Magnetic Triggering Status

Luc Le Pottier

March 14, 2023

Debugging Charge Injection

Overview

- Majority of my time spent on this
- External triggering doesn't seem to work with charge, despite working great without charge
- Problem seems to come from mismatch between 'BurstCalibrationSetup' and external trigger quantities
- Short list of ways I'm working on this
 - Modify strobe delay to be externally triggered (hardest / least other work on this)
 - Modify External 3pg until it works with our trigger
 - Modify ExternalTriggerLatencyScan to have some charge injection

Debugging Charge Injection

So far, nothing has been successful, but I have iterated quite a bit with help from the 'ITSDAQ-talk' mattermost channel. As of right now there are a few outstanding things to try from them, but it is definitely frustrating.

Misc. things that may be haunting us:

- Very low rate from trigger setup compared to AFG
- External3PG was originally used with ITSDAQ-controlled AFG, which we aren't using
- Network seems quite slow on 'fieldwork'. consistent indications of this.

Analysis Tools

To determine if things were working I had to make a few different offline analysis tools, i.e. to see if 3PG changes as FPGA delay changes, or to see if charge injection is working for latency scans by comparing them. No result found yet except that the CN seems worse after a week in the cold chamber.

Analysis Tools



Analysis Tools



3PG Noise Result (innse), SN20USBHX2001032, (Internal Trigger)

Figure 2: 3PG Latency Scan (Internal, i.e. not working properly)

Temperature Plot

Also made a temp/freq plot for the new module, indicating similar response to the previous one.



Figure 3: False blue module temperature/DCDC freq plot

Goals

As always:

Finally have the External 3PG running

▶ Test on the false blue (double layer) module, both at warm and cold