

BigBite Analysis

BB Čerenkov Pion Rejection and Ped Shift

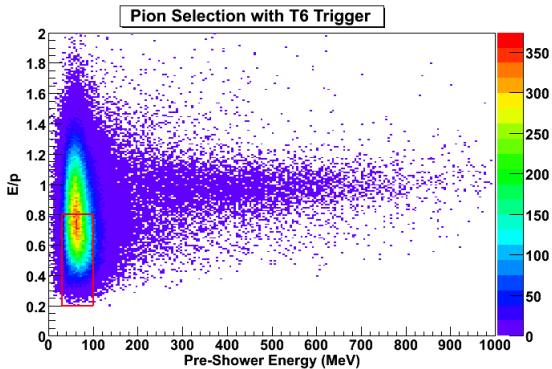
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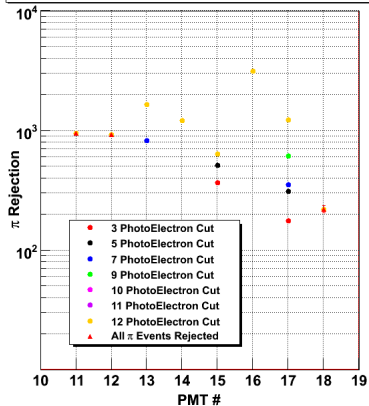
- 1 Pion Rejection Factors
 - RHRS-Side π Rejection
 - Beam-Side π Rejection
- 2 BigBite Čerenkov Pedestal Shifts
 - Pedestal Shifts Behaviour
 - Pedestal Shift Effects
- 3 Other DB Changes

Pion Selection

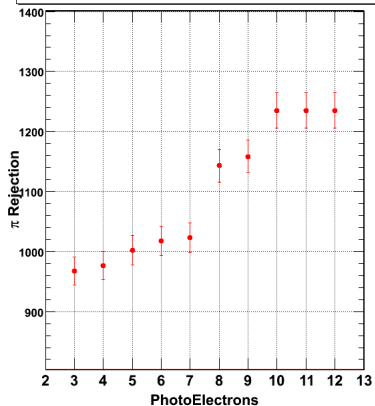


RHRS-Side Pion Rejection

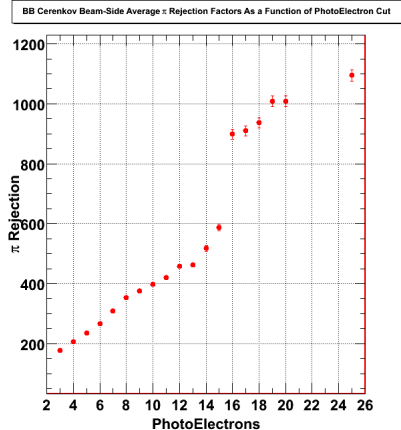
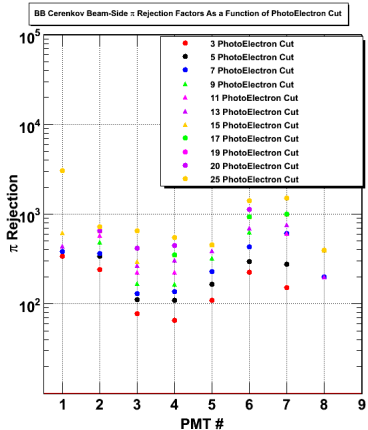
BB Cerenkov RHRS-Side π Rejection Factors As a Function of PhotoElectron Cut



BB Cerenkov RHRS-Side Average π Rejection Factors As a Function of PhotoElectron Cut



Beam-Side Pion Rejection



Pedestal Shift With Current

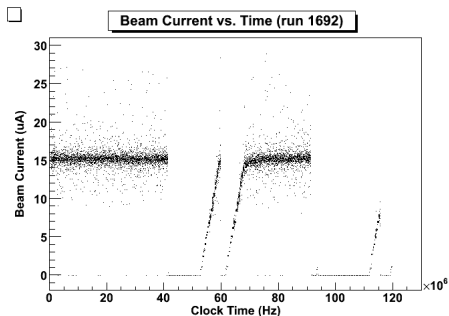


Figure: Shows the current as a function of time for ^3He for run 1692.

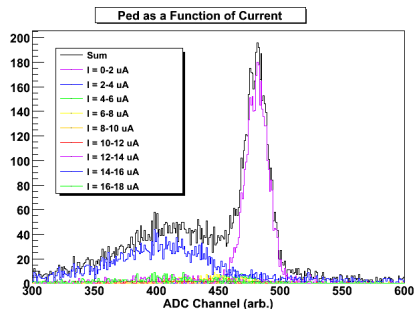


Figure: Shows the PMT 1 pedestal shift as a function of current for run 1692.

Pedestal Shift Effect

Calibrated ADC is defined through

$$A_{cal} = (A_{raw} - A_p) \times C_{pe}$$

- A_{cal} : Calibrated ADC
- A_{raw} : Raw ADC
- A_p : Pedestal of the ADC
- C_{pe} : Calibration constant to bring the 1 p.e to ADC channel 30

Assume the pedestal shifts by $\Delta A_p = 15$ channels and C_{pe} varies from 0.3 to 1.1 this would change A_{cal}

$$A_{cal} = (\Delta A_p) \times C_{pe}$$

Pedestal Shift Effect: Results

$\Delta A_p = 15$ channels

- $4.5 < A_{cal} < 16.5$ channels
- $0.15 < p.e. < 0.55$ photo-electrons

$\Delta A_p = 5$ channels

- $1.5 < A_{cal} < 5.5$ channels
- $0.05 < p.e. < 0.18$ photo-electrons

Pedestal Shift 4pass Fix

- Using Diana's beam trip skim ROOTfiles, currents were selected for the 4-pass ^3He production runs
- These runs used the 1881 ADCs and spanned 2 HV (HV4 and HV5) changes to the Čerenkov
- There were 4 different mean currents **13.85, 14.13, 14.94 and 15.14 μA**
- 13.85, 14.13 μA and 14.94, 15.14 μA differed by less than 5 ADC channels, so treated as one

Beam Trip Cut

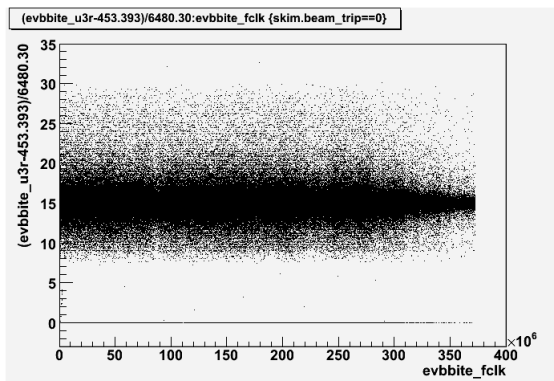


Figure: Shows representative sample of beam current vs time with the beam trip cut applied.

Average 4-pass Currents

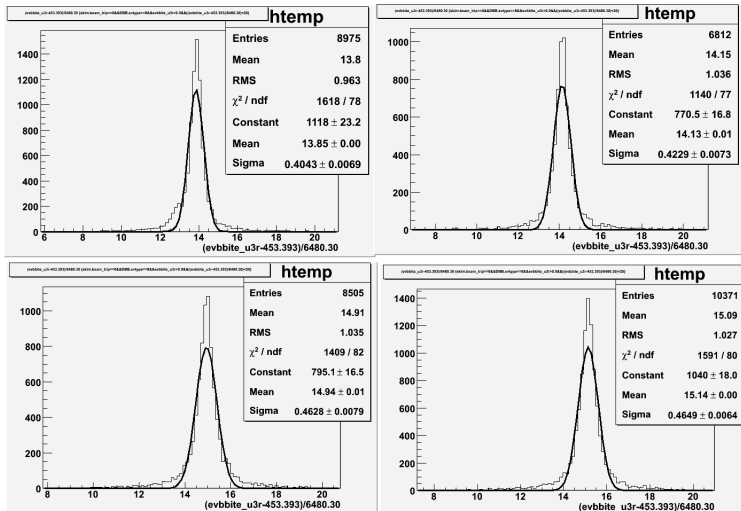


Figure: Shows the 4 current values with beam trip cut and T8 cut for the 4-pass production data. ▶

Pedestal Shift 4pass DB Fix

- using the 14 and 15 μA settings, I made added the correct ped values to the DB.
- Will need to fine tune some of the pedestal values with the 5-pass data as well. Current values should be within 15 channels (As this was already done using the end of run current values)

Other DB Changes

- I also updated a few runs that were using an incorrect photo-electron calibrations (calibrations were only slightly off)
- Removed the shower and pre-shower data files from time stamped directories and replaced the main DB directory with my shower calibration constants
- Changed the pre-shower dat file to match transversity (changed the location of the pre-shower detector). This will not affect anything, since the location is not used during replays.
- Changed the total shower dat file to match transversity. This was just a change to the max dx and dy between the pre-shower and shower clusters, from $dx,dy = 0.2,0.2$ to $dx,dy = 0.25,0.4$. And moved to the main DB directory

For Next week

- Examine BB shower cluster multiplicity, (multiple clusters that fire for one track events)
- Begin looking at what pre-shower and E/p cuts to use