

Transversity trigger, DAQ and scalers

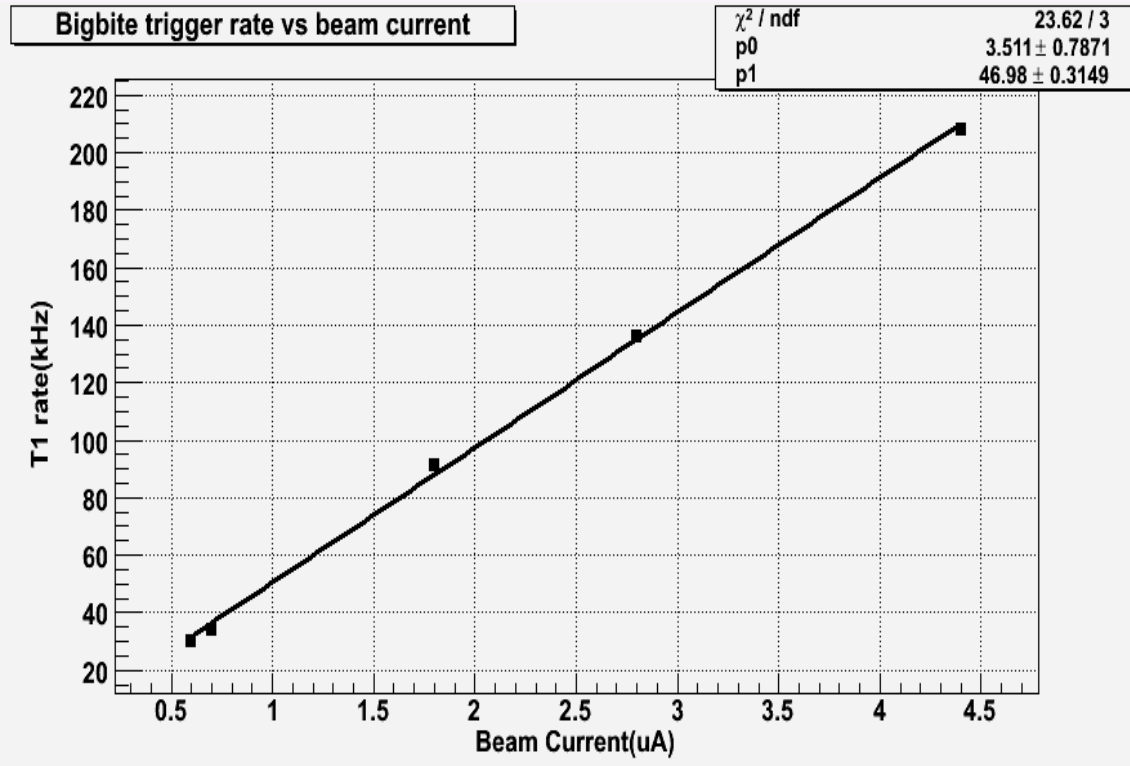
Kalyan Allada

University of Kentucky

Hall-A Transversity Collaboration Meeting. July 21, 2008

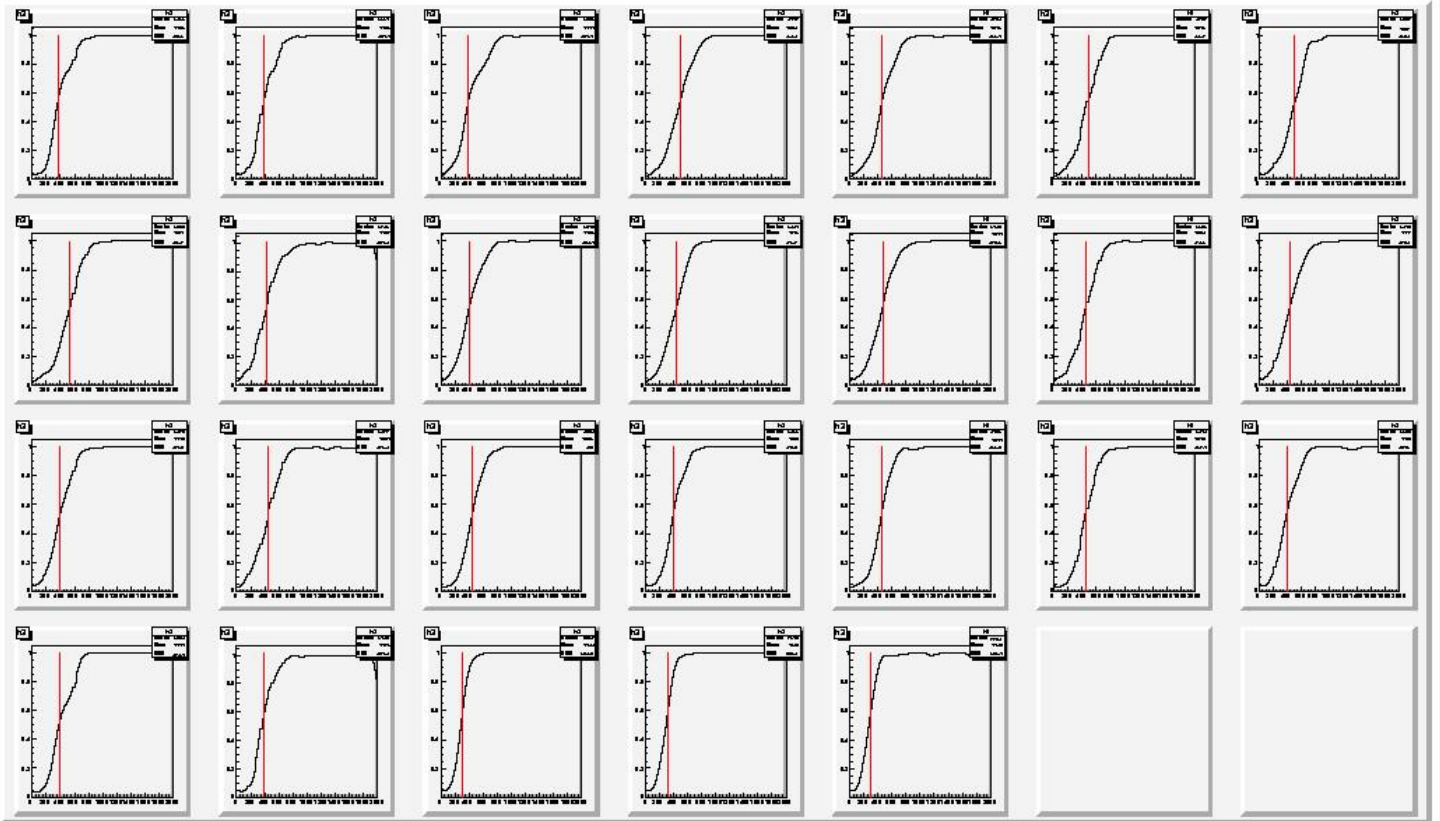
Bigbite trigger performace during May/June running

- Bigbite was commissioned during the May 2008 running.
- Coincidence trigger was formed between L-HRS(proton) and Bigbite(electron)



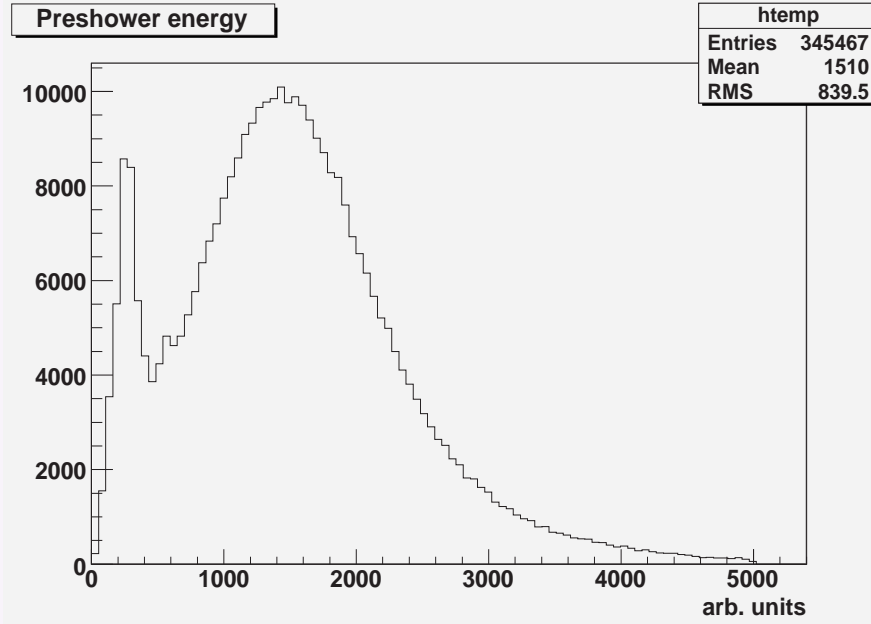
Bigbite total sum thresholds

Plot : ratio of no. of events with TDC hit by total no. of events.

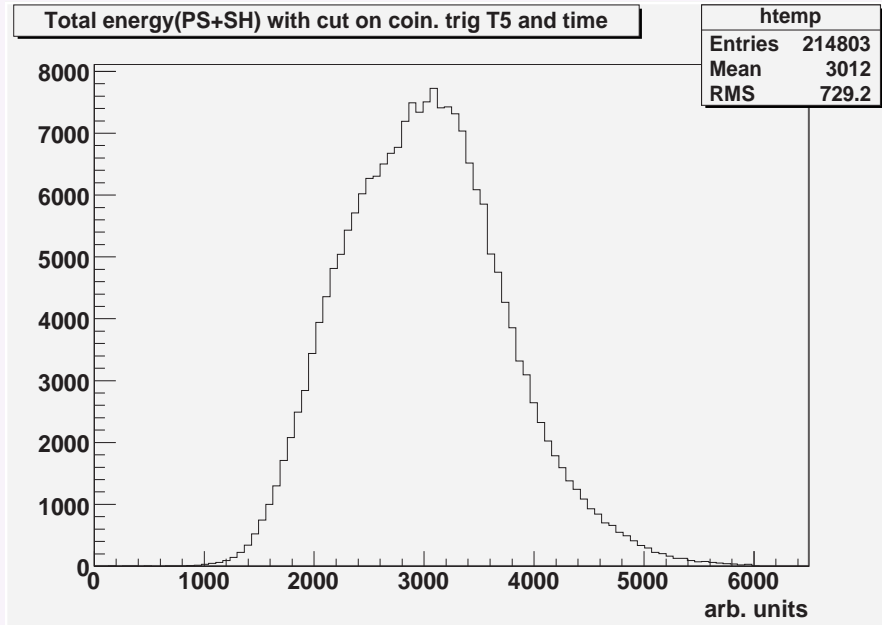


- Total sum discriminator threshold set to -50mV during the May/June run.
- ADC cut-off around channel 400
- Need to carefully set thresholds during the transversity run.

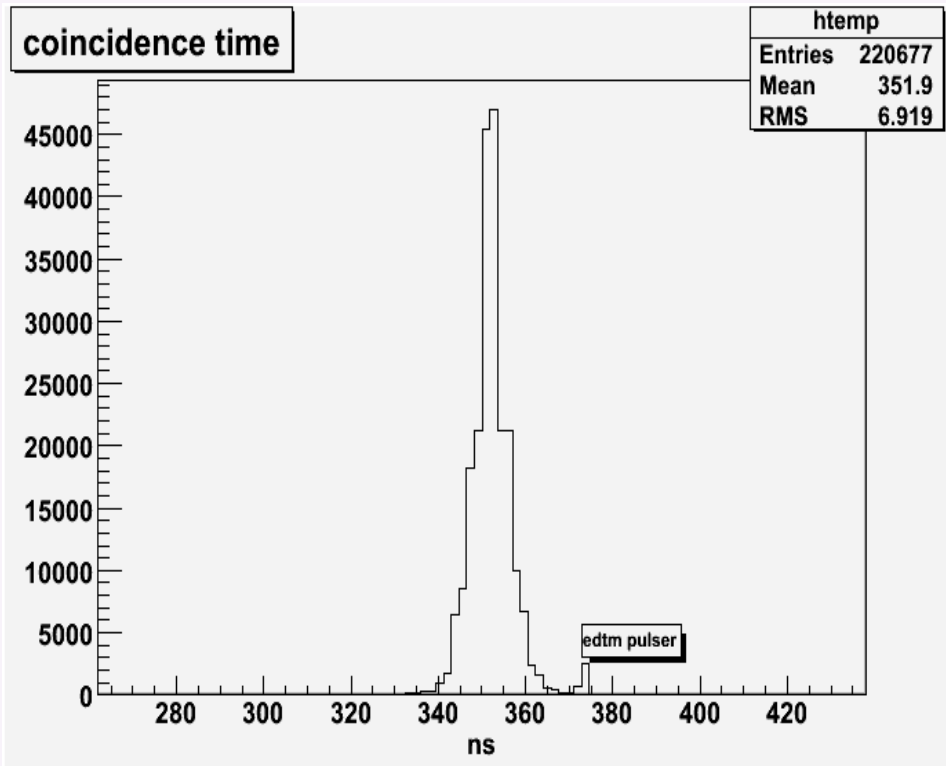
Preshower energy



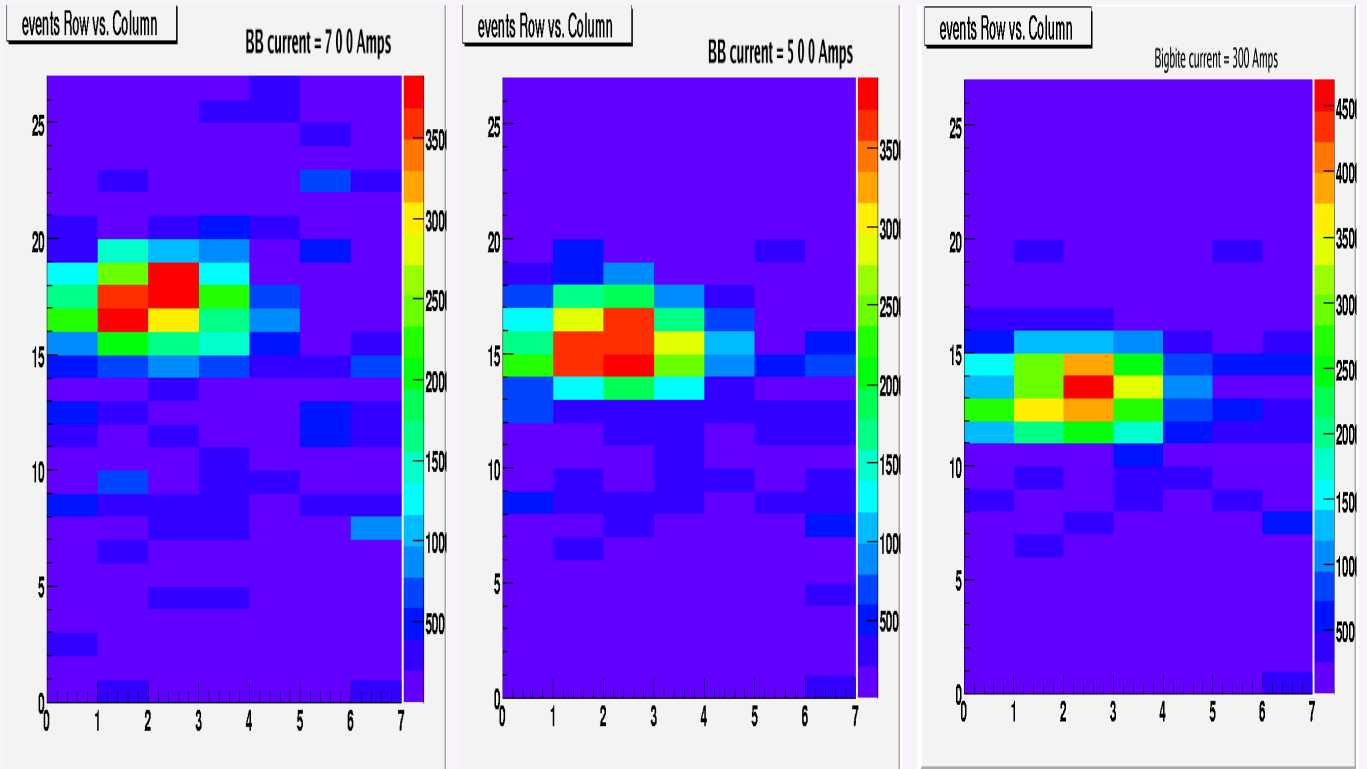
Total energy energy



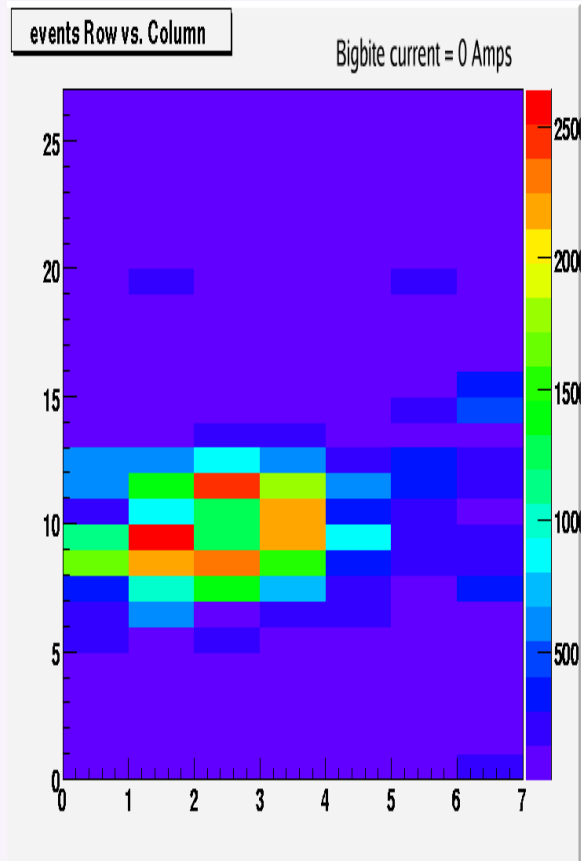
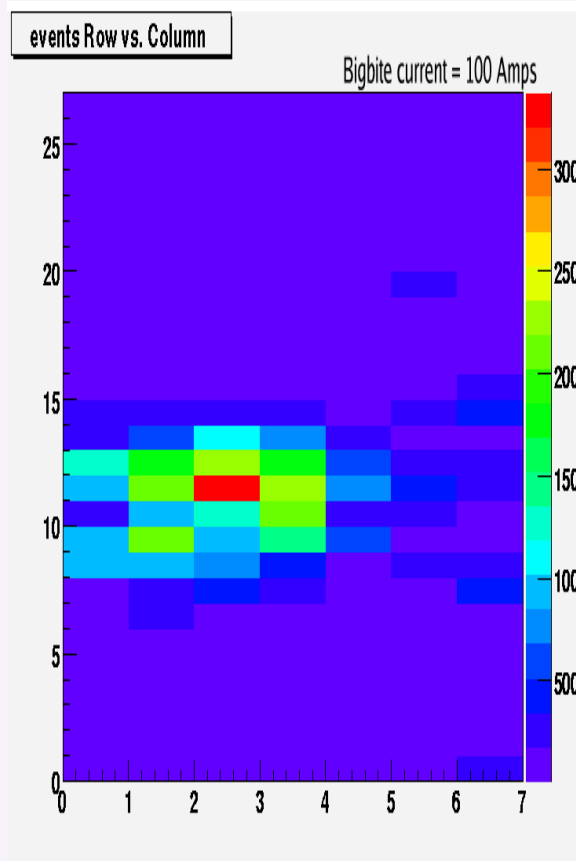
Coincidence time



Bigbite magnet current vs e-p elastic peak



Bigbite magnet current vs e-p elastic peak

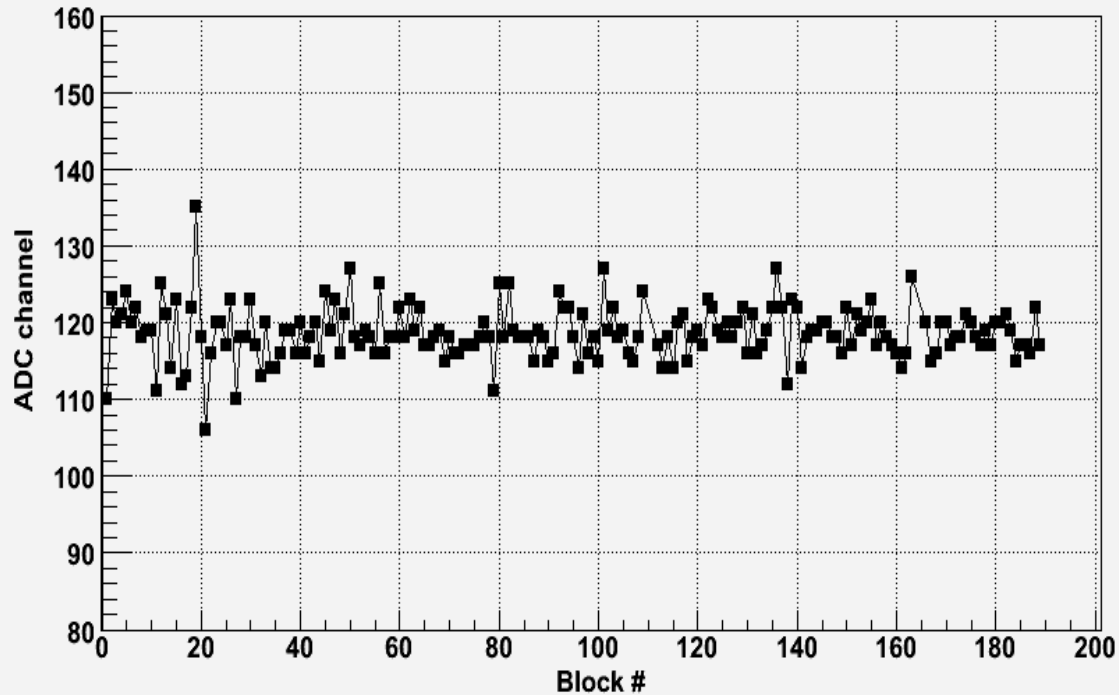


Conclusion of the trigger performance during May run

- Bigbite trigger performance was good.
- Preshower/shower signal calibrated with cosmics to be roughly 0.5 MeV per channel.
- The HV setting was about 15% higher than what we intended to have.
- Remote threshold control worked fine during the expt.

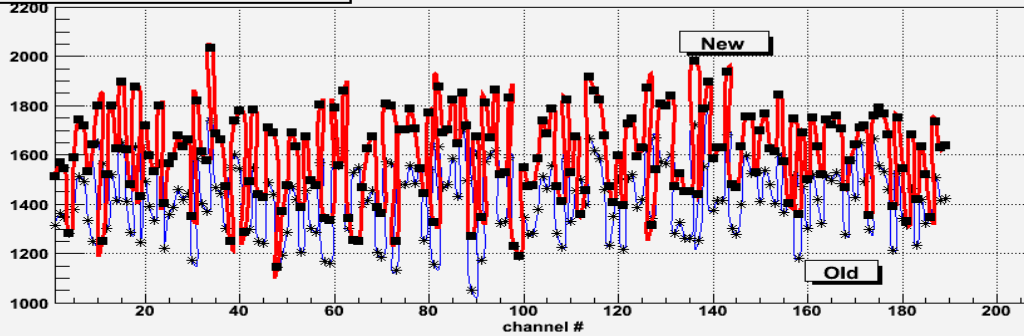
Bigbite shower: cosmics test after the May expt

ADC peak value for shower blocks

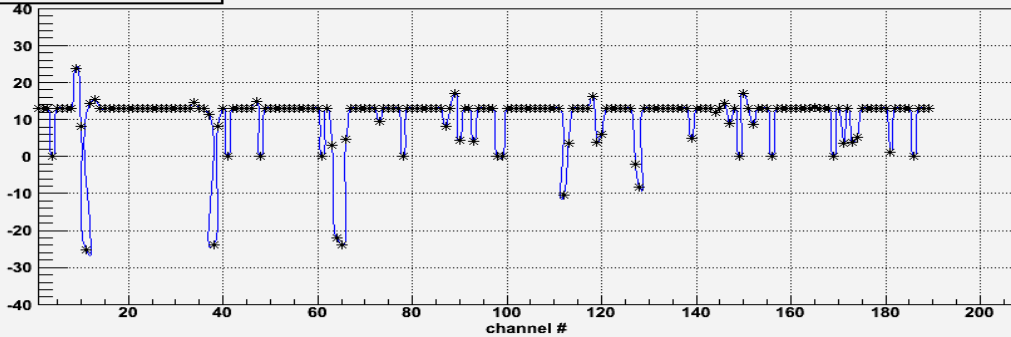


Bigbite shower high voltage

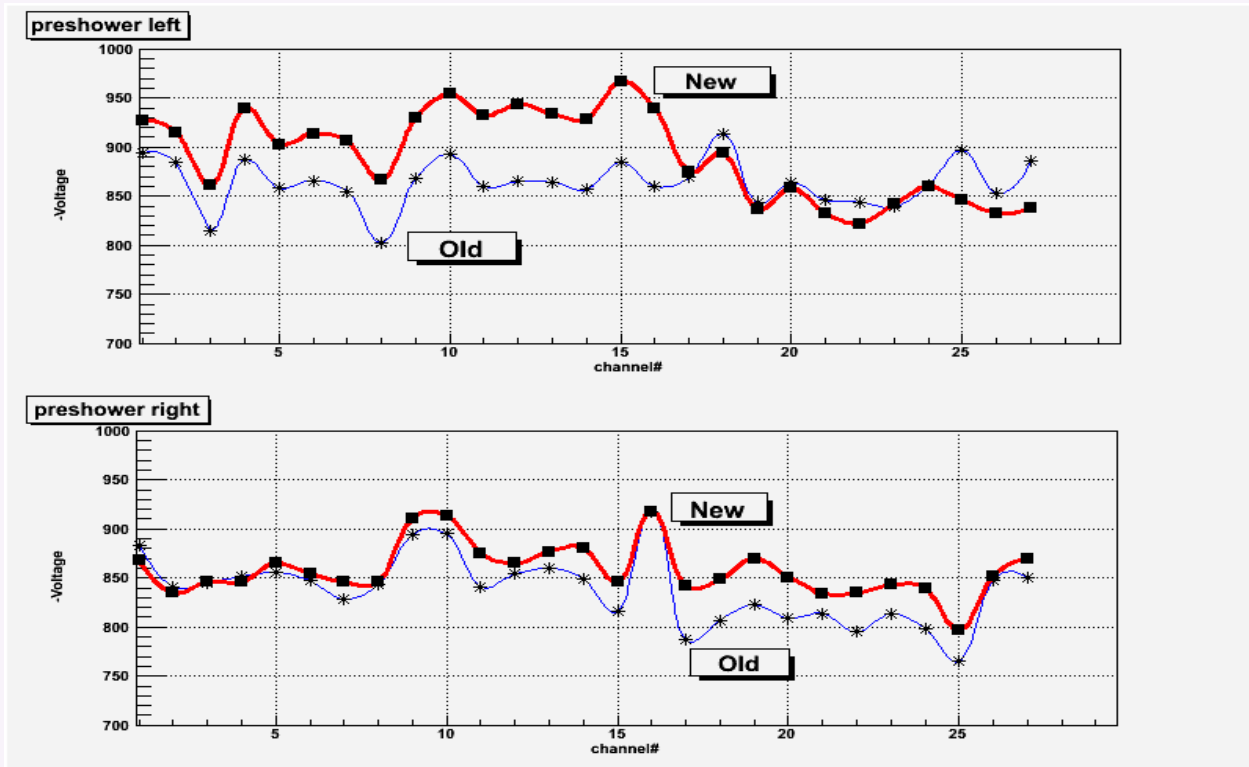
Shower HV: before and after the expt.



percentage change in HV



Bigbite preshower high voltage

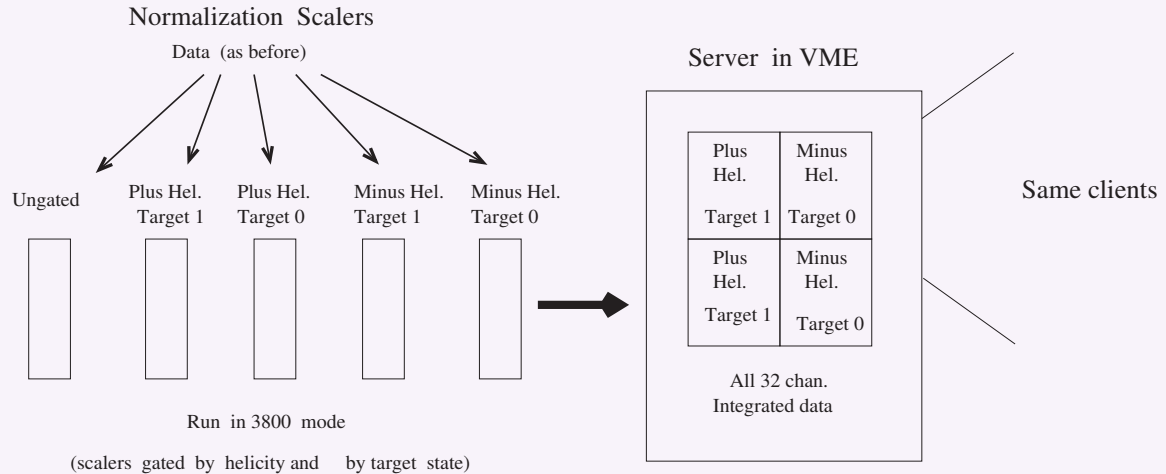


- Shower - only about 15% increase in HV when ADC peaks are aligned before and after May running.
- No damage to the preshower after one month of running.

Bigbite scalers

Using the Target State Info -- used to help form a gate

(Note: this requires a real-time target state signal)



This works because helicity (and target info) are in real-time (not delayed)

(Diagram by Bob Michaels)

Bigbite scalers

- Helicity and target spin gated scaler design (Bob Michaels)
- One ungated and four gated scalers (corresponding to four states) all running in SIS3800 mode.
- Scaler gate will be AND of three signals(target spin, beam helicity and run ON)

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- Signals that already exists at the Bigbite side
 - All the triggers and one BCM signal, clock and DAQ rate(L1A)
- Additional signals that we want to have
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- Additional signals that we want to have
 - Beam helicity, target spin information and atleast two more BCM signals
- Need to run more cables from L-HRS to Bigbite (about eight cables)
- Module for making gates (NIM PS757 ?)
- All these signals(triggers,helicity,target spin etc..)will be duplicated at L-HRS.

Things need to be done before beam comes

- Check coincidence trigger timing again (1.25GeV proton and 2.4GeV pion in the L-HRS).
- Simulate the coin. trigger with edtm pluser and make sure the timing is right during the commissioning.
- Setup and check scaler readout and make sure the gating system is working.
- Put BB scintillator signals into a 1875 high resolution TDC
- Get rid of the ground noise