Use of Calibration Pulses

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- Current uses
- Future uses?
- Test vectors

Current L1Calo Pulser Runs

- We use LAr calibration pulses for:
  - Energy calibrations (like LAr Ramps)
    - Purely electronic calibration, offline compared L1Calo Et with LAr Et reconstructed with all appropriate corrections (and no others!)
  - Timing in calibration pulses for the energy calibrations
    - Bit like LAr Delay scans? Find the peak of the pulse for every tower, then set ADC strobe to pulse peak individually for each tower (unlike LTDB)
  - Connectivity tests
    - However this code is rather outdated and would need an update to use again, but the intention is to be able to fully check all cabling after interventions by pulsing in patterns, eg alternating phi or eta slices in groups of 1, 2, 4, etc units of 0.1
  - Checking dead/sick towers: check signals in USA15 tracing faults to front end or receivers or PPMs
  - NB need additional delays cf Physics (two USA15-US15 trips)

Future Uses of Pulser?

- Similar uses as in the present L1Calo setup:
  - Checks connections all the way through the system
  - Timing scans for LTDB ADC strobe
  - Filter studies and energy calibrations in DPS
  - Checking dead/hot tower monitoring etc
- But digital test vectors are more useful for FEXes…

Playback Test Vectors

- For DPS to FEXes best to use test vectors
  - Load patterns in DPS playback memories and play back
    - Easiest to synchronise across the system using BCR
      - Needs 3564 deep memory per supercell - is that OK?
    - Need a nice way to specify a variety of patterns and predict what to expect in the FEXes
    - Useful for testing links and also commissioning algorithms
    - Mapping patterns: supercell Et = coded module and channel number
    - Ramp patterns for synchronisation: supercell Et = BC modulo N
    - More sophisticated patterns to exercise features of algorithms
- Test vectors also useful for LTDB to DPS?
  - Easier to make exact predictions of filter, test links etc?
  - Mapping patterns, etc
    - Do LTDBs know which crate they are in?