Calibration Operations

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- Recent Changes
- Required Changes
- Calibration by Shifters

Recent Changes (1)

- Receivers now part of the L1Calo segment
  - Receiver configuration still handled by LAr software
  - Until this year, the receivers were part of the LAr segment
    - Not available for L1Calo standalone or L1Calo+Tile calibrations
    - Had to configure them manually by command line script
  - Now receivers configured automatically for all ATLAS and calibration runs
  - However since moving to SLC5, the receiver control system (via USB) is suffering occasional errors
    - The only cure for these errors is to power cycle the offending crate
    - Damien and/or L1Calo experts may be called day or night to do this
    - Meanwhile Damien is trying to debug the problem...

Recent Changes (2)

- Separate LAr global parameters for calibration
  - Until this year, the ATLAS partition and L1Calo+LAr calibrations shared the same global parameter settings (text file)
  - It was tricky for LAr to separate this for our calibrations
    - But it has now been done
- TileCal updates
  - No functional changes
  - But move to new TDAQ (and new python version) required some updates to Tile software
  - Plan to integrate mapping tests into standard scripts
    - So far these have to be done manually

Required Changes

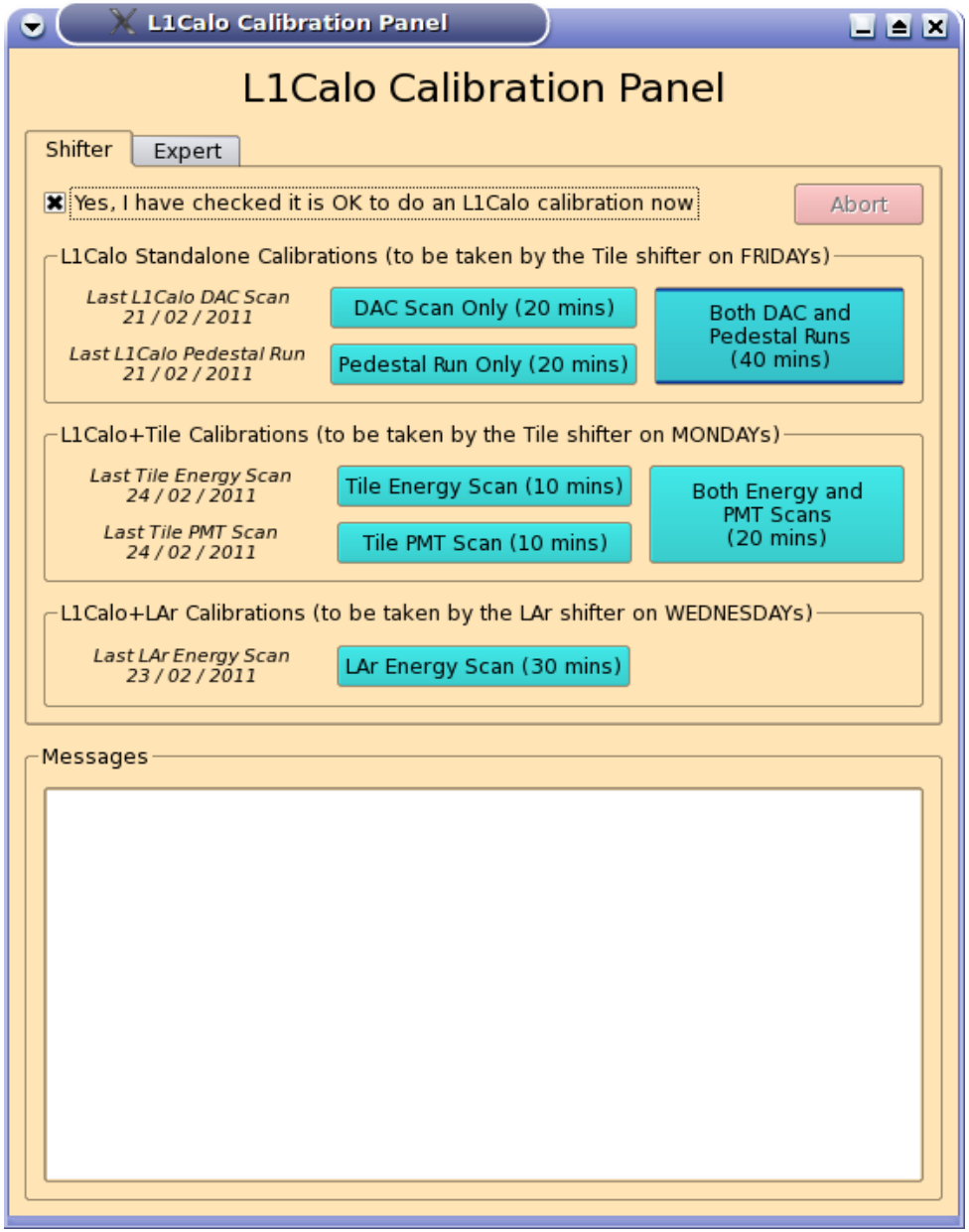
- Tower builder board (TBB) delay database
  - LAr still has a single set of TBB delays (text files)
  - Physics & calibrations need different TBB delays
  - Only solution up to now:
    - Overwrite physics delays before doing a calibration
    - Overwrite them again afterwards with the correct Physics delays
  - Somewhat hazardous...
    - Risk of taking next ATLAS stable beams run with wrong delays if the calibration is aborted without the correct delays being restored
  - Longstanding request to LAr SW experts to improve this!
    - Plan is to put separate physics & calibration delays into COOL
    - LAr aiming to do this by mid April
    - Until this, "shifter" calibration needs expert oversight

Possible Changes

- New version of calibration results folders?
  - Outputs of calibrations are stored in "Results" folders
    - Separate folder for each type of calibration
  - These are single version folders, indexed by timestamp
    - Time stamp is just when the results were uploaded
      - Not when the calibration run was taken
  - Better to have multiple version folders, indexed by Run/LB
    - Time stamp would always be the calibration run number
    - Could upload new versions of results for the same run
  - This would need:
    - Changes to various software tools
    - Complete new set of folders
    - Suitable time to make the change (not while running)

Calibration by Shifters

- Shifter GUI script
  - Incorporates knowledge painfully gained (by Martin) over the last few years
- Aim for simplicity
  - Check its OK and click button
- Aim for robustness
  - Give up, shut down and clean up in case of any errors
    - Let expert find out later what went wrong
- Also expert calibrations
  - Validation, PHOS4 runs, etc



Calibration Schedule

- Agreed schedule for shifter calibrations
  - MON: L1Calo+Tile (by Tile shifter)
  - WED: L1Calo+LAr (by LAr/Fwd shifter)
    - With L1Calo on-call expert checking…
  - FRI: L1Calo standalone (by Tile shifter)
  - Unless agreed by appropriate system run coordinators
  - May change again in July
    - Tile merges with LAr/Fwd to have a single Calo shifter
    - Shifter will be even busier during calibration breaks between fills

Details of Shifter Calibration Runs

- L1Calo Standalone
  - DAC scan (for Physics PHOS4 delays)
  - Pedestal run (for Physics PHOS4 delays)
- L1Calo+Tile
  - Energy scans
    - Run with gain one
    - Run with default gains
  - PMT scan: pulse one PMT per tower at a time
- L1Calo+LAr
  - Energy scans
    - Run with gain one: EMEC overlap and FCAL23 low eta components
    - Run with gain one: EMB overlap and FCAL23 high eta components
    - Run with default gains (both overlap and FCAL23 components)

Expert Calibrations via the GUI

- L1Calo Standalone
  - DAC and pedestal runs for other timing regimes (Calib1, Calib2) with optional validation of results
  - Aim to include CP/JEP scans (not yet done)
- L1Calo+Tile
  - PHOS4 scan (fixed energy, gain one)
- L1Calo+LAr
  - PHOS4 scans (two fixed energy runs, gain one)
    - Need two different sets of energies to get decent size pulses everywhere in LAr without saturation despite varying number of cells per tower with a fixed energy per cell

Analysis and Checking

- L1Calo Standalone
  - DAC and pedestal runs analysed by the script at point 1
  - DB updated with new results
    - Not automatically validated (unless using expert panel)
- L1Calo+Tile/LAr
  - Data analysed on the CAF (see talk by Pete Faulkner)
  - Results available (after an hour or so) via the web:
    - http://cern.ch/atlas-l1calo/calib/CalibRunsCAF.php
    - (would like something similar for DAC/pedestal runs if possible)
  - Results need to be returned to point 1 DB and validated
    - This is not yet automated
    - An ATLAS mechanism for this is available, not yet tried by L1Calo
    - Details for the receiver gains need to be discussed with Damien

Summary

- Several recent changes made for easier calibrations
  - And quite a few TDAQ/LAr/other problems along the way
- L1Calo calibrations are now being taken by shifters
  - Though still with expert oversight for L1Calo+LAr
- Still need:
  - LAr to store TBB delays in COOL
  - More automation of returning results from CAF to point 1
  - More automation of validation?
  - Various other jobs to be mentioned by Pete and Juraj...