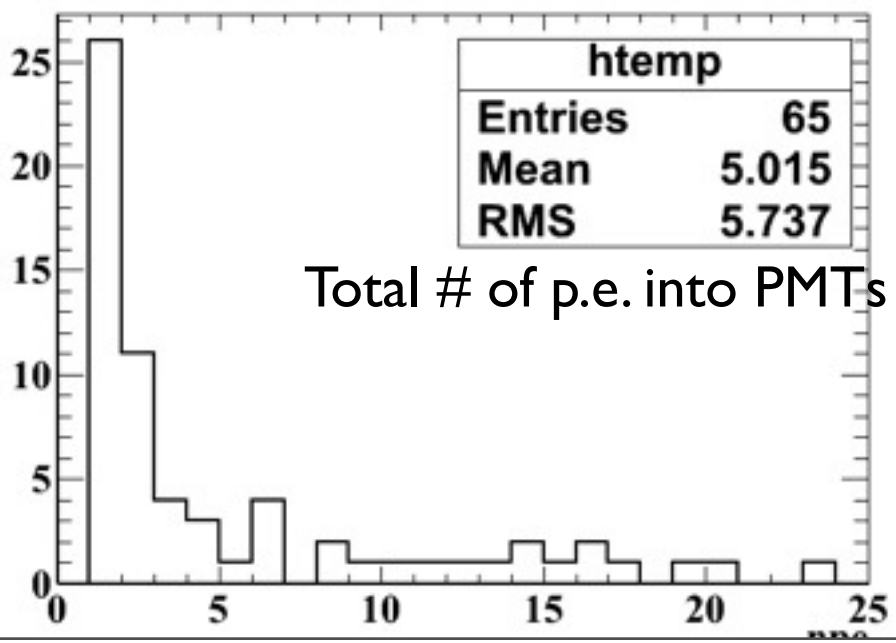






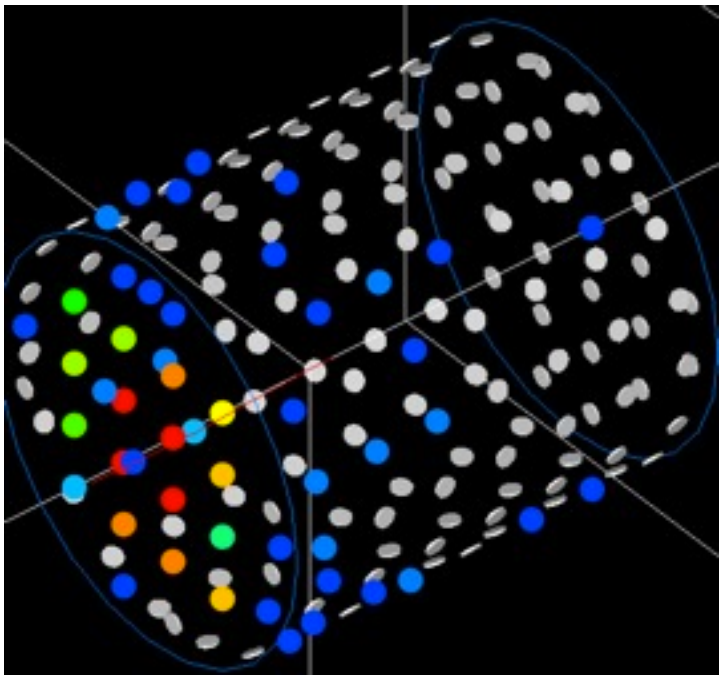
# of optical photons produced in this event : 25230

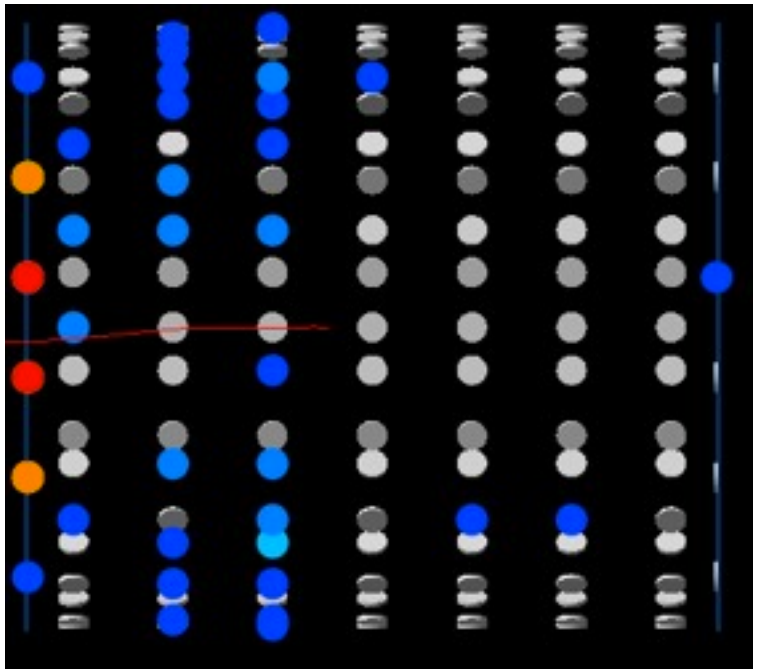
# of photo-electrons produced in this event : 4858

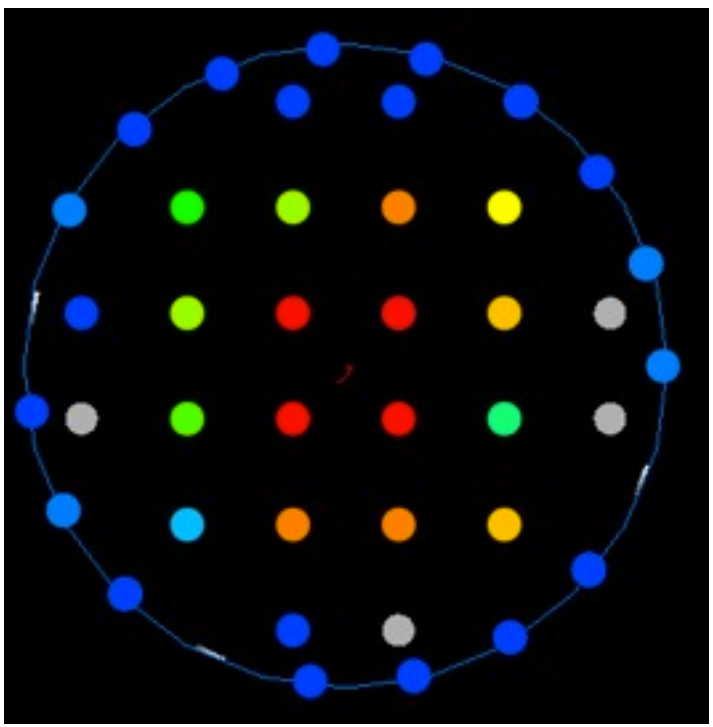


Total # of p.e. into PMTs 326

Z = 10cm

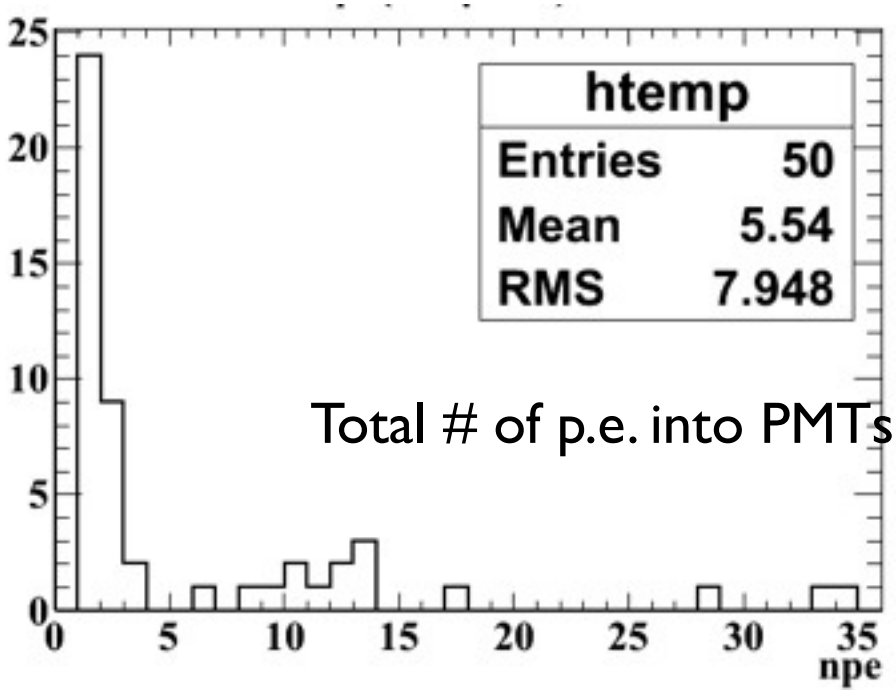






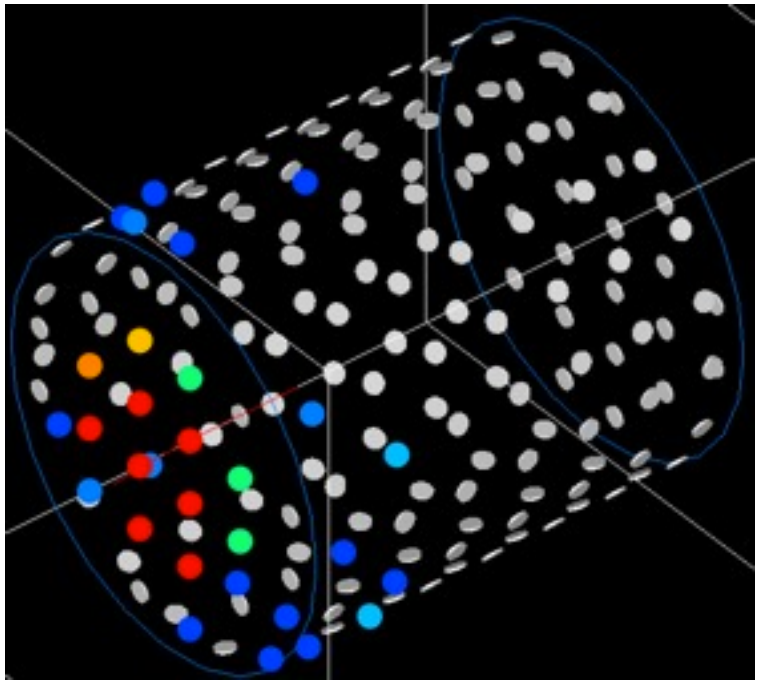
# of optical photons produced in this event : 21435

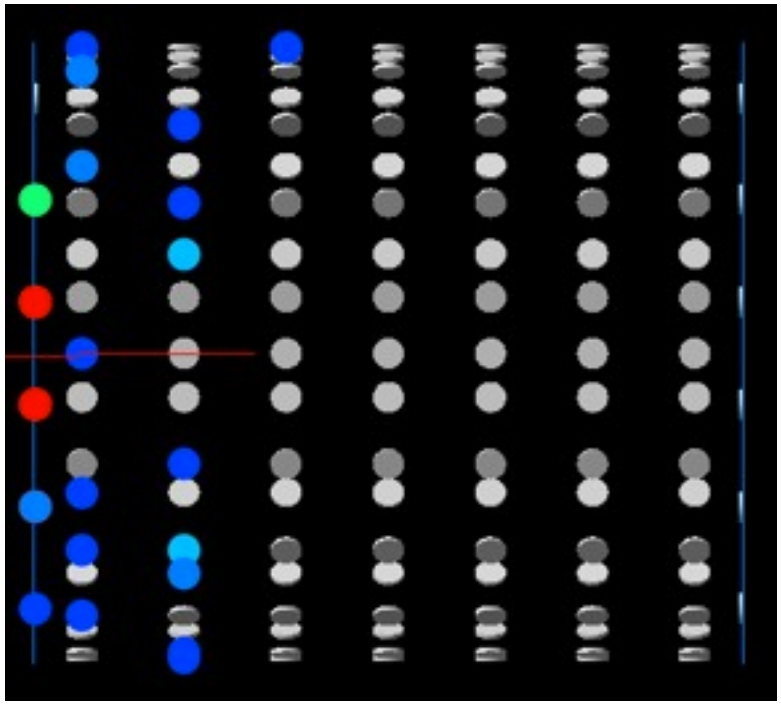
# of photo-electrons produced in this event : 4047

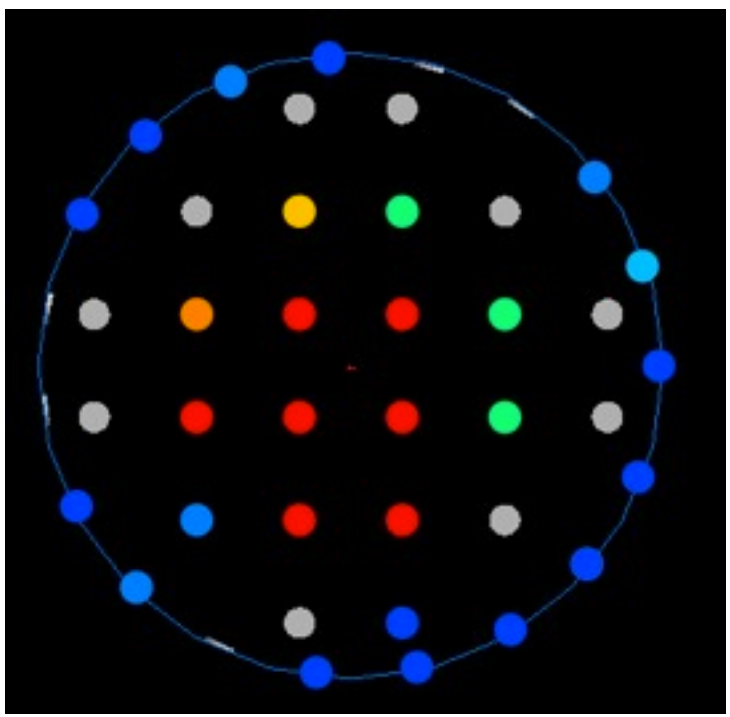


Total # of p.e. into PMTs 277

Z = 30cm

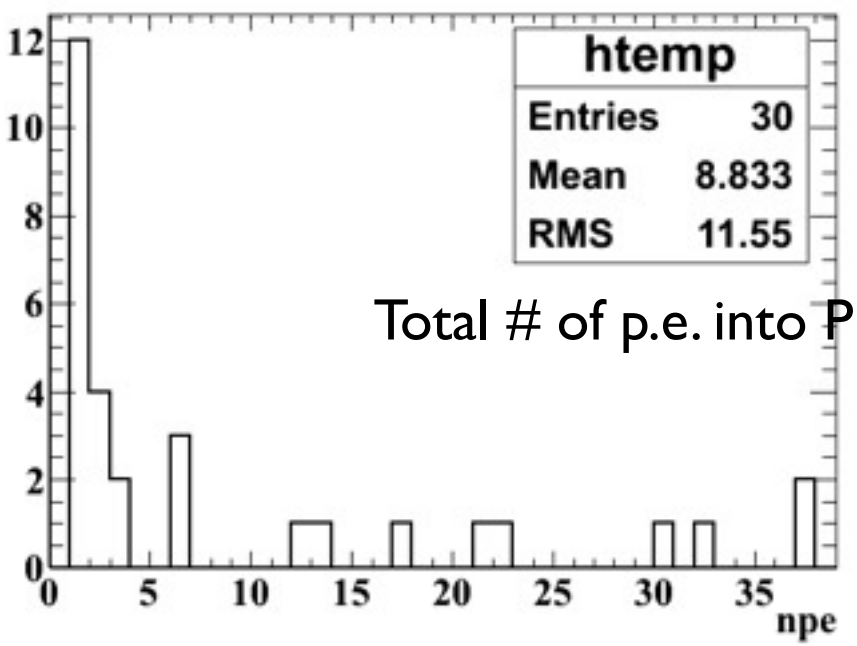






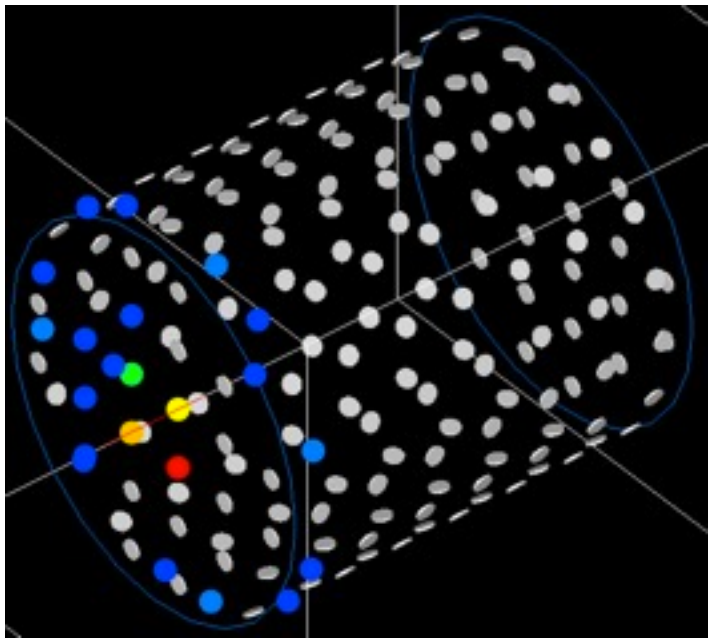
# of optical photons produced in this event : 18158

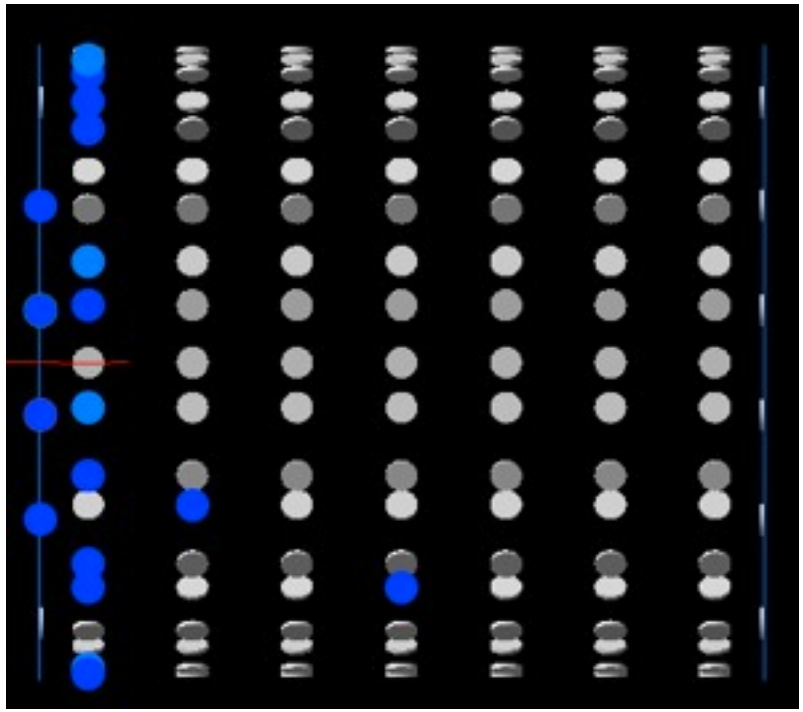
# of photo-electrons produced in this event : 3476

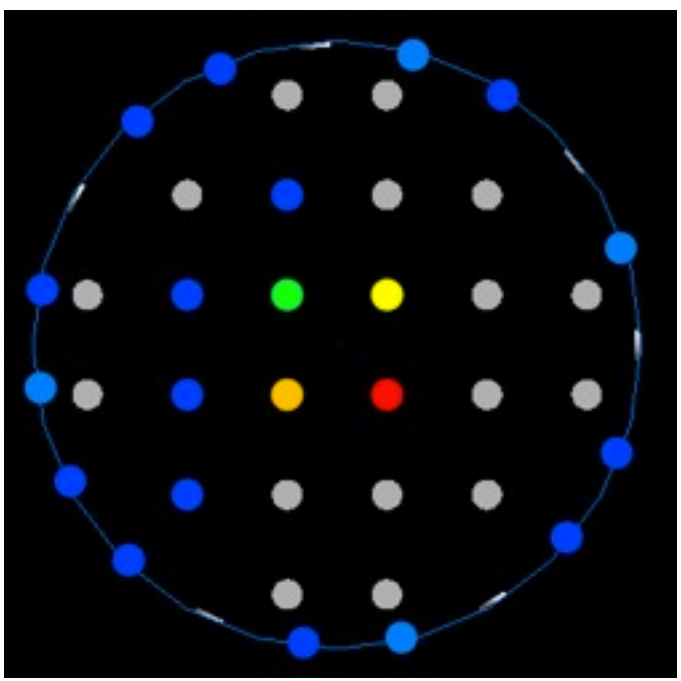


Total # of p.e. into PMTs 265

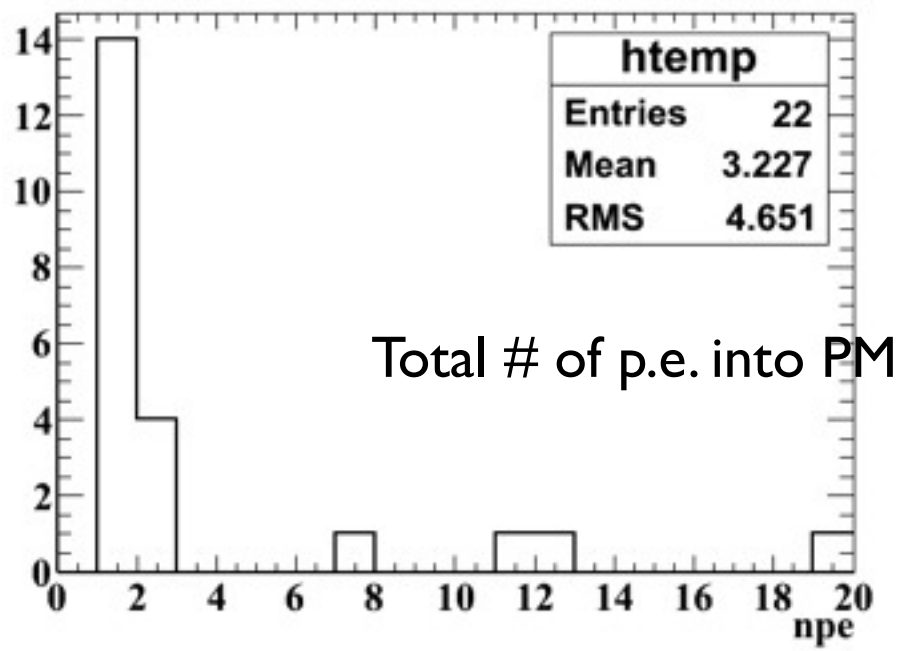
Z = 60cm





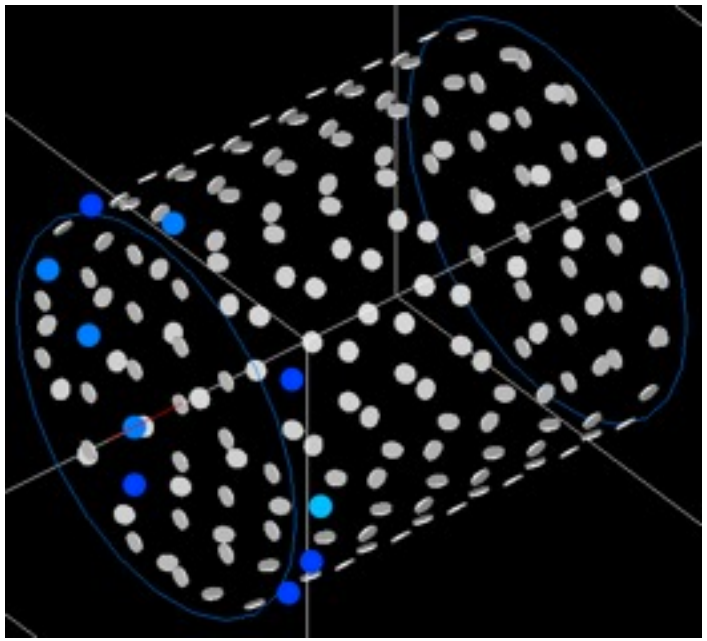


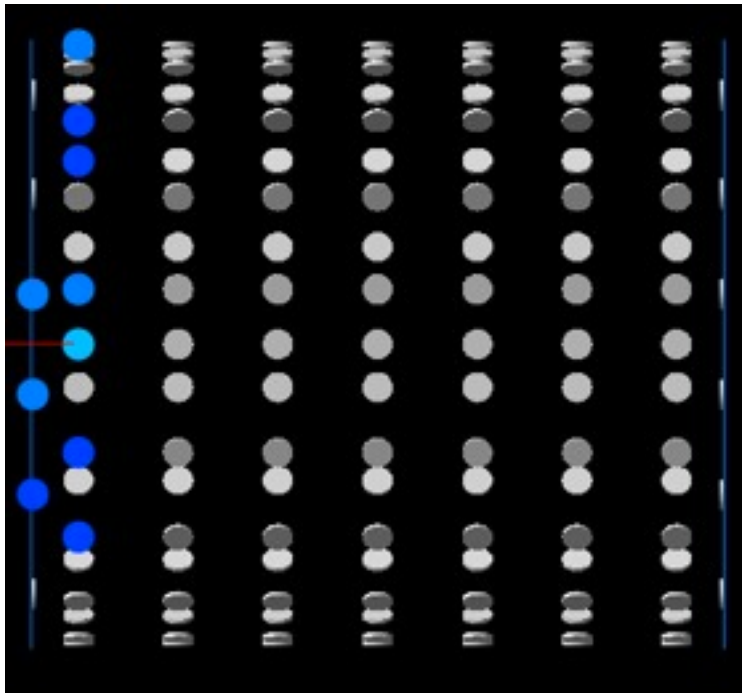
# of optical photons produced in this event : 7816
# of photo-electrons produced in this event : 1477



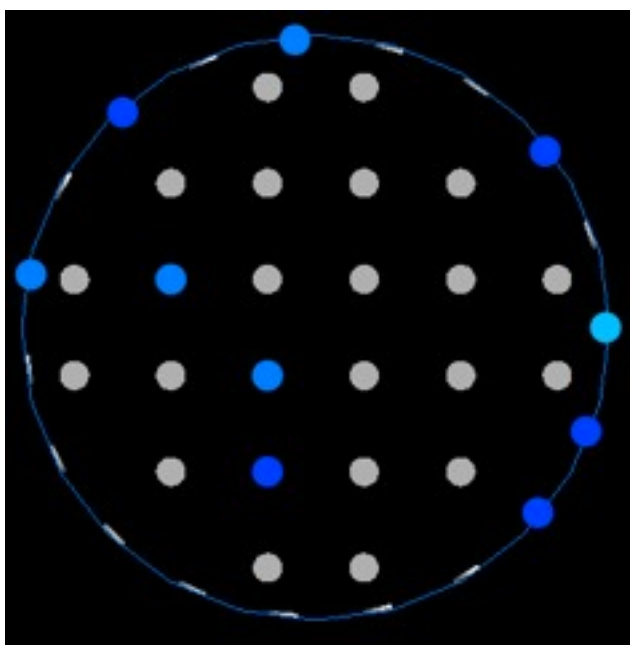
Total # of p.e. into PMTs 71

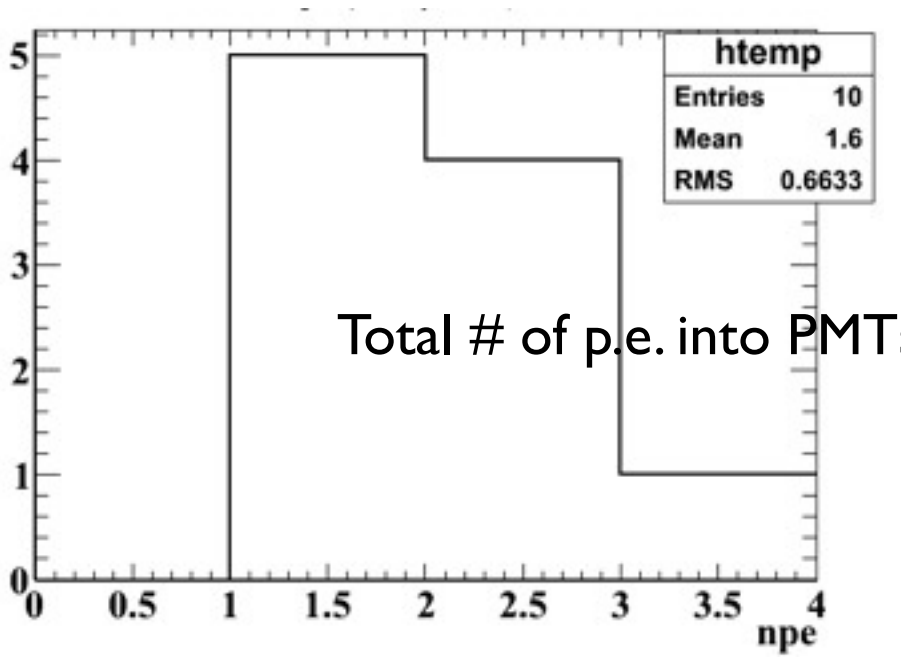
Z = 70cm





# of optical photons produced in this event : 4286
# of photo-electrons produced in this event : 782

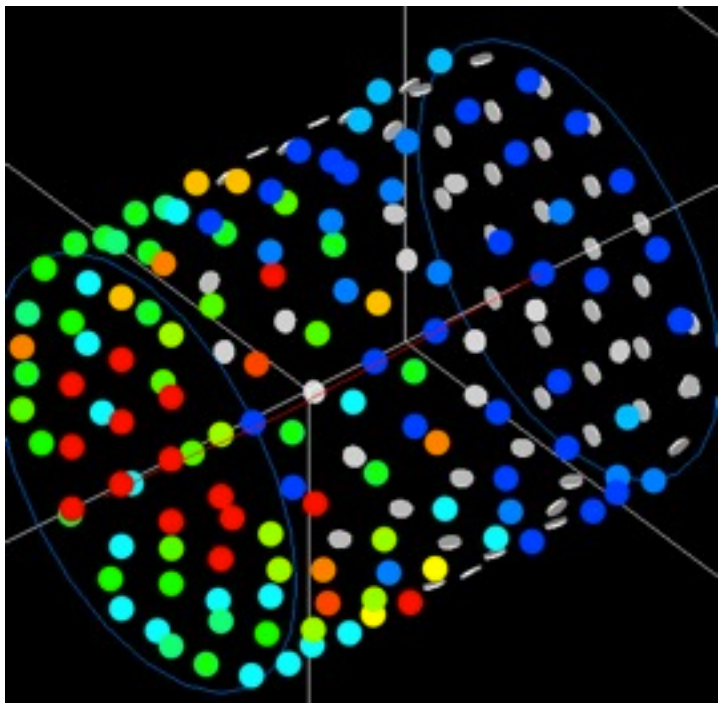


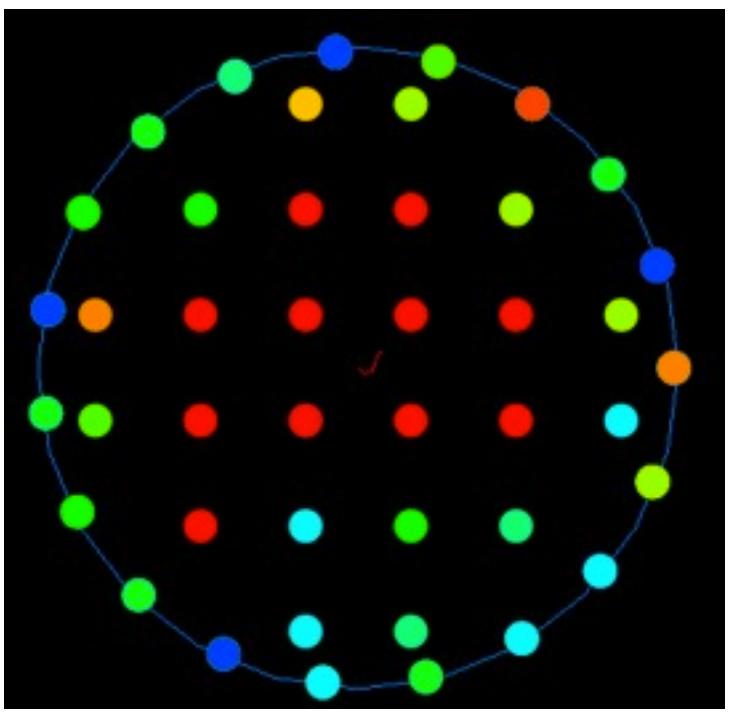


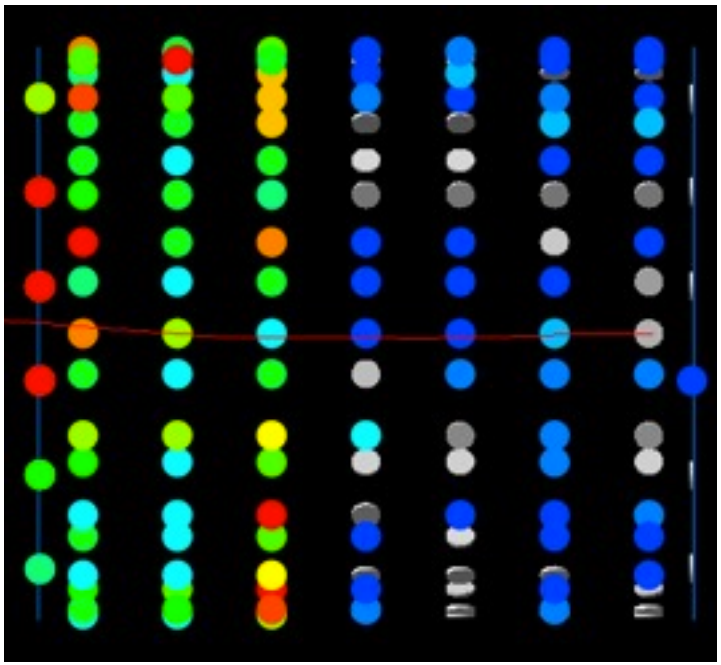
Total # of p.e. into PMTs 16

Muon energy = 400MeV

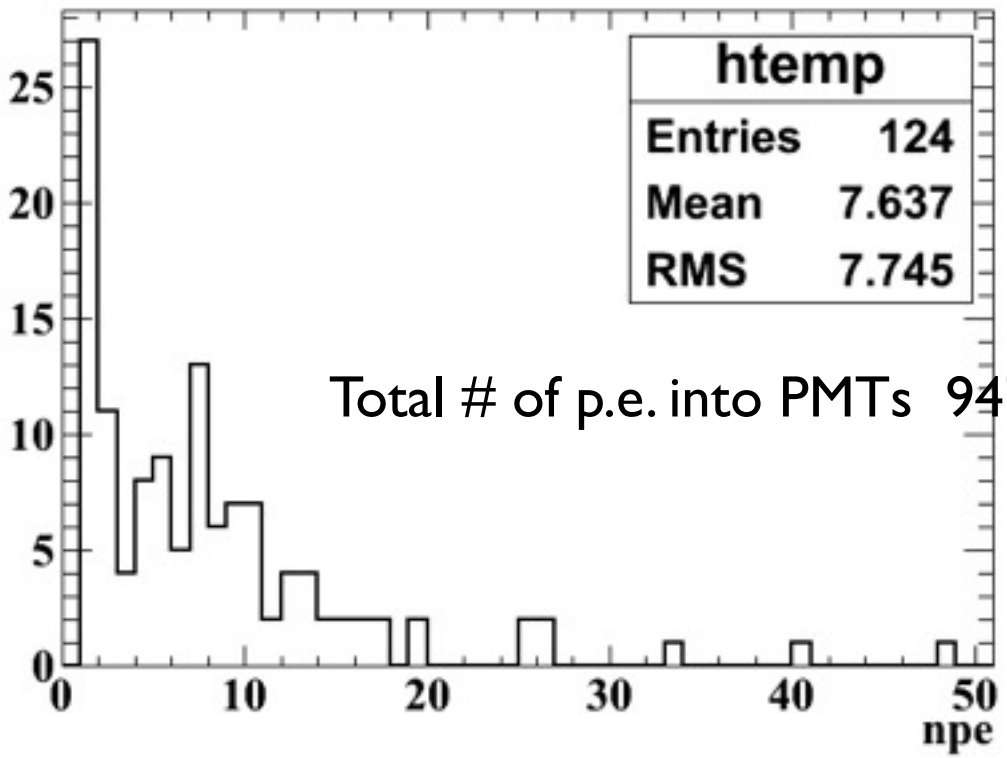
Z = -70cm



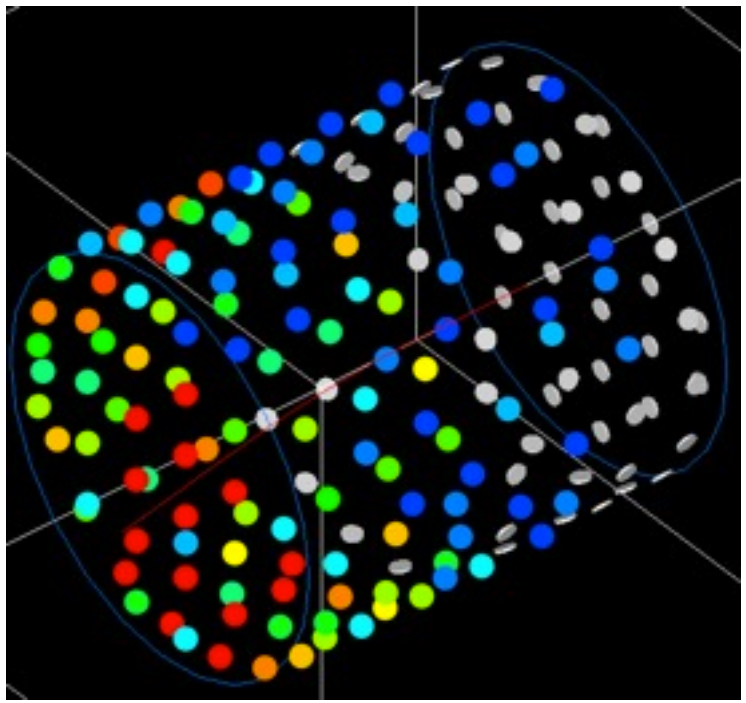


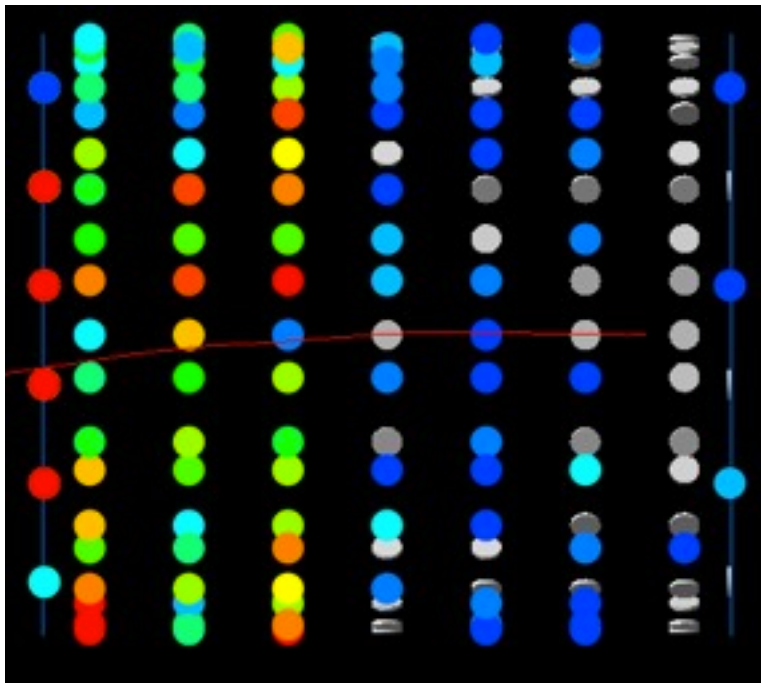


# of optical photons produced in this event : 62910
# of photo-electrons produced in this event : 11937



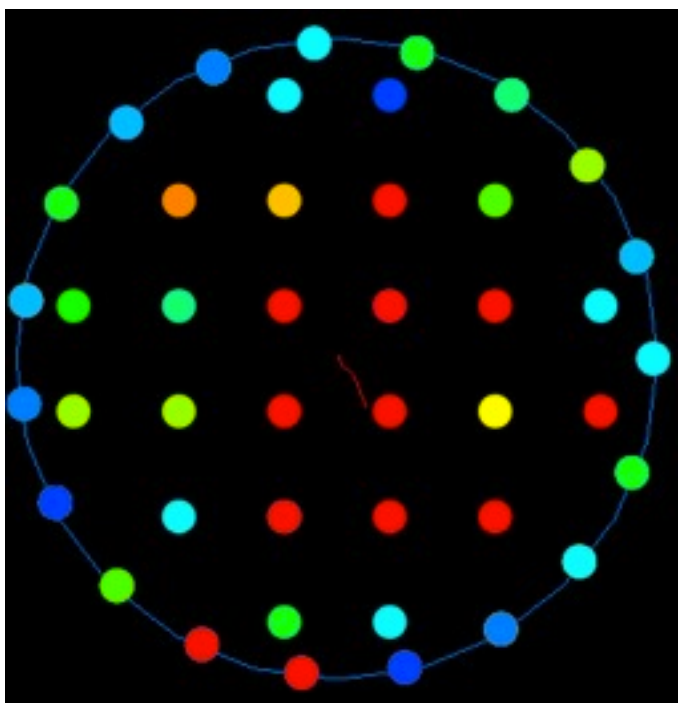
Z = -60cm

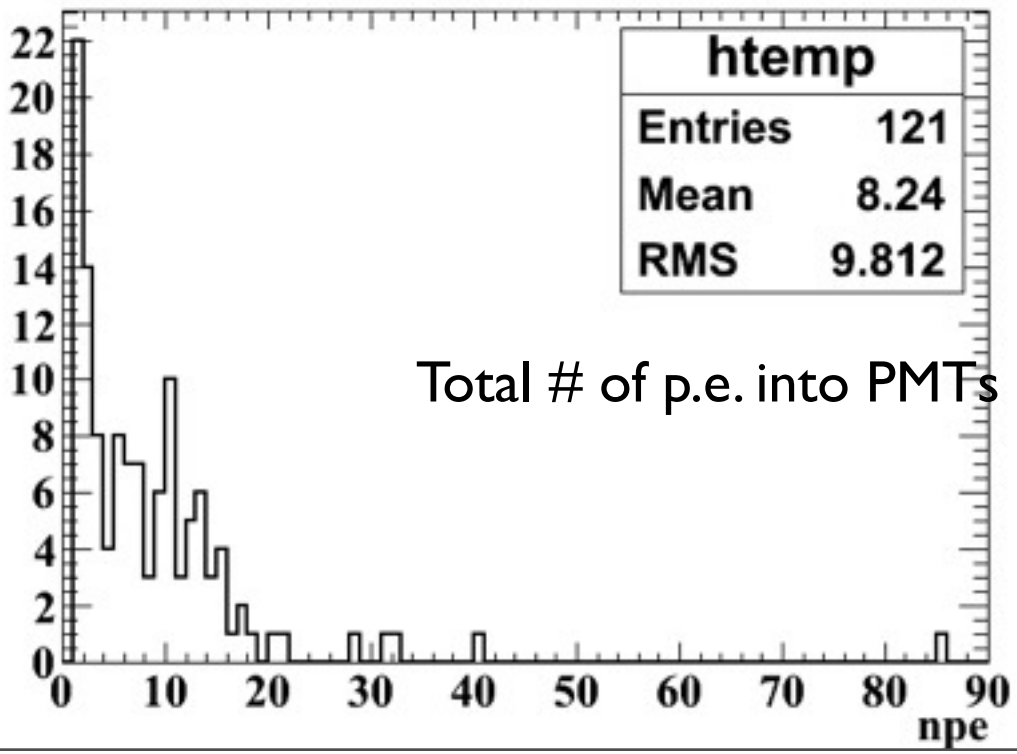




of optical photons produced in this event : 59359

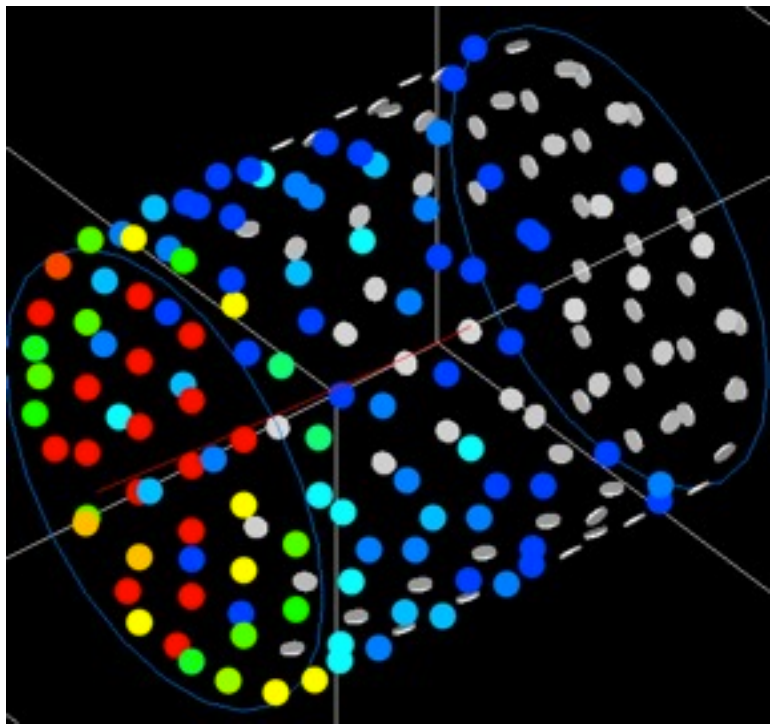
# of photo-electrons produced in this event : 11350

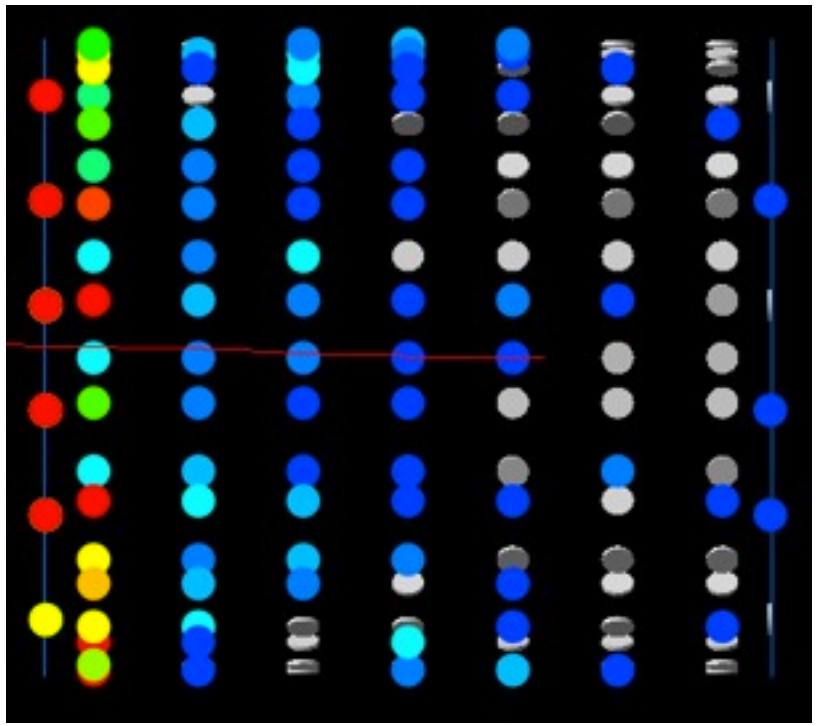




Total # of p.e. into PMTs 997

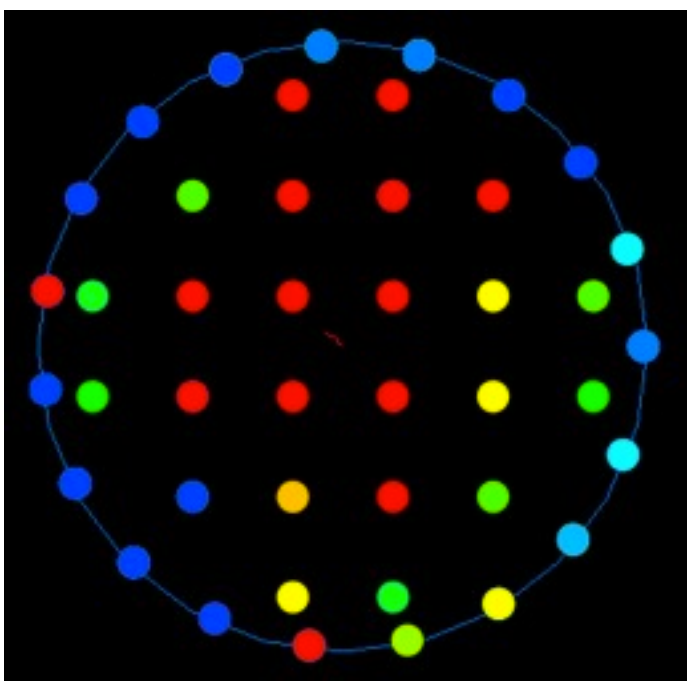
Z = -30cm

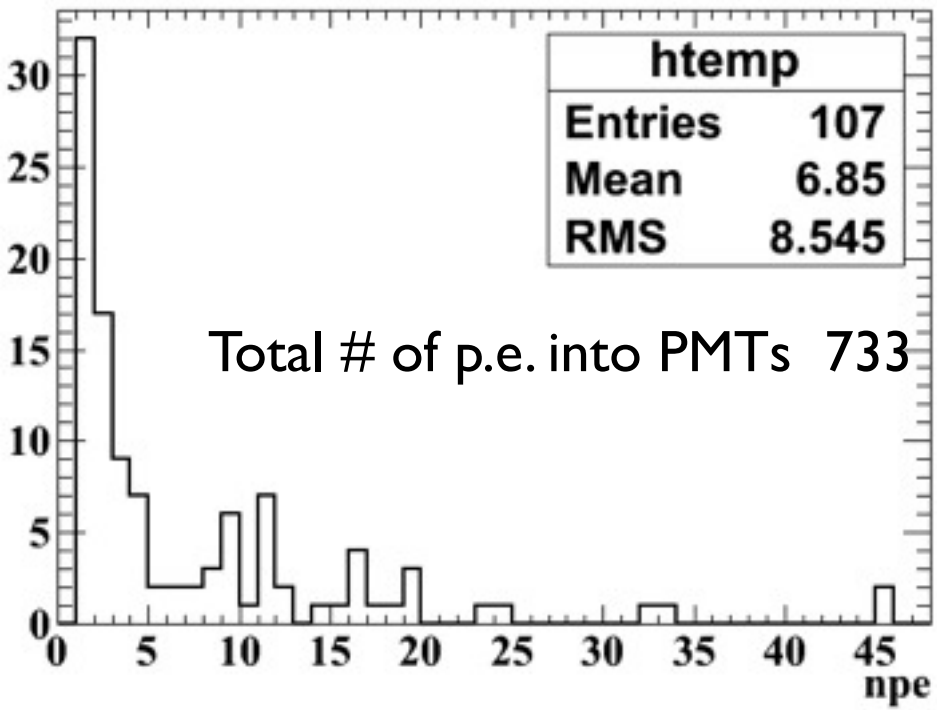




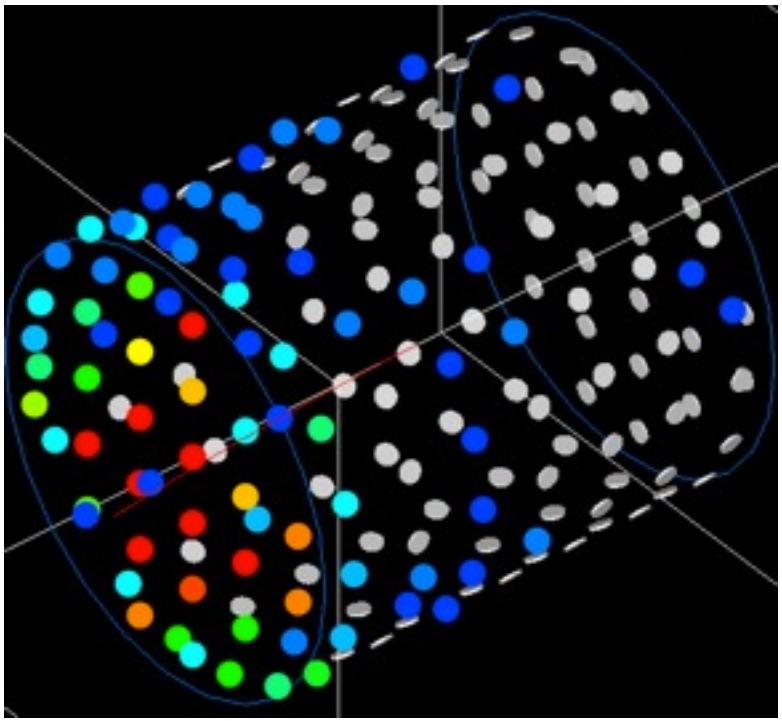
# of optical photons produced in this event : 53310

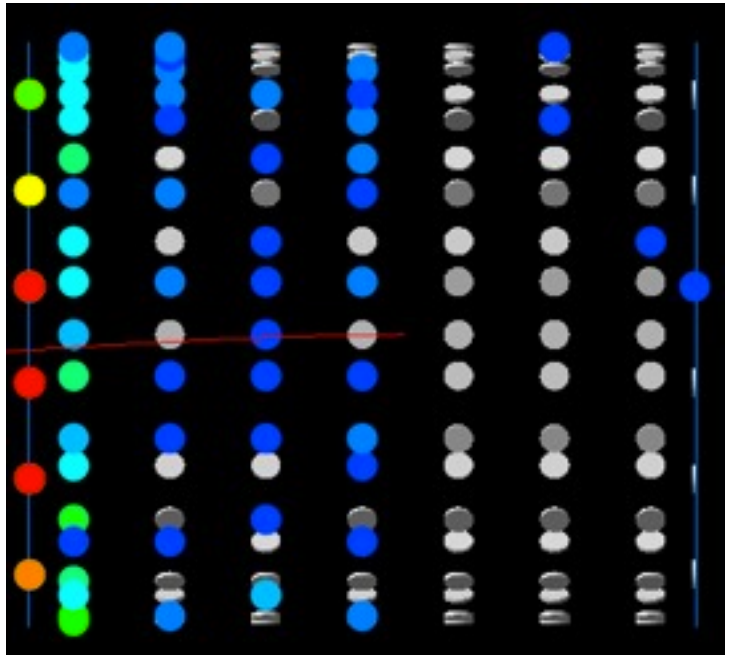
# of photo-electrons produced in this event : 10269



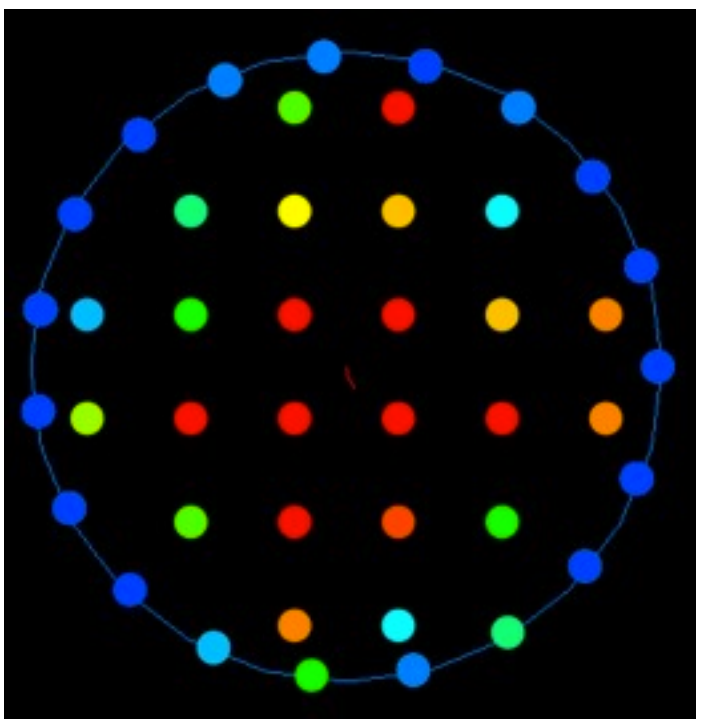


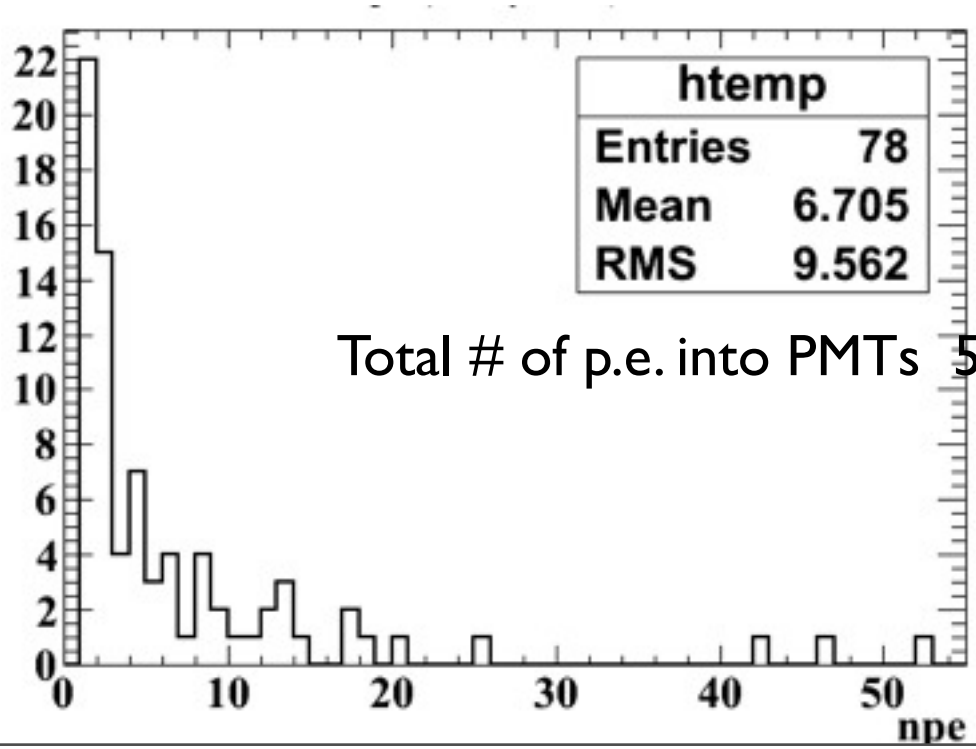
Z = -10cm





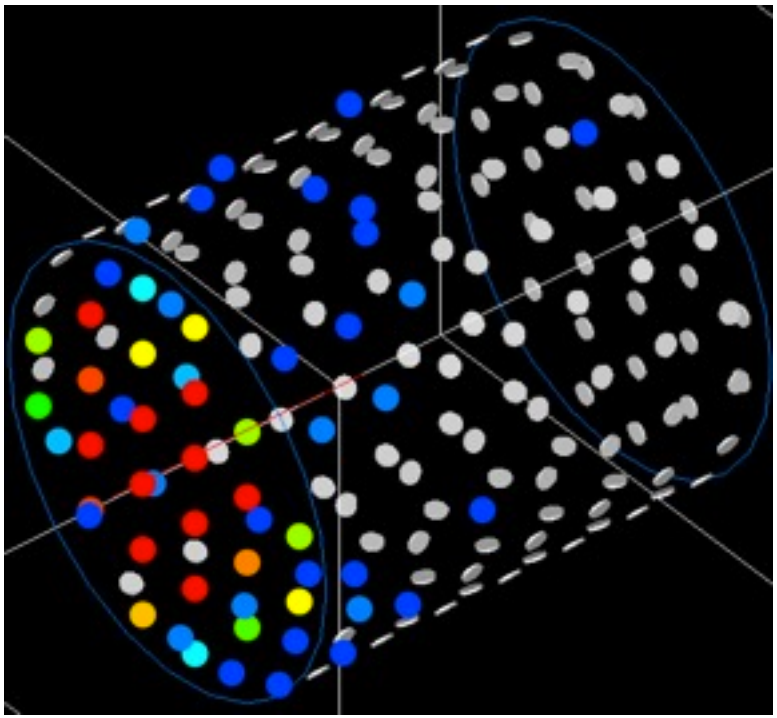
# of optical photons produced in this event : 39833
# of photo-electrons produced in this event : 7470

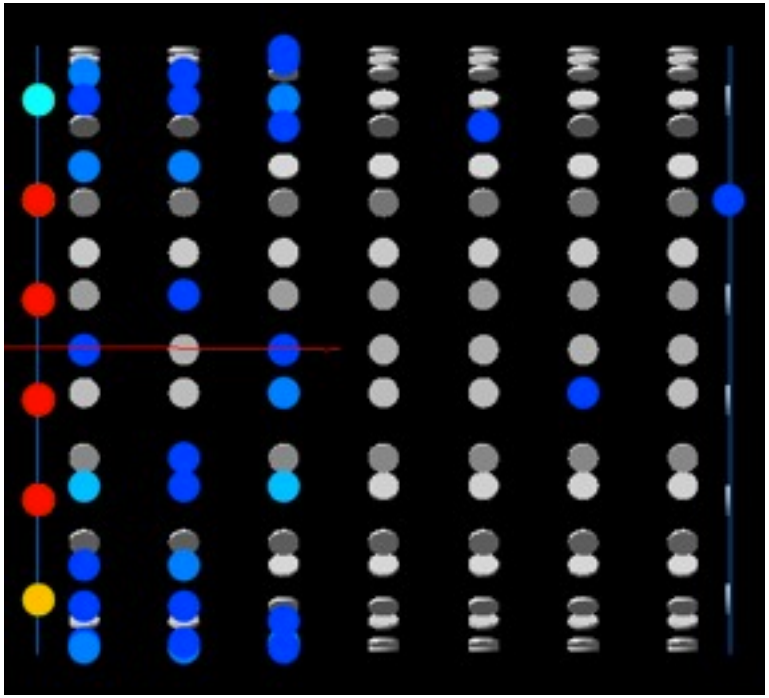




Total # of p.e. into PMTs 523

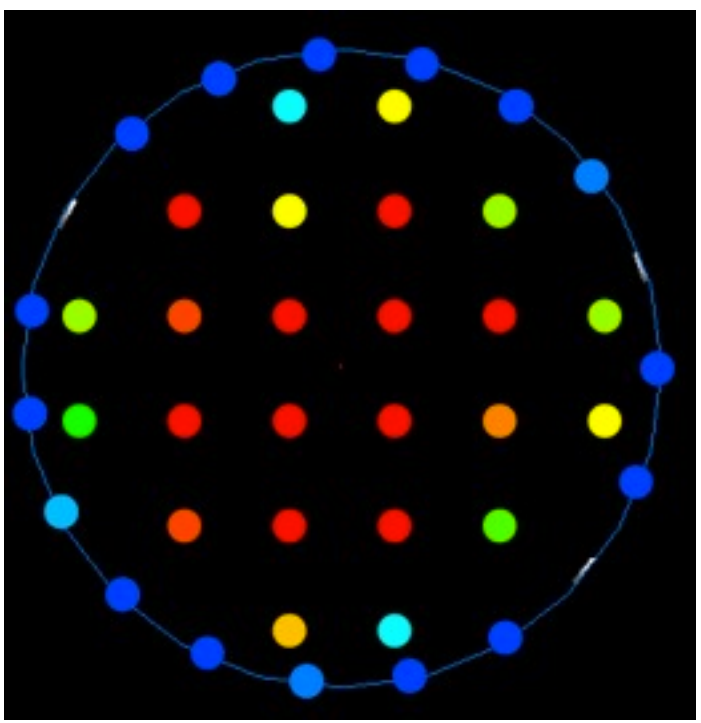
Z = 10 cm

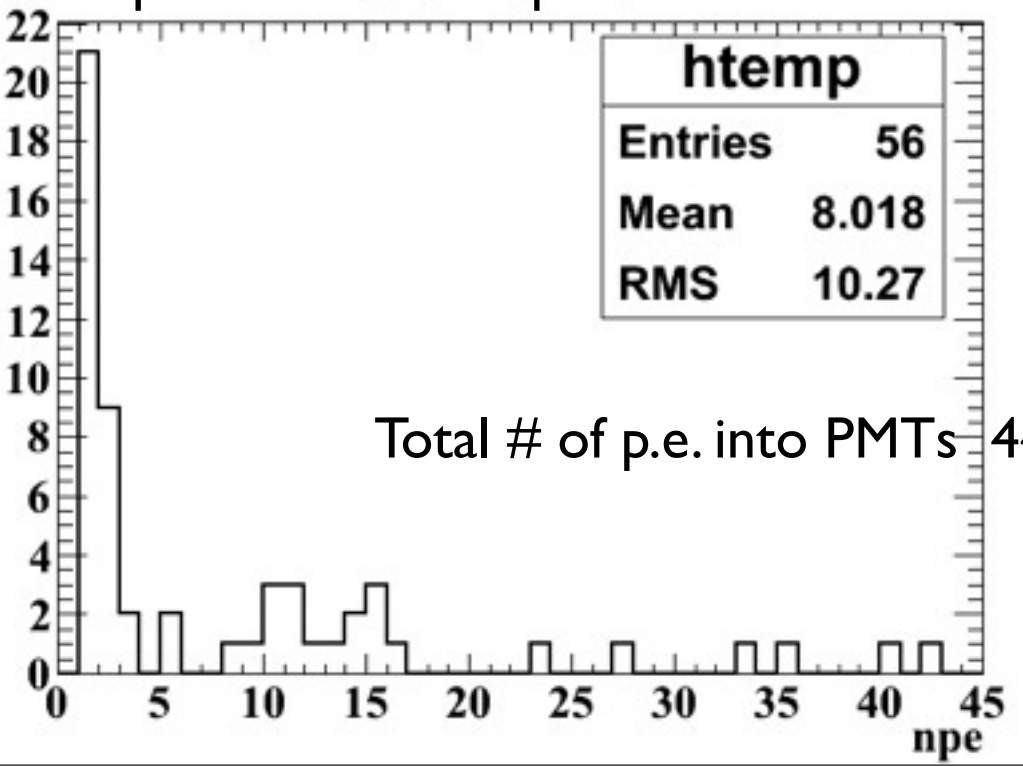




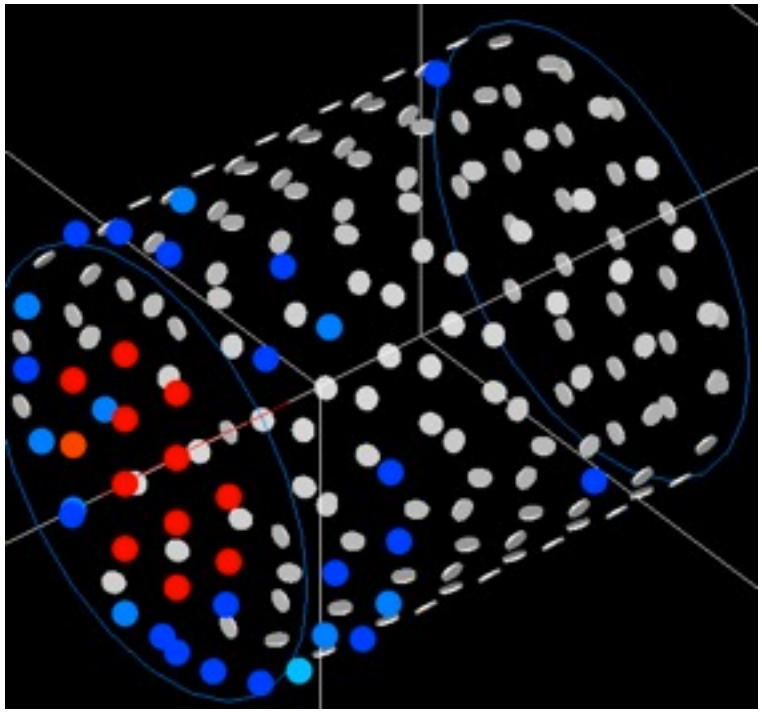
# of optical photons produced in this event : 31372

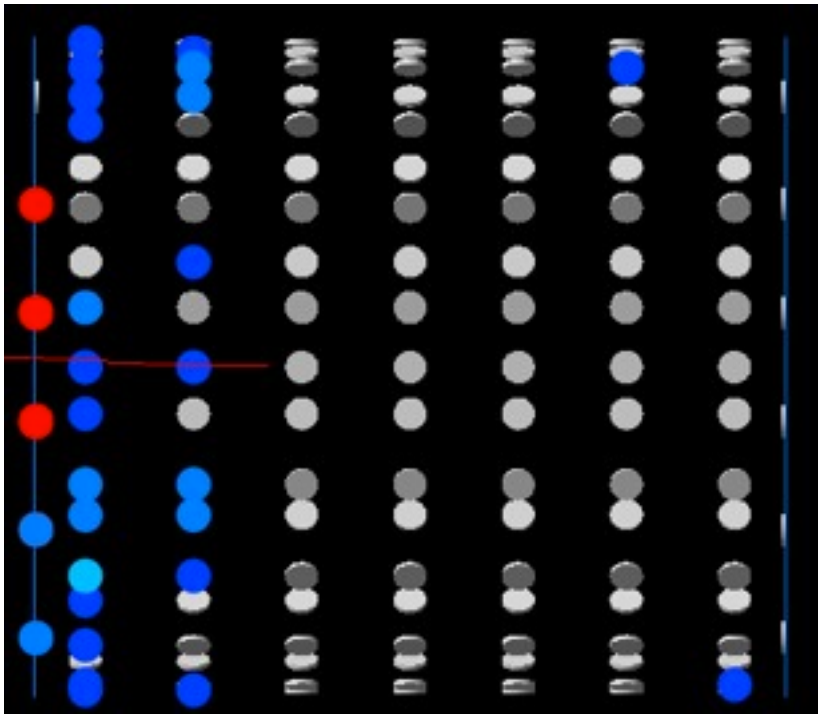
# of photo-electrons produced in this event : 6058

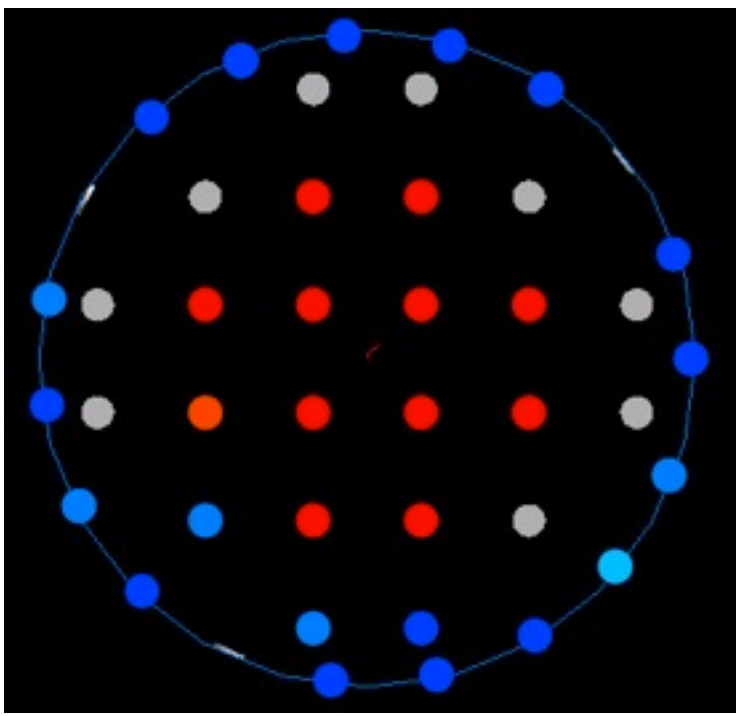




Z = 30cm

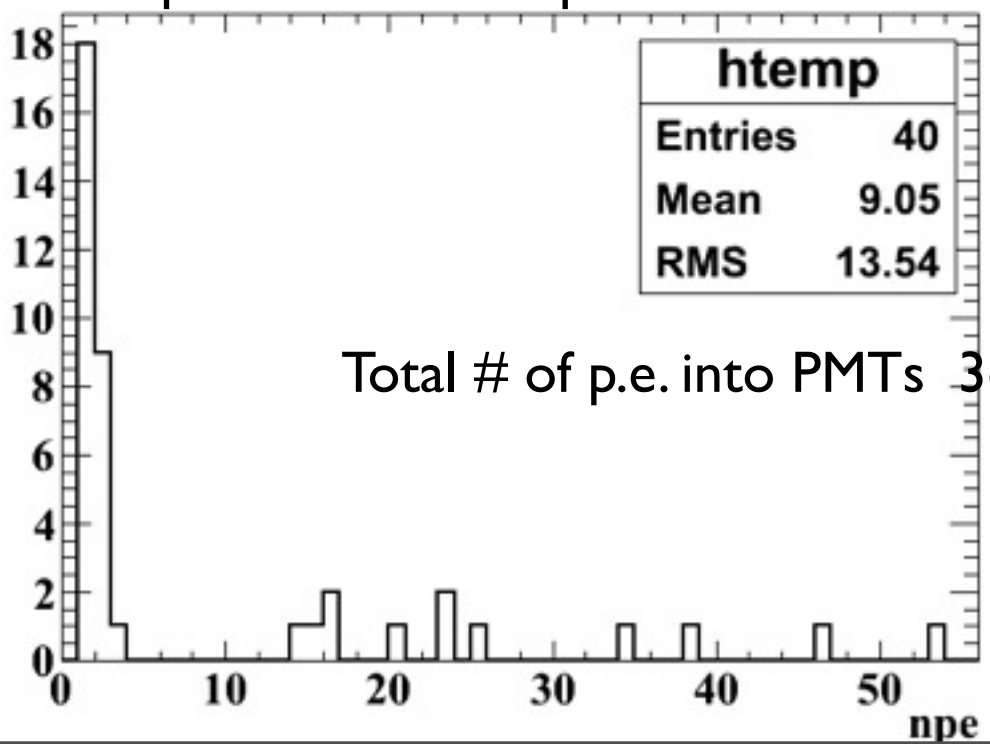






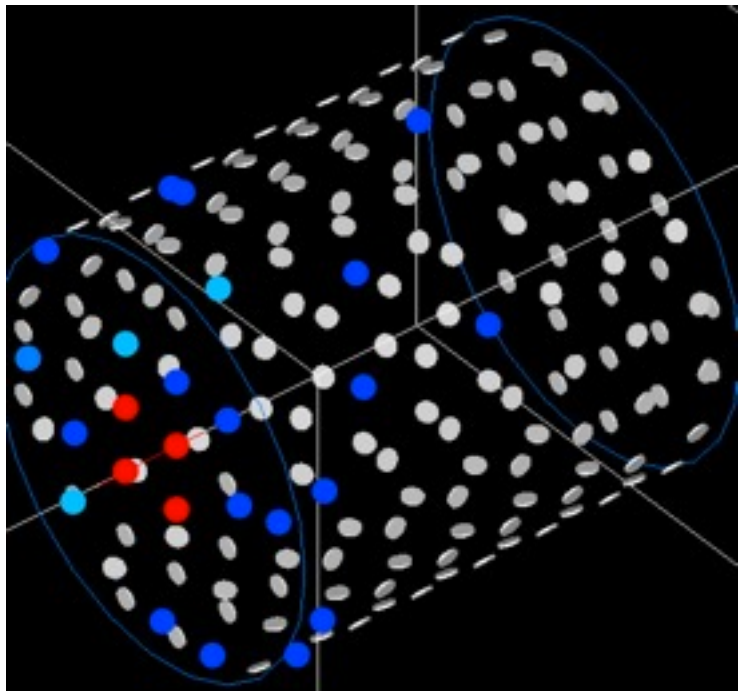
# of optical photons produced in this event : 23455

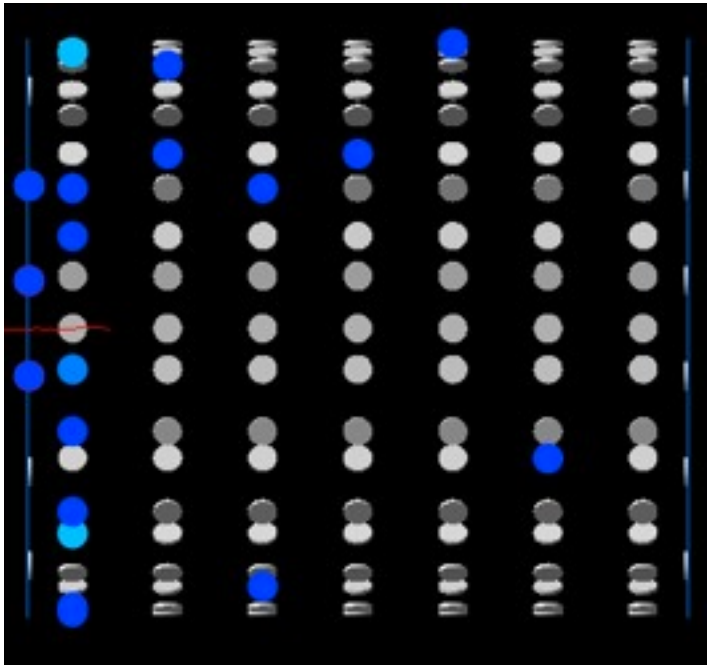
# of photo-electrons produced in this event : 4503



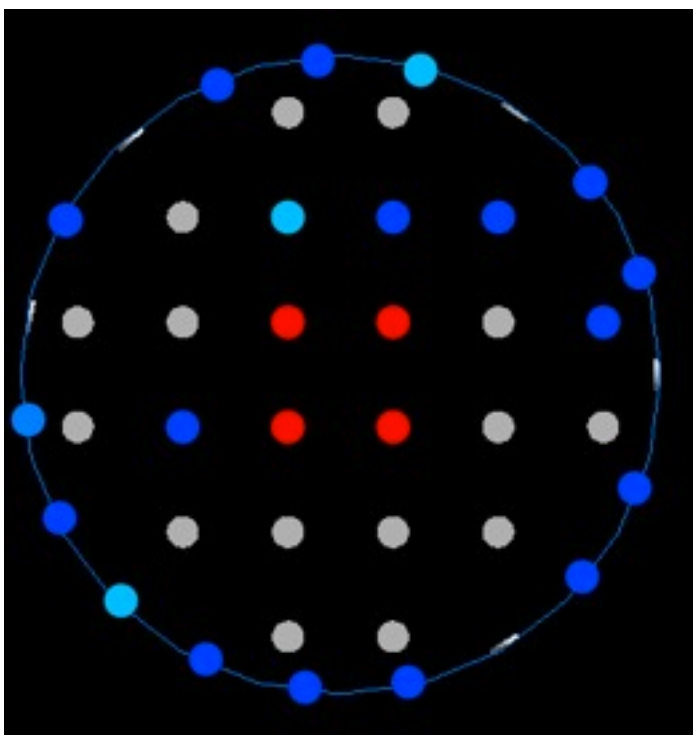
Total # of p.e. into PMTs 362

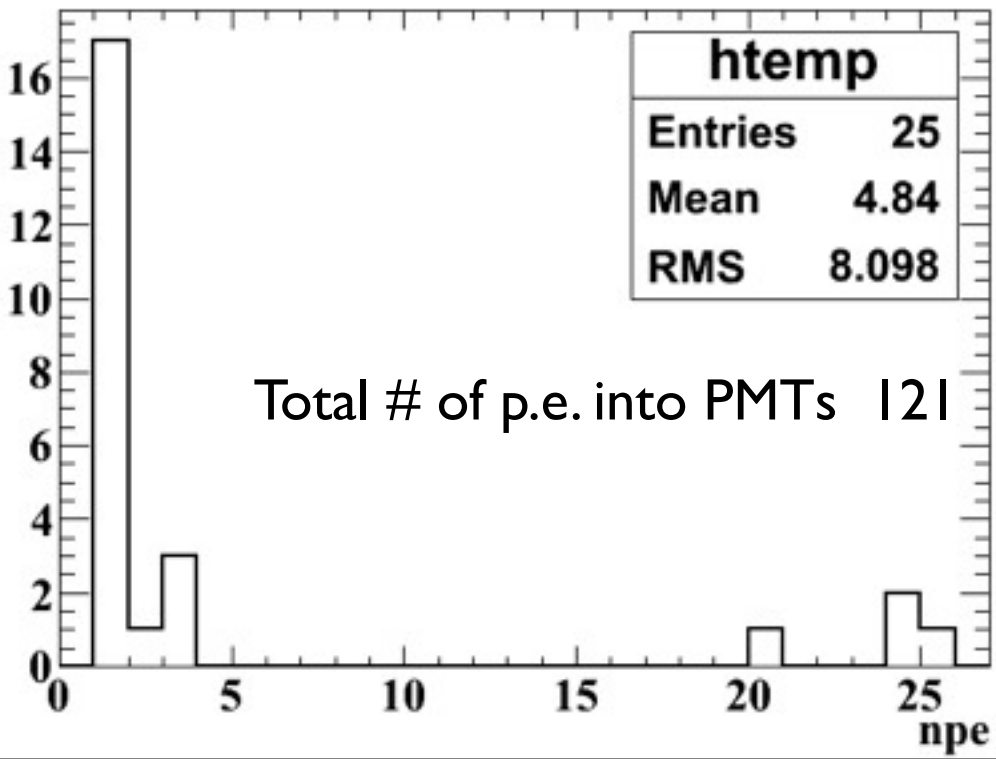
Z = 60cm



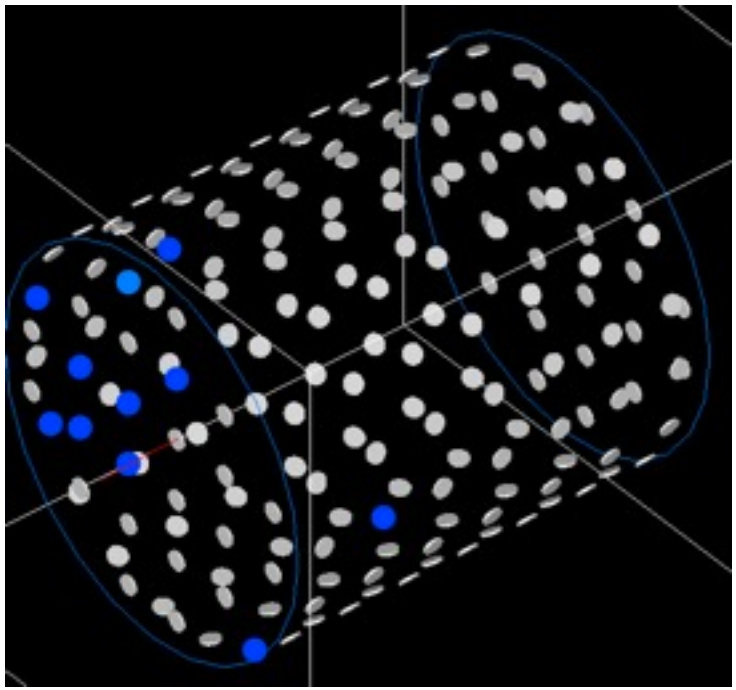


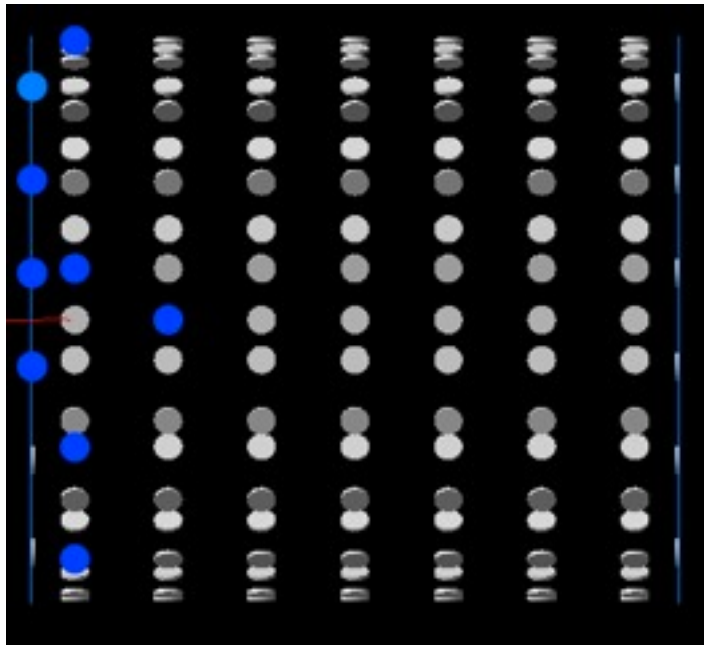
# of optical photons produced in this event : 9939
# of photo-electrons produced in this event : 1969



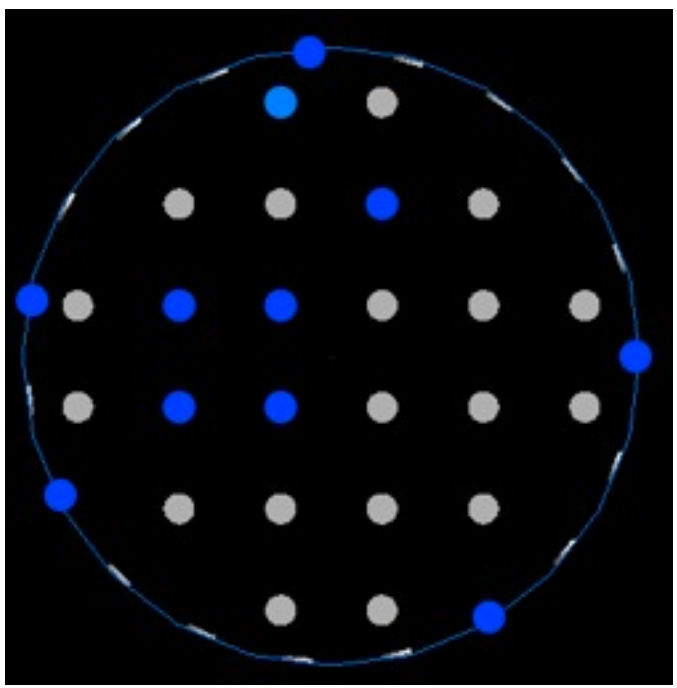


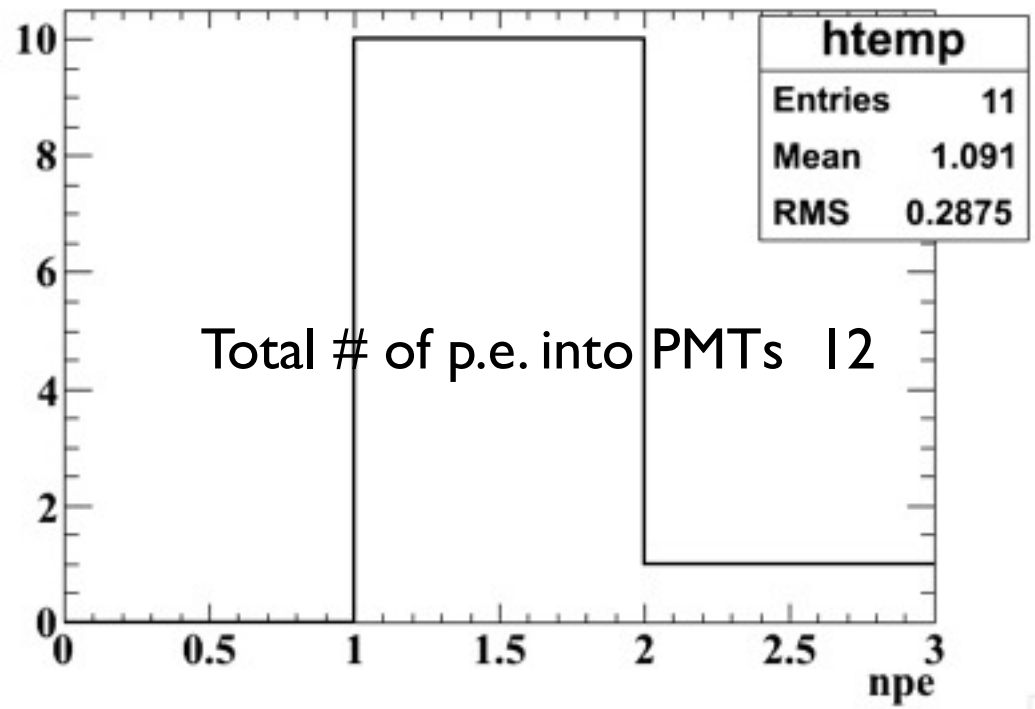
Z = 70cm





# of optical photons produced in this event : 4495
# of photo-electrons produced in this event : 848





- タンクを突き抜けるミューオンのVertexの(X,Y)ははタンク底のだいたい10p.e.以上の光量分布を見ればわかりそう。
- VertexのZはタンク側面のある閾値以上の光量分布から判断する。
- 途中でミューオンが止まってしまうようなもののVertexの再構成は難しいか