Cosmic ray 7/28

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Report

- Trigger top & bottom signal check
- Determine the threshold of the PMT signal by the oscilloscope
- Output signal from the discriminator
- Voltage divider problem

PMT Model

- HAMAMATSU - H7195

[Max. Rating] Anode to Cathode Voltage	-2700 V
[Max. Rating] Average Anode Current	1.23 mA
Anode to Cathode Supply Voltage	-2000 V

PMT Signal Confirm

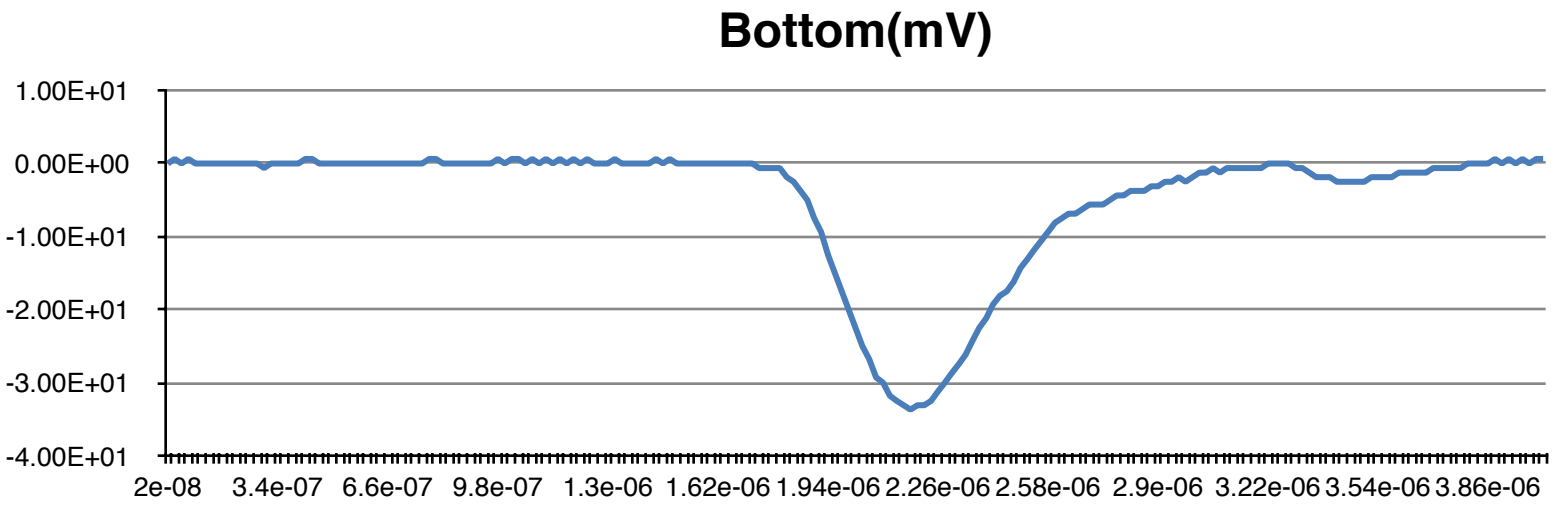
- PMT signal (-2000V) by oscilloscope
- Check signal with & without light
- Compare the counts of the PMT signal with and without light

Trigger Signal

- Top & Bottom trigger signal (-2000V)

- Information of the oscilloscope setting
  - Coupling DC 50 Ω, Bandwidth 100MHz

- Signal amplitude : Both 30~40mV



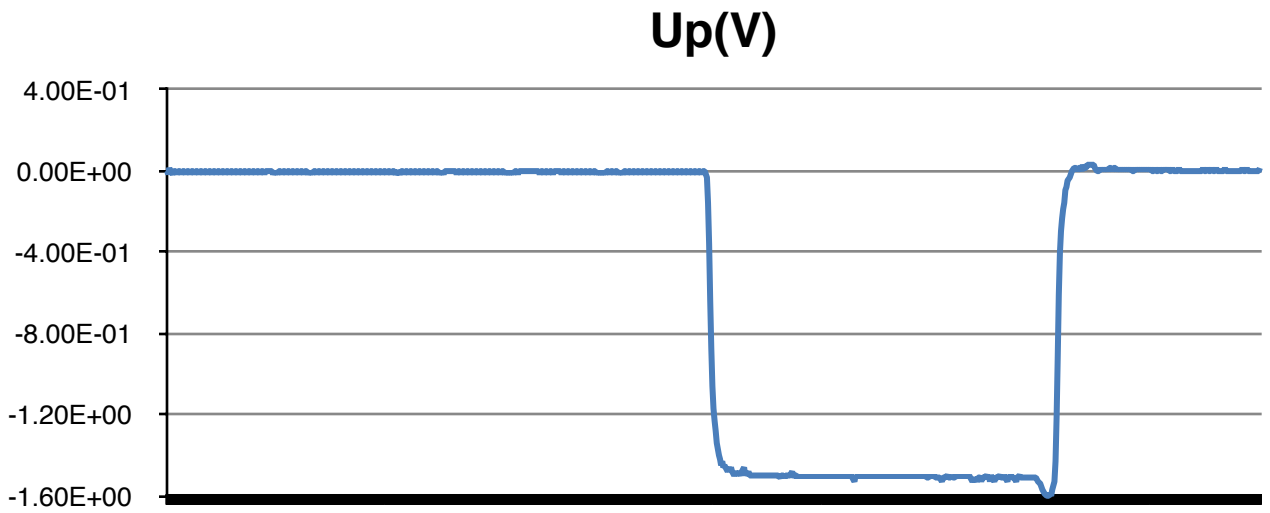
Threshold Determination

- Determine threshold by N_{count} (counts per second)
  1. N_{count_top} = about 100 (count/sec) - threshold 20mV
  2. N_{count_bottom} = about 180 (count/sec) - threshold 15mV
  3. N_{count_coin} = 0.8 ~ 1 (count/sec) - threshold 20mV

- For threshold = 20mV
  A. 3~4 hours to take 1set (10,000 events) from trigger coincidence
  B. 1day to take 1set from selected scintillators

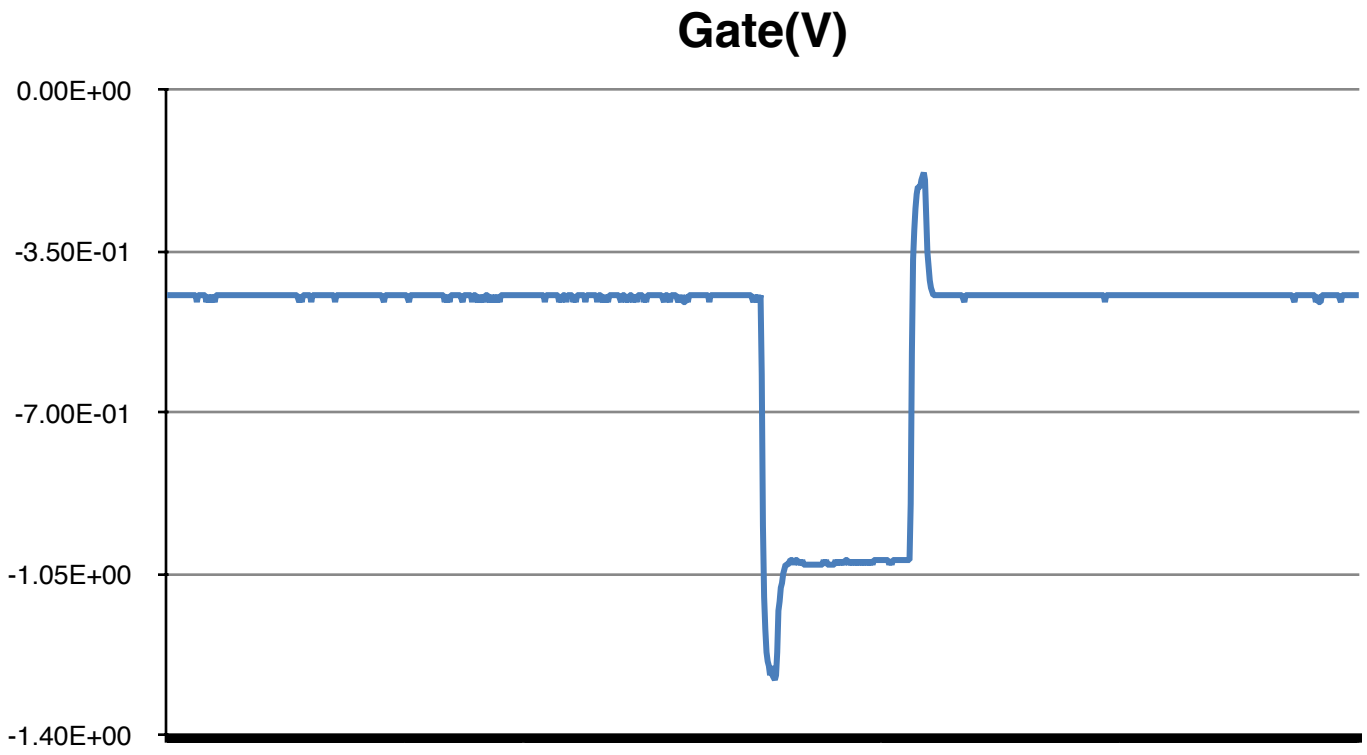
Discriminator Signal

- Oscilloscope setting : Coupling DC 50 Ω, Bandwidth 100MHz
- Signal size ~ 1.5 V
- Top&Bottom signal time delay : 40 ~ 50 ns



Coincidence Output Signal

- Oscilloscope setting : Coupling DC 50 Ω, Bandwith 100MHz



Voltage Divider Problem

- Apply -2000V to each PMT -> shut down within 10 sec.

- Lack of Power -> too much current in some PMT`s?

Plan

- Check PMT signal for every PMT`s
- Find the PMT that needs too much power and try again with turning off the HV for unusable PMT`
- PMT gain matching for workable PMT

Back up

Bandwidth

Bandwidth