TELLIE PCA Automation

Overview

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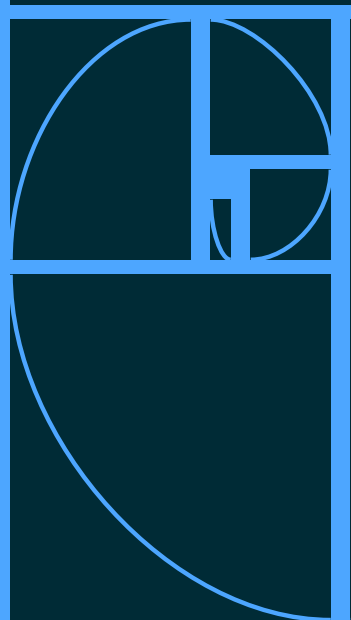

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This study

- **Data-taking Auto**
  - Profiling (how often? once before set?)
    - Calibration curves (IPW - PIN)
    - Tuning curves (PIN - NHit)
  - Data-recording
    - Mode: a) dedicated | b) continuous
    - Environment: a) ORCA | b) python
- **Processing Auto**

Processing Automation

GOAL:
script that reads run list for 95 fibres, then does the processing and analysis automatically, with monitoring.

This way it would work for both continuous and dedicated mode.
The selection / creation of the list can also be automated (later).

Steps

What data:
(IF DEDICATED) Need a method to select the best run when we have retakes. Could use the nearline processors that we have (may need modifying) and fits.

(IF CONTINUOUS) Just take the latest run for each fibre. Need to create the list once we have collected data.
What to do if run type is changes - say ECA? Hold on to data-taking, then resume?

Steps

Access to data:
Options:

- Move the reprocessing responsibility onto the processing group. Then need to download the data, which is almost always complicated and will be hard to automate.
- Do it ourselves: apollo2 OR use SNO+ computers. Data is retained UG for at least a week (is that enough?). SNUG2 is unused and available. Do processing ourselves.

Steps

PCA table:
PCA tables contains data and fits needed for PCA extraction.
Requires:

- pca offsets = the injection time.
  Fit to residual hit times (hit - ToF - bucket).
- fitted position*
- fitted direction*
- angular systematic fits*
- * depends on pca offset values

Once calculated, create and update final json table.
UNIFIED event selection, checks, cuts, ranges...

Steps

Extract constants:
= running the PCA processor. Still running custom version, needs PR. Split LB - TELLIE proc?
Requires:

- PCA table
- recent ECA

When/how to store and load the constants? Currently starting from next run once calib is finished - in continuous this can be a week late...
If we decide to load when the calib was done, will need a table for each fibre - 95 tables to load...

Steps

Benchmarking:
Maaany things to look at:

- compare PCA table values
- apply PCA constants to a run, fit residual hit times, compare distribution to previous
- fit residual prompt peak
- compare TW
- compare cable delays
- other related fits: charges, LED offsets, RMS...

Steps

Monitoring:

- Have a PCA page (has not been used or updated). It does what we need, is reeeeeeal slow.

- Will need logs / monitoring for the different steps of processing once automated - using couchdb, using some overview platform similar to BT.