Experience with the hec_adc Package

Dugan O'Neil

University of Victoria
Victoria, B.C.

May 7, 1997

Outline

- Ensure that the code runs as it should:
  - use of existing system packages
  - reproduction of results from previous offline codes
  - consistency of results from ZEBRA and EPIO
- Verify that the code structure is user-friendly and that needed information can be accessed easily.
  - July 96 electrons
  - September 96 electrons
  - February 97 technical run

Pedestal Package

The pedestal package is datacard driven and allows to

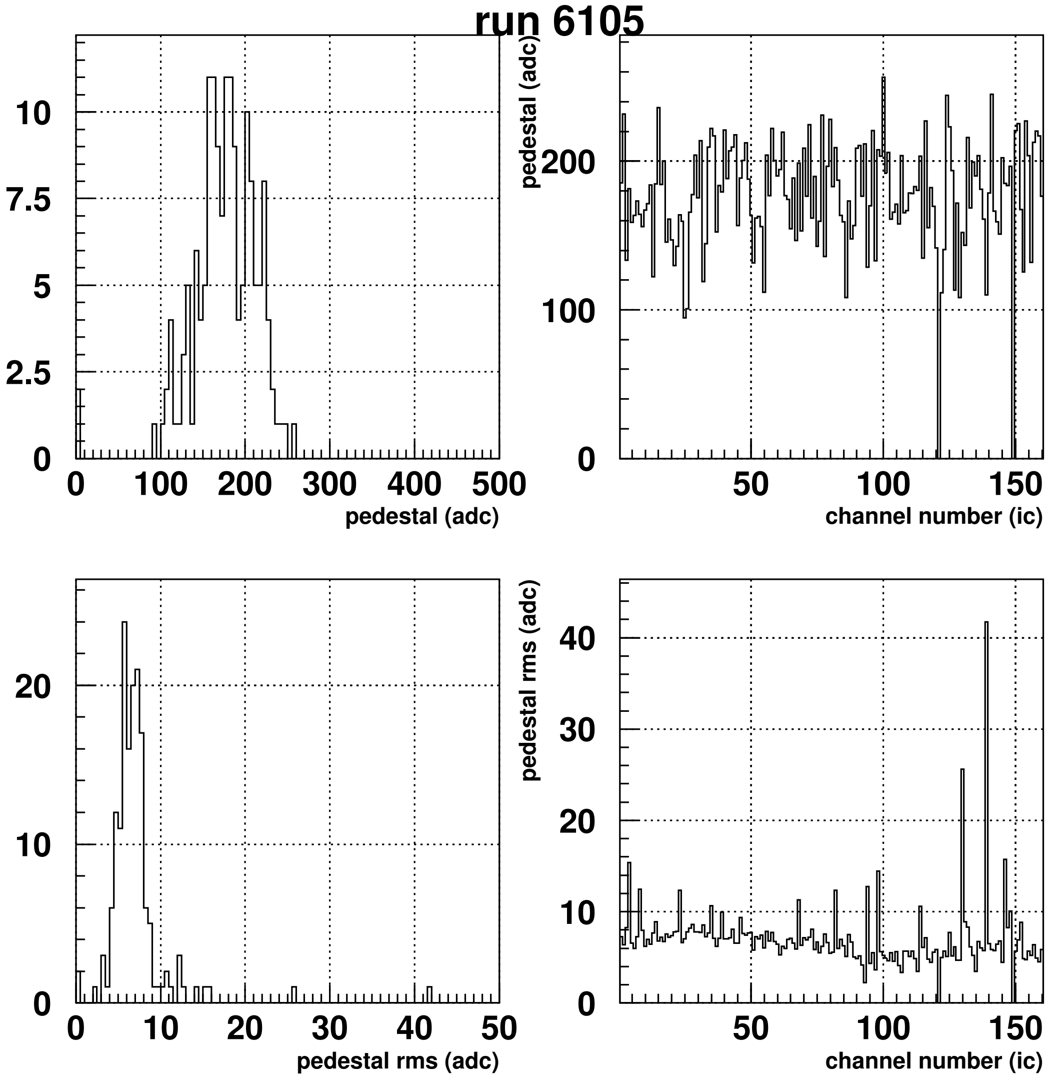
read, **produce**, and **output** pedestals.

It uses two passes. A datacard driven sigma cut is applied at the second pass.
A sample second pass output looks like the following:

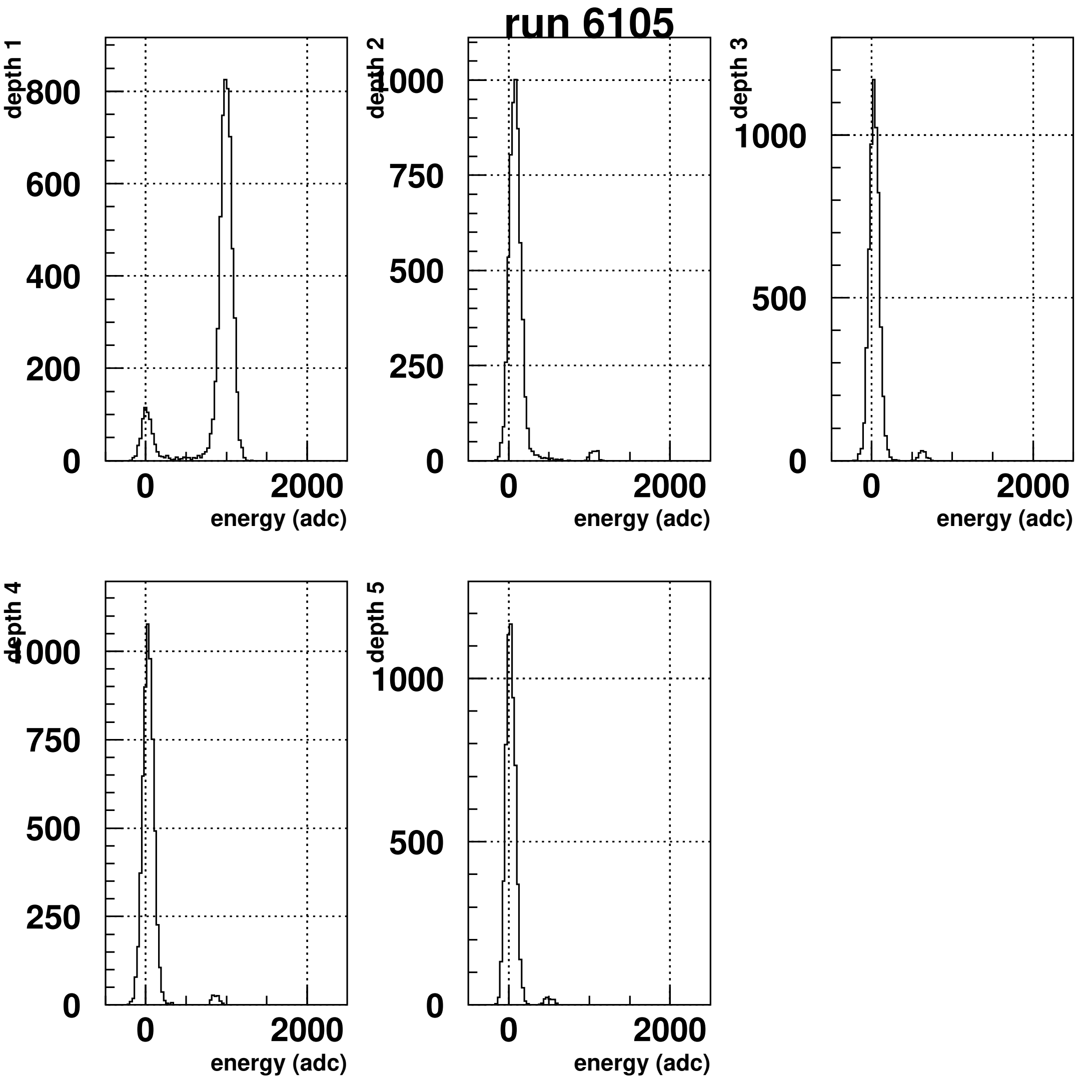
```
 Pedestal computation summary
   Number of events used at pass 1  322
   Number of events used at pass 2  322
   ic      ped      rms  %cut at pass 2
    1    184.9      7.4             .00
    2    233.2      6.2             .31
    3    131.9      9.2             .62
    4    180.9     14.9             .00
                    .
                    .
                    .
  156    129.5      5.4             .62
  157    214.0      5.7             .31
  158    221.7      4.9             .31
  159    219.4      5.0             .31
  160    177.4      5.5             .62
```

System Histogram Package

The system histogram package is datacard driven and provides default system histograms for quick data quality check.
Sample histograms:



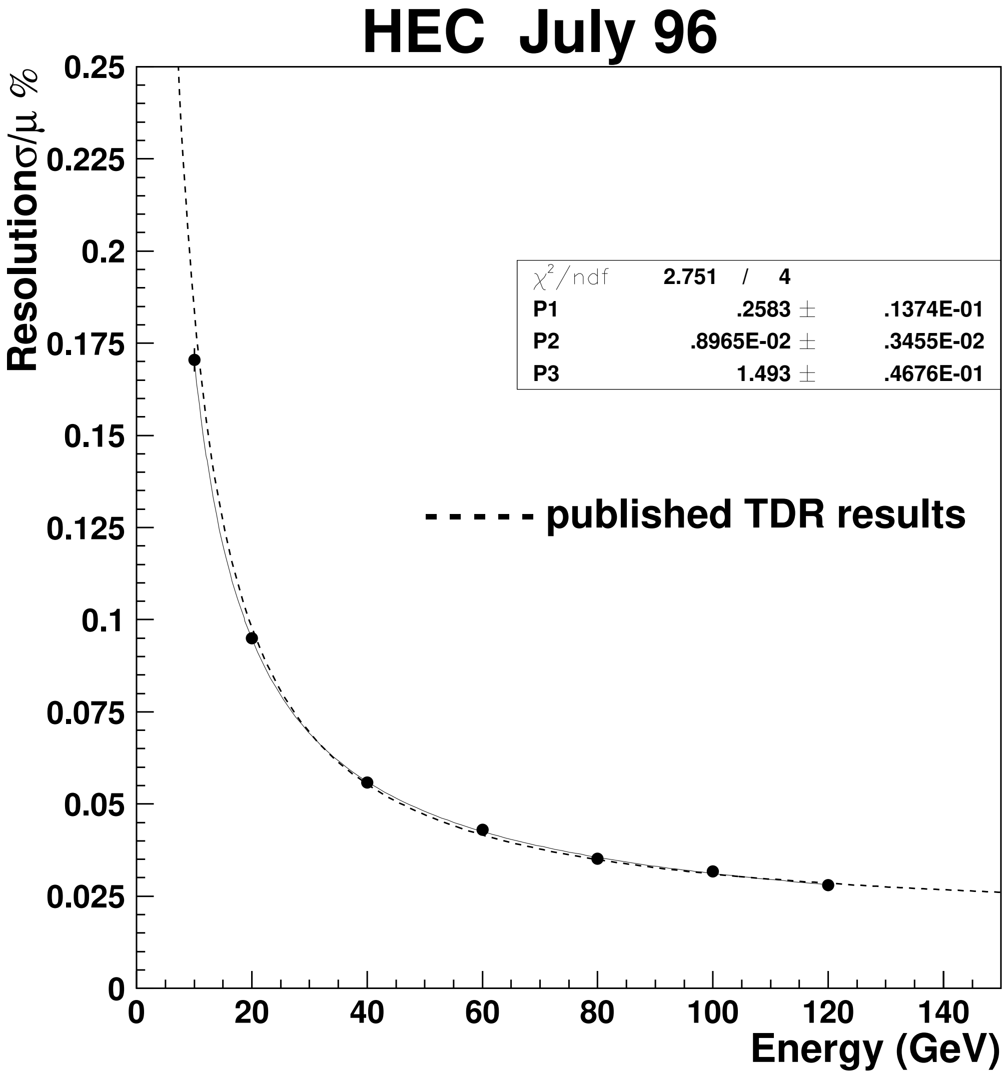
System Histogram Package (continued)



Consistency Checks

- ensured that hec_adc package gives same results as the old code for a few 1996 runs. eg. pedestals, number of events per run.
- ensured that hec_adc package gives same results as from EPIO as from ZEBRA inputs 1996 runs from each run period. eg. pedestals, histo package dumps of adc values.

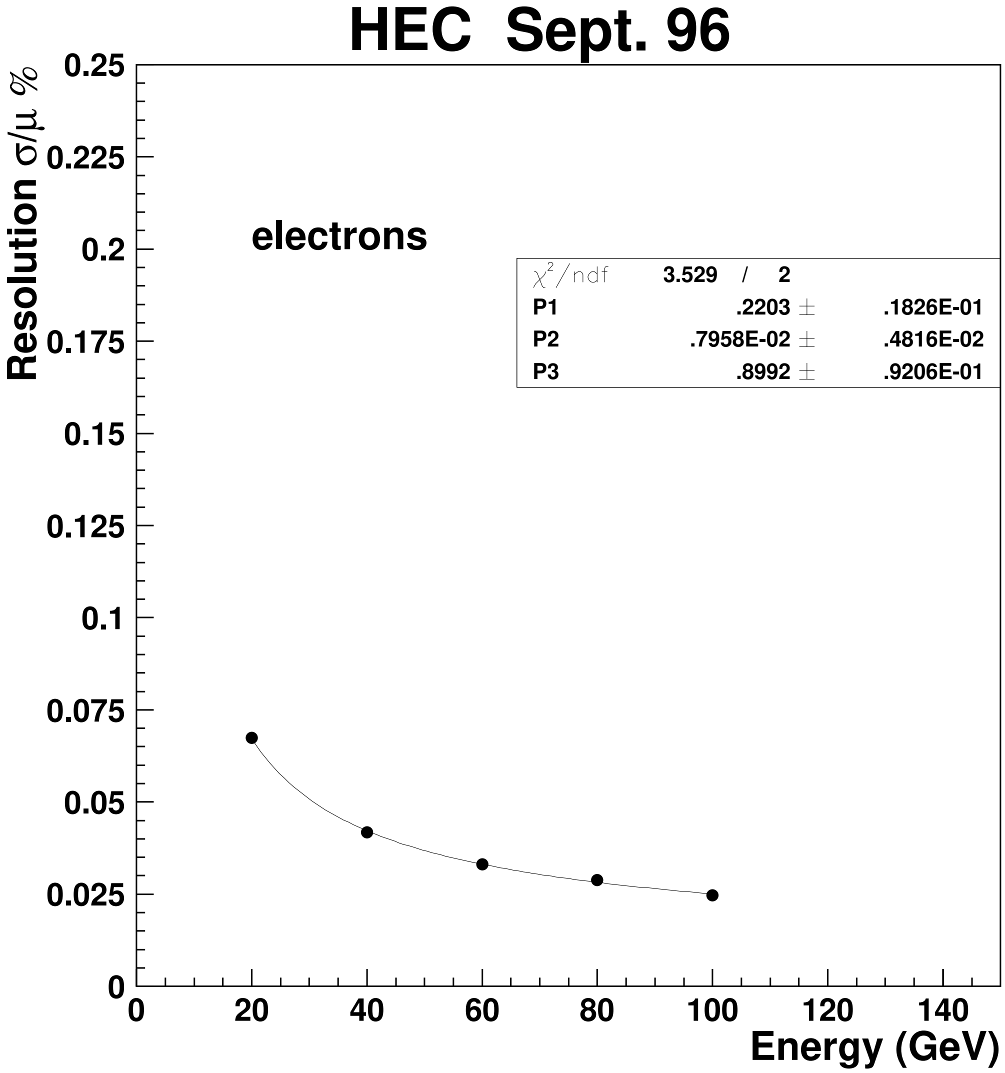
July 96 Electron Analysis



$$\frac{\sigma}{\mu} = \frac{26\%}{\sqrt{E}} \oplus \frac{1.5}{E}$$

Cluster noise found from pedestals: 1.4 GeV

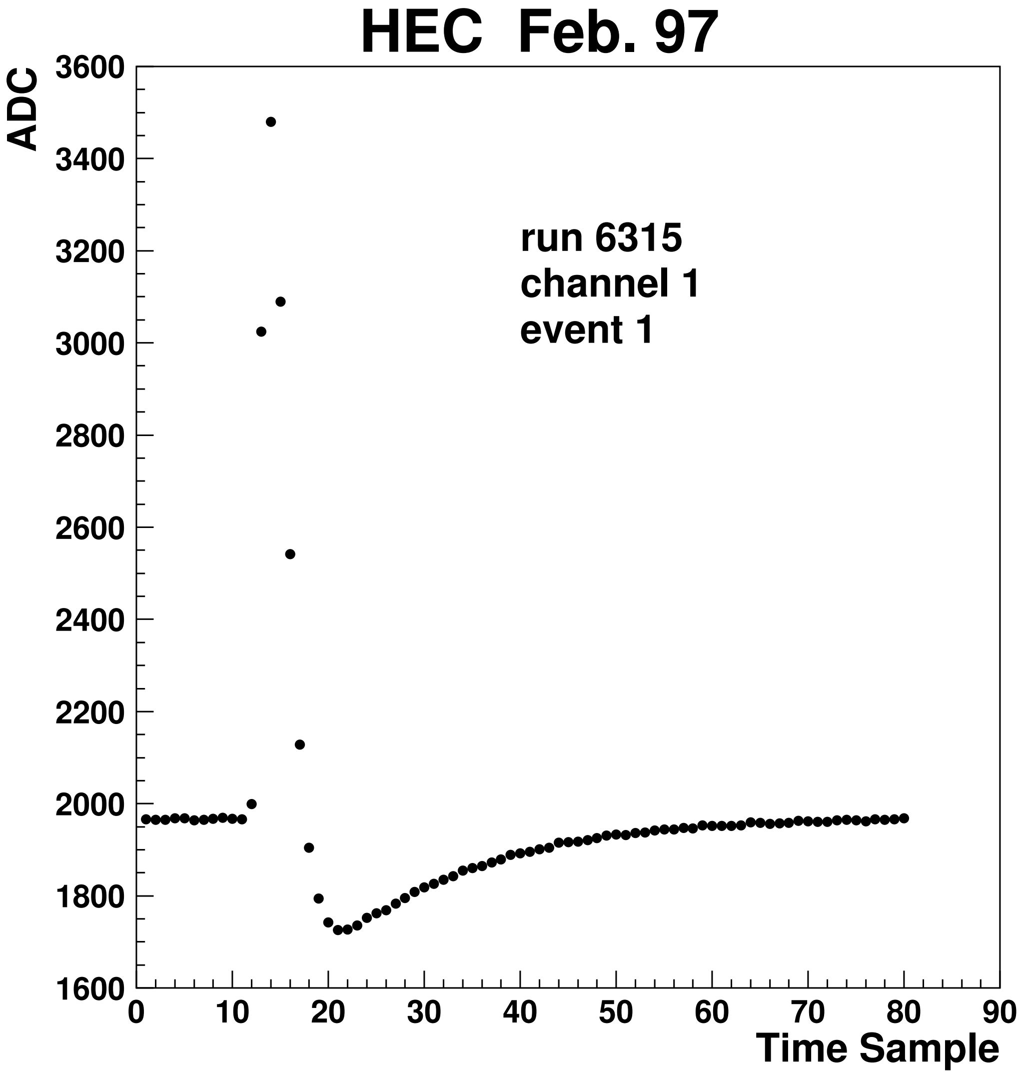
Sept. 96 Electron Analysis



$$\frac{\sigma}{\mu} = \frac{22\%}{\sqrt{E}} \oplus \frac{0.90}{E}$$

Cluster noise found from pedestals: 0.89 GeV

Feb. 97 Technical Run



So far, have access to the data banks on tape. Need system packages!

Conclusions

- hec_adc framework runs on all 1996 run periods for EPIO and ZEBRA
- hec_adc package reproduces results of previous code
- EPIO and ZEBRA input give **identical** results
- energy resolution analysis was easily done using the hec_adc framework, using provided common blocks. Results agree with TDR.