LHRS Analysis for d_2^n

Scintillators and E/p

D. Flay

1/14/11

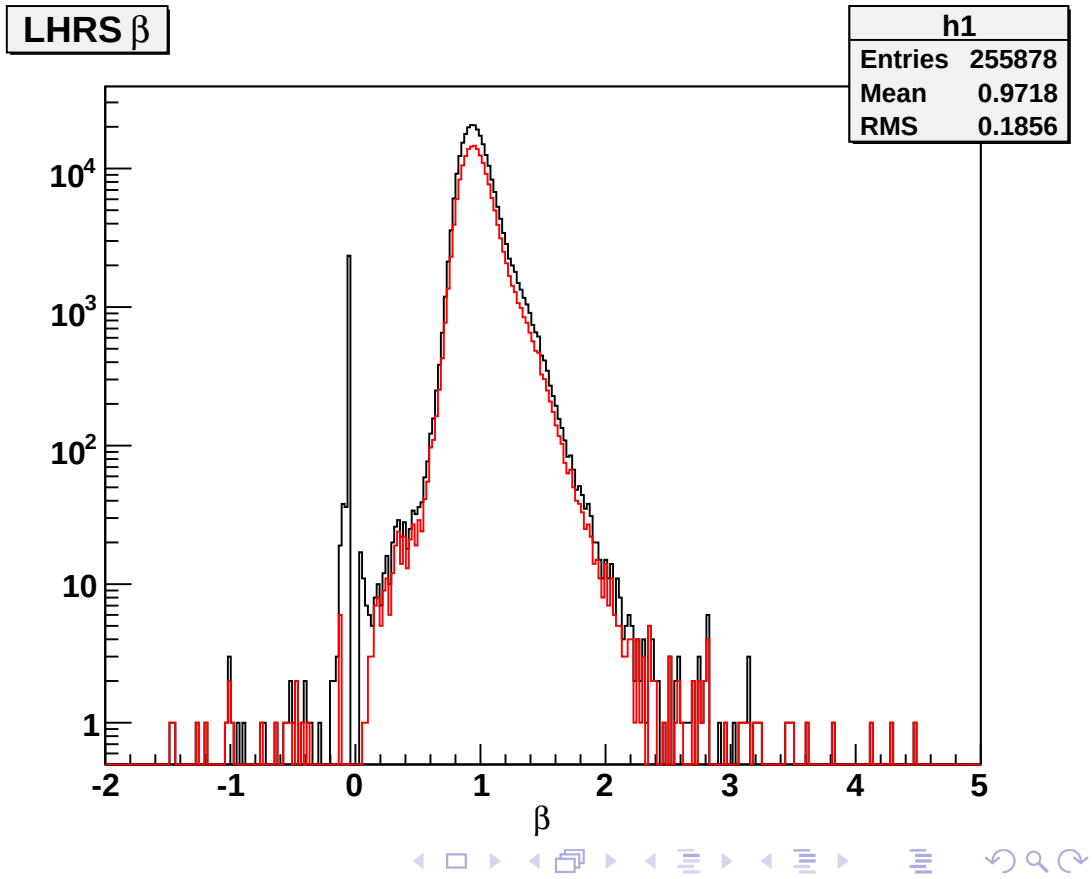
Outline

LHRS β (1)

Spike Near Zero Events: Elastic Data

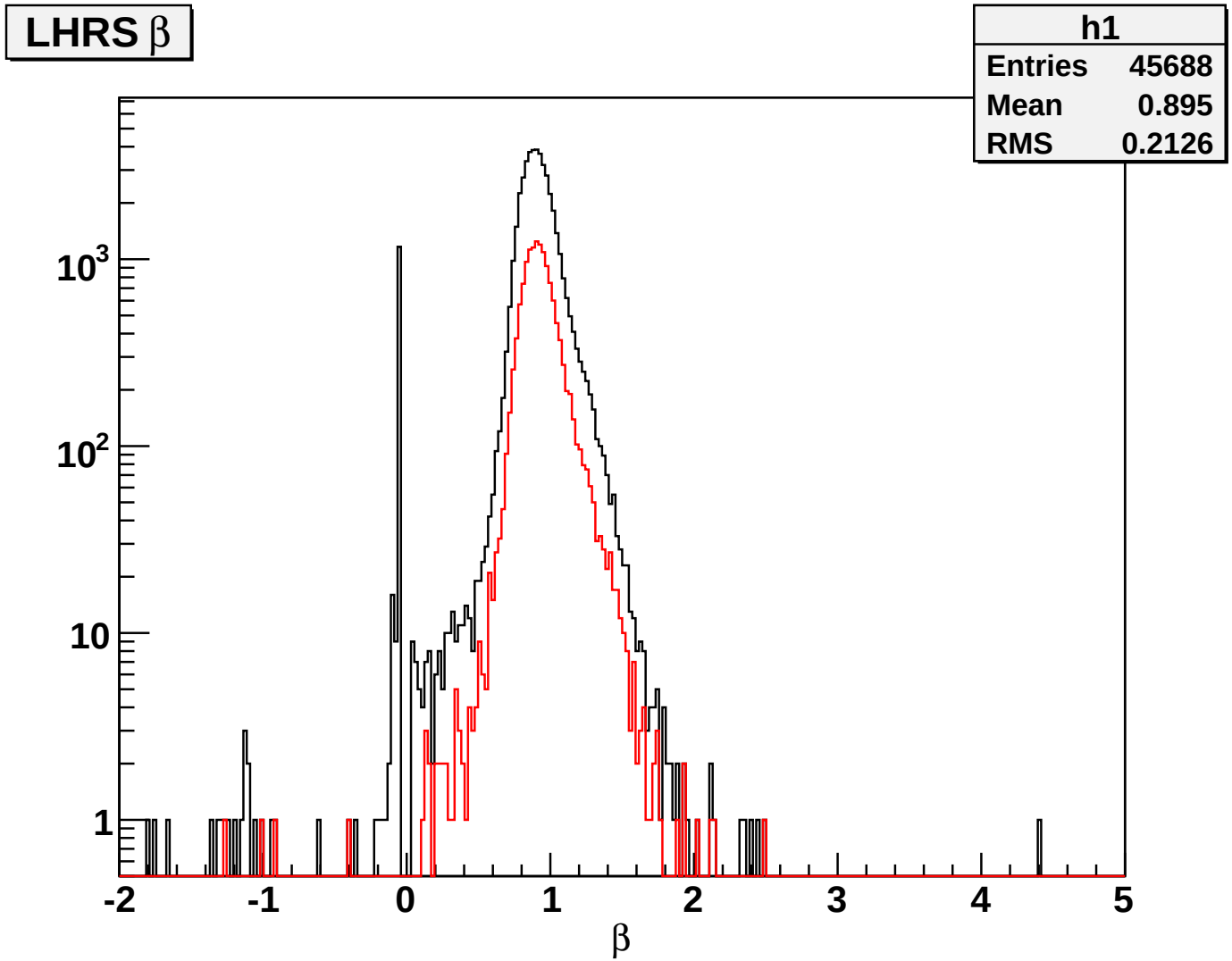
- Placing cuts on each TDC to remove bad events at large times (~ 150 ns) removes the spike at $\beta \sim 0$

- Baseline cuts:
  - One-track
  - T3
  - EDTM
  - VDC
  - Target
- Elastic data
  - Run 1229



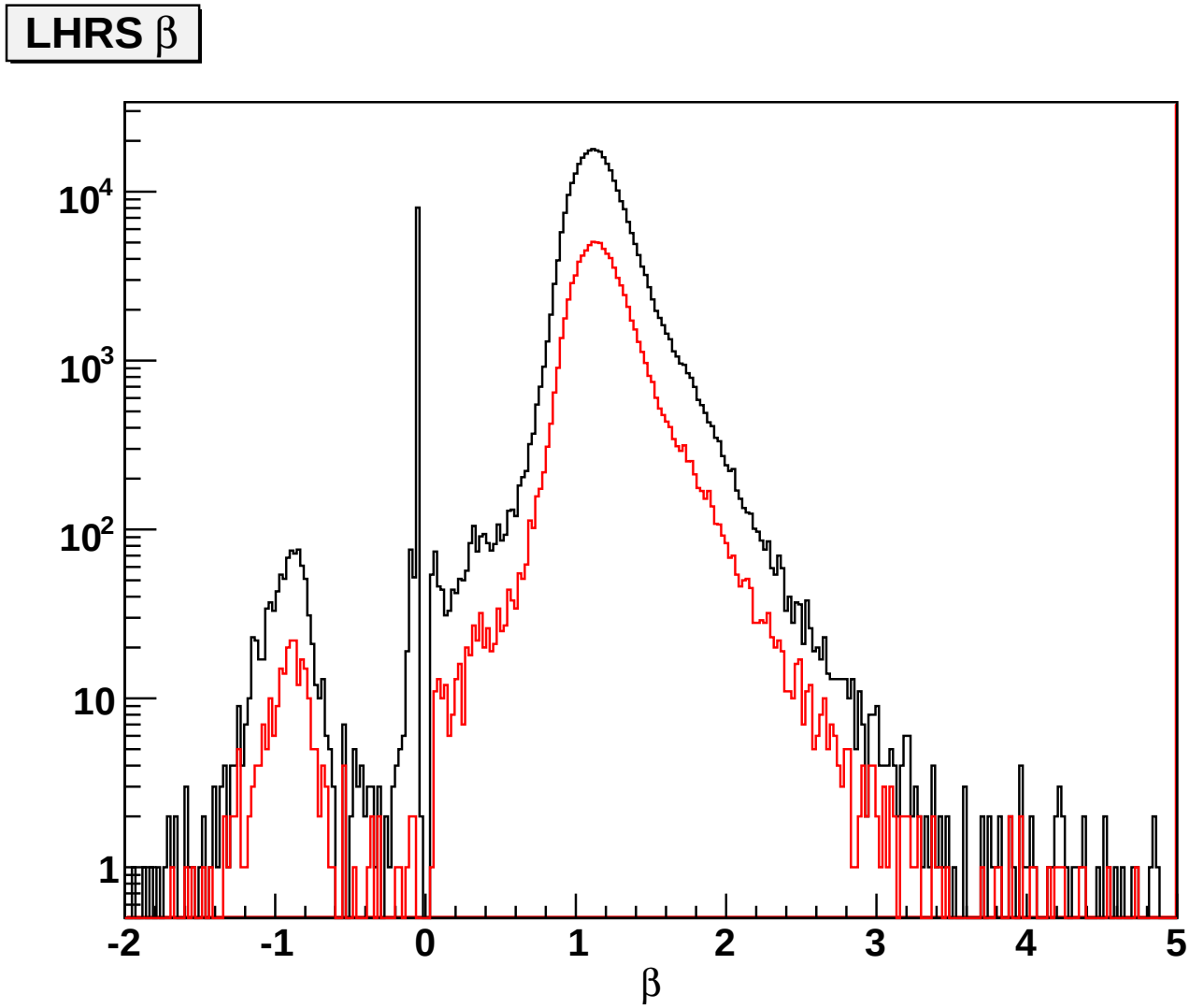
LHRS β (2)

Spike Near Zero Events: Inelastic Data ($p = 0.60$ GeV, 4-pass)



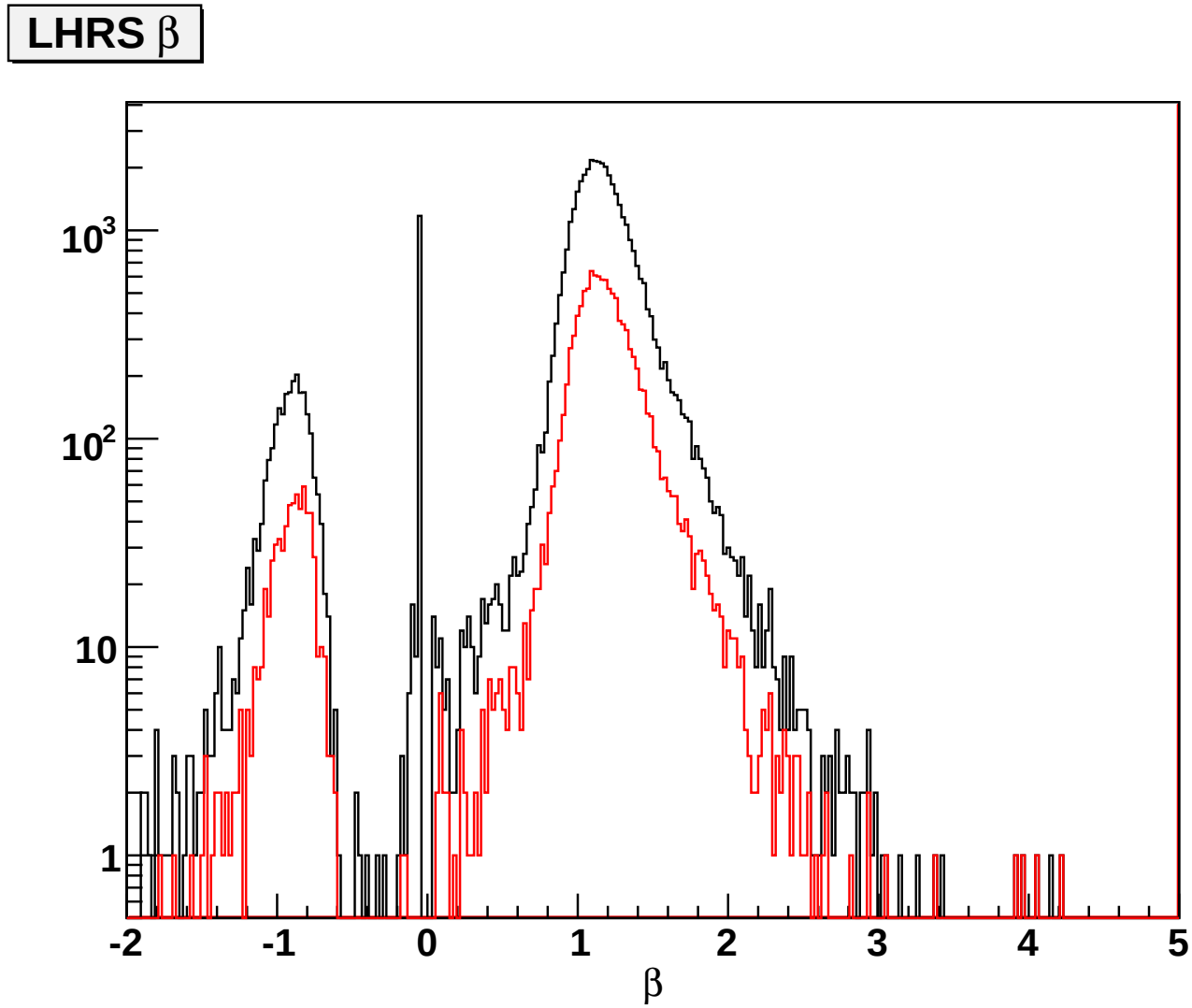
LHRS β (3)

Spike Near Zero Events: Inelastic Data ($p = 1.20$ GeV, 5-pass)



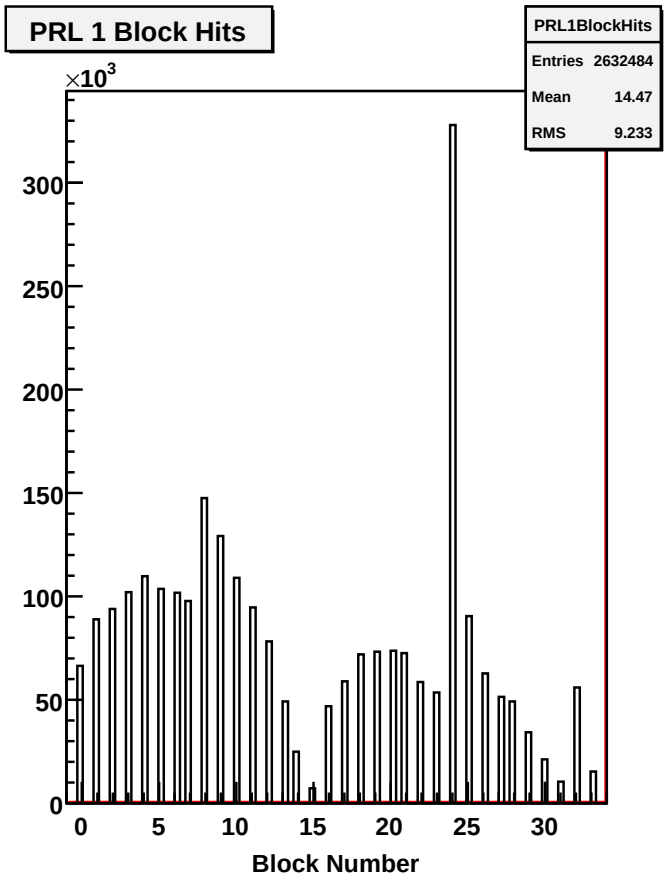
LHRS β (4)

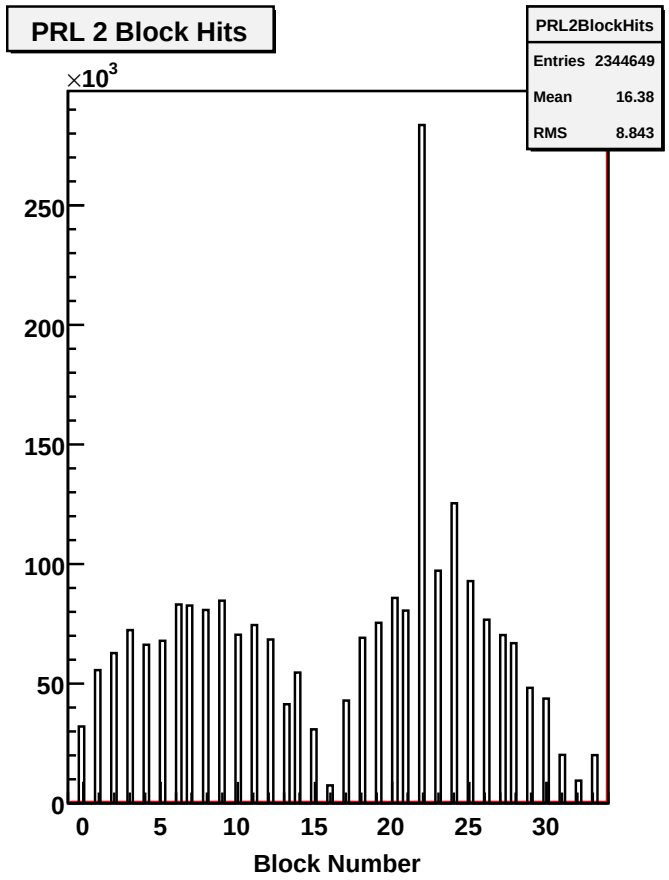
Spike Near Zero Events: Inelastic Data ($p = 1.70$ GeV, 5-pass)



PION REJECTOR (1)
$E = 0$ EVENTS: ELASTIC DATA

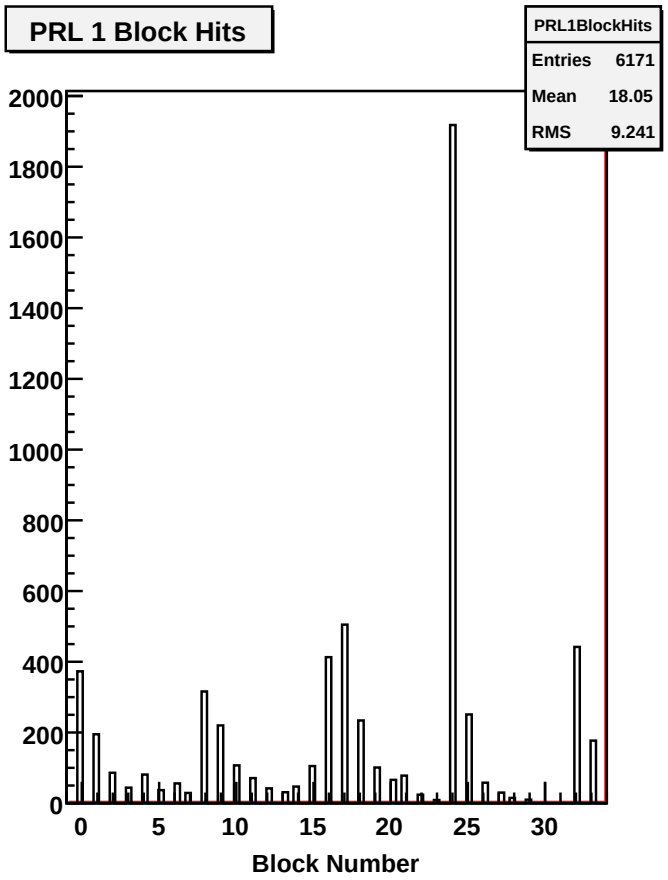
- Hit distribution as a function of block number
  - Good events – $E > 0$, good p

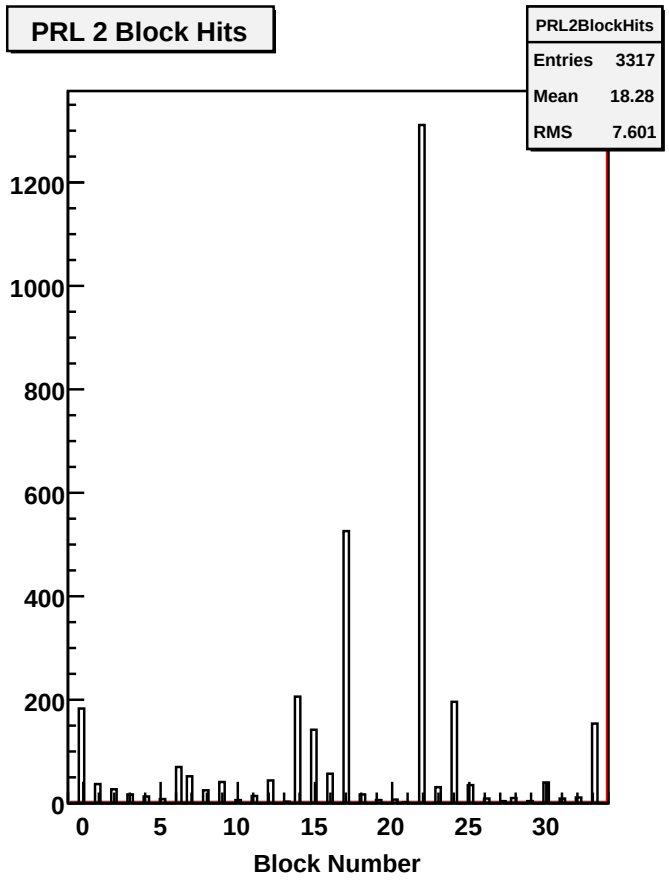




PION REJECTOR (2)
$E = 0$ EVENTS: ELASTIC DATA

- Hit distribution as a function of block number
  - Bad events – $E = 0$, good p

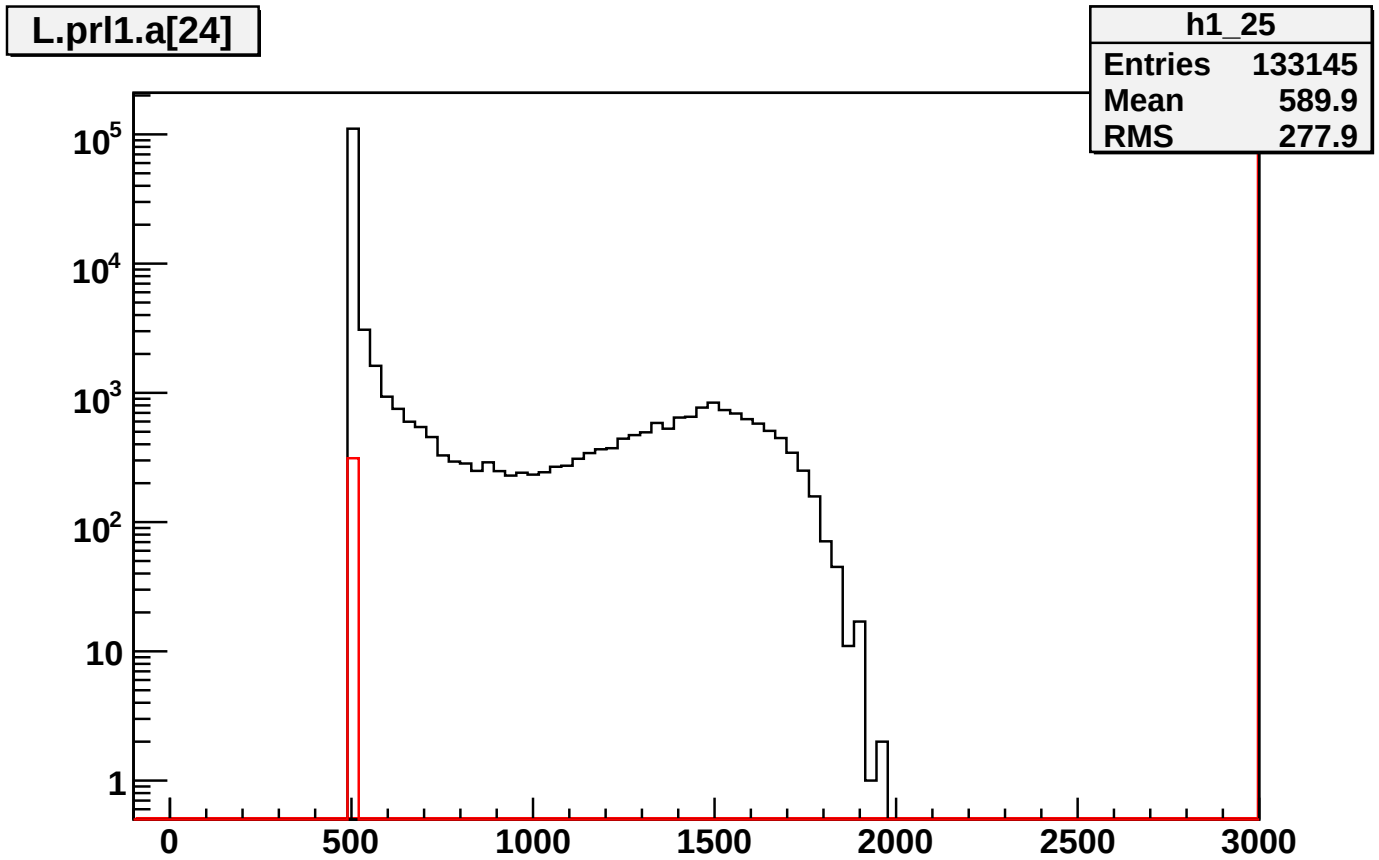




PION REJECTOR (3)

$E = 0$ EVENTS: ELASTIC DATA, PRL1 BLOCK #24

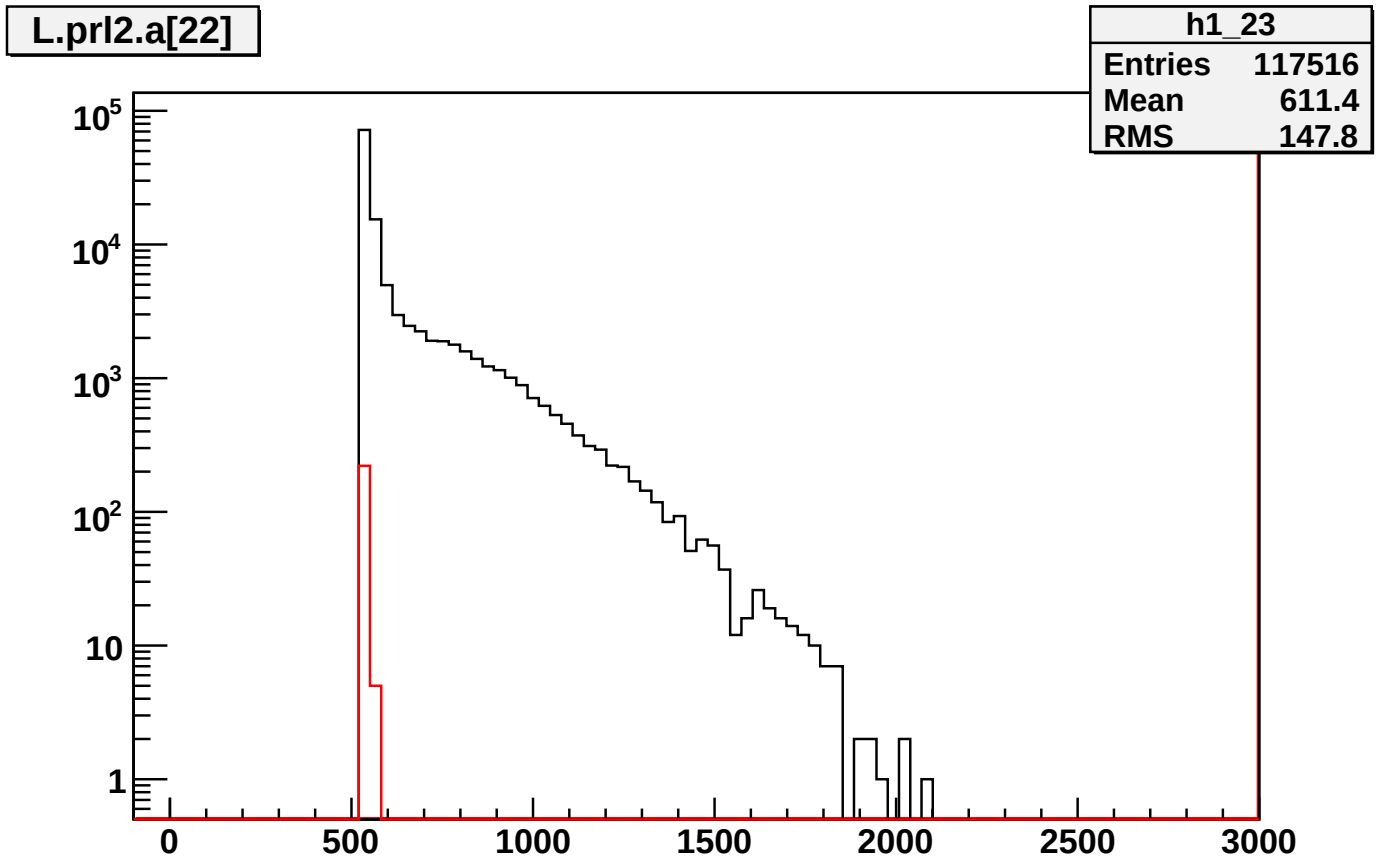
- A typical individual ADC spectrum
  - Bad events—$E = 0$ (with good event cuts)—are in red



PION REJECTOR (4)

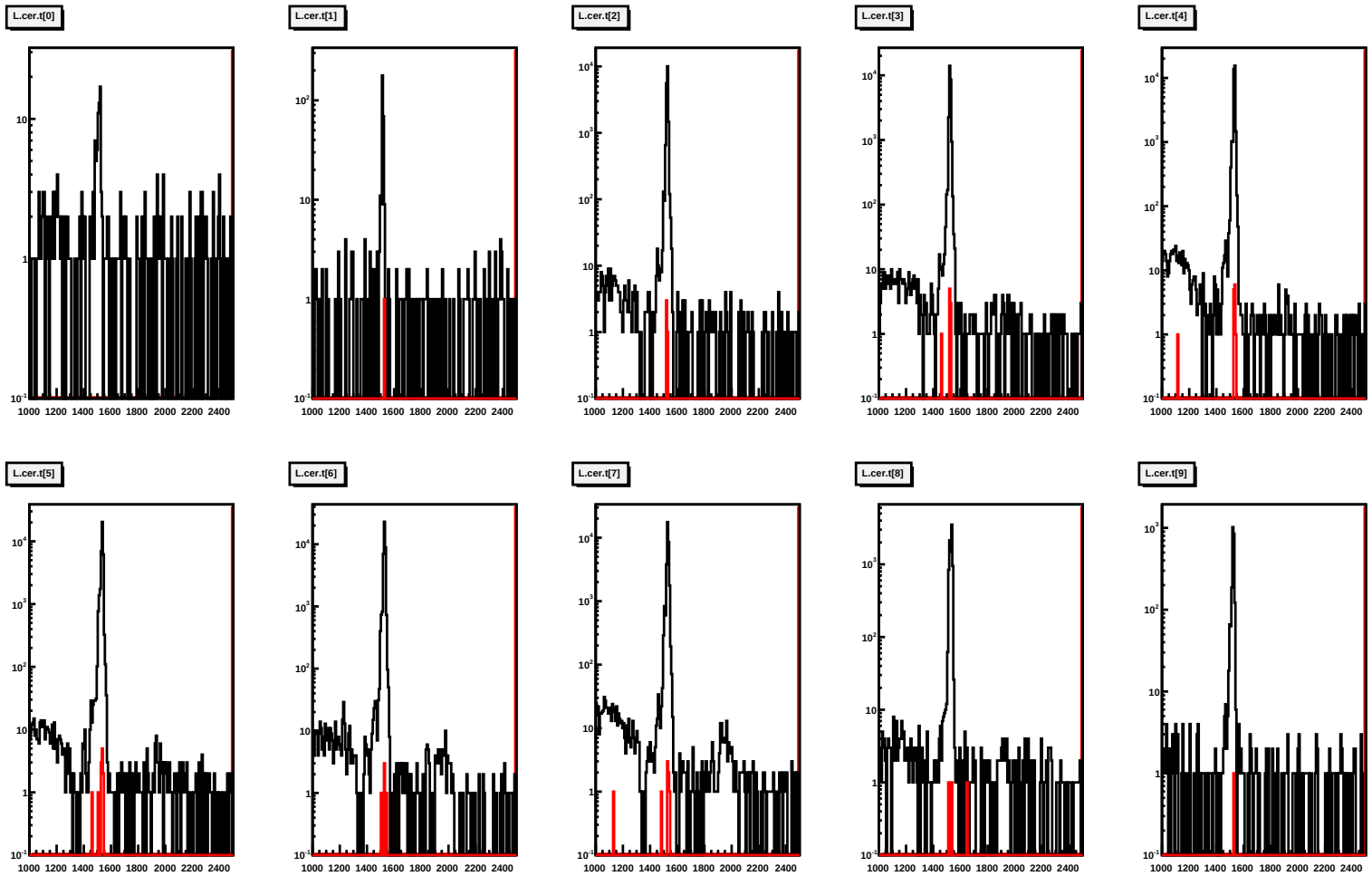
$E = 0$ EVENTS: ELASTIC DATA, PRL2 BLOCK #22

- A typical individual ADC spectrum
  - Bad events—$E = 0$ (with good event cuts)—are in red



PION REJECTOR (5)
$E = 0$ EVENTS: ELASTIC DATA

- Gas Čerenkov TDC distributions (red $\Rightarrow E = 0$ events)



Summary

- LHRS β:
  - Removing bad events at large TDC times (~ 150 ns) removes the spike at $\beta \sim 0$
- Pion Rejector:
  - $E = 0$ events are confined to the pedestal region of the pion rejector ADCs, yet they have good timing as seen in the gas Čerenkov TDCs...
- Data Quality:
  - Perl script to grab data from HALOG is complete for the LHRS, will start on BigBite side soon
  - Database for Start-of-run and End-of-run HALOG entries has been generated for the LHRS (for the whole experiment)
  - Working on script to plot all data vs. run number

WHAT'S NEXT?

- Pion Rejector E/p
  - Track down issue with $E = 0$ events
- Data Quality:
  - Continue work on scripts for HALOG data
  - Look into the THaPrimaryKinematic class
    - W for elastic runs (positive polarity, at least) is incorrect