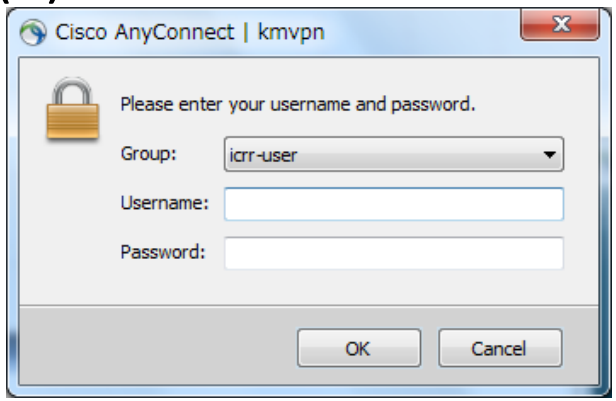
SK Software training: Scan electron and muon

M.Miura

Kamioka observatory, ICRR

1. Start event display

(1) Connect VPN.



Login with your account and password in Kamioka computer system (see also Setup.pdf).

(2) Start Xsession (Xming, e.t.c.)

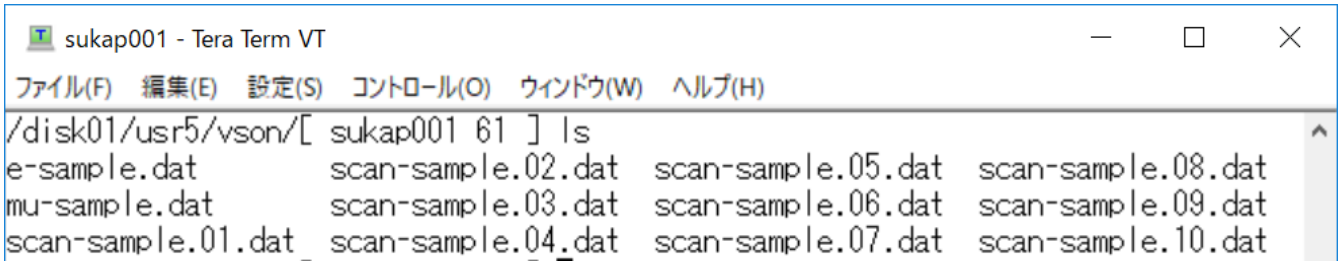
(3) Connect to sukap01

Windows case: Click TeraTerm and login.
Others (Mac, Ubuntu e.t.c.): Open terminal and type
ssh –X (your-account)@sukap01

(4) Type ;

ls /disk01/usr5/vson

then you can find event samples.



(5) Type;

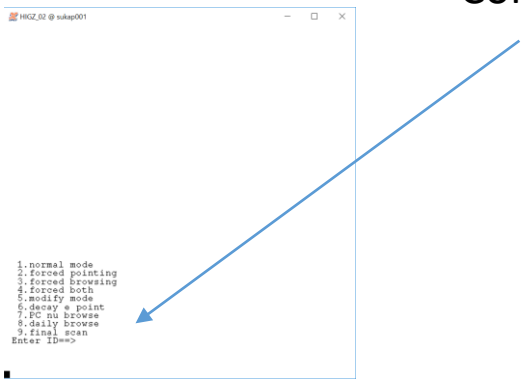
source /usr/local/sklib_gcc8/atmpd_21b/env.csh

(5) Type;

apdraw.csh /disk01/usr5/vson/e-sample.dat

then event display starts.

Command line



Type; 1

Type; 36

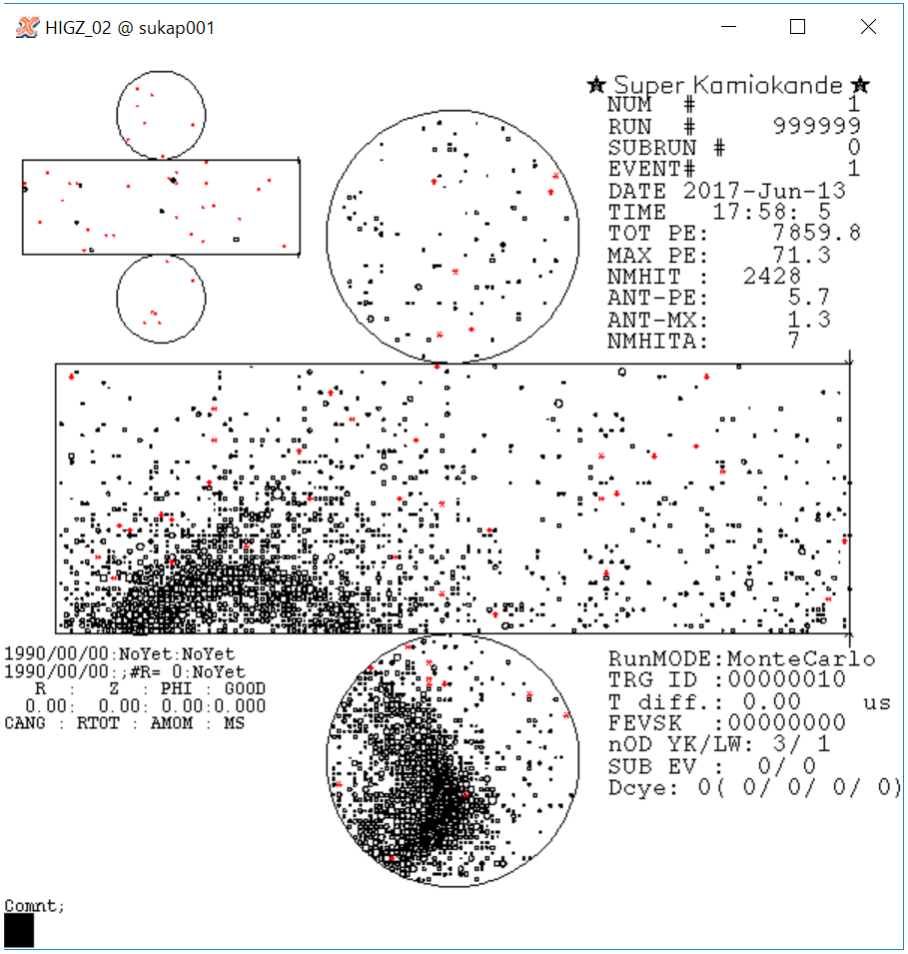
Type; n

```
 1.normal mode
 2.forced pointing
 3.forced browsing
 4.forced both
 5.modify mode
 6.decay e point
 7.PC nu browse
 8.daily browse
 9.final scan
Enter ID==>
```

```
-1.anonymous
 1.kajita          2.kaneyuki        3.itow
 4.masato          5.hayato          6.kirisawa
 7.obayashi        8.ishihara        9.miuram
10.moriyama       11.hatakeyama     12.etoh
13.kenkou         14.takuya         15.kameda
16.yamada         17.suzuki         18.fujiyasu
19.toshito        20.nakayama       21.hideki
22.atsuko         23.casper         24.earl
25.habig          26.kearns         27.mauger
28.mcgrew         29.messier        30.schol
31.tomba          32.walter         33.mine
34.guest1         35.guest2         36.guest3
Enter ID==>
```

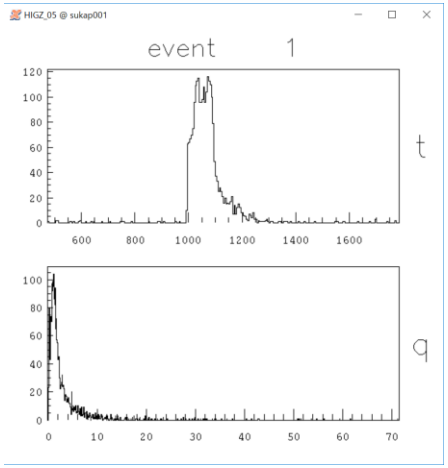
```
Selecting new mode
Still open output ?
Enter y or n ? [n]
```

You can see three windows.

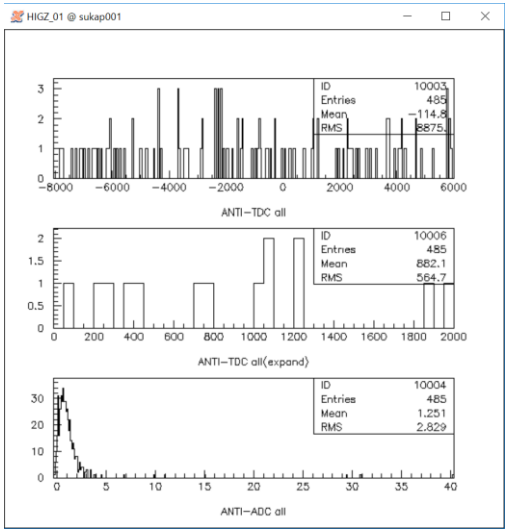


Main display

Histograms for inner detector

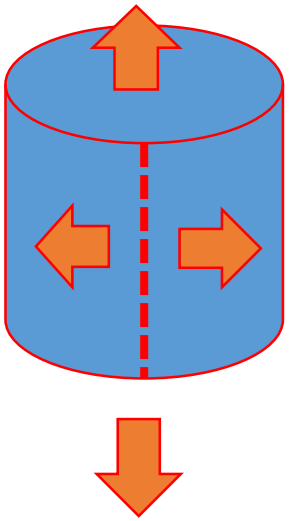


Histograms for outer detector



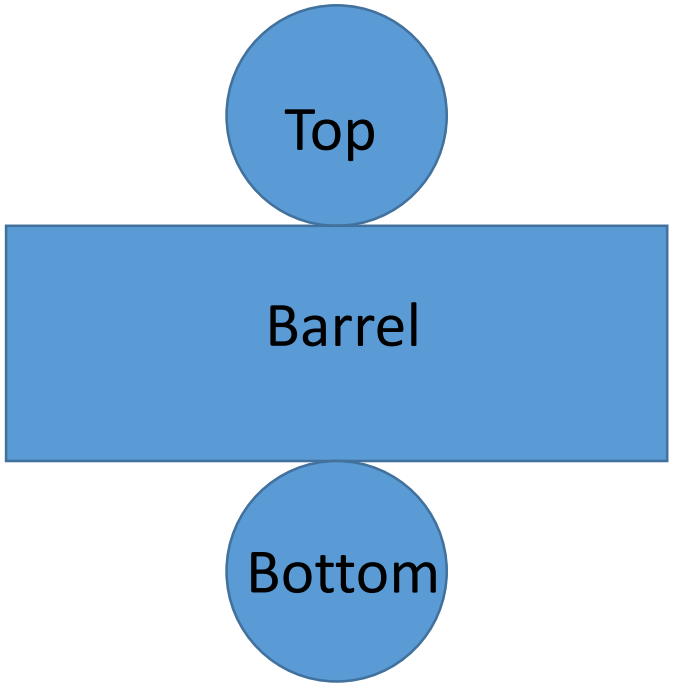
SK event display

SK is cylindrical in 3-D.



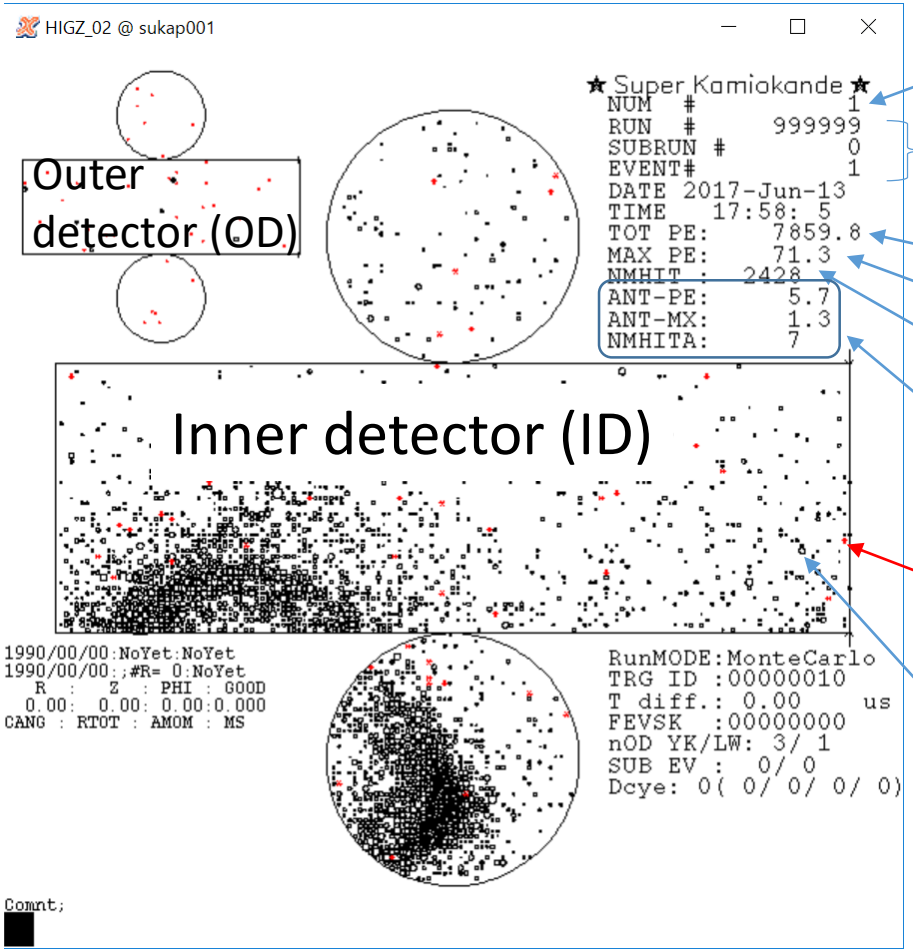
Cut and open.

2-D with 2 circles and rectangle.



2. Explanation about each windows

2-1 Main display



Serial number in this file.

SK run number (999999 for MC), Subrun number (~1 min) and event number.

Total charge in ID (unit: photo electron,pe).

Max charge in ID.

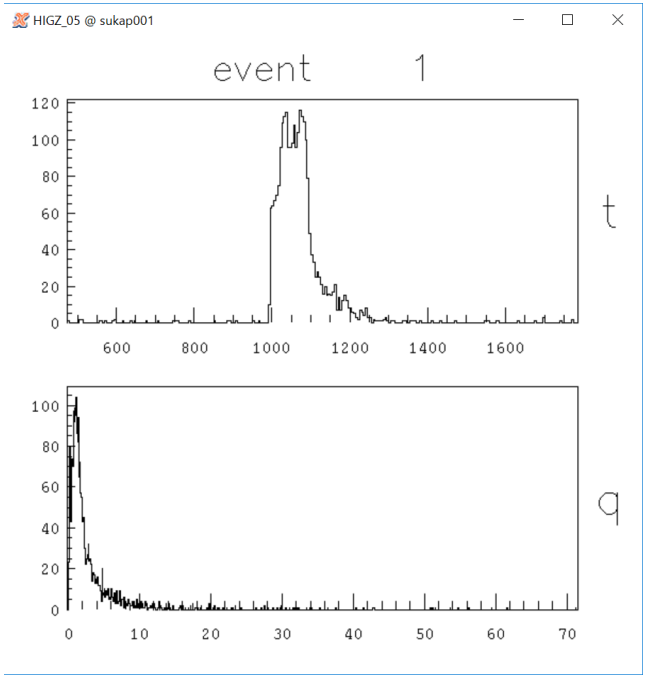
Number of fired PMT.

OD information (not used here).

Red mark shows dead PMT.(~130/11,000 now)

Each circle corresponds to one fired PMT. Circle size corresponds to charge (~ amount of light) detected by the PMT.

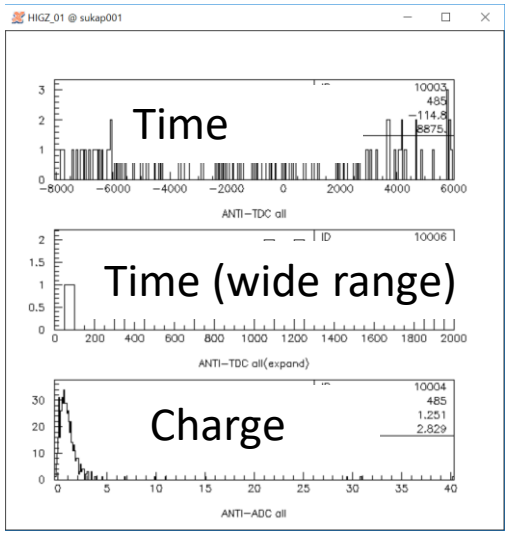
2-2 ID histogram



Time distribution for each PMT (nano second)
Trigger time is adjusted around 1000 nsec.

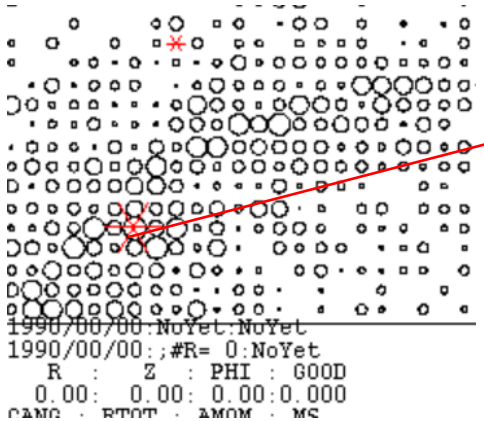
Charge distribution for each PMT (pe).

2-3 OD histogram



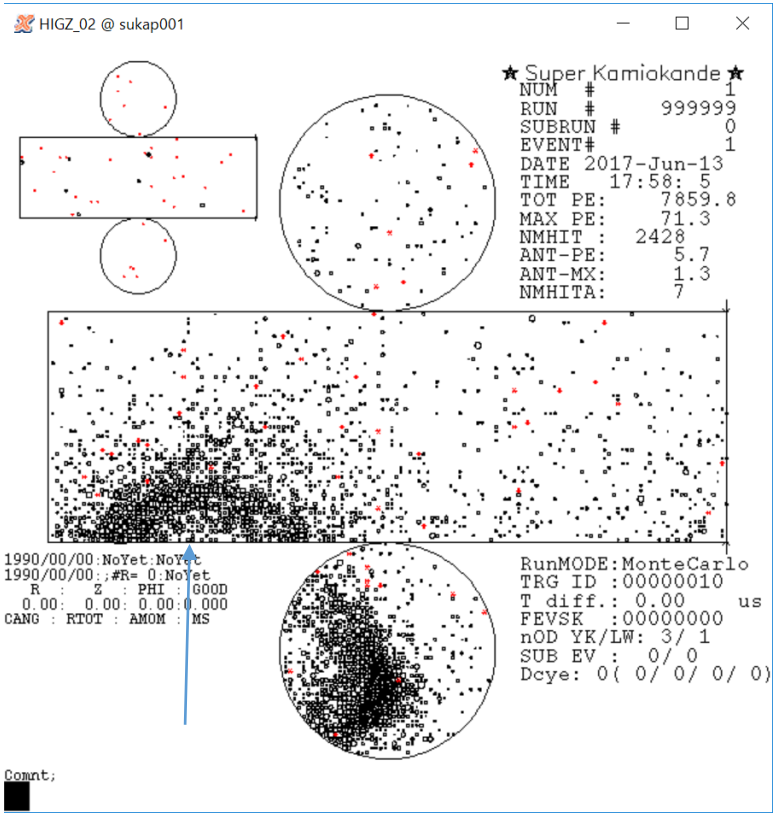
3. Basic command

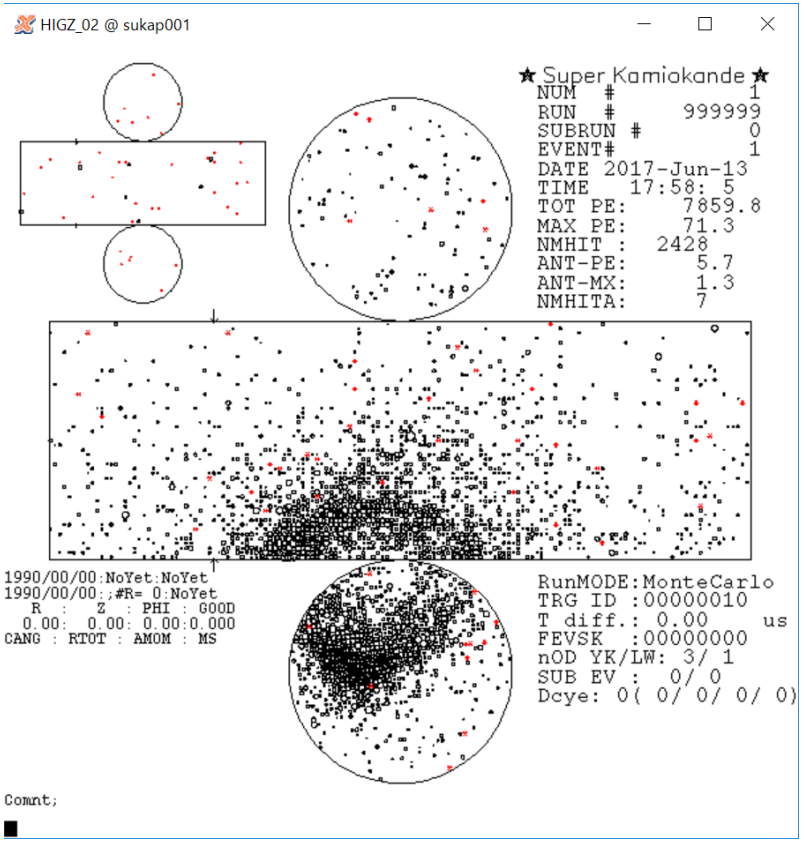
- quit: End event display.
- n: Move to next event.
- sk “n”: Skip “n” events. “sk -1” then go back to the previous event.
- zoom “n”: n=1~3, zoom in. Click where you want to zoom. zoom 0 then go back to original size.
- cab: and click PMT (center of circle) then information about the PMT is shown in terminal.




```
 CMD=(cab)
Nearest ID cable number :   6635 Status:    0
sk geometry 4           4
     Hut : 4   TKO :  6   QB slot : 17   QB ch. :  1
     Q :    18.68       T :    1039.
```

- mc: and click then the event display rotates in phi direction so that the clicked point becomes center of the display.





Excise 1

- In /disk01/usr5/vson, you can find event samples.
  - e-sample.dat: electron only.
  - mu-sample.dat: muon only.
  - Random vertex, direction, and momentum.
  - Each sample includes 20 events.
  - Let's scan e-sample.dat and mu-sample.dat to train your eyes !

Excise 2

- In the same directory, event samples for each group are prepared.

  Group A → scan-sample.01.dat

  Group B→ scan-sample.02.dat

  Group C → scan-sample.03.dat

  Group D → scan-sample.04.dat

- Each sample includes 20 events.
  - Random vertex. direction, and momentum.
- Identify electron or muon by your eyes.
- Discuss among group and make final answers of each group.