Parity Data Analysis Issues

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What we have

- Working analysis chain used during HAPPEx III and PVDIS
  - PAN writing root files
  - Panguin online data display
  - Daily and slug analyses (somewhat kludgey)
  - Regression and dithering slopes (very kludgey)

What's new?

- 240 Hz flip rate
  - 8 times data rate & size
- New multiplet tree
  - more data
  - changes to analysis
- New dithering system (fast differential measurement)

Increased data rate

- Possible limits
  - 2 GB root file size limit (not a train-smash)
  - IO disk write limit?
- Solutions:
  - Control which trees are written to the files (done)
  - Decrease number of entries in raw tree.
  - Separate trees between files?
    - Avoid 2 GB file limit;
    - separately manage different trees while still accessing the data (i.e. produce raw tree and delete later.)

Dithering and regression

- Online access to dithering and regression slopes.
- Use of new multiplet tree.
- Dithering: new faster modulation structure
- Ability to use multiple combinations of BPMs simultaneously.
  - Dithering: multiple files of slopes.
  - Regression: multiple regressed trees.

Conclusion

- Getting the final working analysis will require software tweaks throughout the chain.
  - e.g. generalise file naming conventions
    - multiplet and pair
    - multiple BPM combinations

Changes to DAQ chain