GATE Simulation study

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    (PhotoCathode was registered)
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GATE simulation

XEMIS2 Geometry

- radial 7 < r < 19 cm
- axial (z) Length = 2 × 12 cm
  (divided by cathode)
- Electric Field in z direction 2 kV/cm
- FEE 3.175 x 3.175 mm^2
- Source ^{44}Sc (β^+, γ : 1.157 MeV)
- Size of source
  (cylinder : R = 2.5 cm z = 15 cm)
- Drift velocity : 3 mm/usec
- PMTs
  - 1 inch : 8 x 32
    (1.8 x 1.8 cm^2)
  - 2inch : 4 x 20
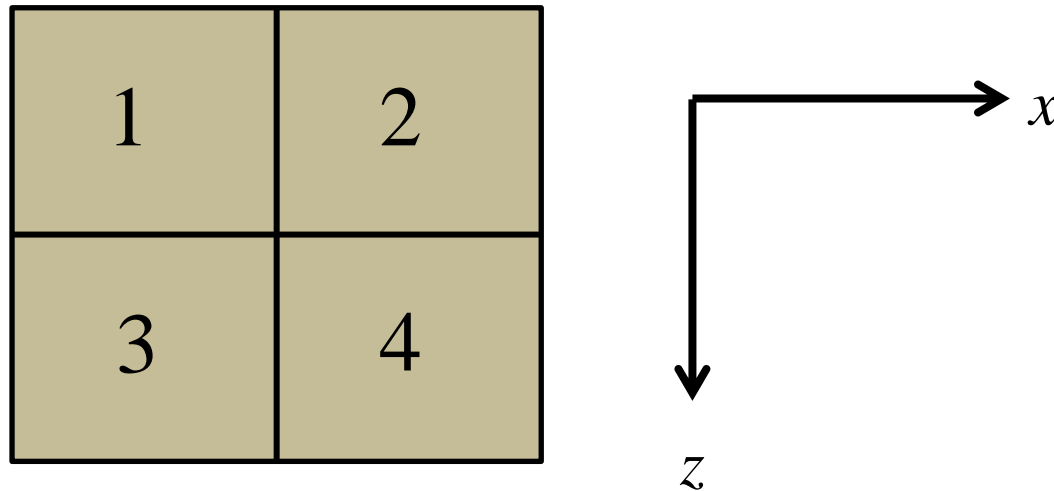   (4.624 x 4.624 cm^2)
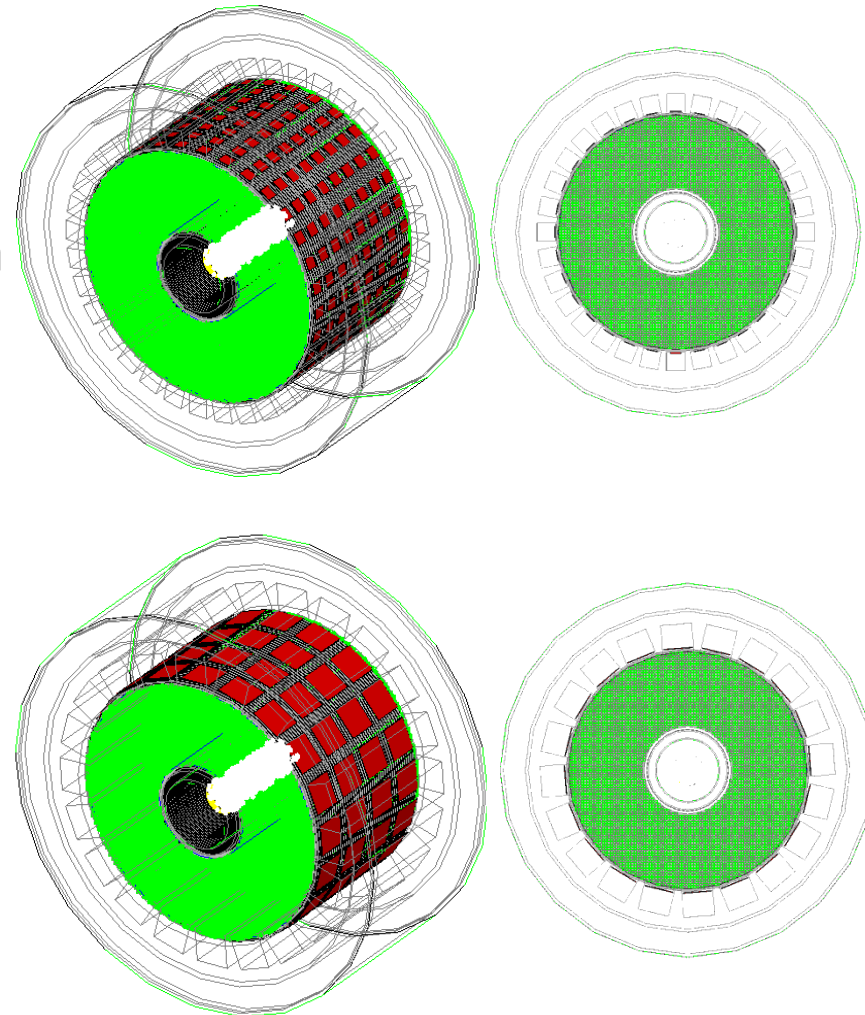
Change XEMIS2 Geometry

- To get high resolution, I divided PhotoCathode of 2" PMT by 4.

- And I registered PhotoCathode to crystal, in such case, entries of photoelectron to each crystals are recorded.

46.24mm

23.115mm
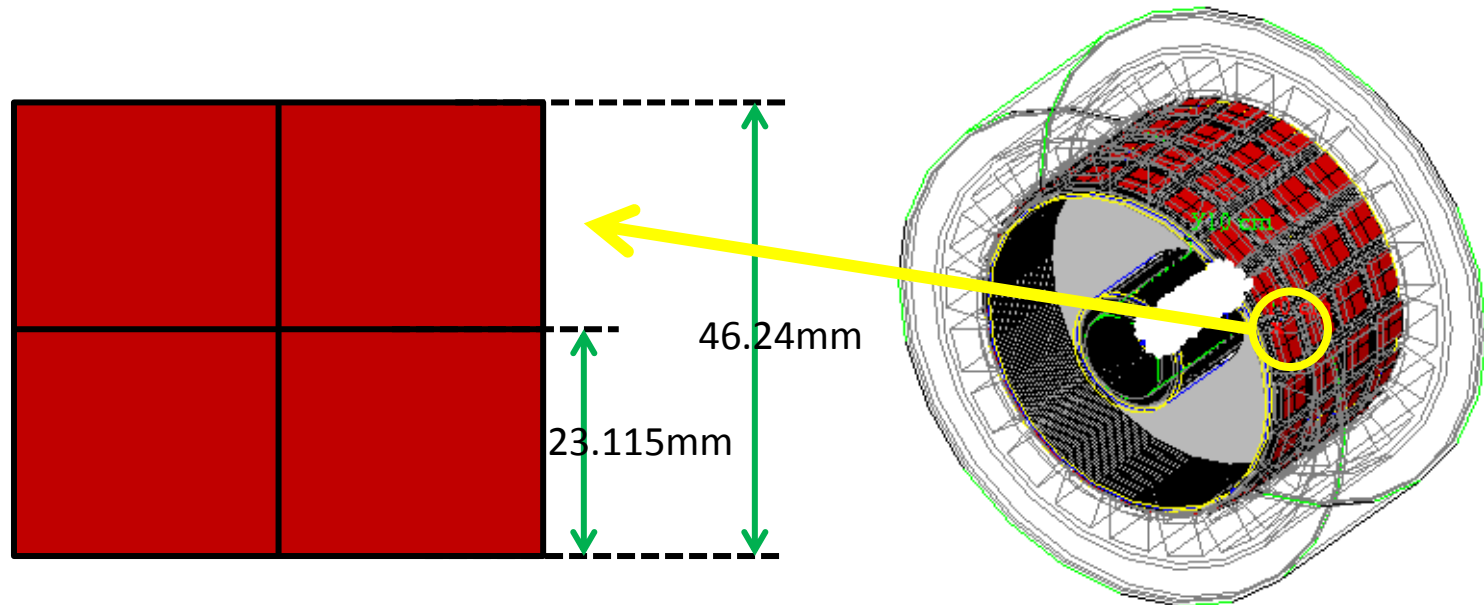
crystalID Position

- I studied how to assign the crystalID.

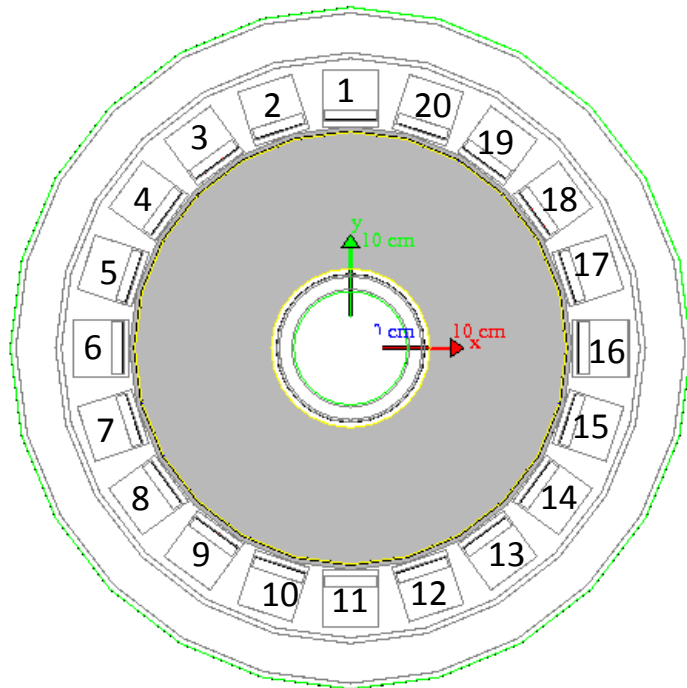
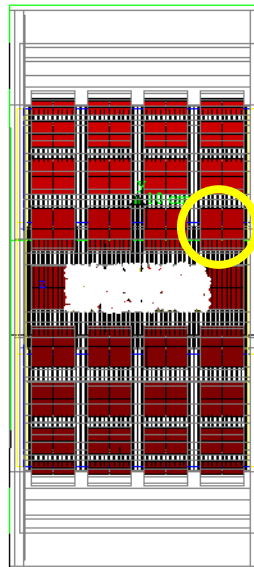- This turn of number is the view which we can see from (0, 0, 0).

ID Position

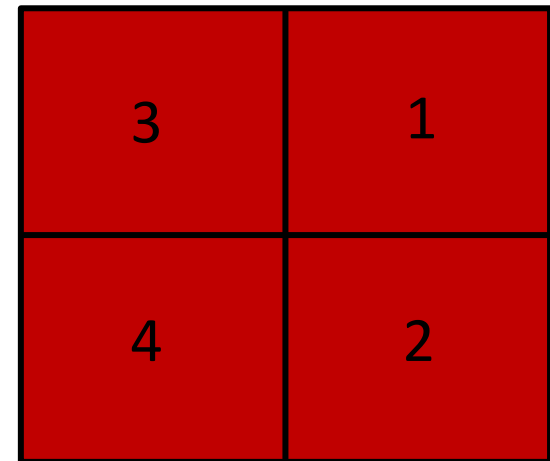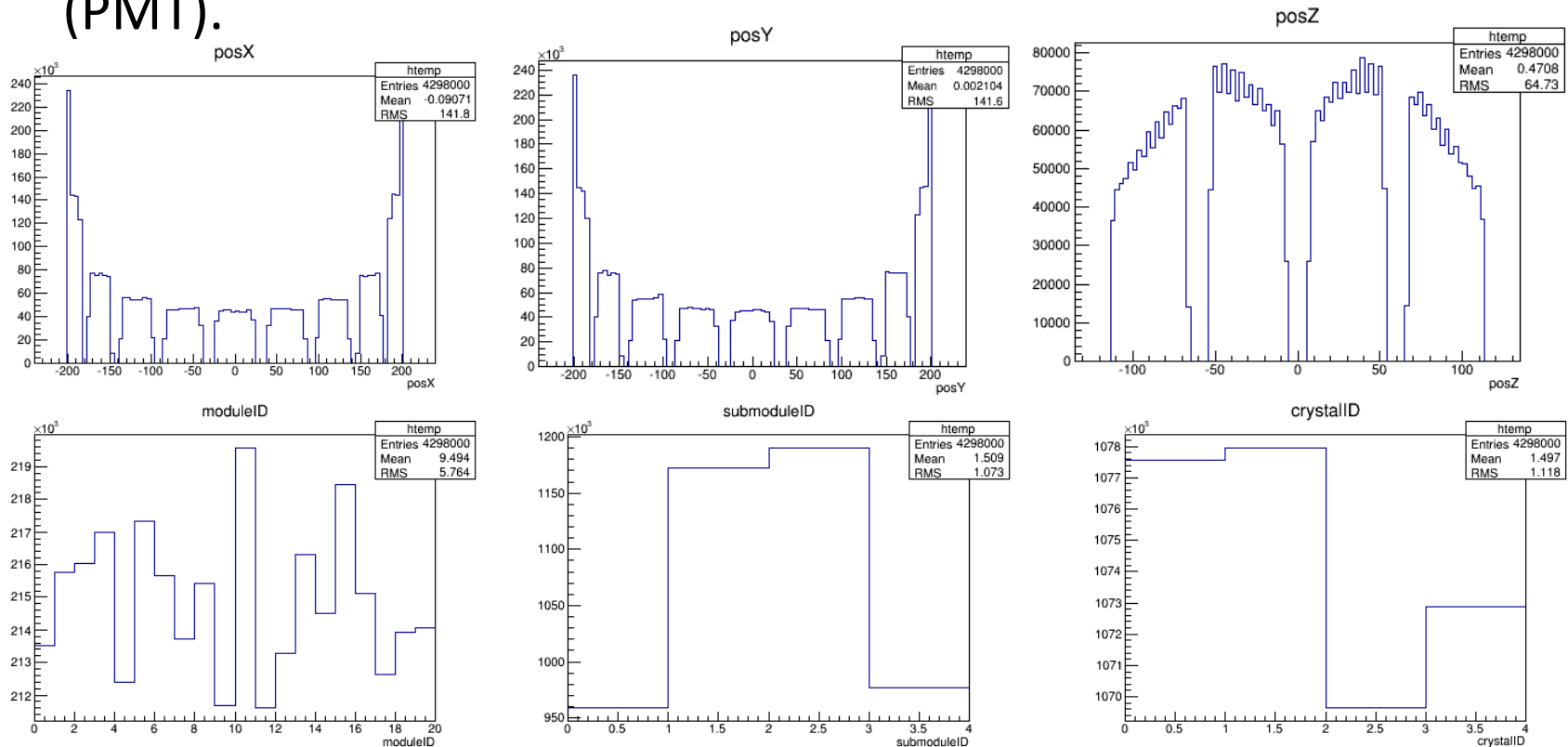- Three ID position

moduleID (PMTBox)   submoduleID (PMT)   crystalID (PhotoCathode)

Histograms

- GATE output shows some histograms.
- These show the entries of photoclectron which incident to each ID (module, submodule, crystal) or sensitive detector (PMT).

How to define incident position

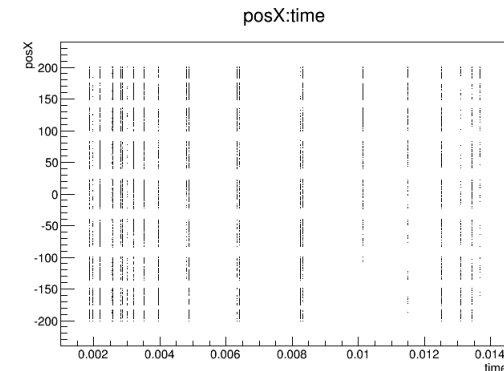- Set bin of time histogram (per 10^{-9} sec)

  (**memory leak** ?)

- Read entries of

  time:posX, time:posY, time:posZ

posX:time

- Convert the entry positions of posX, posY and posZ to cyrindrical coordinate

- Assort the entry position (to each IDs)

  (where PhotoCathode)

Next

- To avoid memory leak, I should make ASCII form date which GATE can record because ROOT file make only histograms.

  -> study ASCII form data of GATE