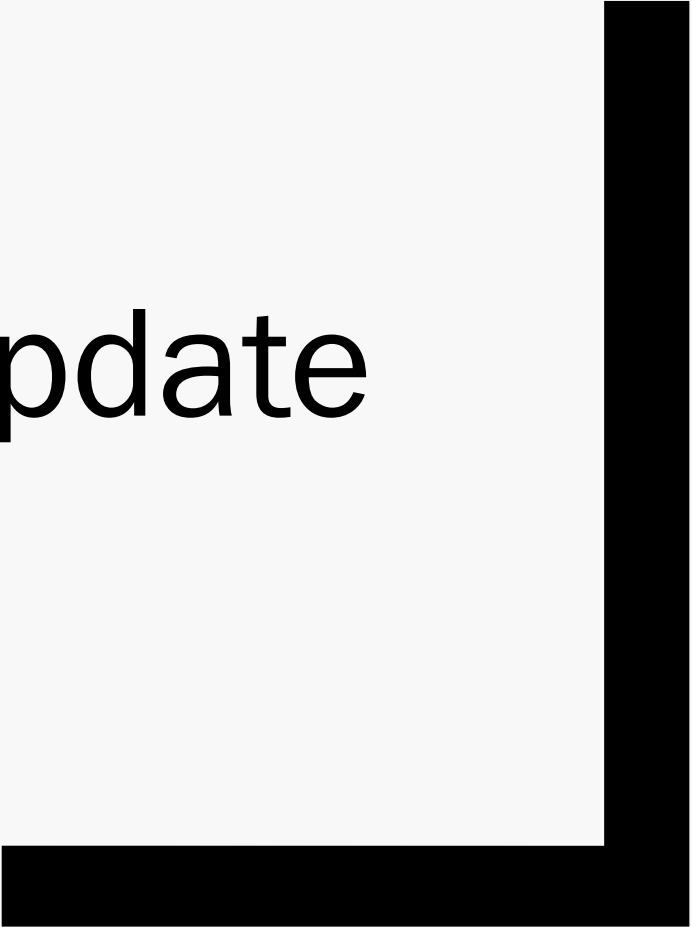




GSU Tile Testing Update

Anthony Hodges



Current Status

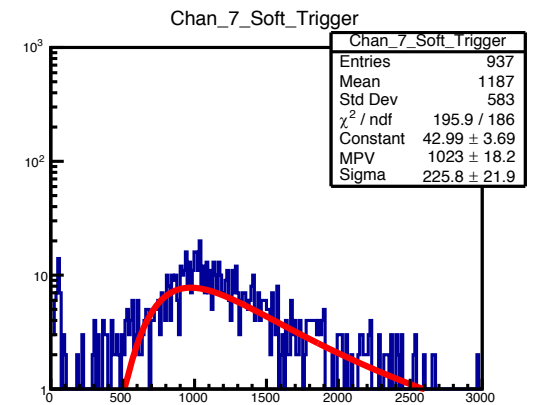
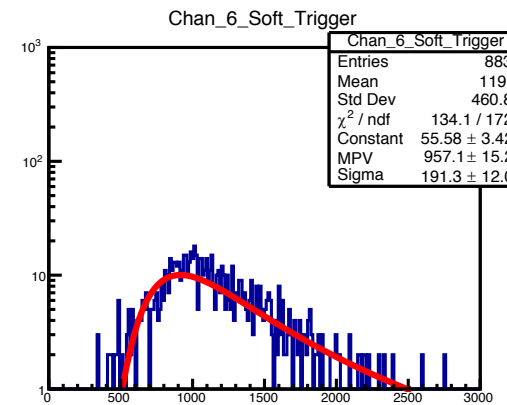
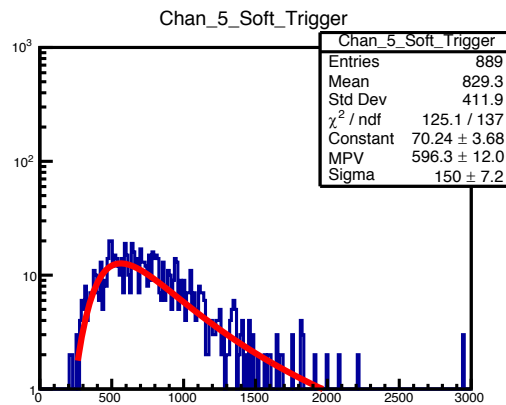
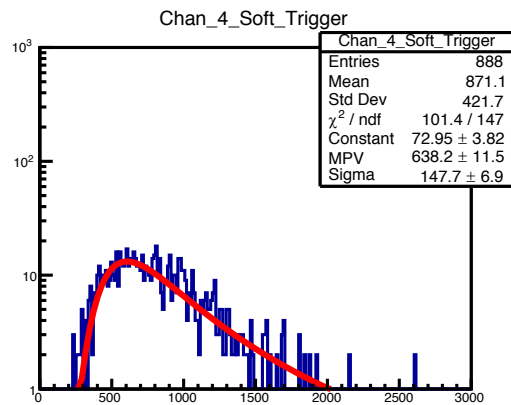
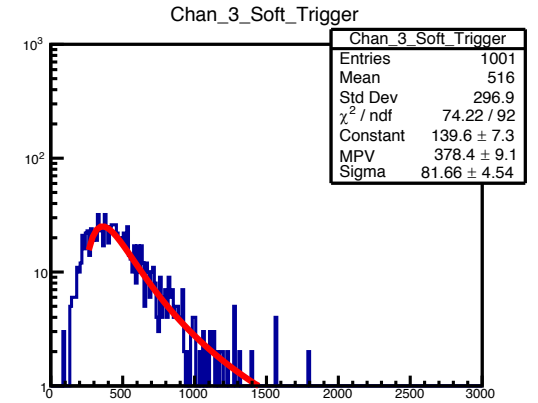
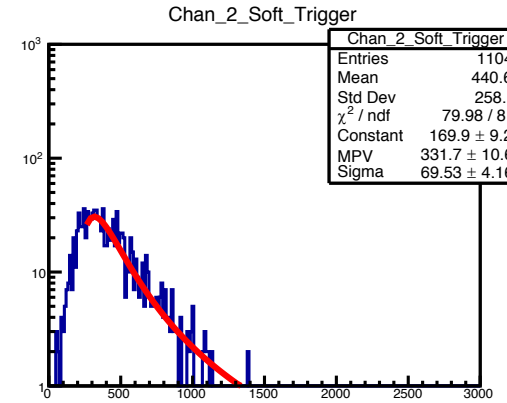
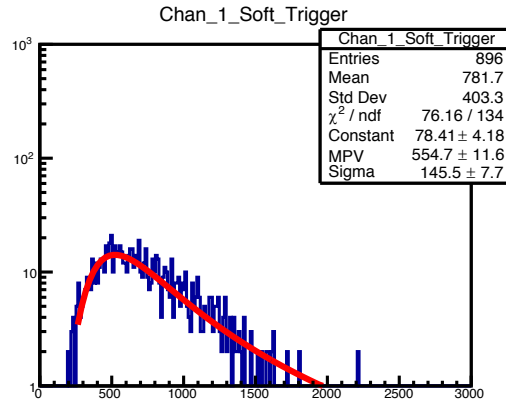
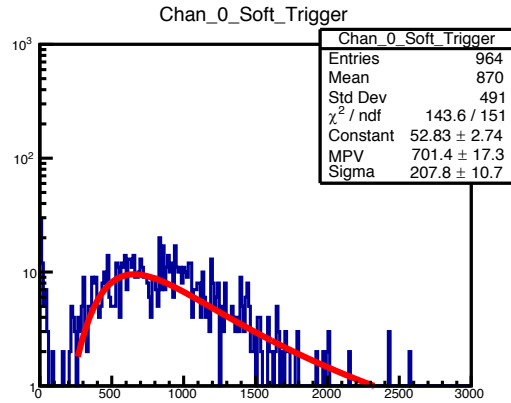
- Tested three or so configurations
- Ultimately, SiPM/fiber gap precludes any strong statements from being made
 - Updated test stand necessary

Tested Configurations

- Tried a few different trigger configurations to see if there's a way to physically tease out higher fidelity data
- Config 1:
 - Simple CAEN configuration, 8 SiPM's mapped to channels 0-7, trigger on any pair of channels
- Config 2
 - Open coincidence, assign channels 0 and 1 to top and bottom tiles, but still allow triggering on any pair of channels
- Config 3
 - Closed coincidence, assign channels 0 and 1 to top and bottom tiles, only trigger on these two channels.
- Analysis done using same software as previous results shown

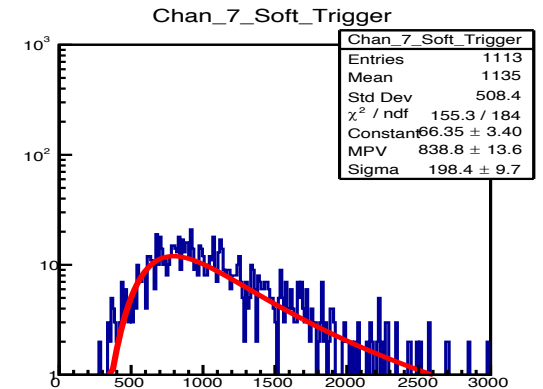
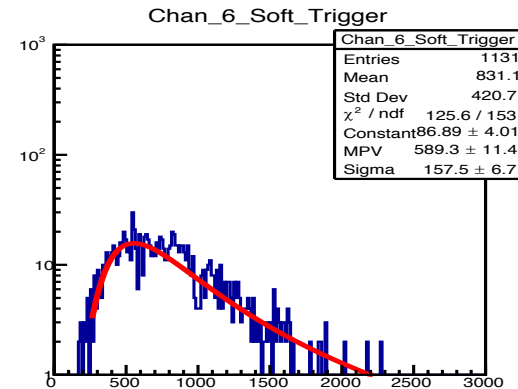
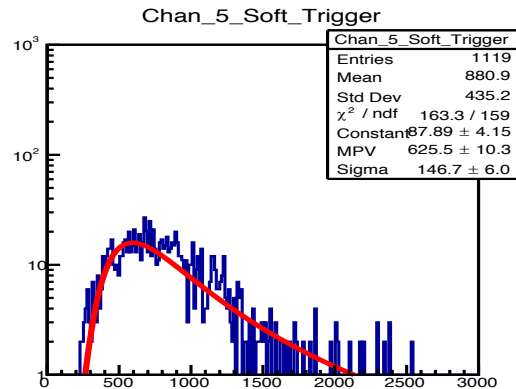
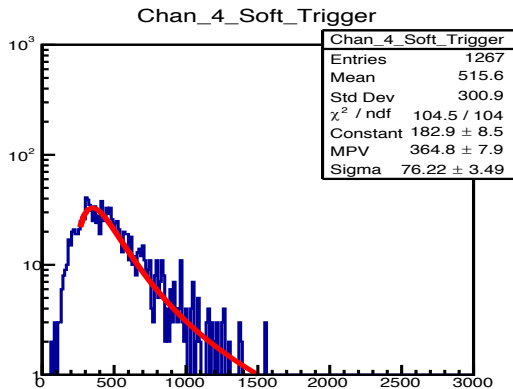
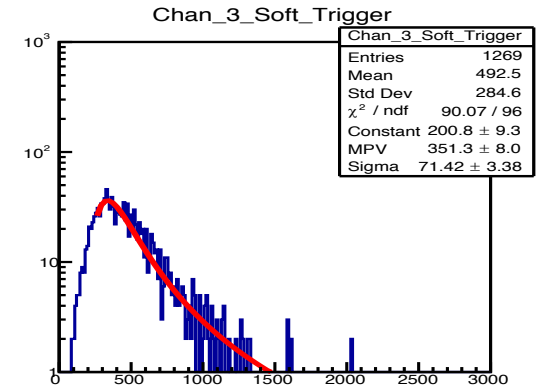
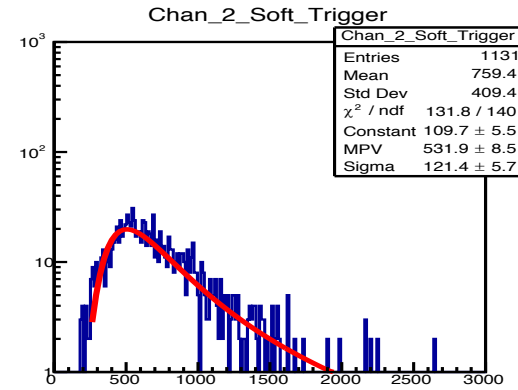
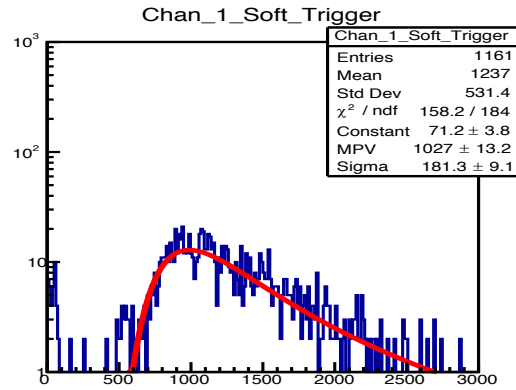
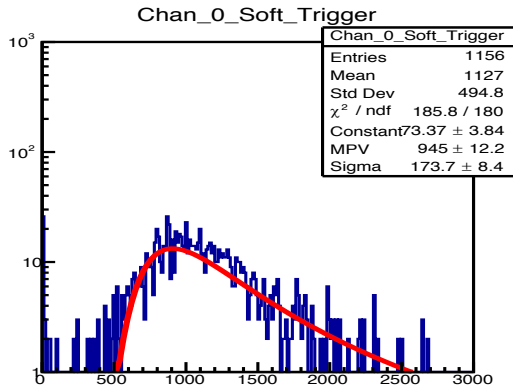
Config 1 Output

- Some decent looking peaks, but low peak counts



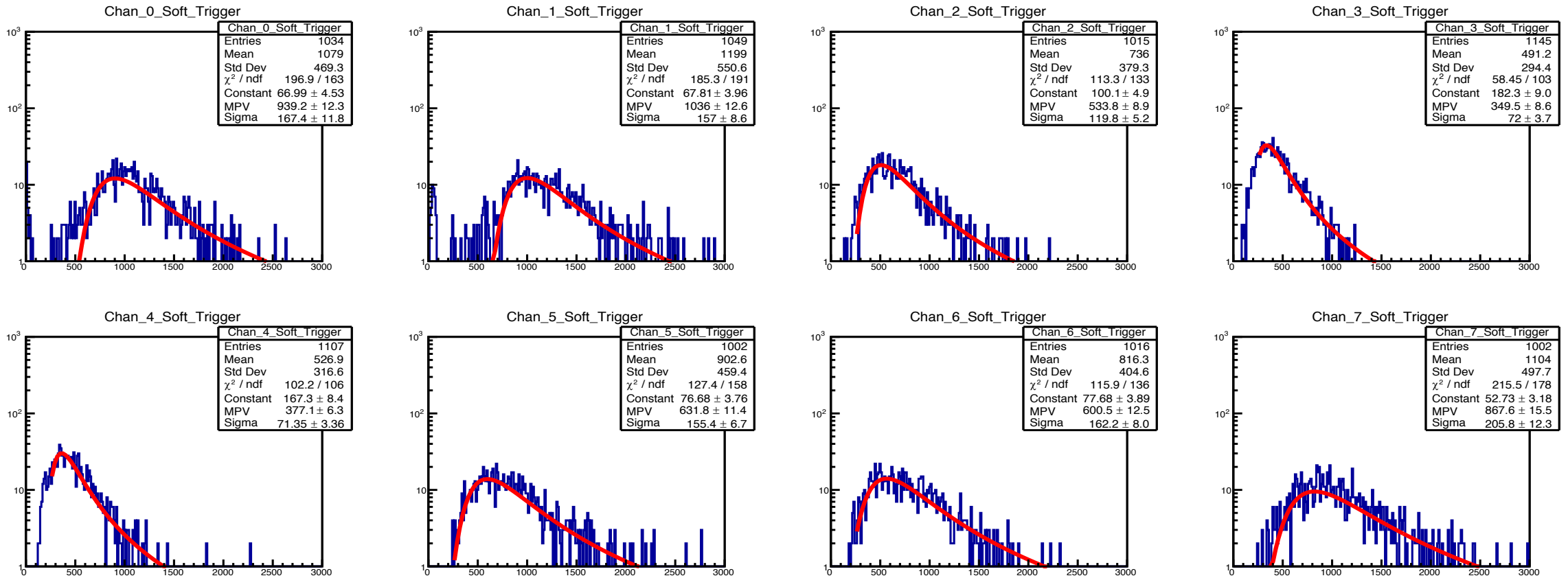
Config 2 Output

- Seems to clean up signal just a little bit in some places



Config 3 Output

- Expectedly similar to config 2

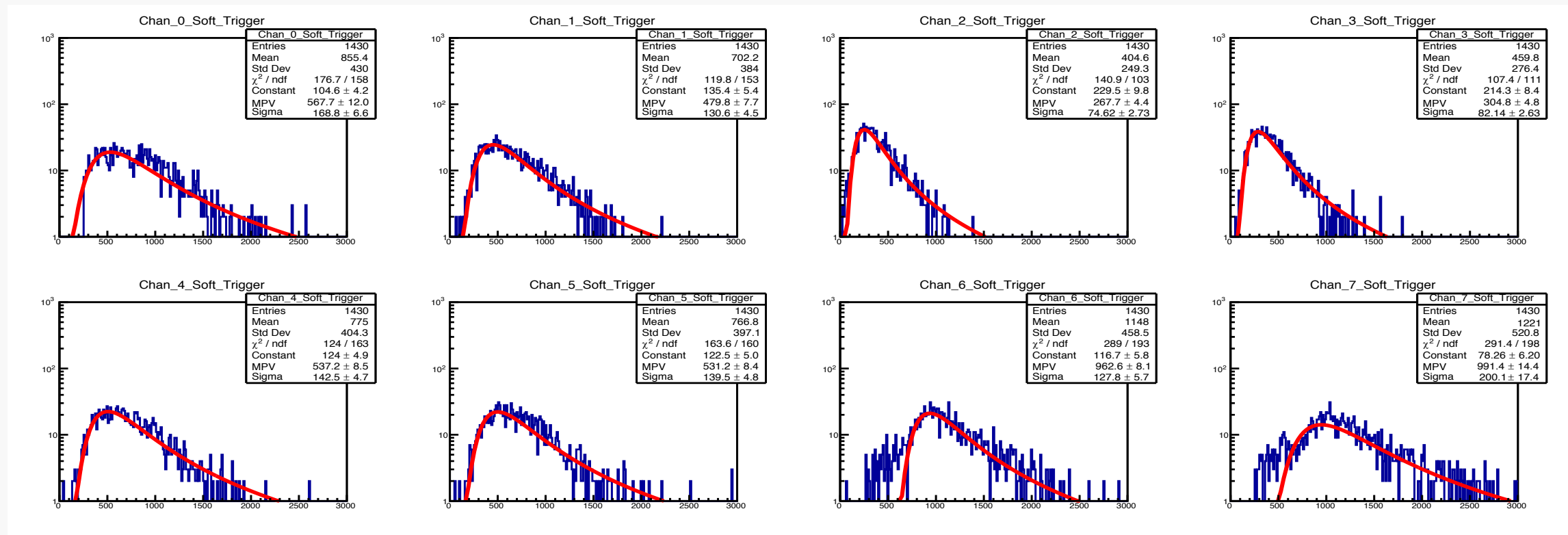


Comments

- No real noticeable improvement from one to the next
- Also have noticed in the past that using a restrictive physical trigger can bias trigger channel MPV's higher than surrounding channels
- Think using standard CAEN logic with offline coincidence requirement would be best
- Runs average about ~1000 events, with about 10-30 at the peak. Uniplast averages about ~7000 for B22 tiles, with ~100 at the peak position.

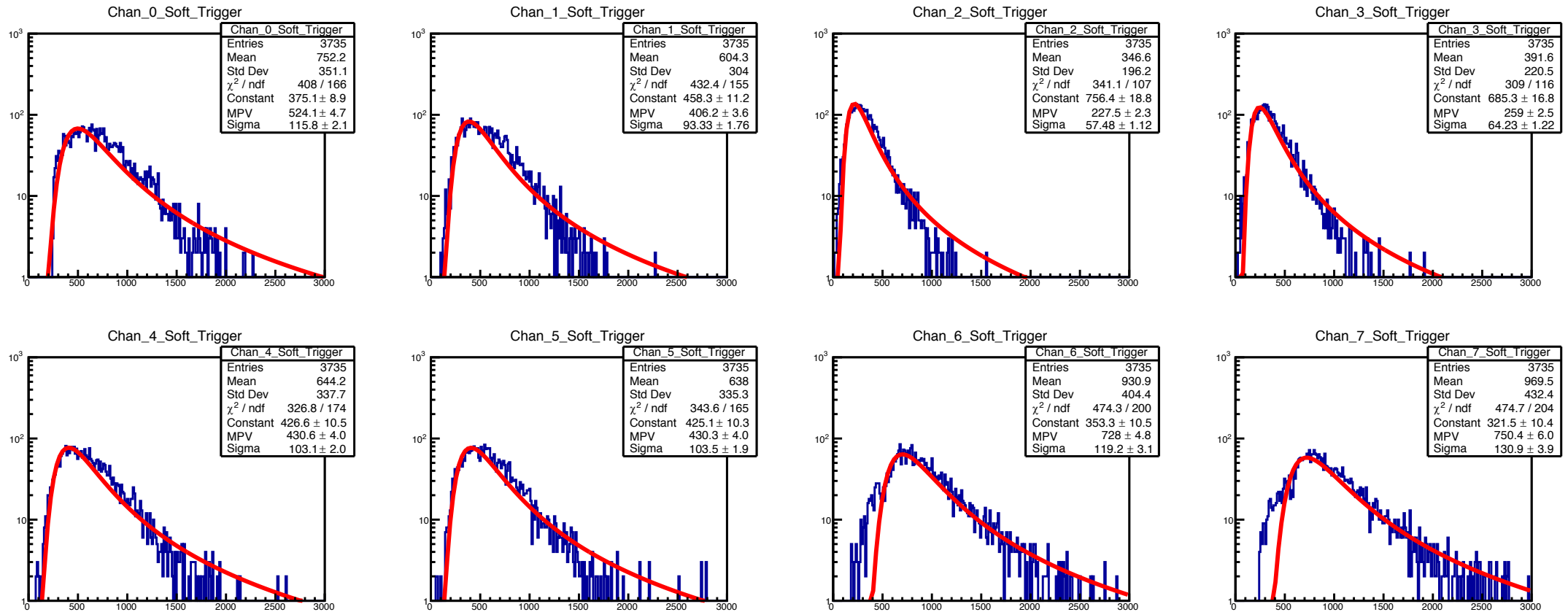
Standard Trigger Logic and Offline Coincidence Requirement

- Not the best looking signals, but the CAEN unit is working as simply as possible, and software is handling the rest. Probably the best running condition.



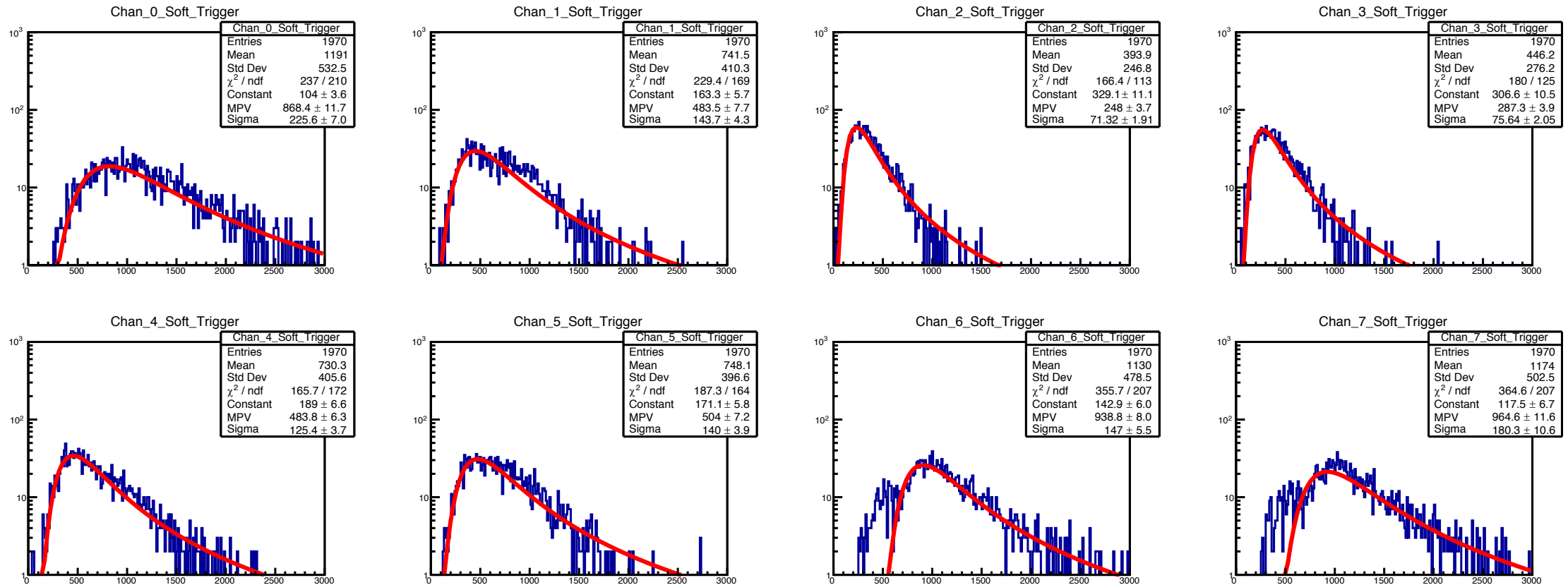
Threshold Change

- Changed threshold from 350 to 300
- Peaks more defined, good statistics and acquisition rate (~ 8 Hz)
- MPV's still wildly varied.



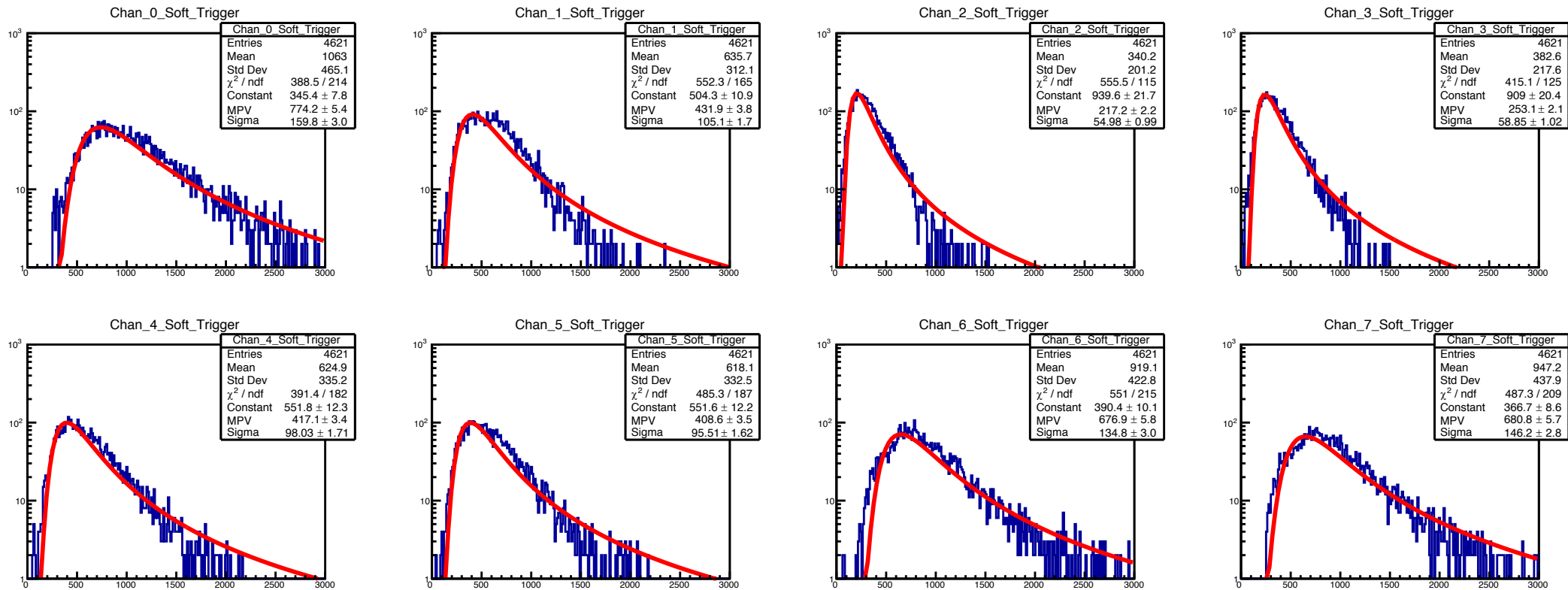
Inclusion of “Pilot Tile”

- Pilot tile has old light blocker on it
- Mixing the two light blockers again, makes it hard to come to a reasonable conclusion about performances.



Inclusion of "Pilot Tile"

- Setting threshold to 325



Conclusion

- Have reached a reasonable running configuration
 - Min bias CAEN trigger, offline coincidence requirement, 20 minutes, no bias offset, 325 threshold (subject to small change upon receiving new test stand).
- Unwilling to make true performance assessment until we get a test stand that fits the new SiPM's.
- With respect to reference tiles, the pilot tiles still have the old SiPM holders in them, so using them as a reference for these new tiles wouldn't really work.
 - Old tiles still work with new test stand? Once the new test stand is here, we can move forward testing with references
 - Or we can select new reference tiles from the first batch.