

# APEX RC Update

## 2/20 - 2/27 2019

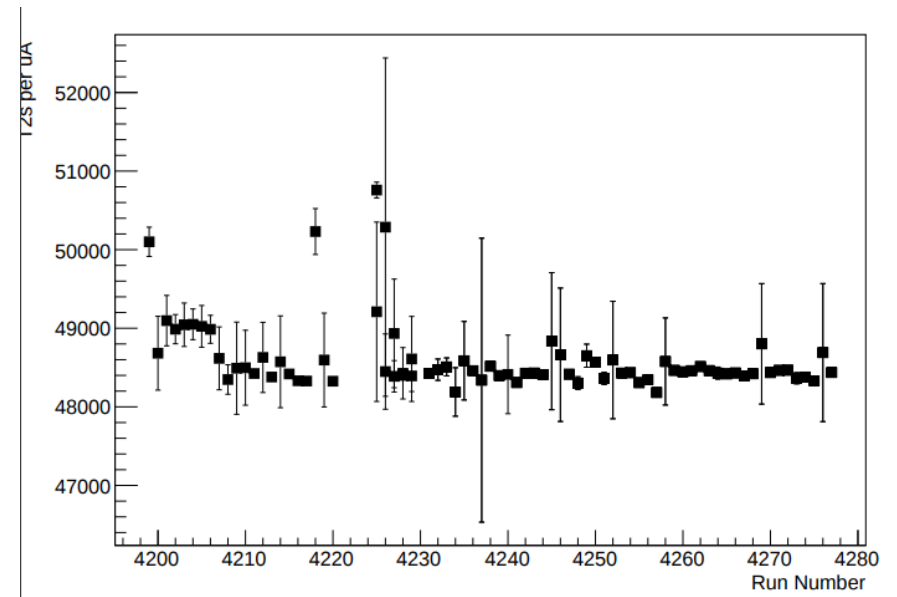
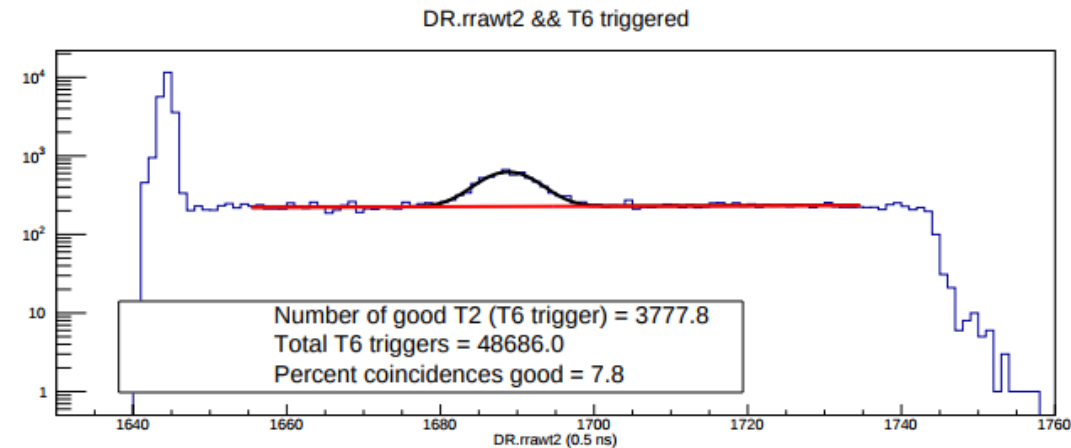
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3/5/2019

# Run Summary

- Experiment: APEX (E12-10-009) 5<sup>th</sup> Week
- Measurement: e+e- in coincidence with Hall A HRSs
- Progress on top of prior weeks:
  - Production running on Tungsten foil target
  - Increased beam current from 30 uA upper limit to 50 uA (with Silviu's approval)
  - SciFi and Sieve in runs for LHRS during opportune down time
  - Identified flaky electronics feeding trigger system

# Daily Activities

- Wednesday (2/20):
  - Attempted to restore Septum power supply
  - Attempted to improve beamline vacuum
- Thursday (2/21):
  - Restored Septum power supply, problem came from transformer wiring issues
  - Made corrections to several other magnet related issues
  - Vacuum improvements didn't help
  - Took sieve in and sci-fi optics data on LHRS with electron polarity
- Friday and Saturday (2/22-23):
  - Some remote controller rebooting issues, but nothing major
  - DAQ timing tuning under Alexandre's supervision
  - Took beam on target up to 40 uA
- Sunday (2/24):
  - Developed some new online plots to monitor rates →
  - Consequently increased current to 50 uA

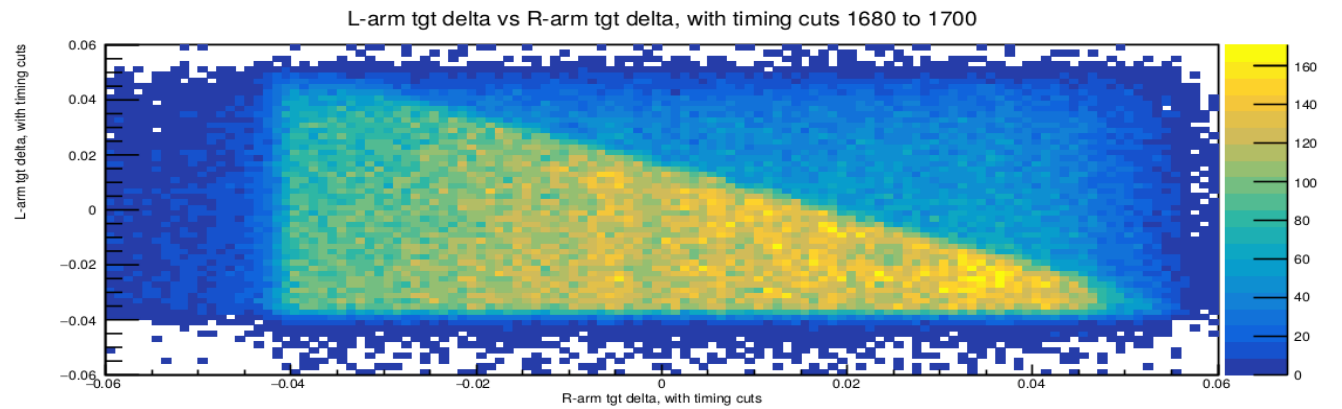
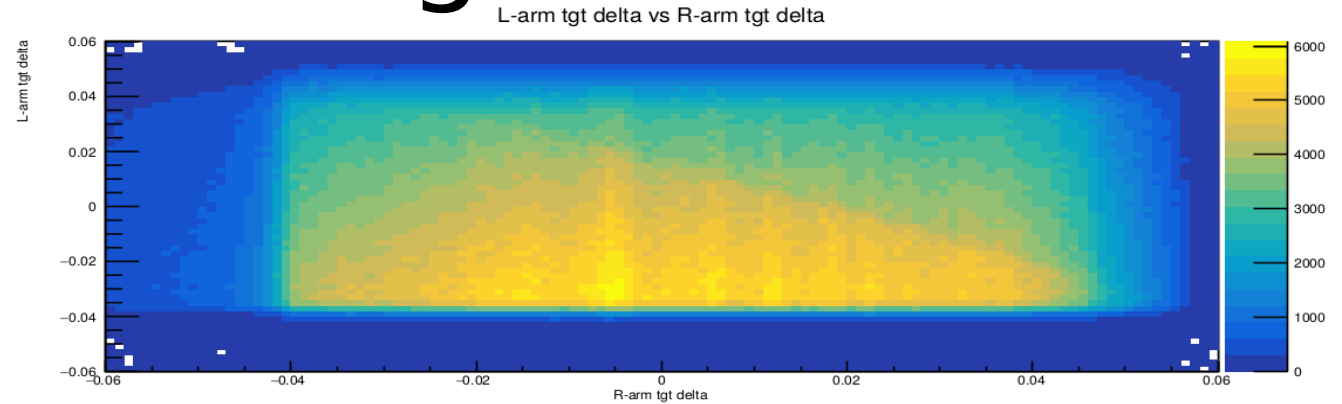


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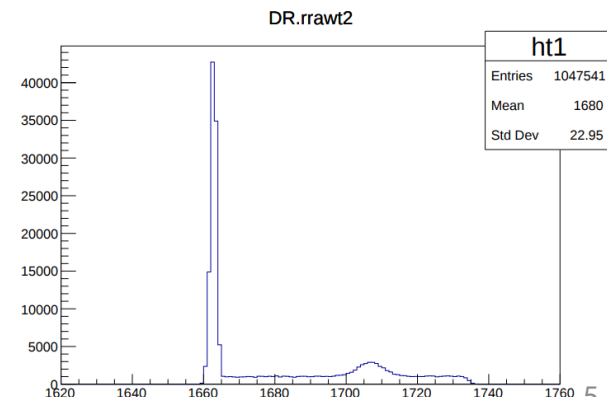
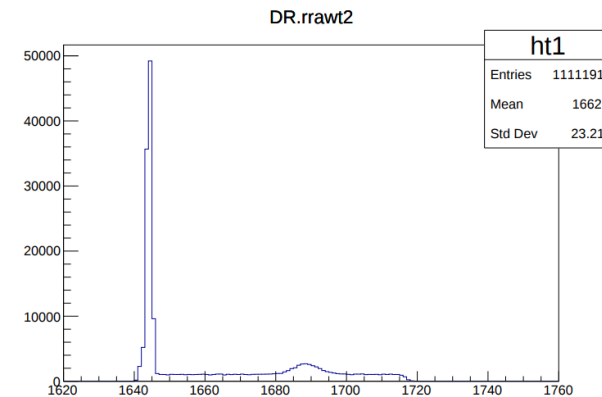
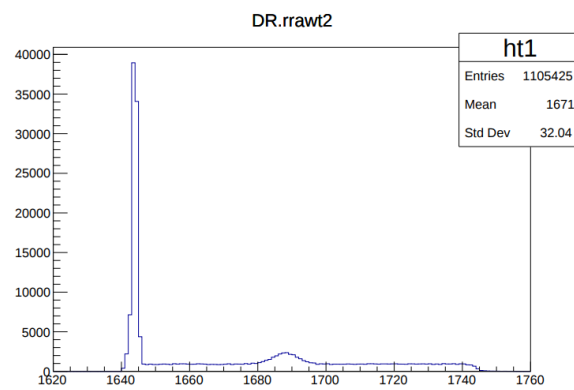
- Monday (2/25):
  - Took an access to optimize trigger rate by reducing coincidence window
  - Noticed inappropriate increase in trigger rate instead of decrease
  - Magnet quenches became a cause of downtime and compounded with PQB studies
  - Scalers started acting weird, giving clear indication of cross talk in trigger signals – replaced a NIM board
- Tuesday (2/26):
  - Continued analyzing results of swapping out the NIM level translator and impact of noise in data collection
  - Likely the impact is minimal, including false triggers that can be cut away later
  - Another access for further investigation of DAQ gate timing and HRS scaler clocks, no major problems still
- Wednesday (2/27):
  - Took more cosmics and sci-fi data to elucidate raw mode DAQ questions
  - Took new BPM pedestal runs (thanks Jason)
  - Corrected a helium flow PID loop problem over night
  - More DAQ coincidence timing shifts, likely due to unstable gate generators – hopefully not serious
  - Established contingencies for optimal calibration data running over the following week

# Coincidence Signal

Same plot Shujie showed, 75 runs combined R vs L arm delta-p, w/ and w/o timing cuts around coincidence peak:



Coincidence timing window shifted, but coincidence peak remains safely in the window



Thanks!