Update of the fiducial volume test analysis

- Cherenkov cone cut
- Decision of ATM p.e./count constant
- Charge distribution with PMT gain correction
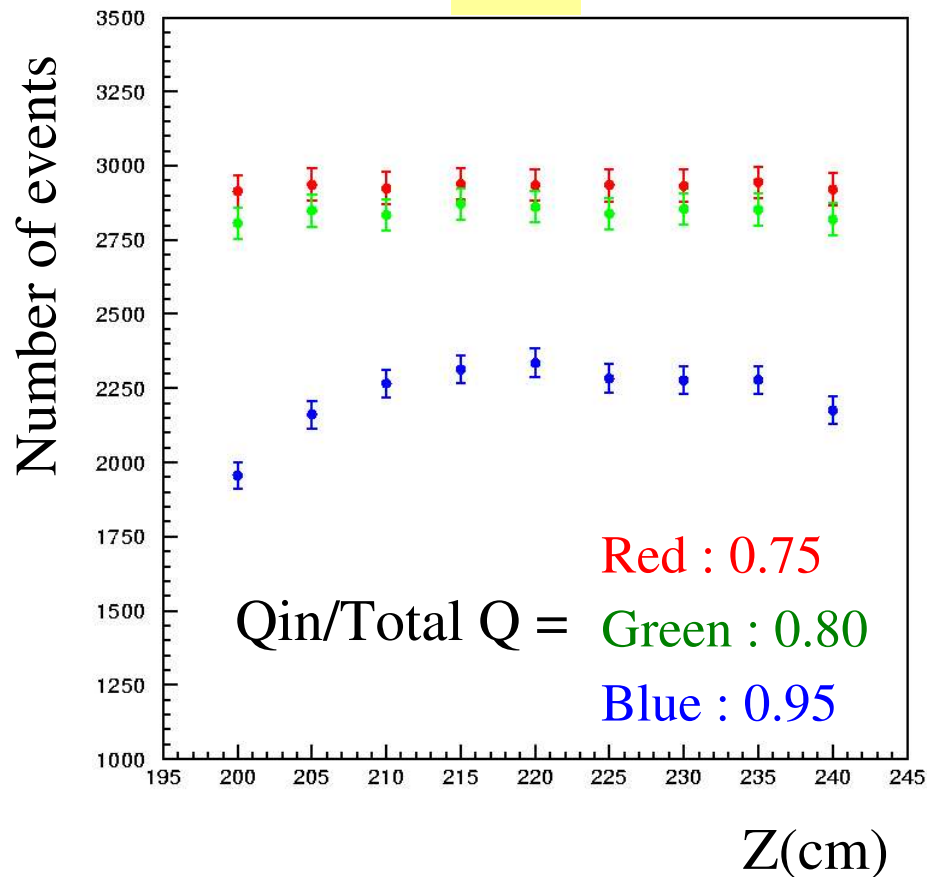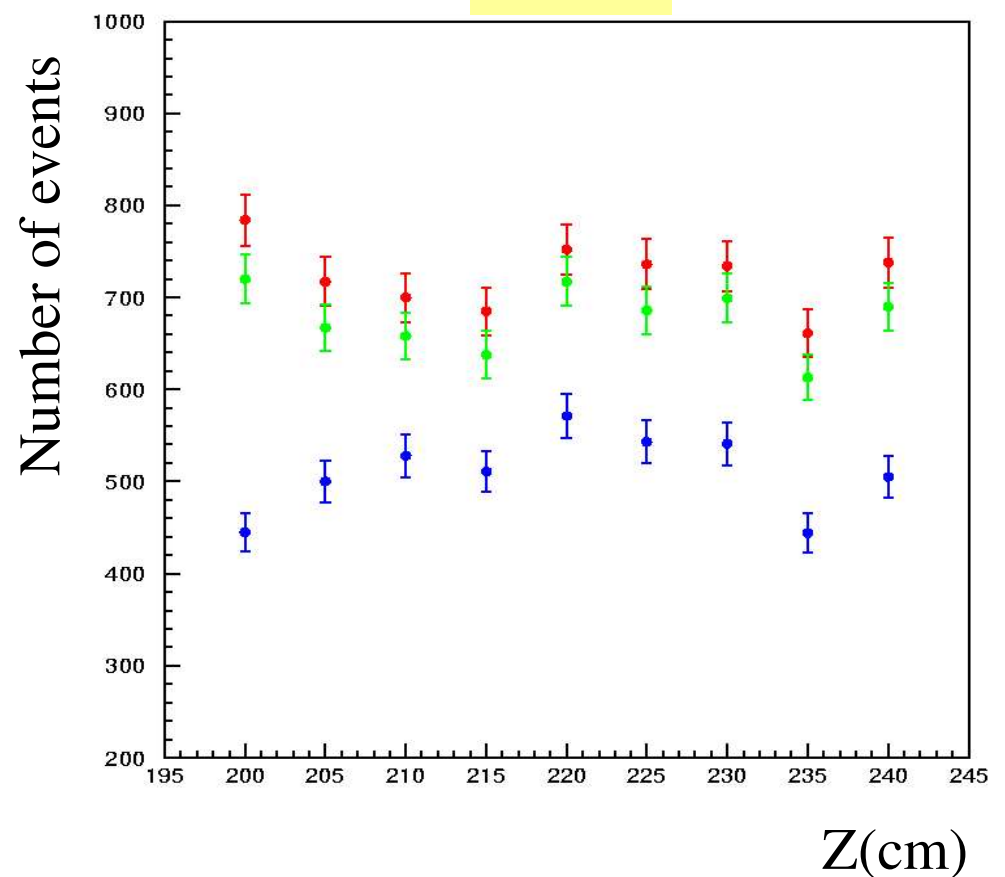
2km video meeting   Nov 10, 2005

G.Mitsuka

K.Okumura

Decision of the criteria of Cherenkov cone cut
(detail of this cut is described in the transparency at Oct 6)

MC
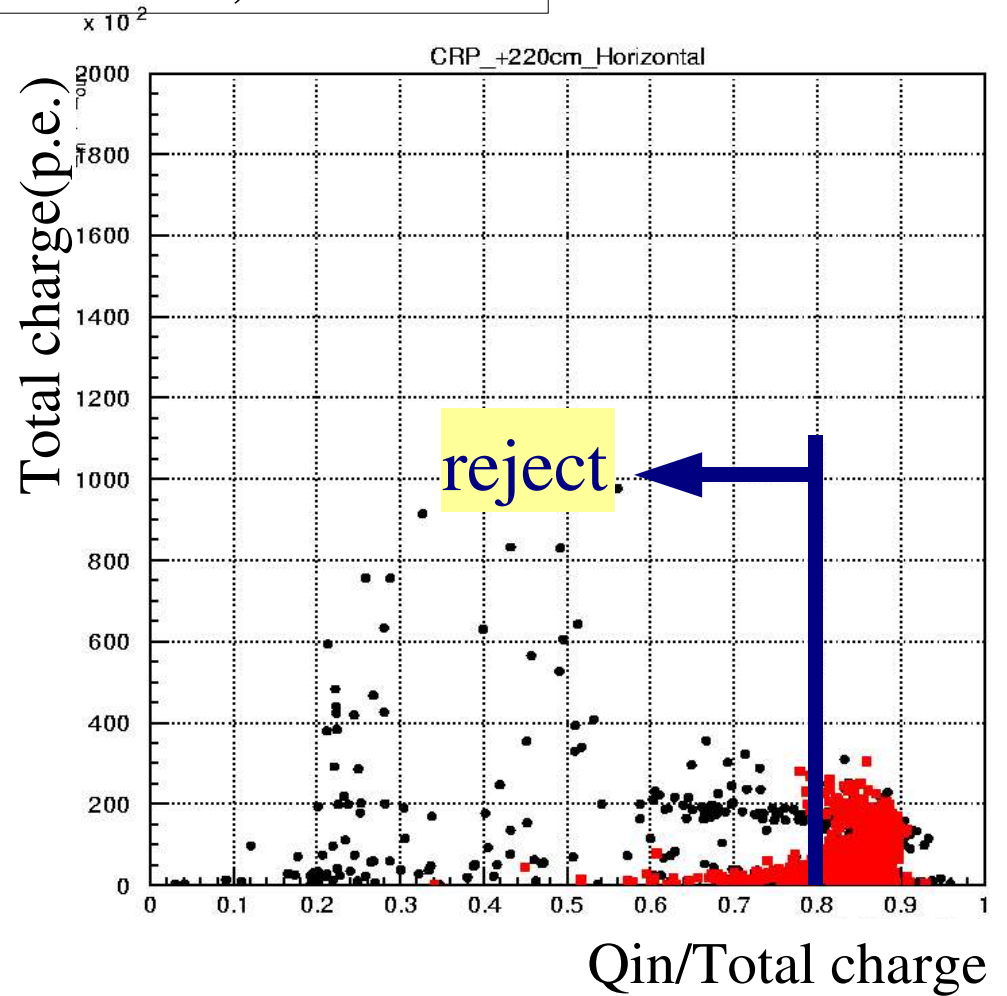
DATA

Qin/Total Q = Red : 0.75
Green : 0.80
Blue : 0.95

Z(cm)

Z(cm)
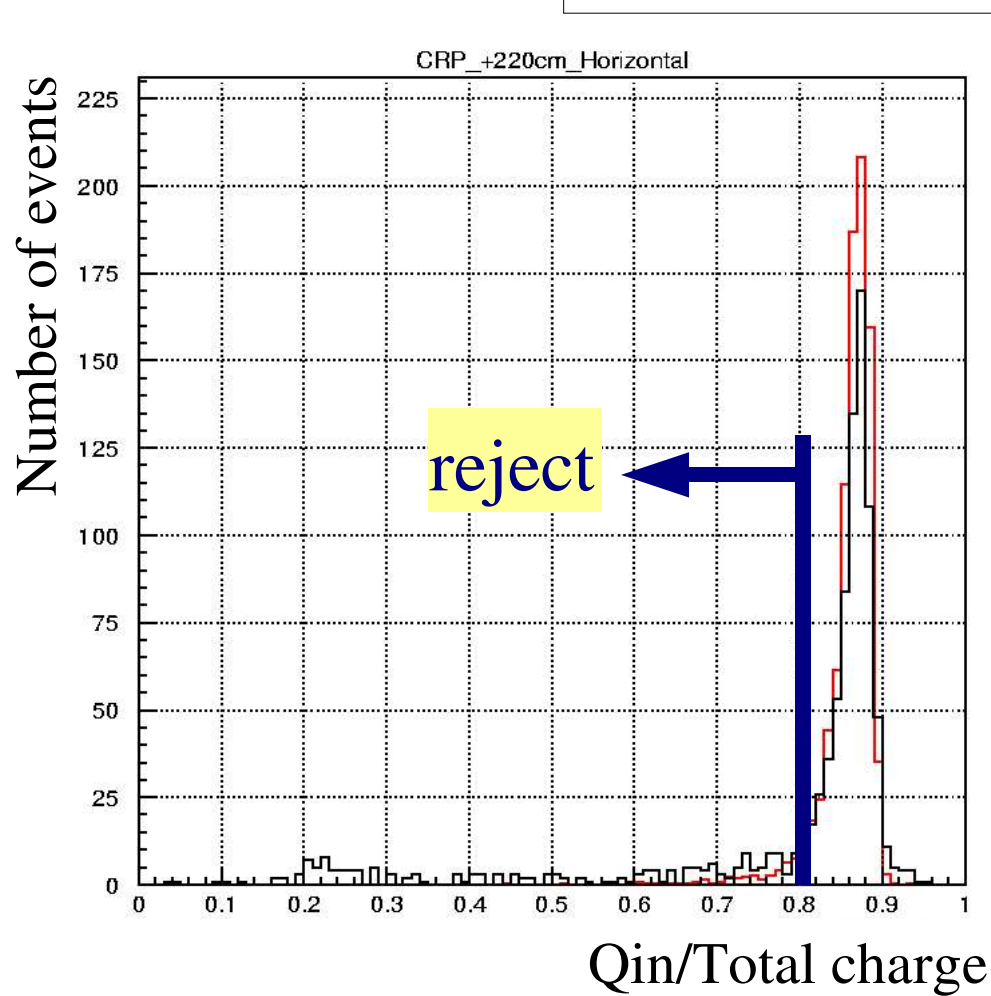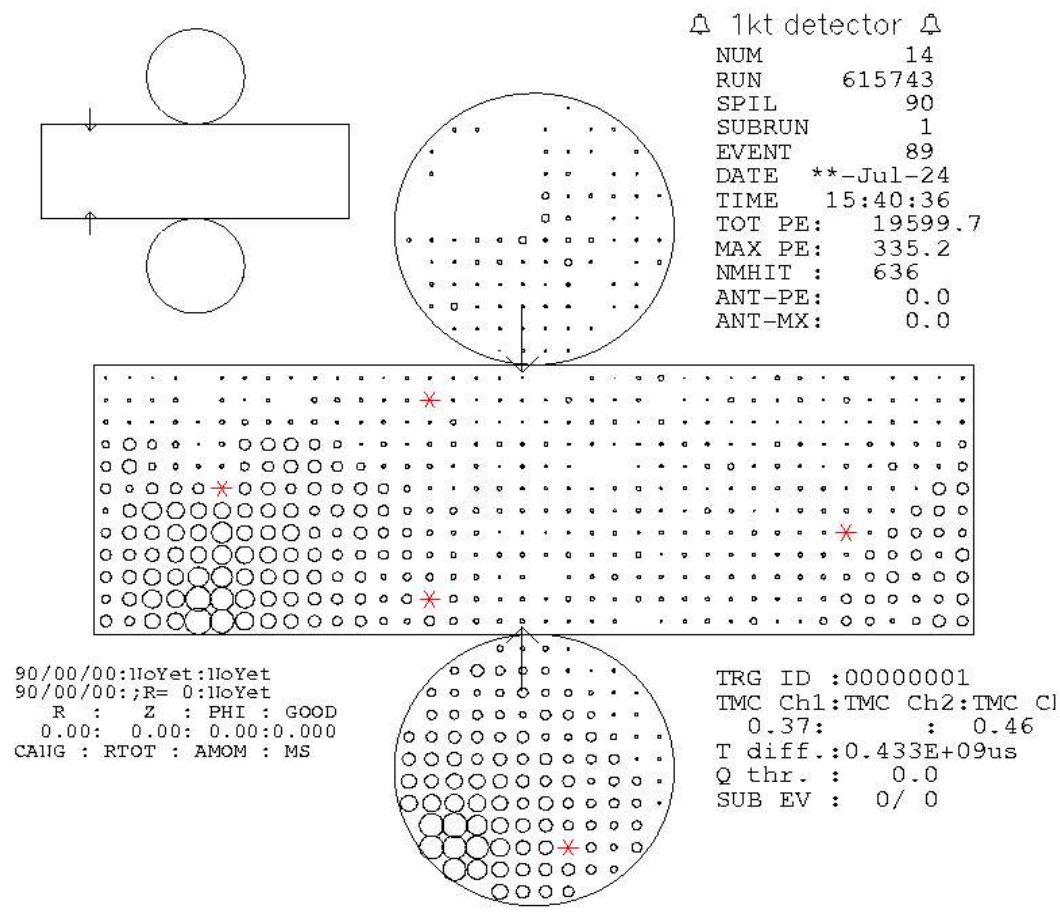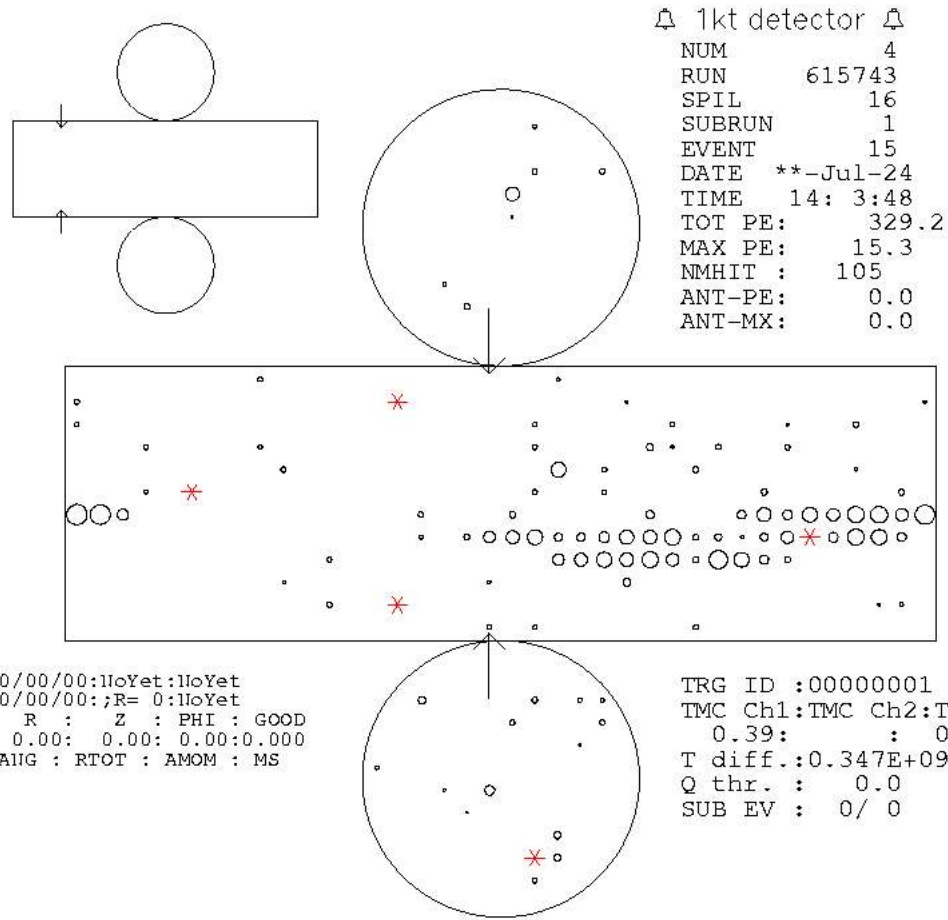
- The stability of the inefficiency of the cut at each Z is needed
- The criteria is desired to be strict to reject BG muon with not-vertical direction, as possible

Cherenkov cone cut
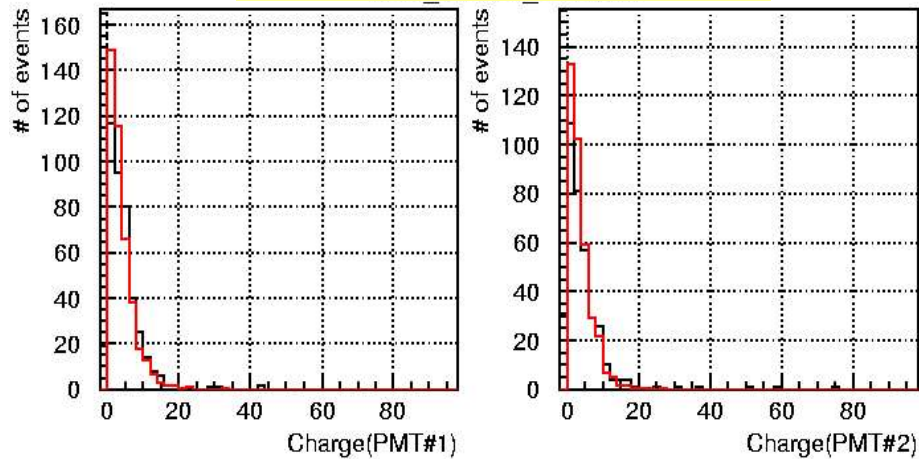
Z=220cm   Black:Data, Red:MC
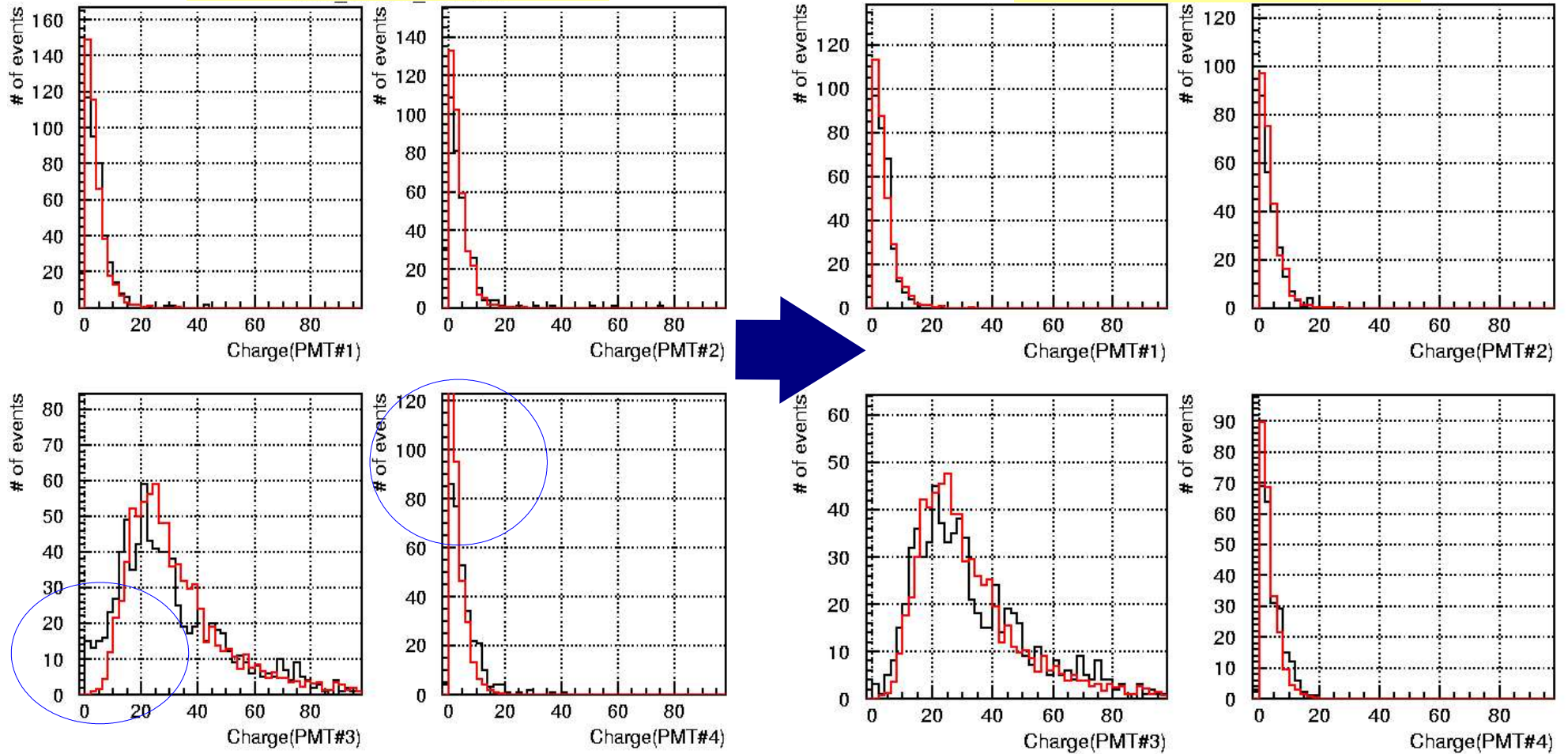
Background events rejected by Cherenkov cone cut

△ 1kt detector △

NUM	4
RUN	615743
SPIL	16
SUBRUN	1
EVENT	15
DATE	**-Jul-24
TIME	14: 3:48
TOT PE:	329.2
MAX PE:	15.3
NMHIT	105
ANT-PE:	0.0
ANT-MX:	0.0

90/00/00:NoYet:NoYet
90/00/00:;R= 0:NoYet
  R : Z : PHI : GOOD
 0.00: 0.00: 0.00:0.000
CANG : RTOT : AMOM : MS

TRG ID :00000001
TMC Ch1:TMC Ch2:T
  0.39:   :   0
T diff.:0.347E+09
Q thr. :   0.0
SUB EV : 0/ 0

△ 1kt detector △

NUM	14
RUN	615743
SPIL	90
SUBRUN	1
EVENT	89
DATE	**-Jul-24
TIME	15:40:36
TOT PE:	19599.7
MAX PE:	335.2
NMHIT	636
ANT-PE:	0.0
ANT-MX:	0.0

90/00/00:NoYet:NoYet
90/00/00:;R= 0:NoYet
  R : Z : PHI : GOOD
 0.00: 0.00: 0.00:0.000
CANG : RTOT : AMOM : MS

TRG ID :00000001
TMC Ch1:TMC Ch2:TMC Cl
  0.37:   :   0.46
T diff.:0.433E+09us
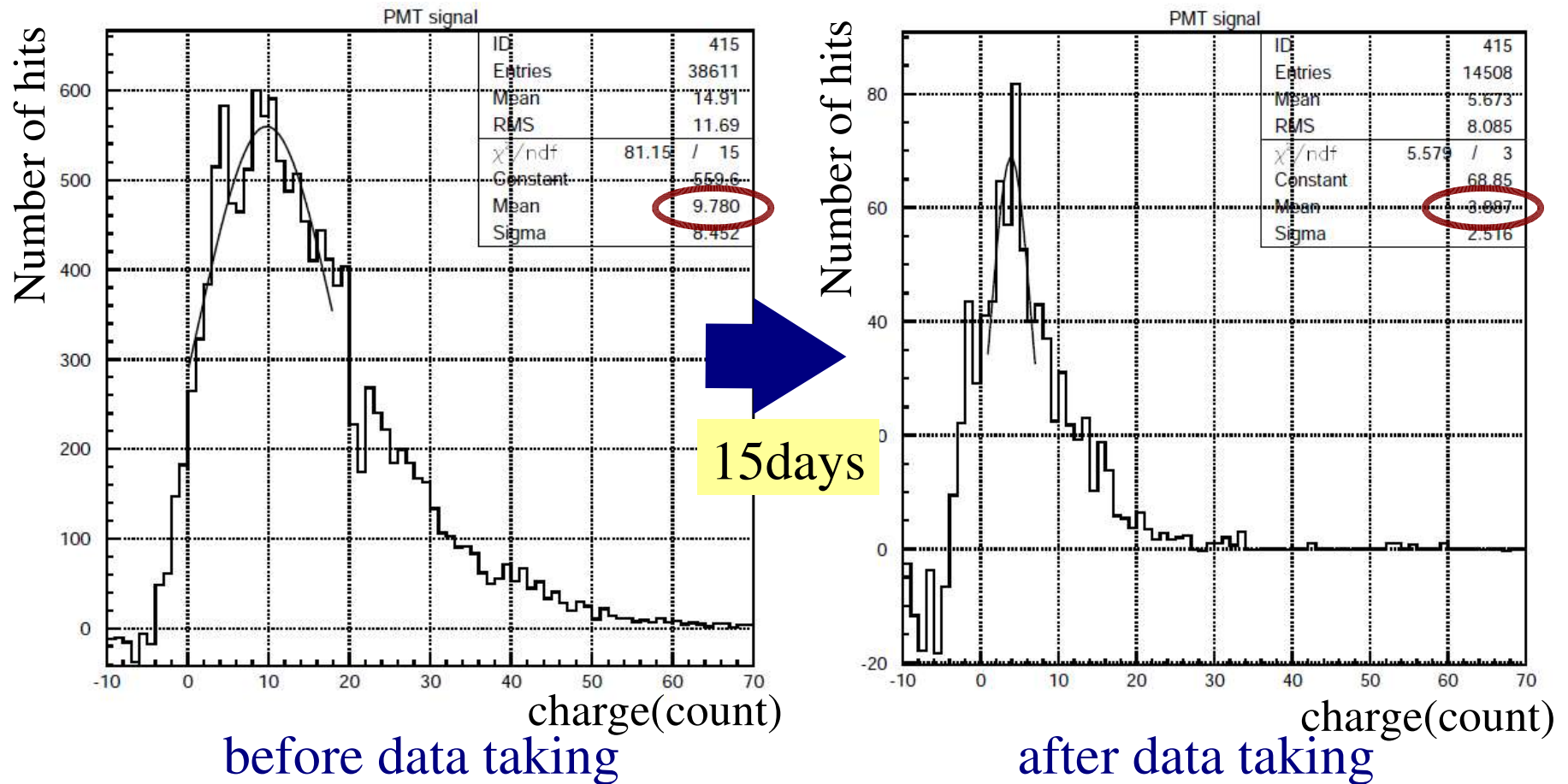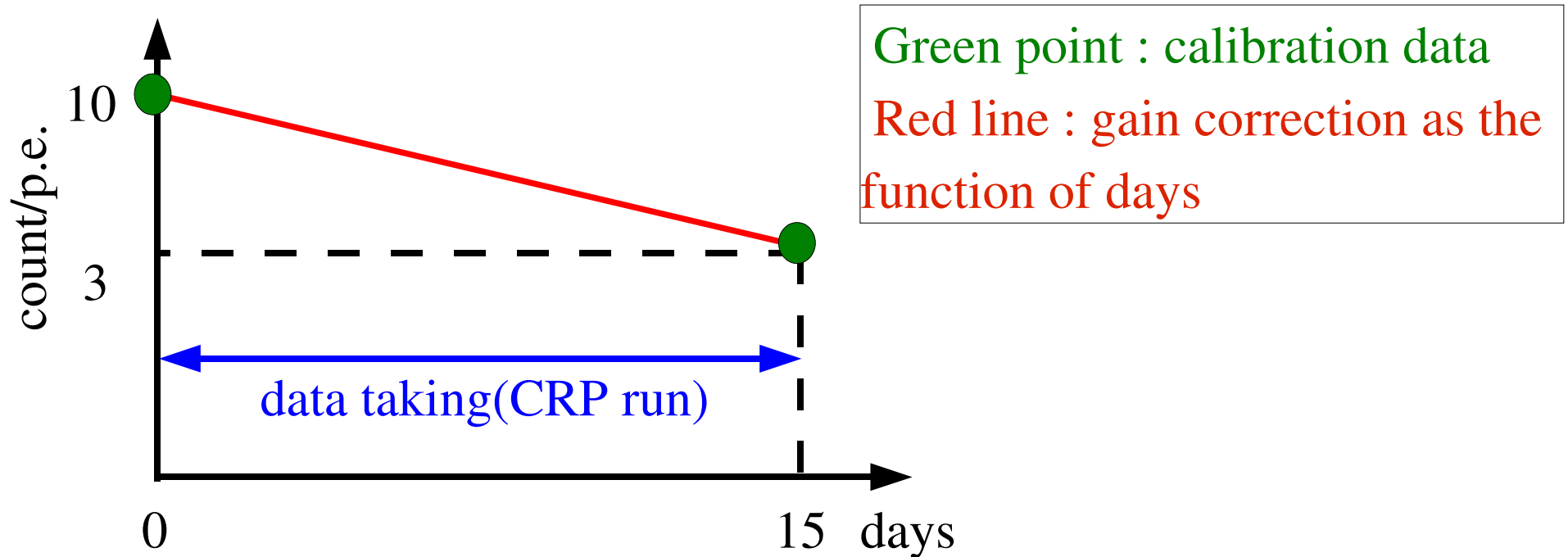Q thr. :   0.0
SUB EV : 0/ 0

Effect of Cherenkov cone cut

- Due to Cherenkov cone cut, charge distribution of data become similar to that of MC

Effect of the lowering of the PMT gain

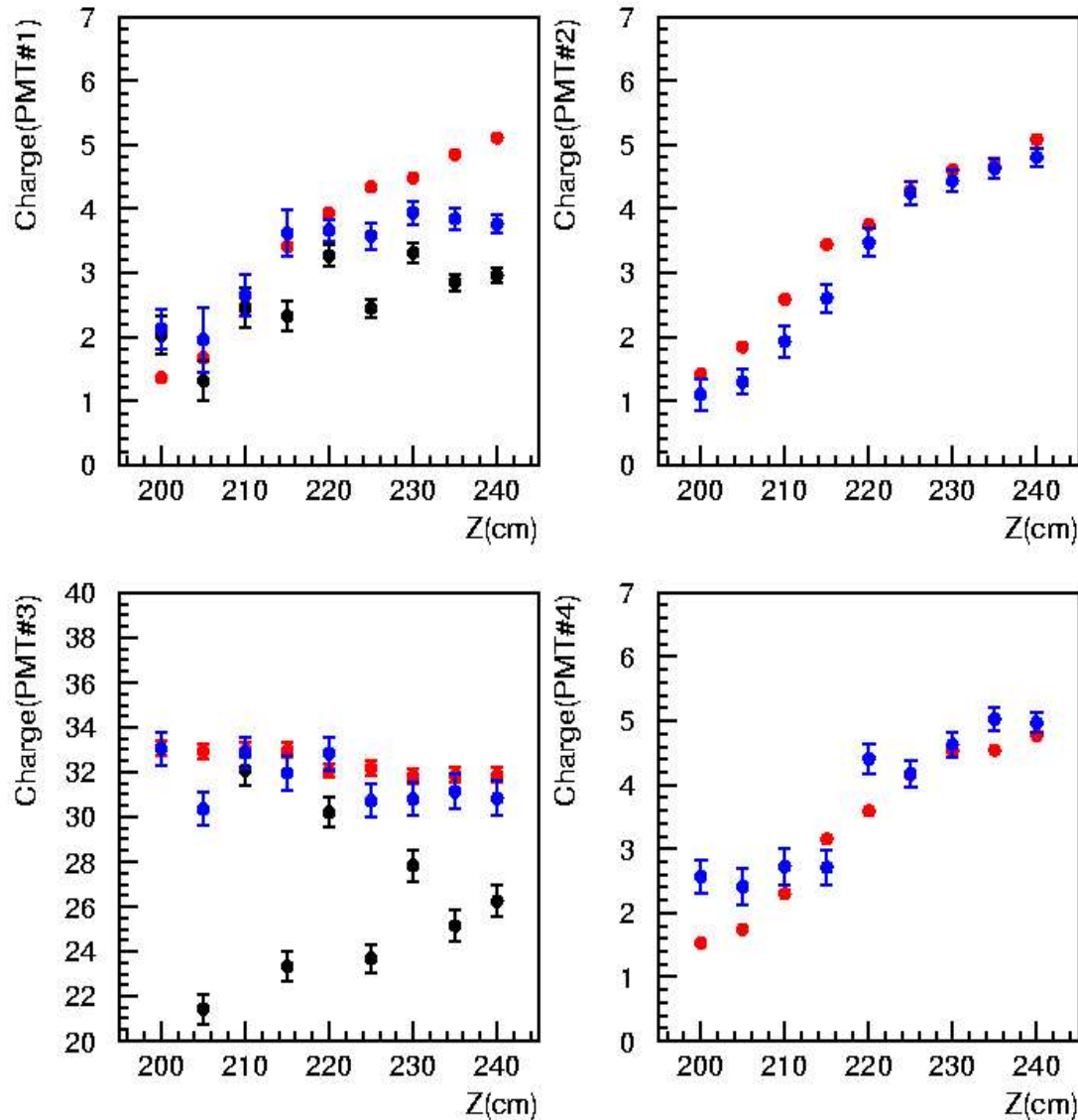before data taking → 15days → after data taking

- 1p.e. peak is fit by gaussian function
- 1p.e. peak(ATM constant) moves lower direction gradually
- At charge distribution, the change of ATM constant is taken into account

Effect of the lowering of the PMT gain(cont'd)

Green point : calibration data
Red line : gain correction as the function of days

- Gain correction is applied for PMT#1 and #3 at each PMT and ATM channel separately
- In PMT#2 or #4, gain correction is not applied, since the difference of the constant is small between before and after data taking

Charge distribution with gain correction

Black : data w/o gain corr.
Blue : data w/ gain corr.
Red : MC

• In PMT#1 and #3, the fluctuation of the charge at each Z becomes small with gain correction

Summary

- Due to Cherenkov cone cut, charge distribution of data become similar to that of MC
- Difference of the charge distribution between data and MC becomes small by using the PMT gain correction

To do

- 1kt MC is need to be improved in the water parameter at short wave length
- Now studying the 2km WC simulation while change the FVPMT geometry special thanks to M. Litos and T.J Corona