

Update of fiducial volume test analysis

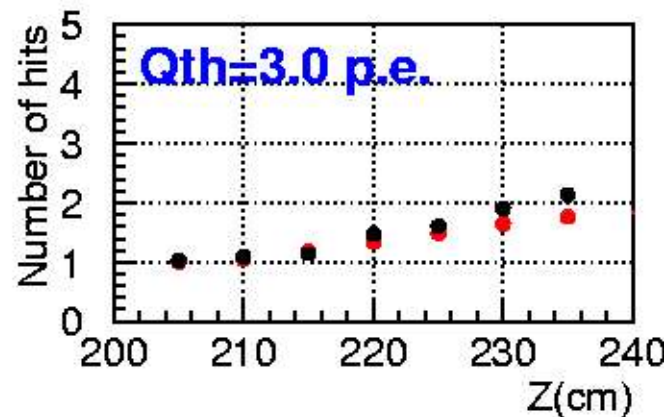
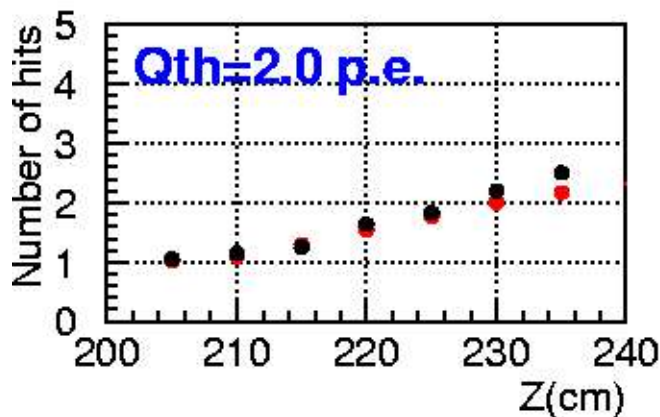
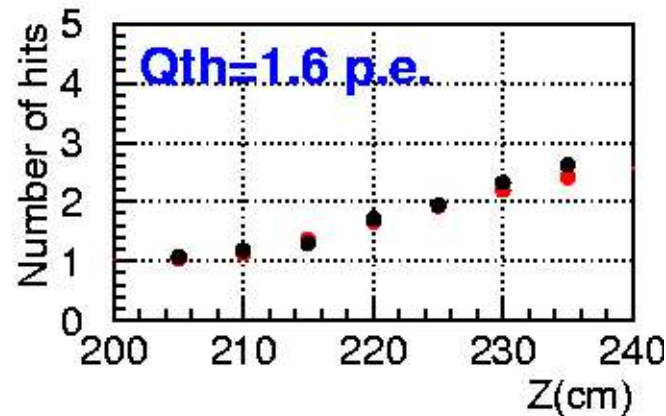
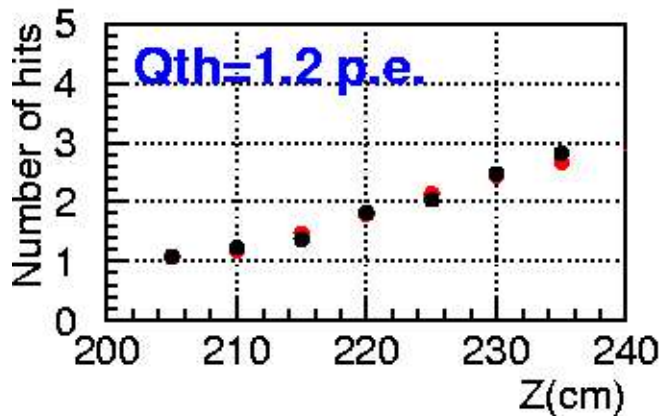
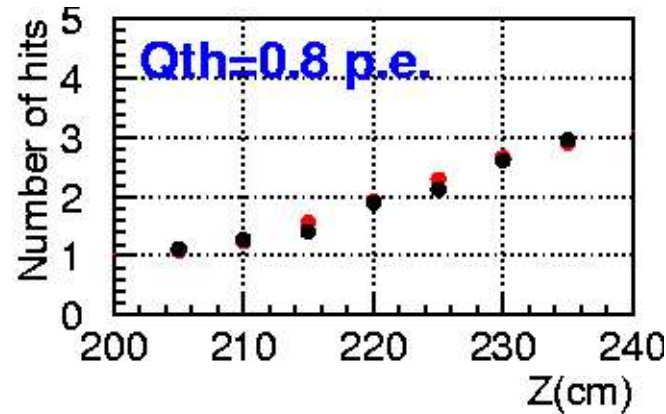
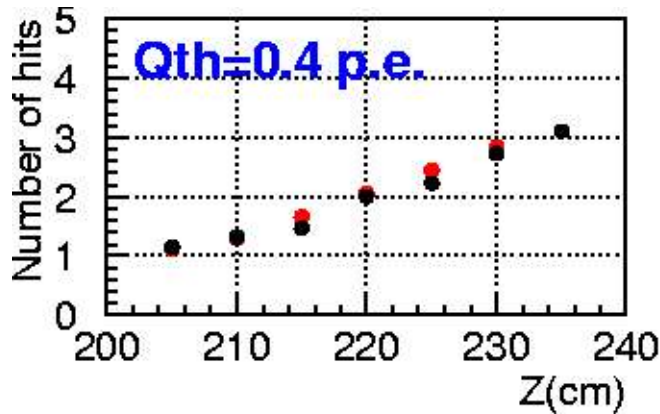
- Nhit distribution
- Nhit/Events distribution
- Other configuration
- Summary

2km Video meeting Dec 15, 2005

G.Mitsuka

K.Okumura

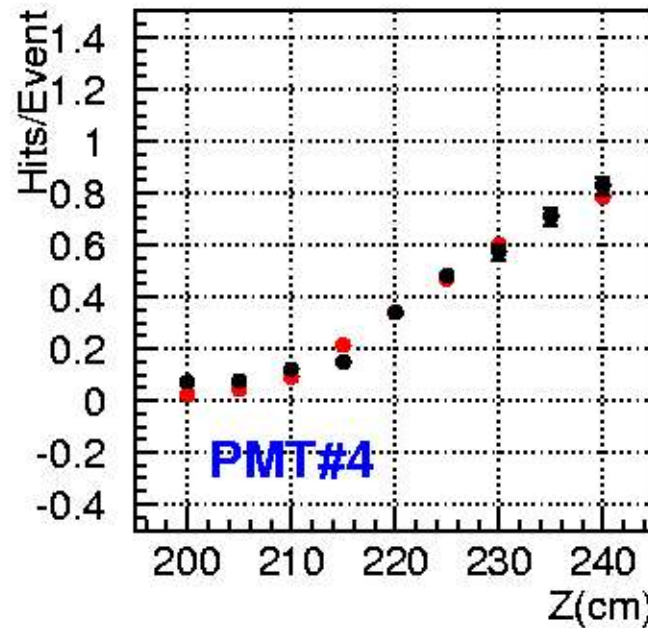
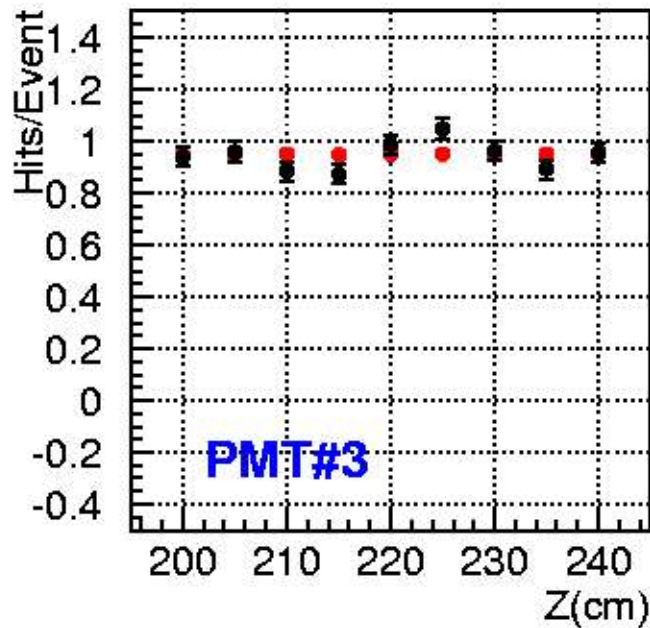
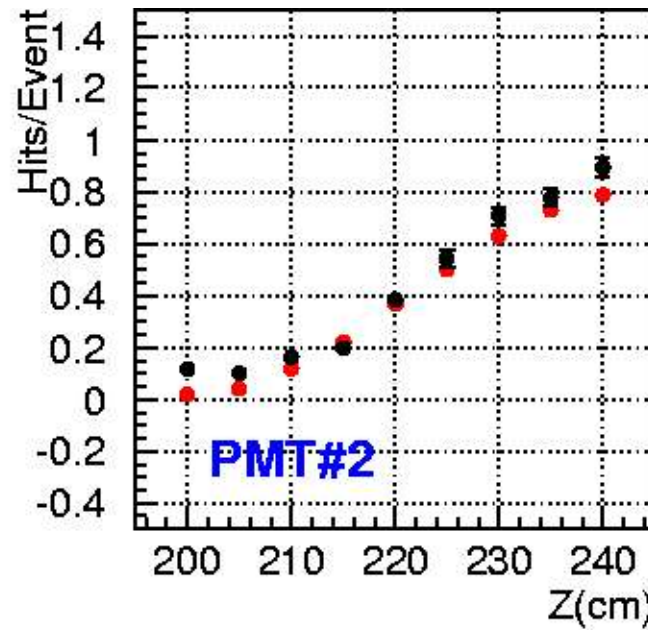
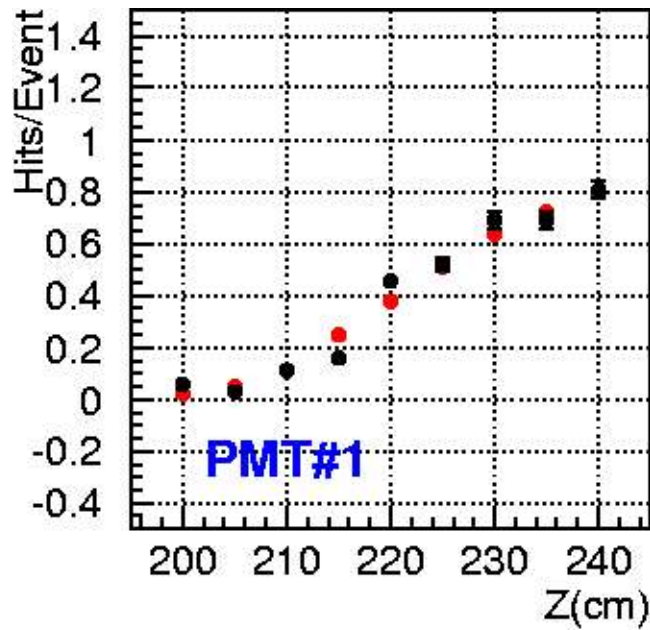
Nhit distribution



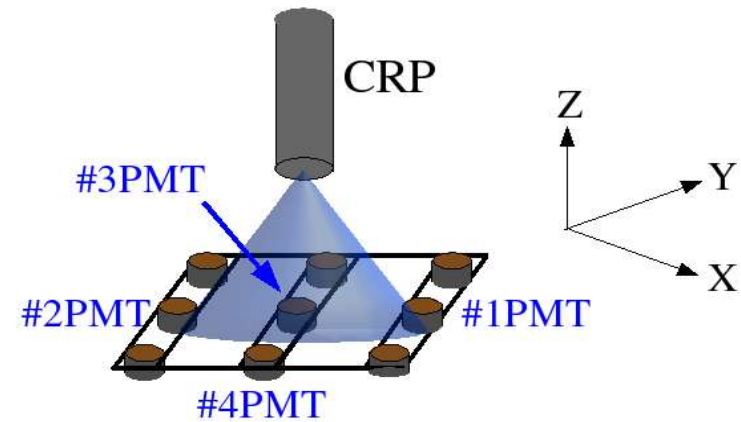
Black : Data
Red : MC

- The absorption parameter in the “fwdetsim” is adjusted only less than 300nm
- Other water parameters are default

Nhit/Events distribution



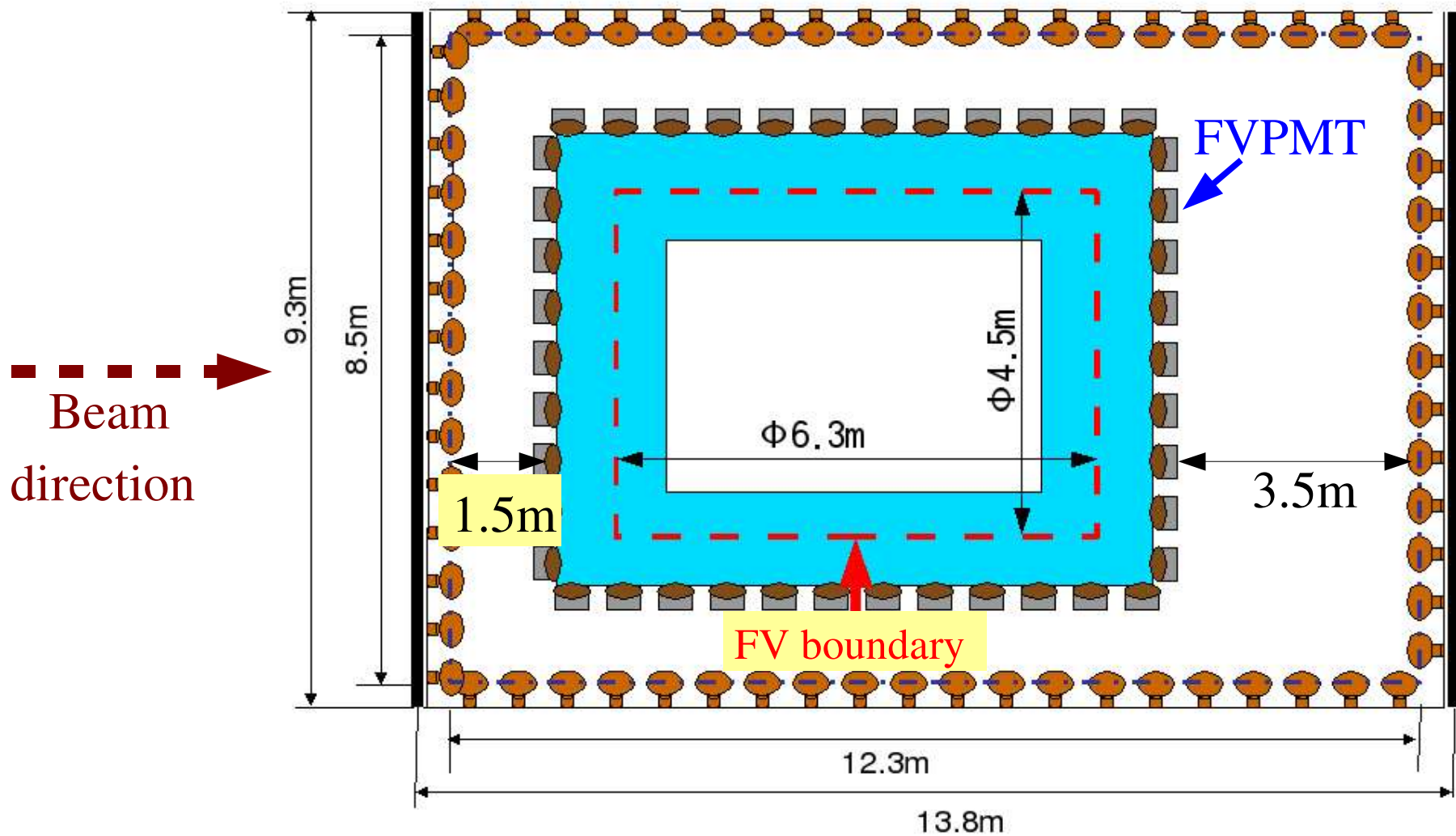
Black : Data
Red : MC



- Qth=0.4 p.e. is applied
- For the Nhit/Events on each PMTs, MC become close to data

2km WC simulation

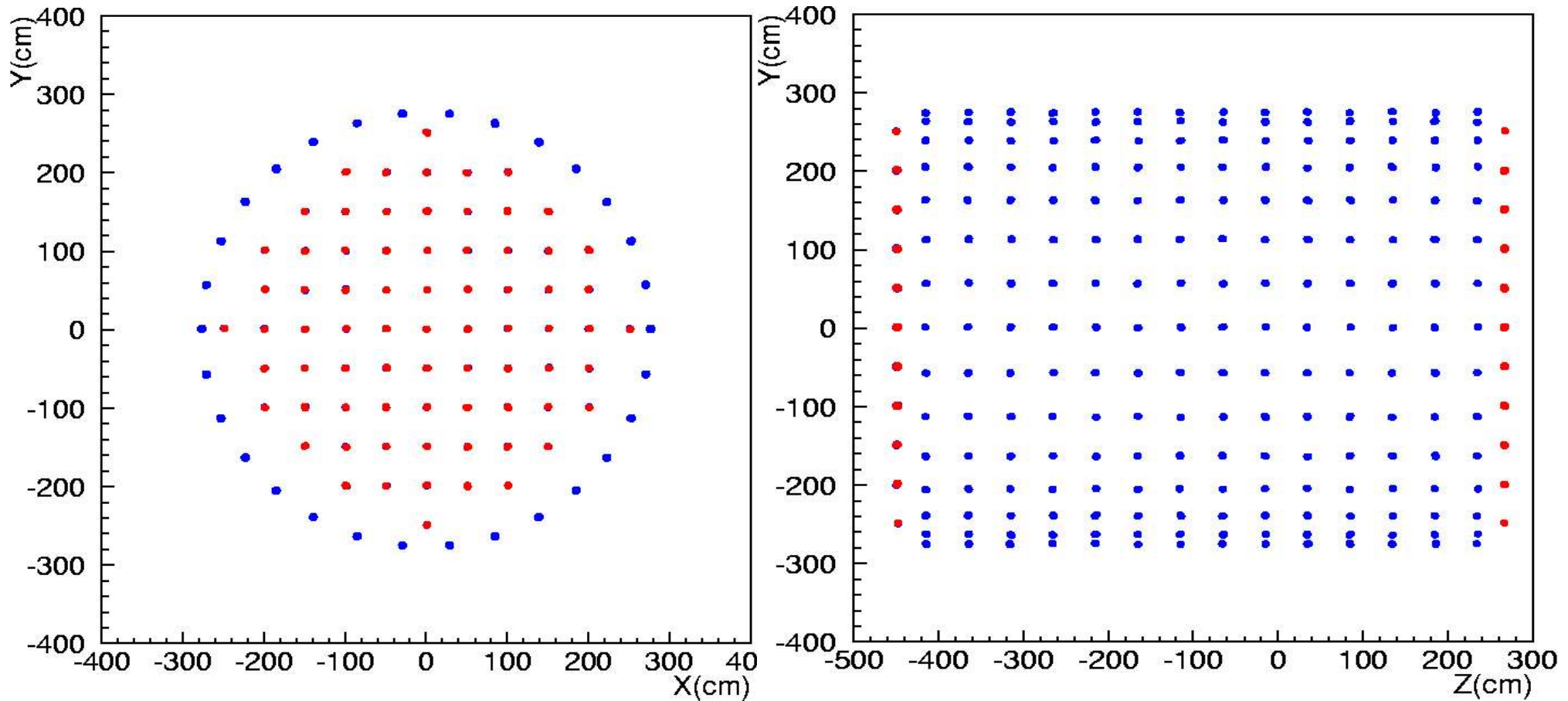
- FVPMTs are set up outside of 50cm of the FV boundary
- Check Nhit FVPMTs using CCQE nu_mu inside/outside 50cm of the FV boundary



Strategy

- CCQE ν_{μ} are classified into 4 parts
 - Front cap
 - End cap
 - Barrel
 - center
 - Events of each part are divided into 3 parts by using the angle to the vertical direction of the boundary
 - 0-15degrees
 - 15-30degrees
 - 30-45degrees
- Hope to obtain the variable depending on the distance between vertex and FV boundary
- Correction depending on the angle to the boundary are applied for events with larger angle

2km WC FVPMT setup

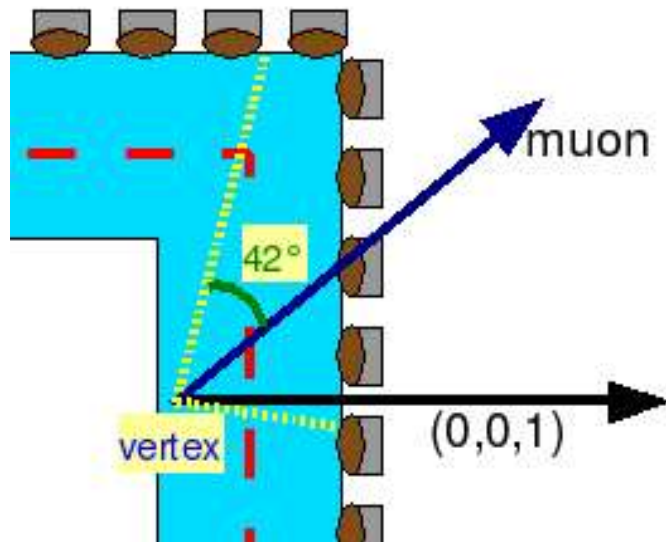


Red : Cap PMT

Blue : Barrel PMT

- In the Barrel and Cap, the distance between FVPMT is 50cm, same as 1kton experiment
- Total $73 \times 2(\text{cap}) + 420(\text{barrel}) = 566$ PMTs

Definition of parameters

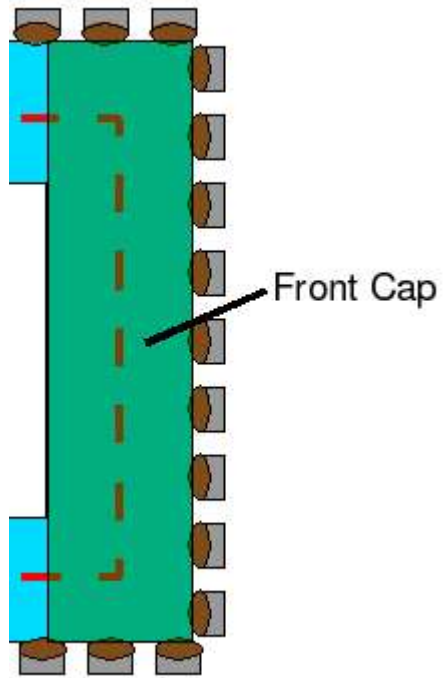


AllPMTs : Number of FVPMTs inside the Cerenkov cone(opening angle is fixed on 42°)

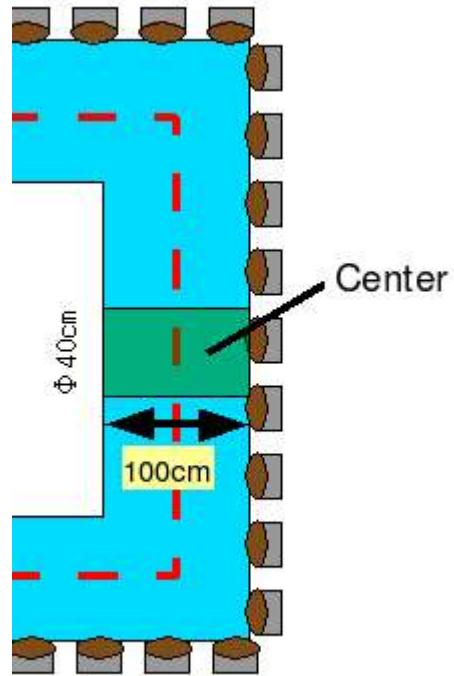
HitPMTs : Number of hits included in AllPMTs

Vertex cut

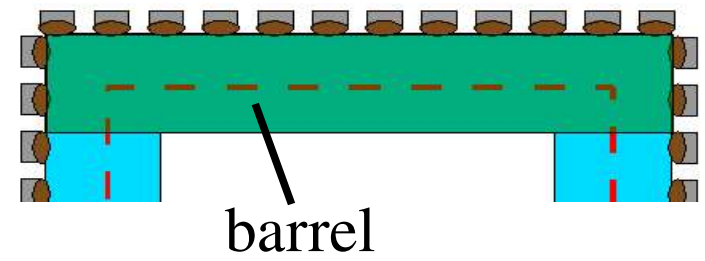
Front cap



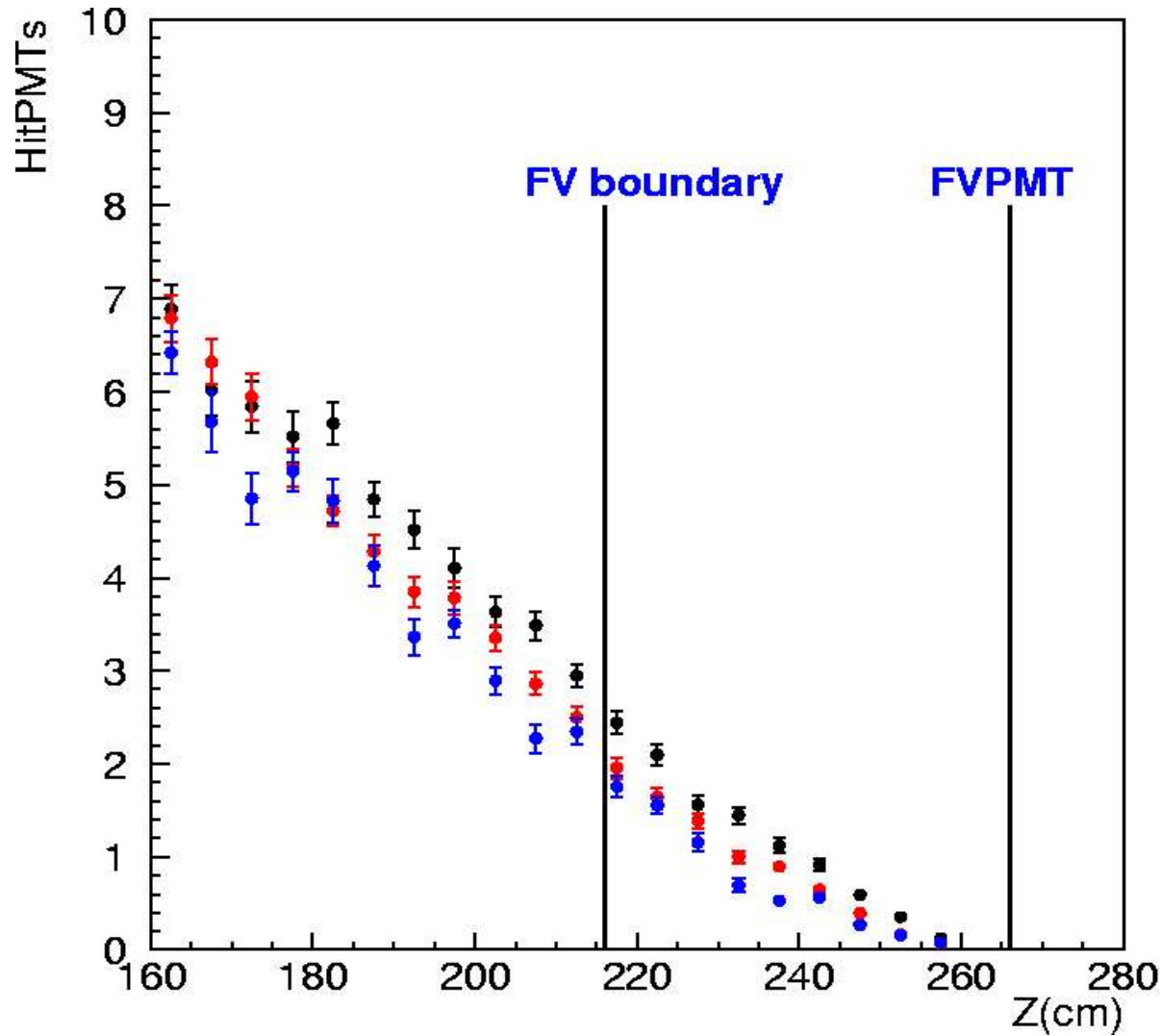
Center



Barrel

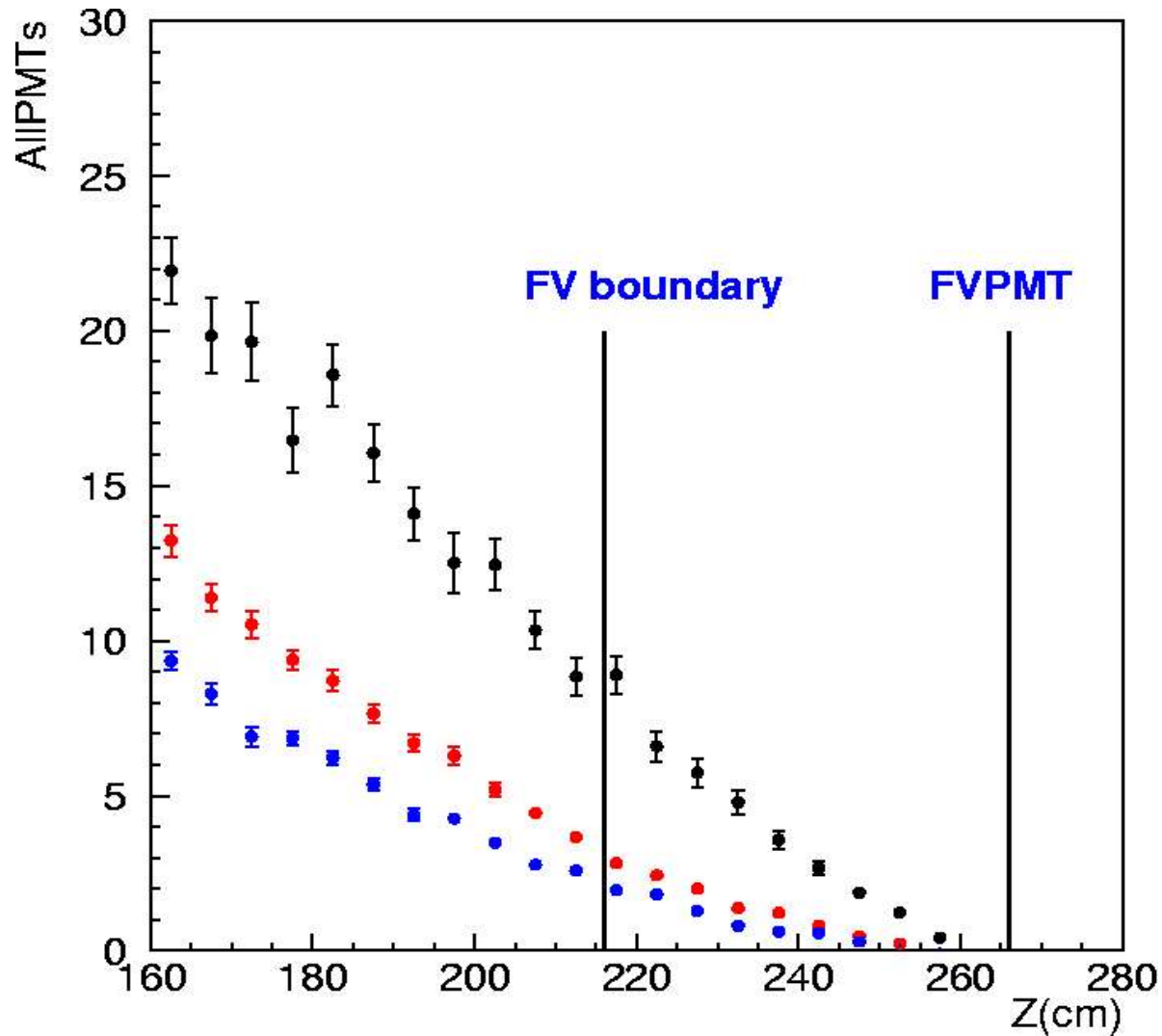


HitPMTs (Front Cap)



- Black : 45° → 30°
- Red : 30° → 15°
- Blue : 15° → 0°

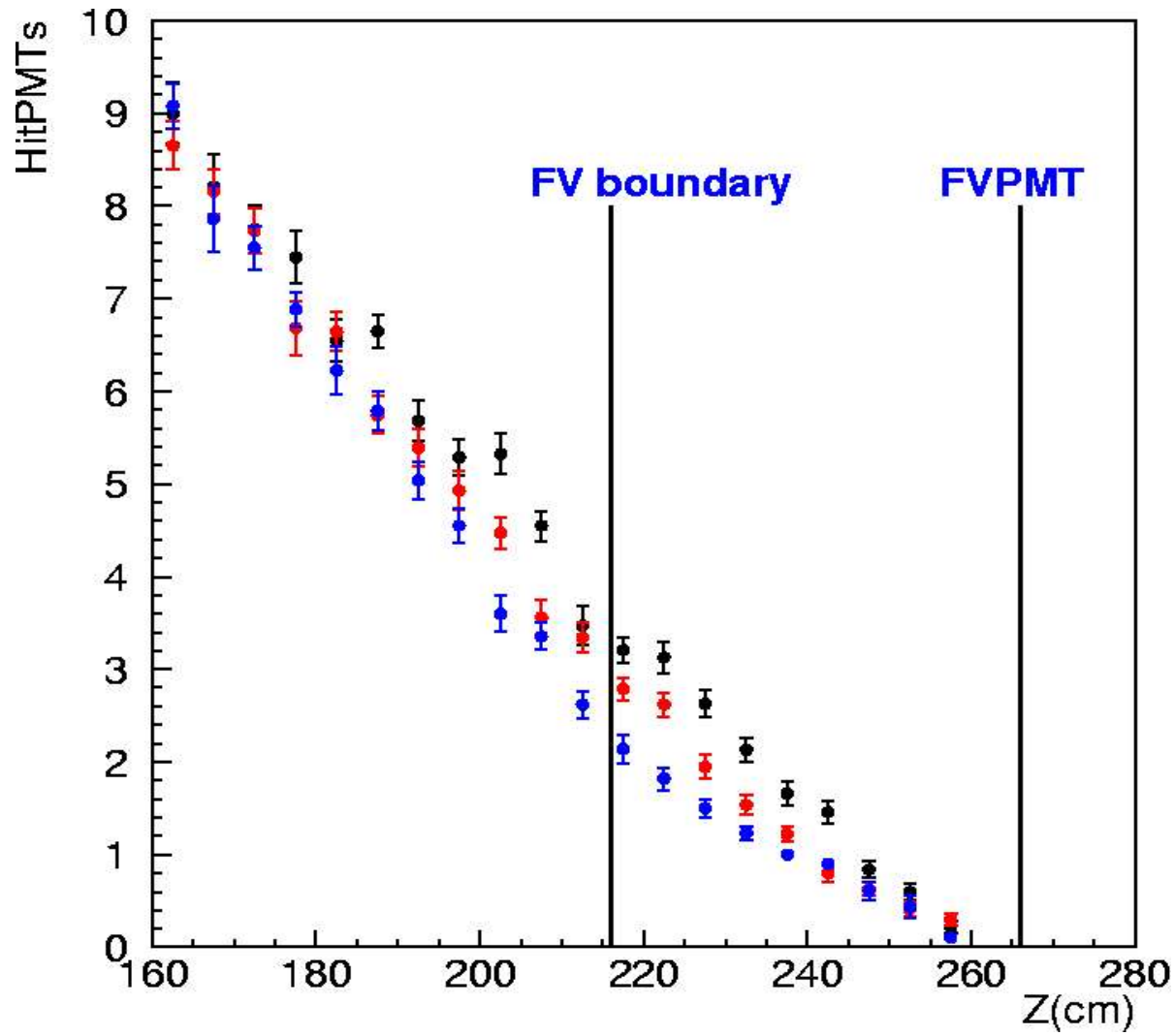
AllPMTs (Front Cap)



- Black : $45^\circ \rightarrow 30^\circ$
- Red : $30^\circ \rightarrow 15^\circ$
- Blue : $15^\circ \rightarrow 0^\circ$

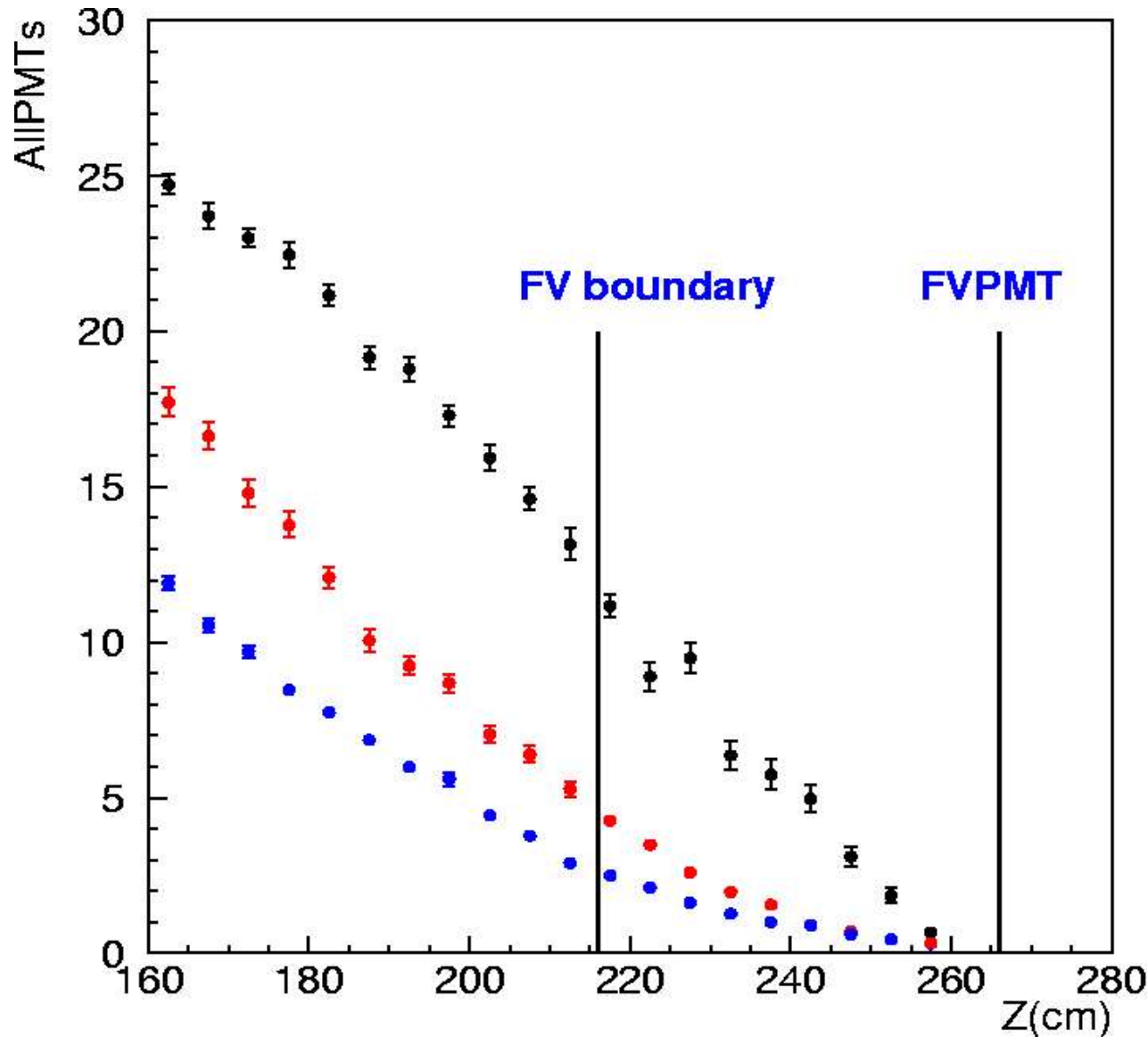
• Now searching for the correction using AllPMTs and angle

HitPMTs(Center)



- Black : 45° → 30°
- Red : 30° → 15°
- Blue : 15° → 0°

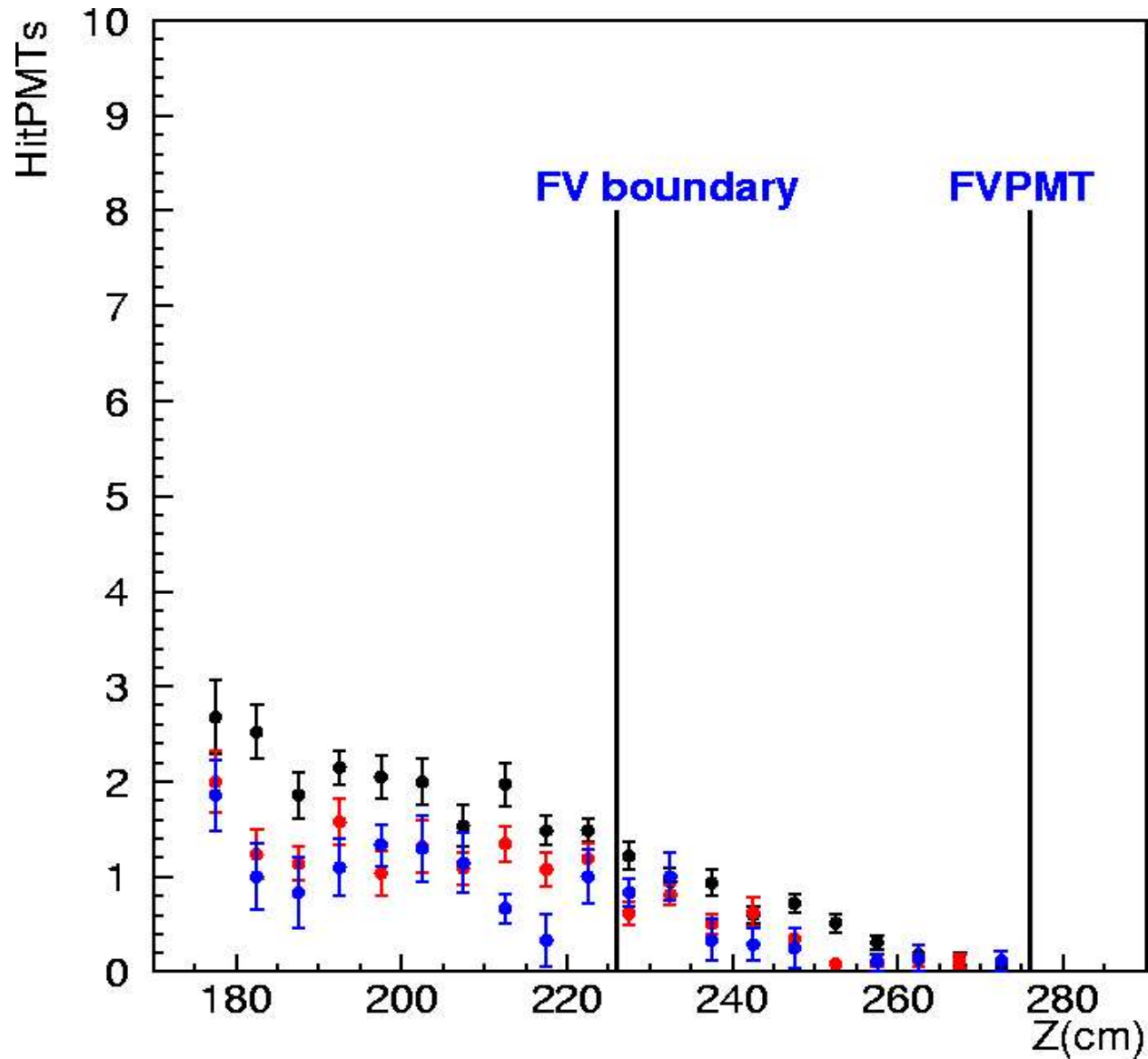
AllPMTs (Center)



- Black : $45^\circ \rightarrow 30^\circ$
- Red : $30^\circ \rightarrow 15^\circ$
- Blue : $15^\circ \rightarrow 0^\circ$

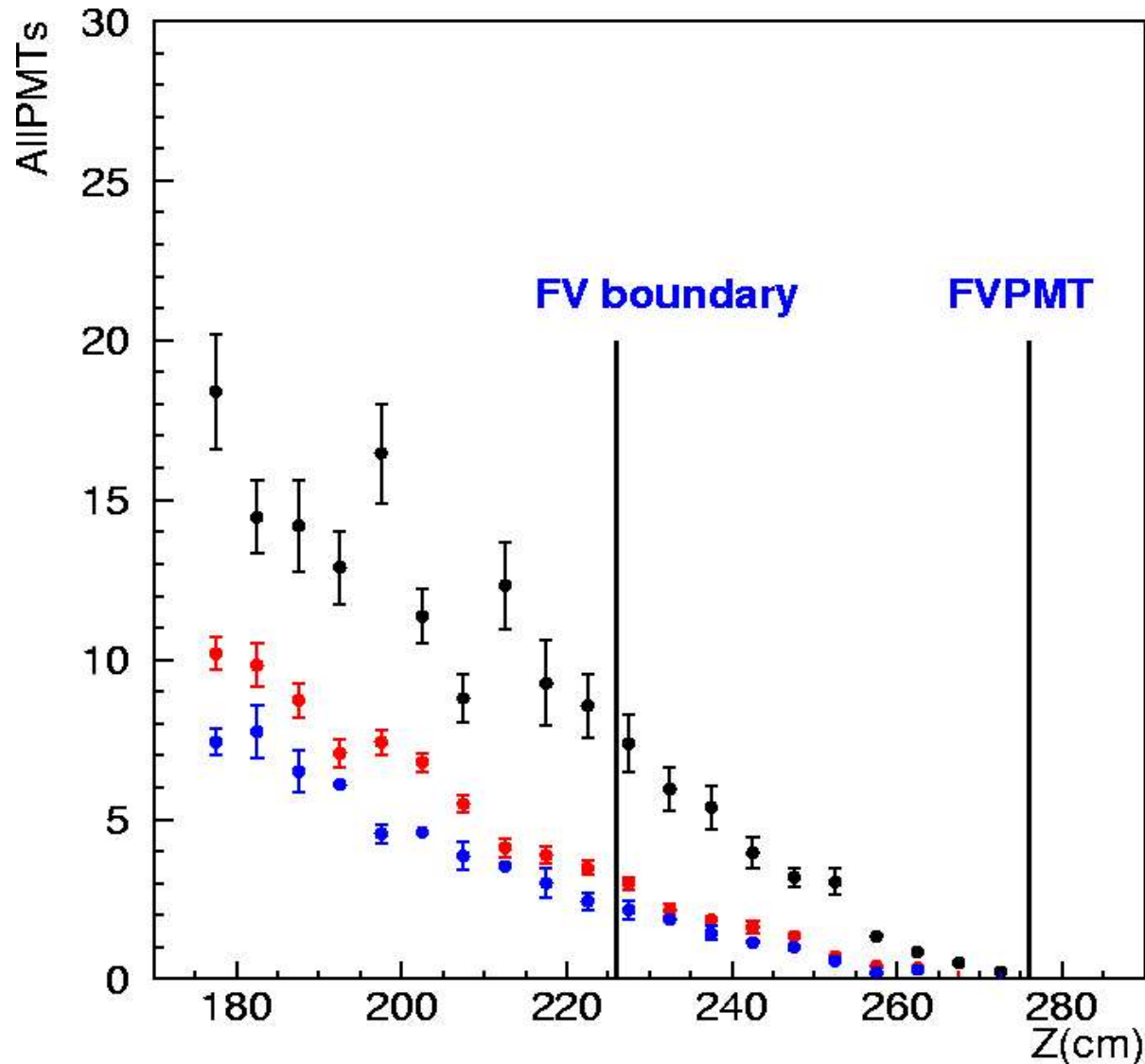
- Also, searching for the correction using AllPMTs and angle

HitPMTs(Barrel)



- Black : 45° → 30°
- Red : 30° → 15°
- Blue : 15° → 0°

AllPMTs (Barrel)



- Black : $45^\circ \rightarrow 30^\circ$
- Red : $30^\circ \rightarrow 15^\circ$
- Blue : $15^\circ \rightarrow 0^\circ$

- Need to more events, and PMT region cut (e.g. not use Cap PMTs)

Summary

- Almost 4PMTs vertical direction(200-240cm) analysis is finished, shift to other configurations(slide or 9PMTs...)
- 2km FVPMT simulation study is continued using more events(i.e. more vector files)