Tracker Commissioning

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Last CM *"Alpha"*

- Upstream in good shape
- Downstream had data corruption in 2 banks (256/4096 channels)
- Repeating pattern in tracker space (4 on / 4 off)
  - Caused by data corruption
- Timing not perfect
- Need to validate detector performance

Cryostat's/Interlocks/Controls

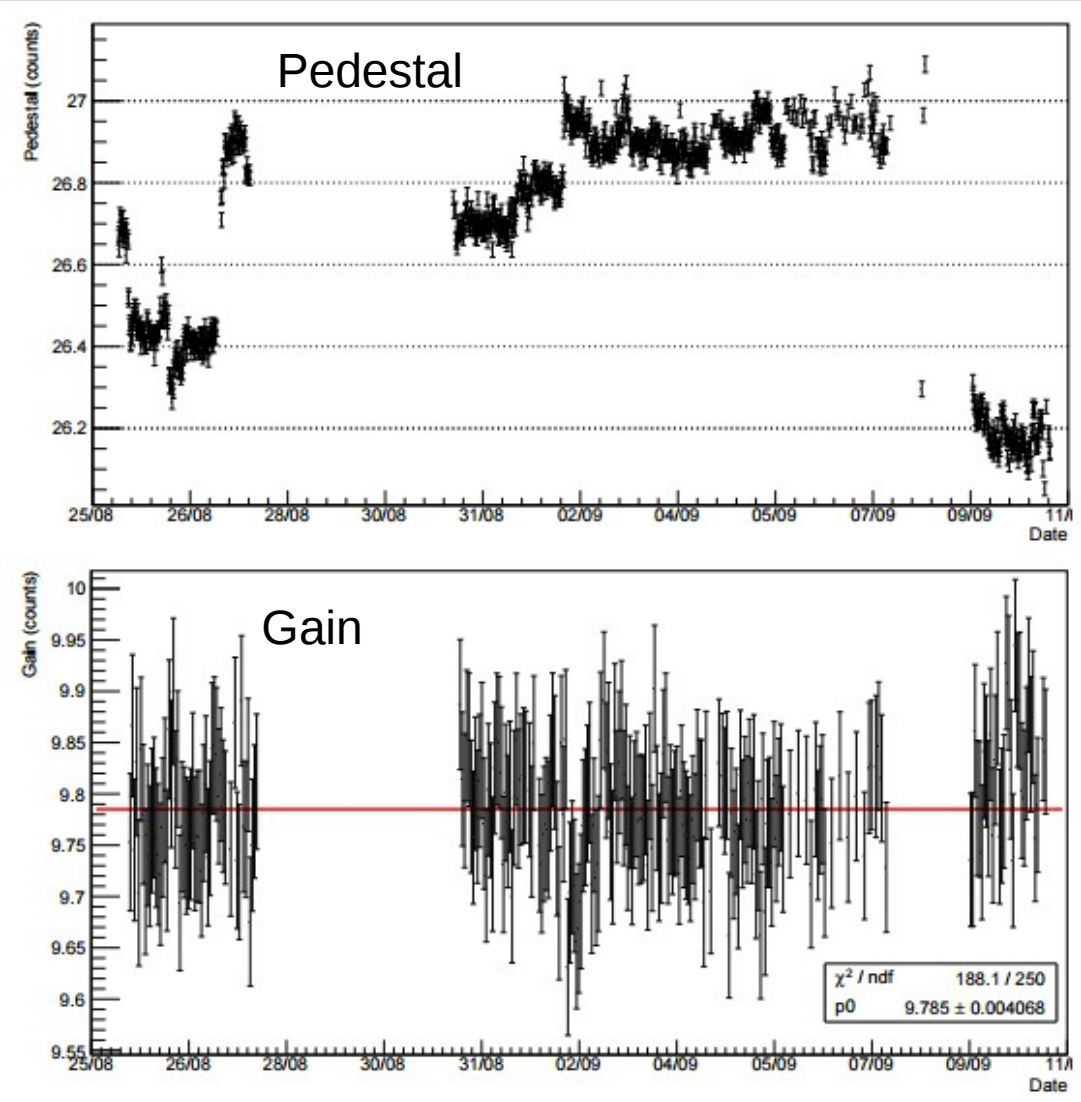
- Cryostat begun operation in hall October 2014.
  - System has been stable
  - Lost one compressor
    - Spare is being found
- New interlock system has been installed
  - Working great!
- Extensions to the control system are being added to also record front end board temperatures.

Hardware: Readout

- Two banks which were reading out corrupt data:
  - Replaced LVDS cables
  - Errors resolved – Now reading out entire detector
- Protocol between AFE and VLSB contains a CRC, results are accessible from VLSB register.
- Added functionality to DAQ to check for data errors in stream coming from detector.
  - Un-sets an internal “good data” flag
  - Writes a warning to the daq logfile
  - In future any effected spills will be deleted.

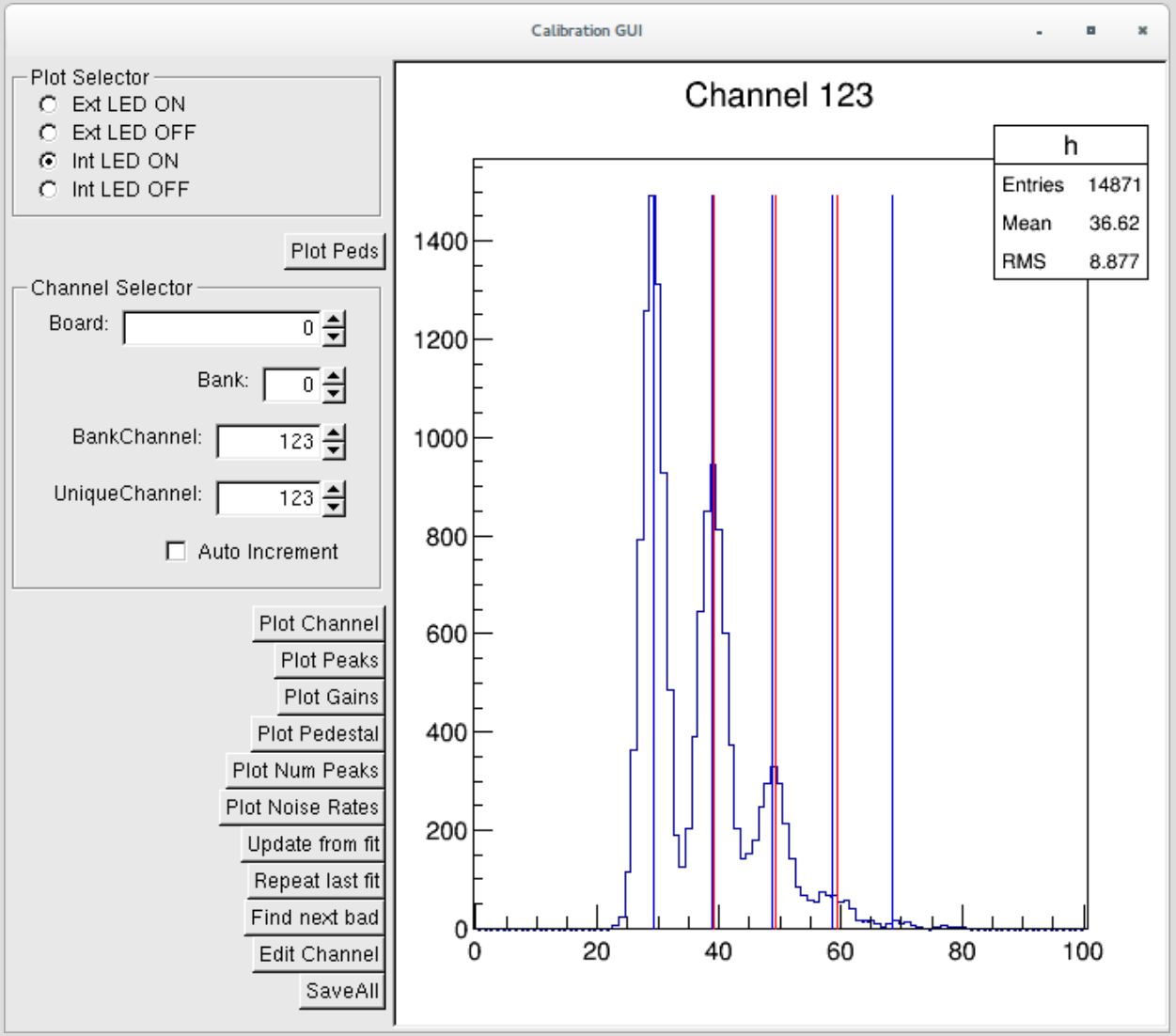
Soak Test

- "Soak tested" for two weeks of "continuous" readout.
  - Gaps are causes by manually pausing the readout and software errors.
- Checked data for corruption and errors from the electronics
  - Found none
- Monitored pedestals & gain of each channel →
- Gain is very stable
- Pedestal drifts considerably.



Calibration tools

- Calibration of the ADCs is performed by fitting the photo electron peaks.
- A first pass, where the data is automatically fitted is performed.
- Next the calibration is verified/fixed using a custom GUI tool.
- Provides output for data reconstruction and online monitoring checks.



Timing/DAQ

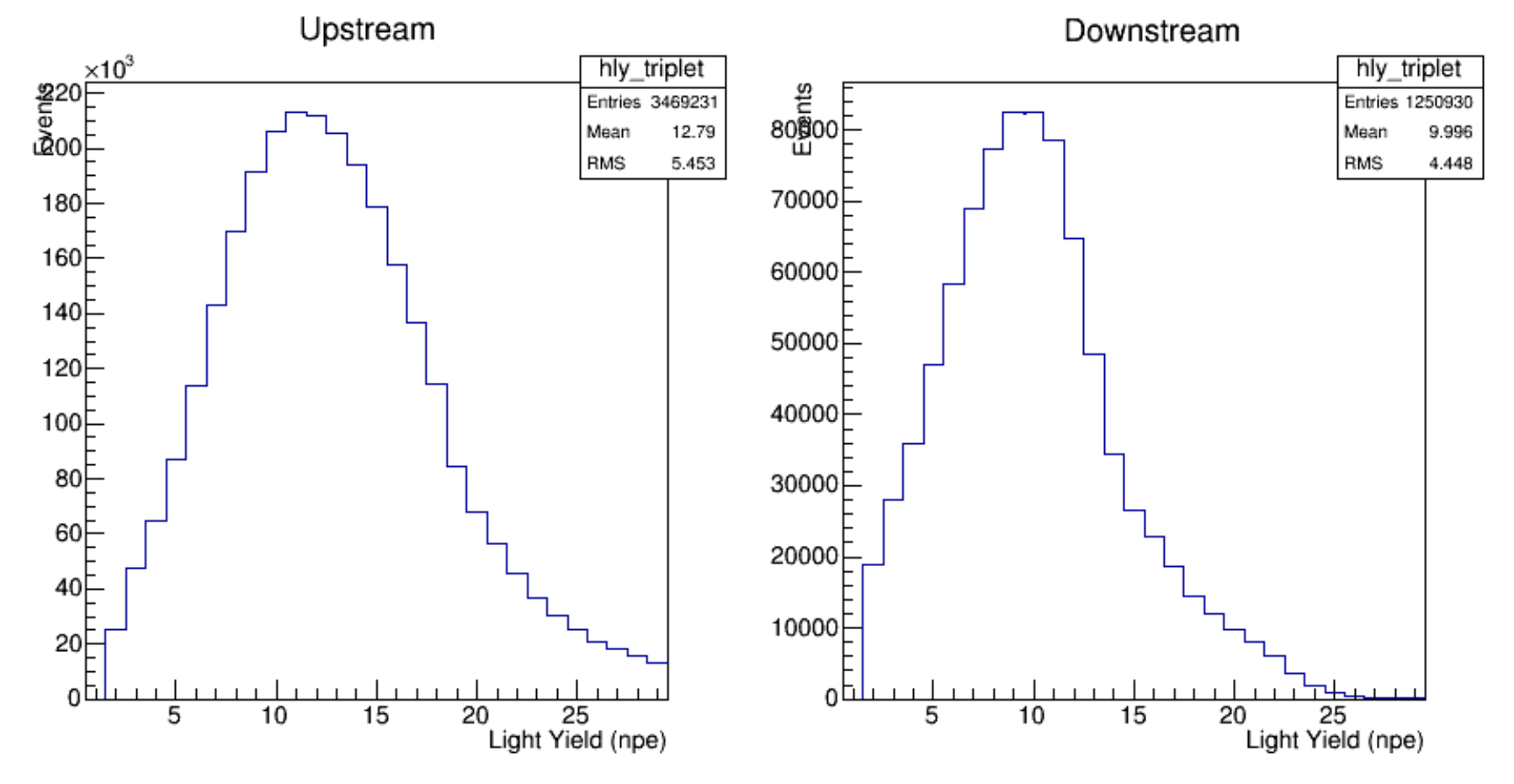
- New DAQ code has been developed
  - More concise than old code
  - Checks hardware error registers.
  - Has more verbose logging
  - Has been tested with beam
  - More additions to be added…

- Timing:
  - Collected data to help finesse tracker timing.
  - Need analysis to carefully measure detector efficiency.

Operation

- User run complete
- Tracker operation is becoming routine:
  - Check sheet for start of run to ensure detectors are on and configured
  - Calibration data is recorded each run
- Had some issues:
  - Tracker configuration files lost.
    - Remade, but also need to revalidate.
    - New files will be promptly committed to epics repository.
- Need to integrate better with control room:
  - EPICS Monitoring
  - Calibration data taking button

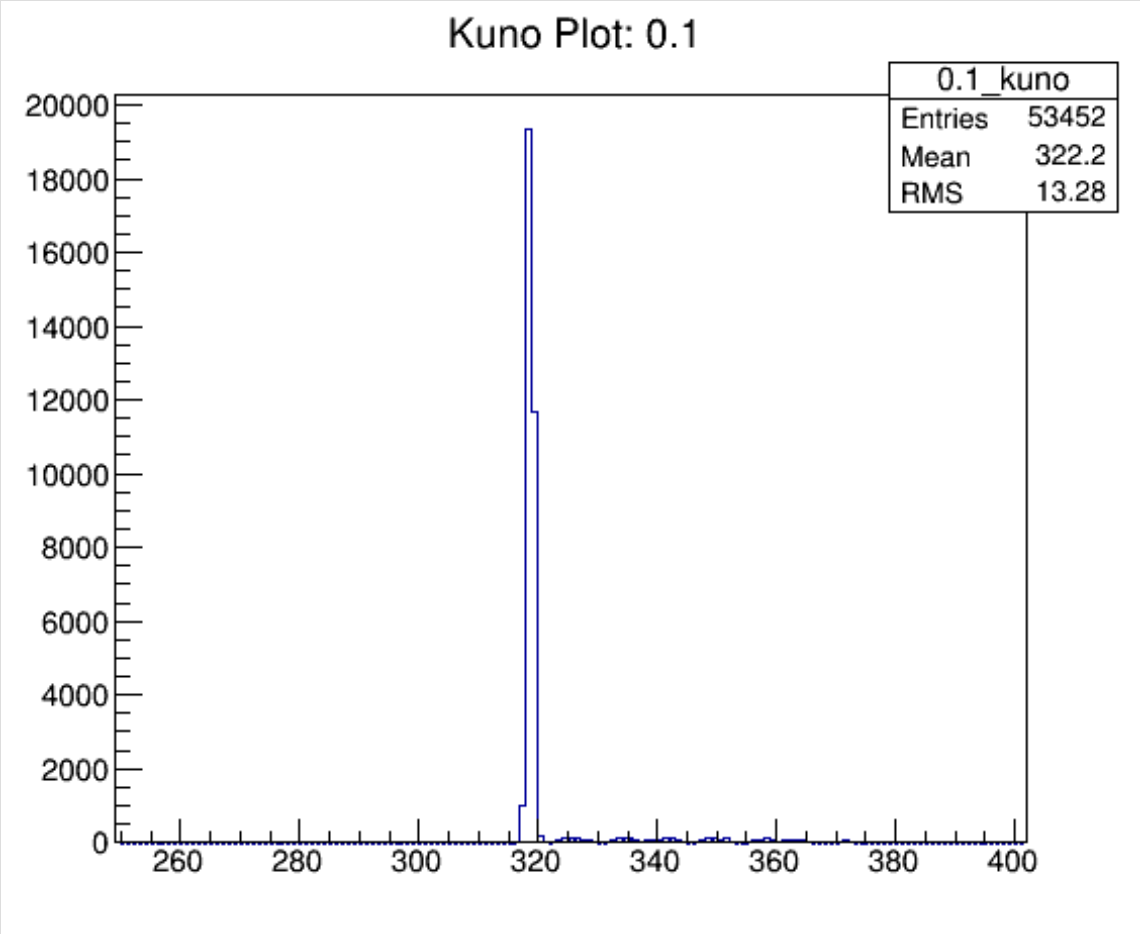
Light Yield



- Beam light yield from triplet spacepoints

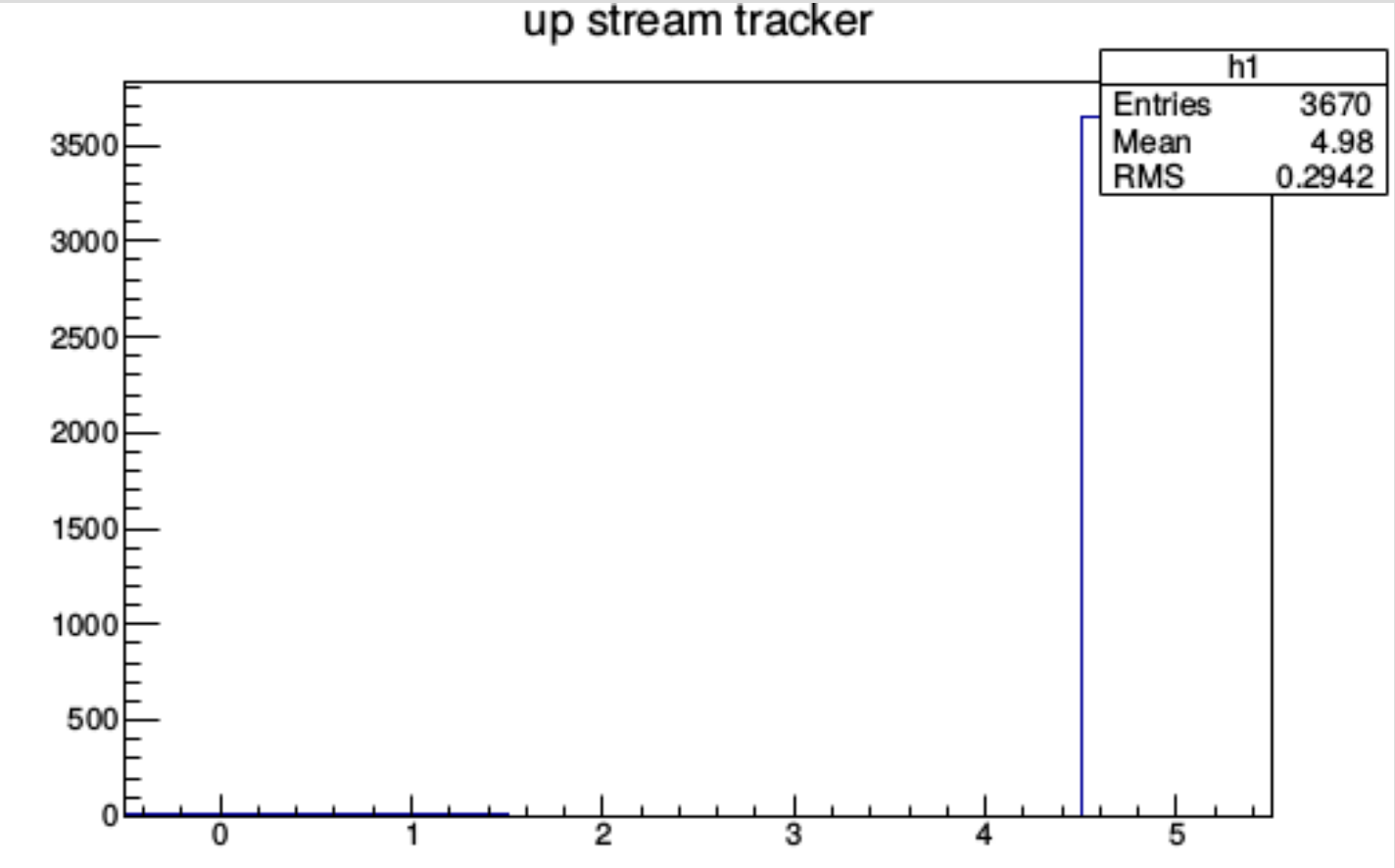
Mapping - Kuno Plot

- Detector channels should sum to 319 for a three fold coincidence
- The large spike at 319 helps verify the mapping.



C.Hunt

Hit Multiplicity

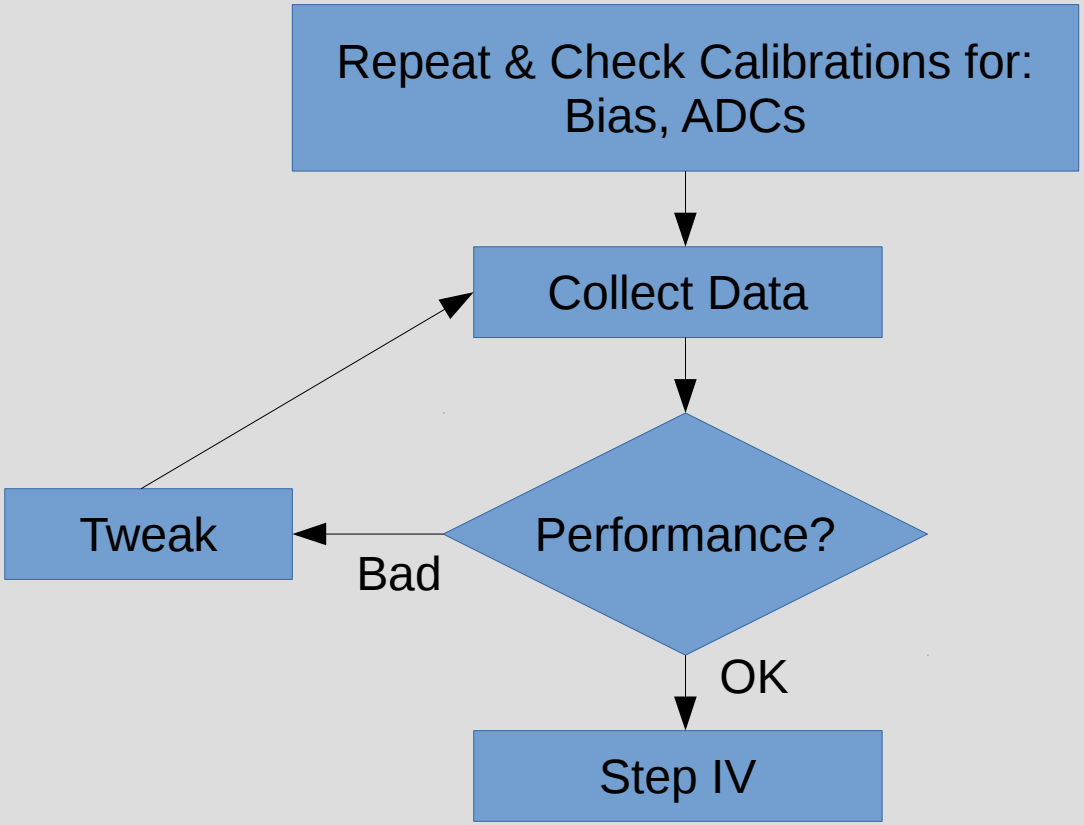


- Upstream Efficiency: 99.5 %
- Downstream Efficiency 99 %

P. Kyberd

Detector Validation

- Our detector is not perfect
- Step IV is a one shot
- We must validate our detector before we start Step IV physics programme
- We must have well defined constraints for required detector performance
- Face to face meeting has identified a range of things to help validate the detector.



Where next

- Detector is operating well and in regular use
- Hardware problems have been debugged
- DAQ & C&M Codes are 95% complete
  - Small set of new features to be added

- Validation
  - Initial indications are looking OK.
  - Need to do a thorough analysis.