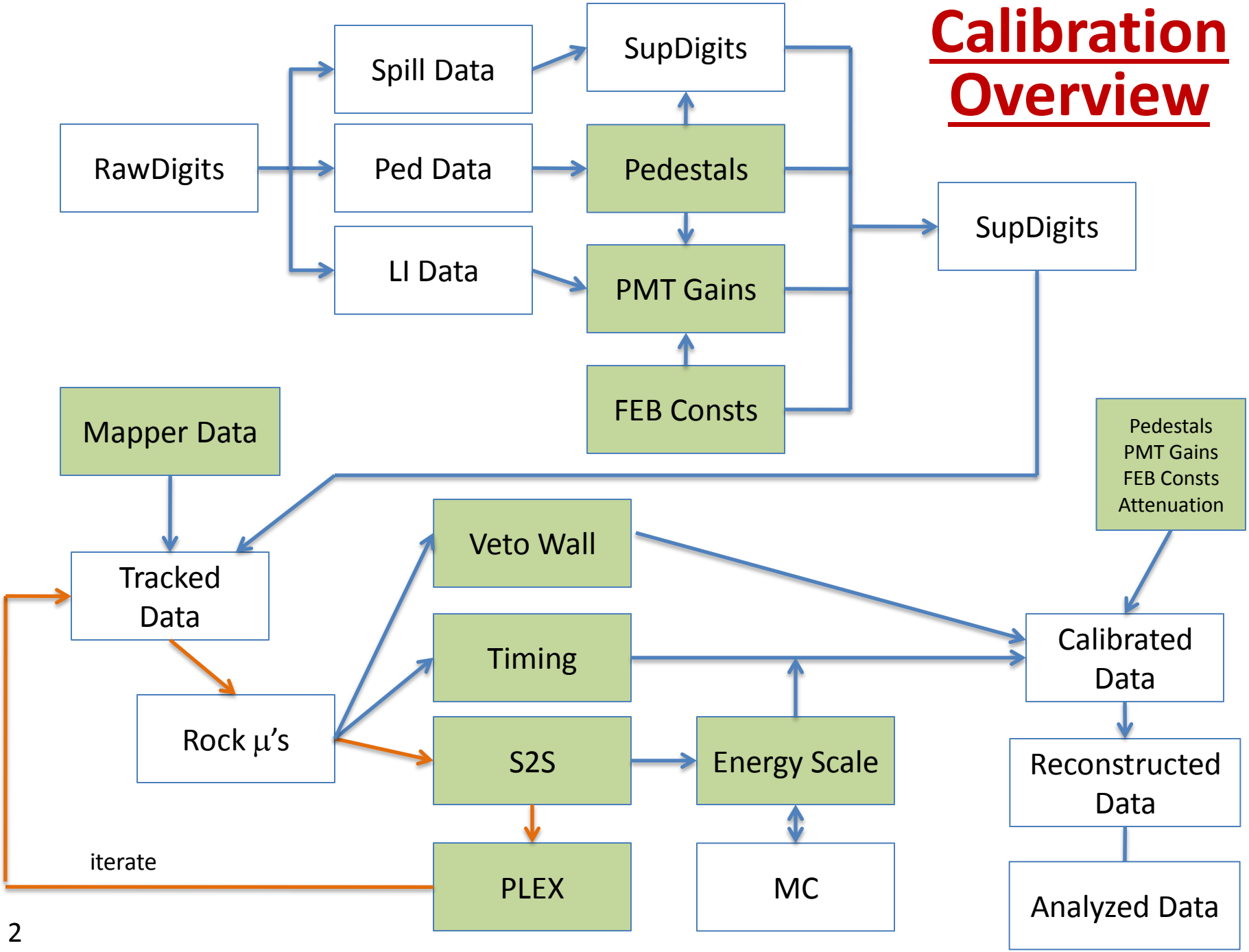
Calibrations

Emily Maher, Cheryl Patrick,
Aaron McGowan, Chris Marshall,
Laza Rakotondravohitra, Heather Ray

April 8, 2014

Calibration Overview



Calibrations Overview

- Determine calibration constants
- Load these calibration constants into the database

- Run separate scripts that execute Gaudi jobs to calculate constants for pedestals, gains, strip to strip, timing, meu, veto wall calibrations
- Also run a separate rock muon reconstruction job that is required for strip to strip, timing, meu, and veto calibrations
- Each calibration is assigned to a different person

Calibration Inputs

Calibration	Input	Input location
Pedestals	RawDigits	/minerva/data/rawdigits
Gains	RawDigits	/minerva/data/rawdigits
Strip to strip	SupDigits, rock muon reconstruction	/minerva/data/supdigits
Timing	SupDigits, rock muon reconstruction	/minerva/data/supdigits
MEU	SupDigits rock muon reconstruction	/minerva/data/supdigits
Veto	SupDigits rock muon reconstruction	/minerva/data/supdigits

Calibrations Scripts

Calibration	Script	Script Location
Pedestals		Cal/CalibrationTools/scripts/pedestal_calibration
Gains	Submit_LI_runs.pl	Tools/ProductionScripts/data_scripts
Rock Muon Reconstruction	submitGridJobs.py	Cal/RockMuonCalibration/script/processing Tools/SystemTests/options/CalibProcessing/RockMuonReconstruction.opts
Strip to strip	make_s2s.sh	Cal/StripCal/scripts
Timing	runTimeCal.py	Cal/CalibrationTools/scripts/timing_calibration
MEU	Make_meu_mc_hist_files.py Make_meu_rock_muon_files.py	Cal/CalibrationTools/scripts/meu_calibration
Veto	Draw_overlays_dbOutput.C	Cal/CalibrationTools/scripts/veto_timing_calibration

Calibrations Output

- All files written to temp location then moved to official staging area /minerva/data/calibration

Calibration	Output	Output Location
Pedestals	Text files of pedestal tables	/minerva/data/calibration/ped_tables
Gains	Text files of gains tables	/minerva/data/calibration/gain_tables
Rock Muon Reconstruction	Root ntuples	
Strip to strip	Text file of strip to strip constants	/minerva/data/calibration/s2s_tables
Timing	Text files of timing constants	/minerva/data/calibration/timecal_tables
MEU	Text files of MEU constants	/minerva/data/calibration/meu
Veto	Text files of veto timing constants	/minerva/data/calibration/veto_timing_tables

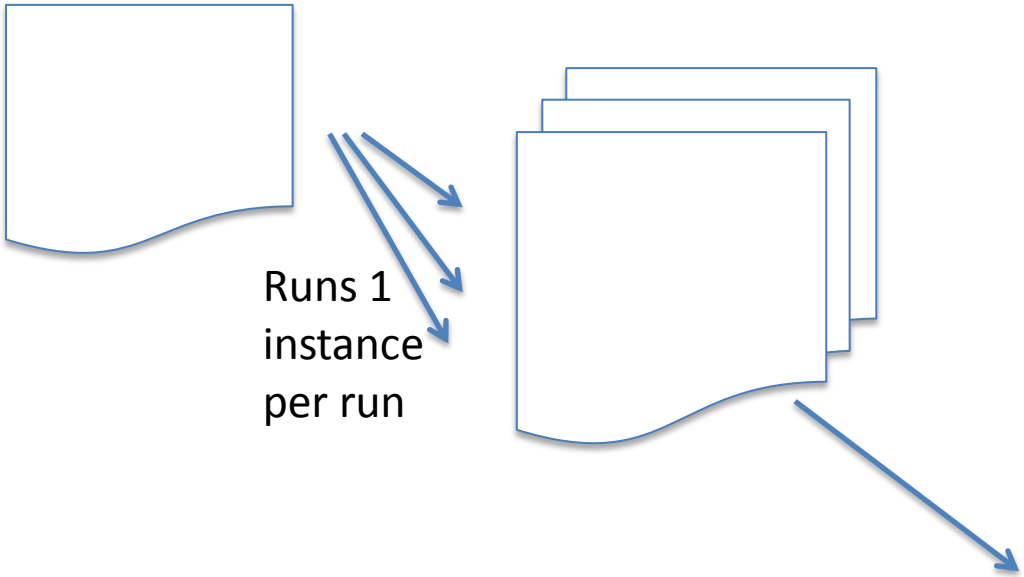
Database Uploads

- Once constants are stages, each calibrator will upload the files to the database website at:

  http://dbweb4.fnal.gov:8080/mnvcon_prd_gui/app/GUI/fileBrowser
- Then one person is in charge of loading all of these tables into the database using the same web site

One process in detail: Gains process

Run manually as shared account minervacal@ minervagpvm0x



Submit grid job for run (runs as minervacal)

OfflinePedSup

MaxPEGainAlg

Typical grid job stats (condor logs)

- Image size of job: 450kB (from condor logs)
- Run Remote Usage
  - Usr around 06:00:00 to 08:00:00
  - Sys around 00:10:00 to 00:15:00
- Proxy provided by cpatrick as for keep-up
- The job is listed in the condor q as running as minervacal – so why are the files created by minervadat?
- Command: jobsub --opportunistic -g -r v10r6p12 -i <*release directory*>-t <*production scripts dir*>-L <*logfile*> -f <*input raw digits file – several of these*> -dMAXPE <*output gain table dir*> <*SystemTestsApp.exe dir on /grid/fermiapp*> <*custom options file*>

Gains algorithm inputs

File	On	Specified in	Notes
Rawdigits files (.root)	Bluearc	Top directory passed manually into script; subdirectories must follow hardcoded pattern	Gain table typically combines data from all LI-type raw digits files for a run. N.B. the algorithm can also run from raw data, regenerating raw digits – but we never do that
Pedestal tables	Conditions database	Pedestals for relevant IOV loaded from DB	Possible to specify a pedestal table from disk, but not used for standard processing
Options file template	Bluearc	Hardcoded in process_max_pe_run.pl	$ENV{SYSTEMTESTSROOT}/options/DecodeRawEvent/DecodeRawEvent_fRawData.opts

Gain algorithm outputs

- All outputs to bluearc: top directory /minerva/data/users/$ENV{USER}/data_processing
  - Output directory can be overridden when calling script
  - Subdirectory structure hardcoded in script
- Files include:
  - Gain table (CSV file) (~1.5MB)
  - Histograms (root file) (~50kB)
  - Problem channel list (CSV file) (~40kB)
  - Tuned HV data file (CSV file) (~40kB)
  - Log file (~100kB)
  - Customized options file (~5kB)
- Files NOT written to SAM – instead gain table is written (manually, after manual quality check) to conditions database
- Files named in red are owned by minervadat, blue by minervacal