

Preparation for the Transversity Experiment - BigBite Detector Test

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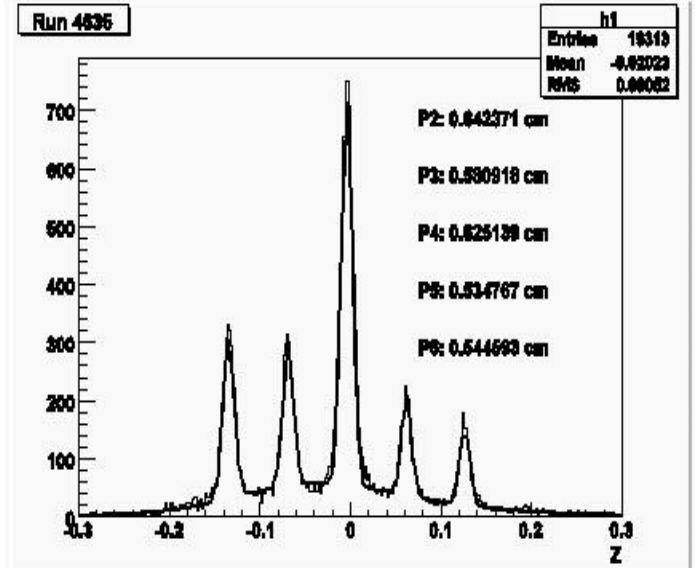
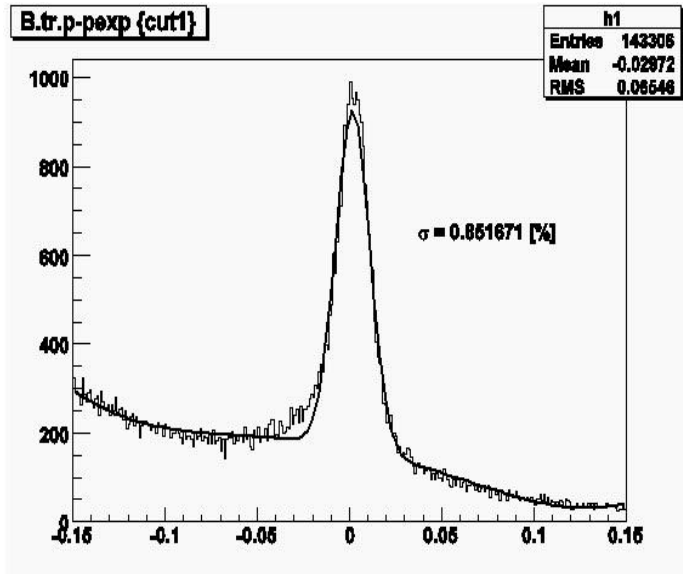
Hall A Collaboration Meeting. Jan 4th, 2007

Outline

- Transversity test run
- Leadglass blocks/PMTs test in Shower and Preshower detectors
- Wirechambers test
- Future plans/tests

Transversity test run

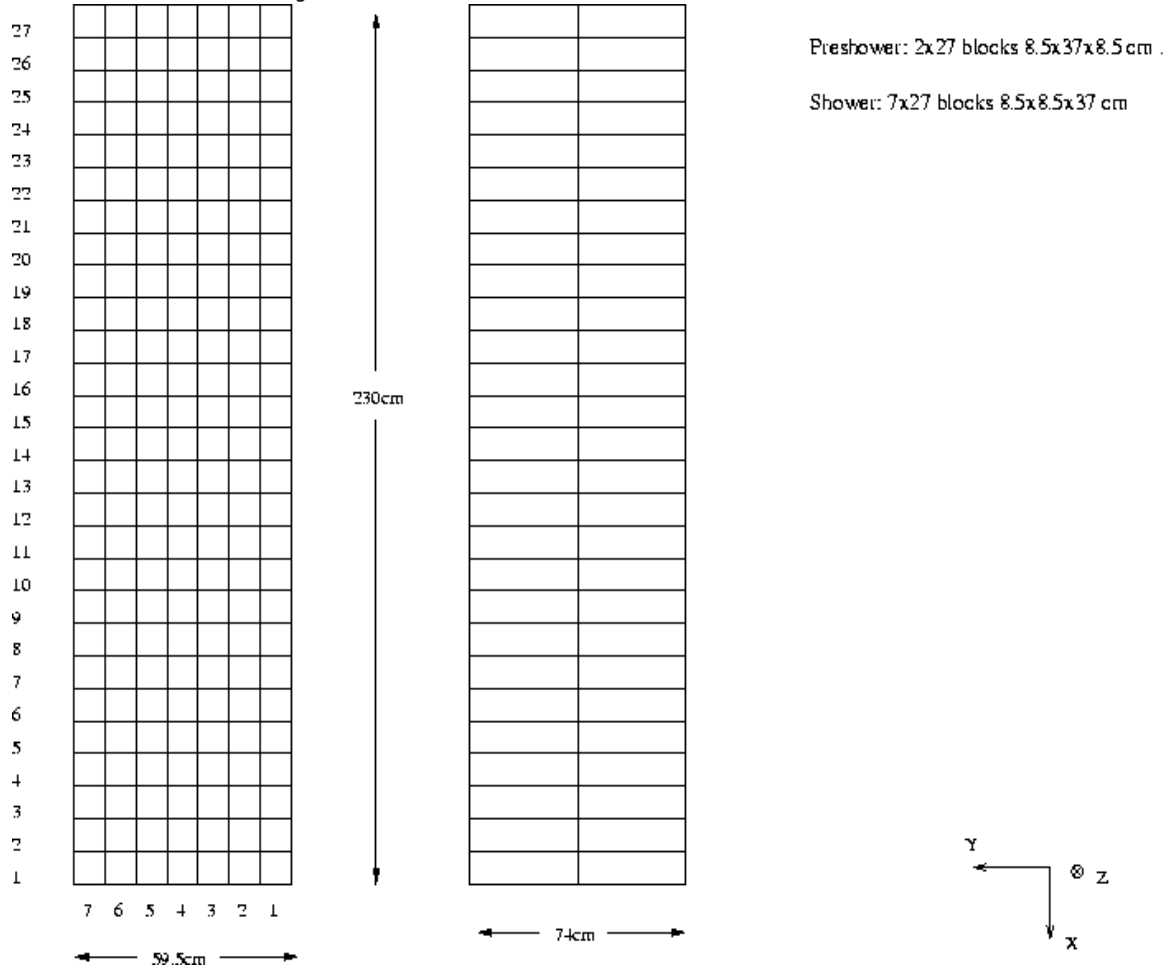
A test run to check the BigBite optics at 1.5m away from the target was taken soon after the GEN expt.



Plots by Xin

Leadglass blocks/PMTs test

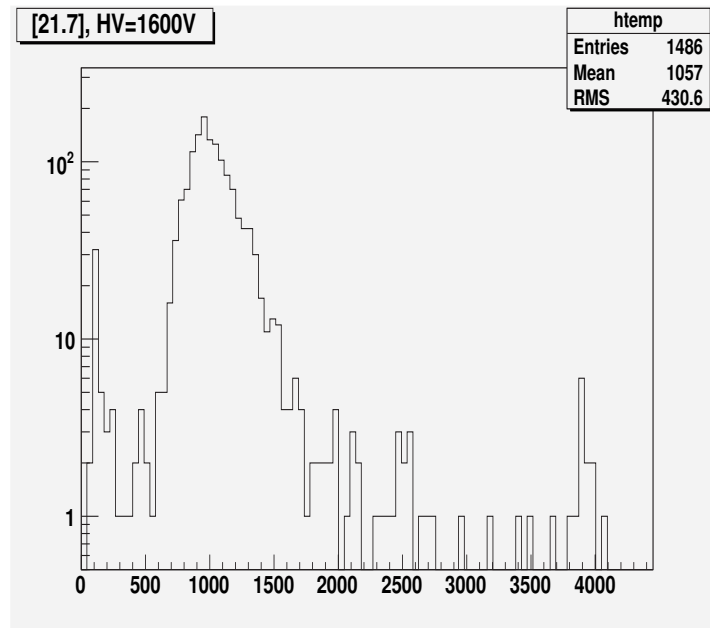
Geometry of Shower and Preshower Detector



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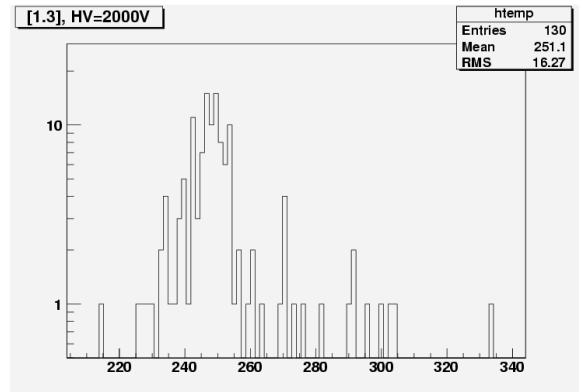
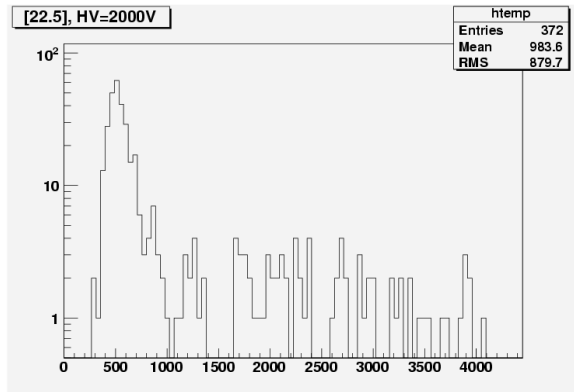
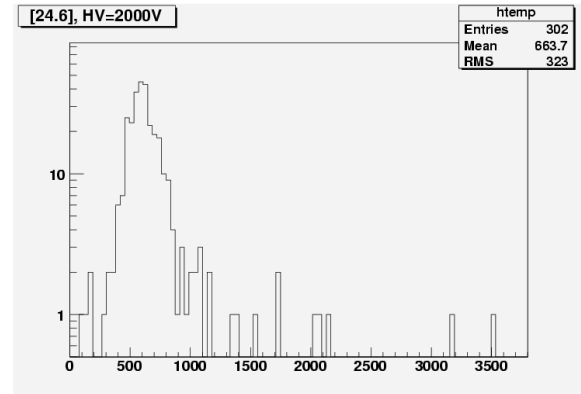
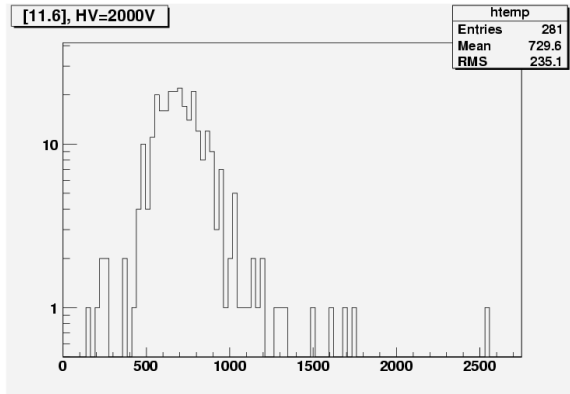
- Total number of leadglass blocks: Preshower=54, Shower=189.
- A simple DAQ was setup to read the ADC and TDC values from the cosmic events. (Thanks to Brad Sawatzky)
- A coincidence trigger was formed to look at the cosmic events passing through the blocks vertically.
- There are no ABSOLUTELY dead blocks/PMTs.

ADC spectrum of the block with good signal

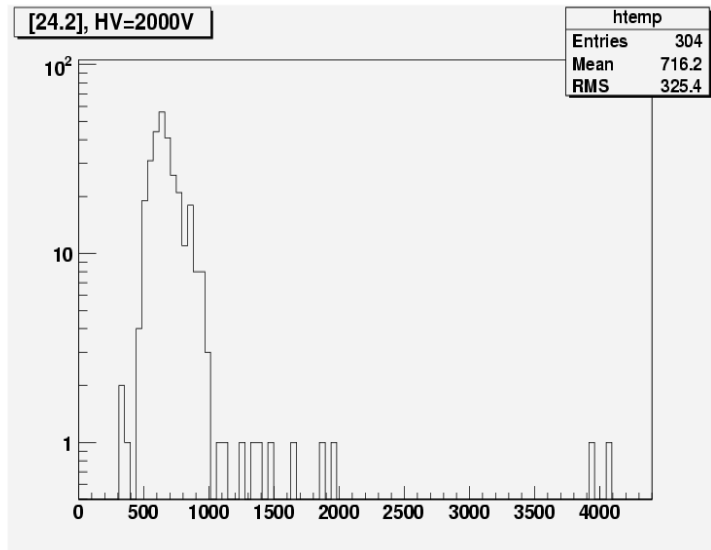


ADC amplitude peak around channel 1000 with 1600V.

ADC spectrum for the blocks with low signal



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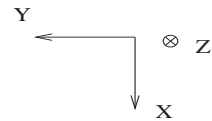
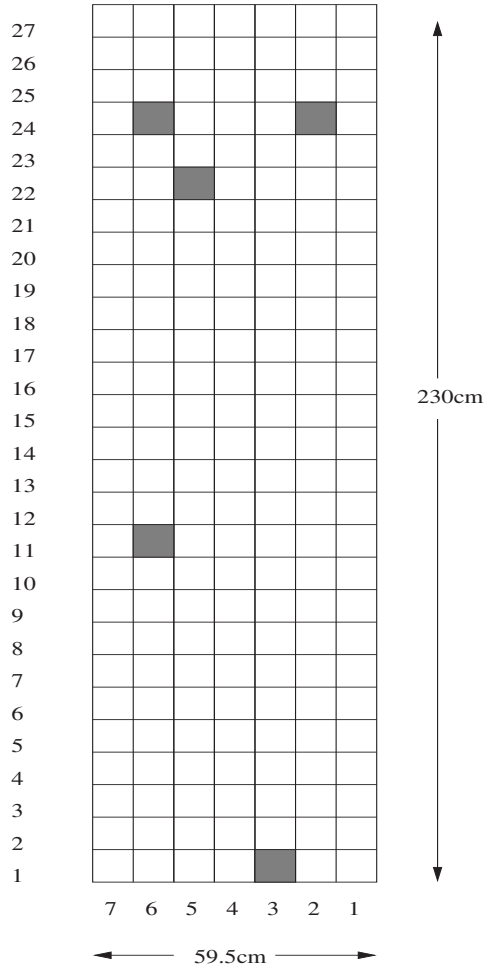


All these spectra are from the shower detector.

ADC peak(channel no.) at different high voltages

Block#	1.9kV	2kV
24.6	340	600
11.6	400	730
22.5	300	500
1.3	100	250
24.2	300	700

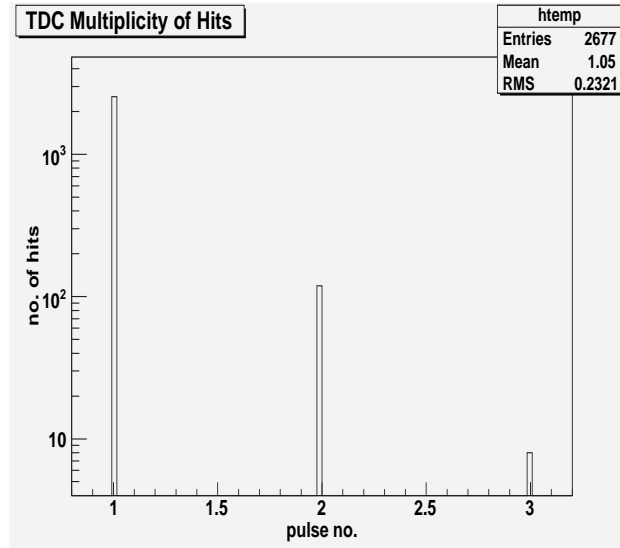
Geometrical position of the “bad” blocks



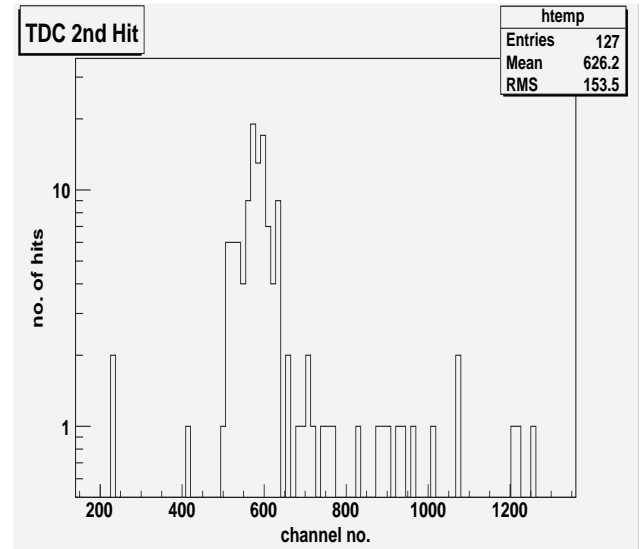
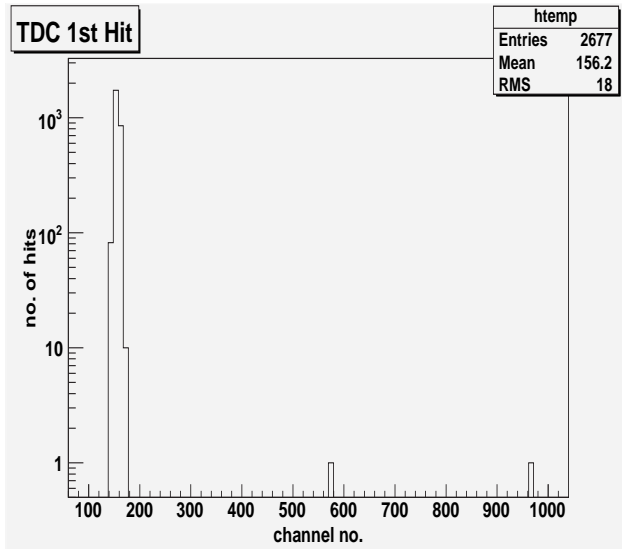
TDC spectrum - to check the after pulses

No. of blocks showing after pulse(roughly)

- Shower = 60, Preshower = 15



TDC spectrum of 1st and 2nd pulse



The difference between 1st and 2nd pulse is about 320ns

Conclusions for the leadglass test

- There are 5 blocks with very low signal in the Shower detector.
- Preshower blocks looks good.
- A lot of PMTs shows after pulses around 320ns after the signal(which should not be a worry)
- Plan is to replace these PMTs with the new ones.

Hardware work in the testlab



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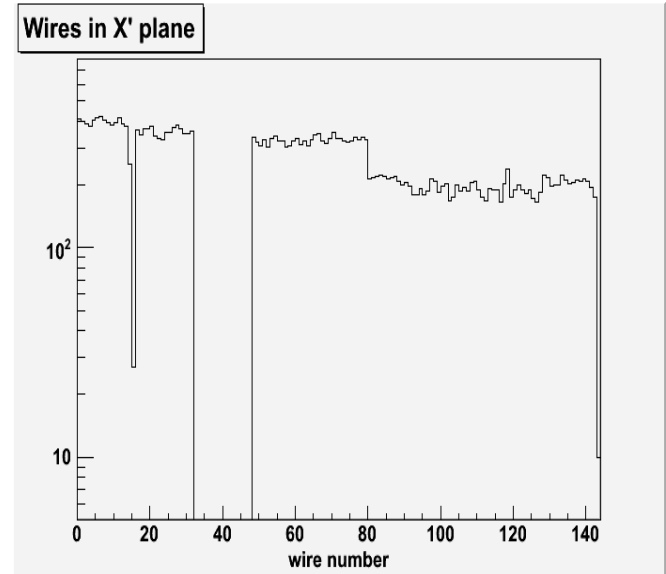
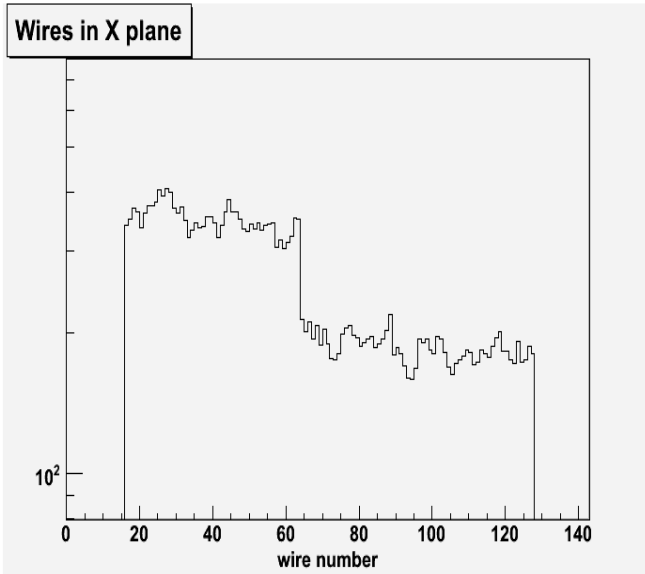
Hardware work in the testlab

- Two cable trays have been assembled to hold the flat cables for the wirechambers.
- Two large cable trays are being assembled to hold the HV and delay cables.
- All the signal and delay cables have been sorted out and tested (Thanks to Chiranjib, Huan, Aidan and Joe).

Wirechambers test

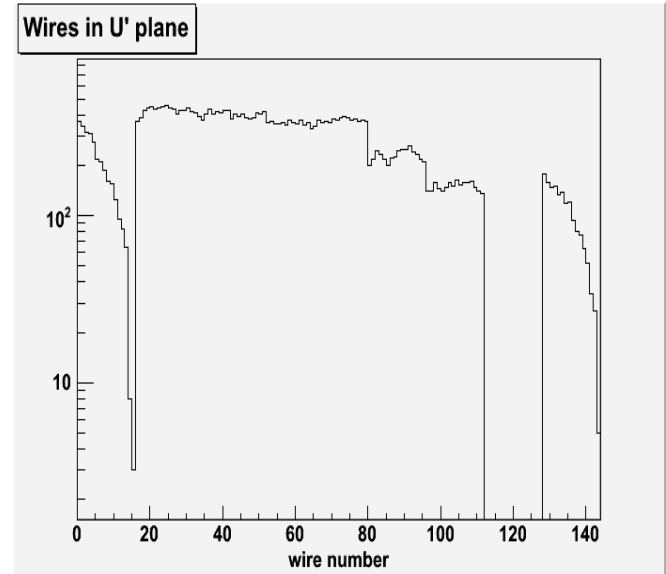
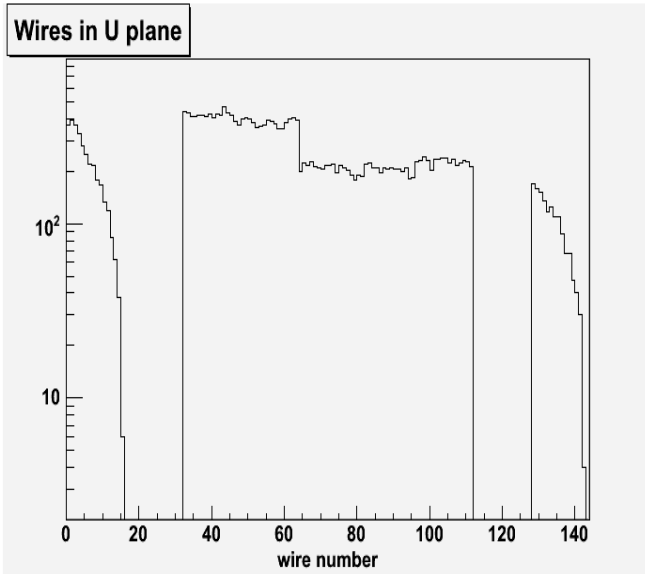
- A trigger is setup using a scintillator paddle in front of the chambers.
- Chamber I is fully connected to the VME TDCs and taking cosmic data using this trigger.
- We miss a few amplifier cards on chamber I – expected soon
- Chamber II and III don't have the new amplifier cards but the cabling is done already. They are ready to take data as soon as we have the cards.

First attempt to read wirechamber I



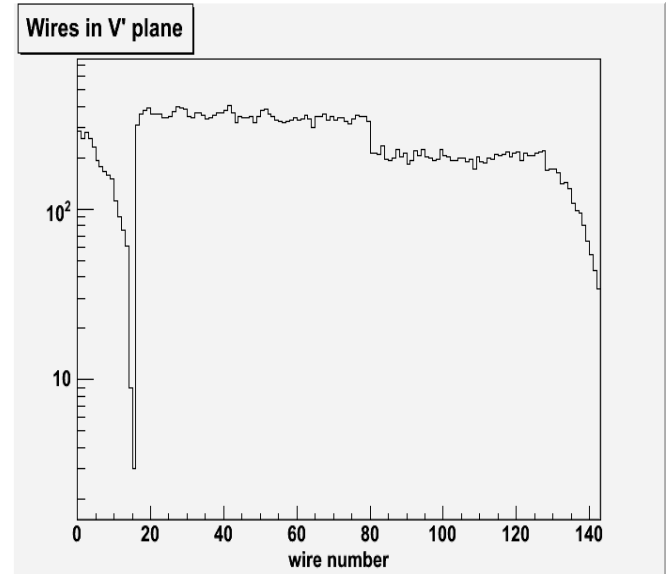
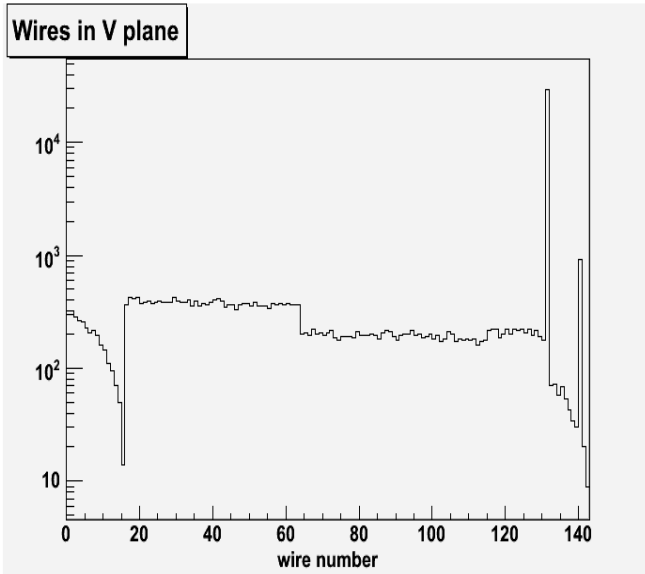
- The empty region in the plot corresponds to the wires with missing amplifier cards.
- Need to investigate the drop in the spectrum near the center (Note: The two different regions in the data corresponds to the data from TDCs in two different VME(ROCs) crates)

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- The empty region in the plot corresponds to the wires with missing amplifier cards

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Thanks to Xiaohui Zhan for the plots

Things to do next...

- To setup the BigBite trigger similar to the GEN experiment
- To test all the detectors with cosmics by March 1st and demonstrate that we can run with minimum configuration.
- Improvements:
 - Replace bad PMTs with the new ones in the shower detector(Albert)
 - Upgrade chamber II from 3 wire planes to 6 wire planes (Nilanga, UVA)
 - Add gas cherenkov detector (Brad, Temple Univ)

Thanks to

- Wolfgang Korsch
- Xiaodong Jiang
- Xin Qian
- Brad Sawatzky
- Brandon Craver
- Nilanga Liyanage