



Tracker DAQ Status

David Adey

Rutherford Appleton Laboratory

15th December 2011

DAQ

- Interterm implementation of DATE code prepared and used in Lab 7 for data taking of calibration and cosmics
- Temporary unpacker used until MAUS interface prepared
- Quick synchronisation of VME crates
- Different synching of VME / LDC in MLCR - should shift to slightly different DATE code
- Unpacking should handle all code variants

DAQ Tasks

- Simple control of zero suppression
- Readout of VLSBMaster trigger count and trigger-data TDC
- Test newer DATE code in Lab 7
- Data chain checking with AFE count mode
- Addition of fast VMEMultiRead to MLCR code
- Distribution of veto period to all triggering detectors

DAQ Error checking

- Issues with AFE data still remains - some events not fully populated - currently watched for at analysis stage
- Some bugs took time to notice
- Need error levels and stages to check
- Zero suppression will remove indicators of some readout problems

- DATE - during readout phases
- Unpacking
- Online Monitoring
- Offline Reconstruction

- Fatal Error - stop run
- Error - warn user
- Inconsistencies - reject spill / event or flag in data

Calibration

- Independent code written for calibration of VLPC bias. Included finding of photopeaks and calculating gains; measuring bias-dependent noise levels; photocurrent efficiency. Discriminator frequency and TDC constants also calculable
- Complete fitted photopeak distribution analysis
- Integration with MAUS, documentation and trustworthiness

Calibration

- Analysis of internal LED system
- Fast calibration with LED system - automated integration of Tracker Initialisation and DATE conceivable
- Discriminator calibration - requires as much as 10x data as bias calibration to fully characterise behaviour, much less just to find optimum level for noise
- TDC calibration and time walk - have code and plan but needs person-hours
- Time dependance of AFE board calibrations - frequent calibrations

Online Monitoring

- Channel by channel ADC distributions
 - VLSBMaster triggers
 - Bank counts / trigger
 - Hits per channel, VLPC, MCM module, bank, board
-
- Light yield per channel, VLPC, VLPC module, cassette
 - Hits per fibre, plane, station
 - Online reconstruction...