Polarimeter Updates

- Scaler readouts
- Running DAQ
- Pedestal adjustment
- Missing channel
- DATA!!

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Translation Table

- Convert from rocid, slot, channel to detector
- Enables grabbing objects with JANA framework
- Also necessary for scalers to be read out
- Within ccdb, set run > 2881, is Translation/DAQ2detector
- Run ccdb -r 2882 dump Translation/DAQ2detector to see contents
- Thanks to Paul M. for putting these in

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Translation Table

- Script used is in online/packages/TranslationTable/tt_add_tpol_sectors.py
- Check what is in tt.db:

```
> sqlite3 tt.db
> sqlite> .headers on
sqlite> .schema
CREATE TABLE BCAL(module INT, layer INT, sector INT, end TEXT, adc_chanid INTEGER, tdc_chanid INTEGER, disc_chanid INTEGER);
CREATE TABLE CDC(ring INT, straw INT, adc_chanid INTEGER);
CREATE TABLE Channel(chanid INTEGER PRIMARY KEY, moduleid INTEGER, name TEXT, channel INT, system TEXT, col_name TEXT, enable INTEGER DEFAULT 1);
CREATE TABLE Crate(crateid INTEGER PRIMARY KEY, name TEXT, area TEXT, rack INT, location TEXT, SN TEXT, Function TEXT, rocid INT, host TEXT, IP TEXT);
CREATE TABLE Detector_Hierarchy( id INTEGER PRIMARY KEY, parent_id INTEGER, name TEXT, type TEXT, chanid INTEGER, mtime DATETIME DEFAULT
CURRENT_TIMESTAMP);
CREATE TABLE FCAL(row INT, col INT, adc_chanid INTEGER);
CREATE TABLE FDC_Cathodes(package INT, chamber INT, view TEXT, strip INT, strip_type TEXT, adc_chanid INTEGER);
CREATE TABLE FDC_Wires(package INT, chamber INT, wire INT, tdc_chanid INTEGER, disc_chanid INTEGER);
CREATE TABLE Module(moduleid INTEGER PRIMARY KEY, crateid INTEGER, slot INT, type TEXT, SN TEXT);
CREATE TABLE PS(side TEXT, id INT, adc_chanid INTEGER);
CREATE TABLE PSC(id INT, adc_chanid INTEGER, tdc_chanid INTEGER, disc_chanid INTEGER);
CREATE TABLE RF(system TEXT, type TEXT, tdc_chanid INT, adc_chanid INT);
CREATE TABLE ST(sector INT, adc_chanid INTEGER, tdc_chanid INTEGER, disc_chanid INTEGER);
CREATE TABLE TAGH(id INT, adc_chanid INTEGER, tdc_chanid INTEGER, disc_chanid INTEGER);
CREATE TABLE TAGM(col INT, row INT, adc_chanid INTEGER, tdc_chanid INTEGER, disc_chanid INTEGER);
CREATE TABLE TOF(plane INT, bar INT, end TEXT, adc_chanid INTEGER, tdc_chanid INTEGER, disc_chanid INTEGER);
CREATE TABLE TPOL(sector INT, ring INT, adc_chanid INT);
sqlite> .exit
```

Translation Table TPOL

```
<crate number="84" type="VXS">
  <slot number="1" type="CPU">
  </slot>
  <slot number="11" type="CTP">
  </slot>
  <slot number="12" type="SD">
  </slot>
  <slot number="13" type="FADC250">
    <channel number="0" detector="TPOL" sector="1" ring="0"/>
    <channel number="1" detector="TPOL" sector="2" ring="0"/>
    <channel number="2" detector="TPOL" sector="3" ring="0"/>
    <channel number="3" detector="TPOL" sector="4" ring="0"/>
    <channel number="4" detector="TPOL" sector="5" ring="0"/>
    <channel number="5" detector="TPOL" sector="6" ring="0"/>
    <channel number="6" detector="TPOL" sector="7" ring="0"/>
    <channel number="7" detector="TPOL" sector="8" ring="0"/>
    <channel number="8" detector="TPOL" sector="9" ring="0"/>
    <channel number="9" detector="TPOL" sector="10" ring="0"/>
    <channel number="10" detector="TPOL" sector="11" ring="0"/>
    <channel number="11" detector="TPOL" sector="12" ring="0"/>
    <channel number="12" detector="TPOL" sector="13" ring="0"/>
    <channel number="13" detector="TPOL" sector="14" ring="0"/>
    <channel number="14" detector="TPOL" sector="15" ring="0"/>
    <channel number="15" detector="TPOL" sector="16" ring="0"/>
    <channel number="16" detector="RF" system="PS" type="FADC250"/>
  </slot>
  <slot number="14" type="FADC250">
    <channel number="0" detector="TPOL" sector="17" ring="0"/>
    <channel number="1" detector="TPOL" sector="18" ring="0"/>
    <channel number="2" detector="TPOL" sector="19" ring="0"/>
    <channel number="3" detector="TPOL" sector="20" ring="0"/>
    <channel number="4" detector="TPOL" sector="21" ring="0"/>
    <channel number="5" detector="TPOL" sector="22" ring="0"/>
    <channel number="6" detector="TPOL" sector="23" ring="0"/>
    <channel number="7" detector="TPOL" sector="24" ring="0"/>
    <channel number="8" detector="TPOL" sector="25" ring="0"/>
    <channel number="9" detector="TPOL" sector="26" ring="0"/>
    <channel number="10" detector="TPOL" sector="27" ring="0"/>
    <channel number="11" detector="TPOL" sector="28" ring="0"/>
    <channel number="12" detector="TPOL" sector="29" ring="0"/>
    <channel number="13" detector="TPOL" sector="30" ring="0"/>
    <channel number="14" detector="TPOL" sector="31" ring="0"/>
    <channel number="15" detector="TPOL" sector="32" ring="0"/>
  </slot>
  <slot number="21" type="TI">
  </slot>
</crate>
```

RF for PS was there already, need to remove later

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Scalers

- Monitor rates online
- In future will be monitored by GUI (Paul M.) and saved in archiver
- For now, log on to rocps2 from hallgw
- Run > /home/pmatt/controls/epics/R3-14-12-3-RHEL5/drivers/bin/linux-x86/testBoards 1 1
- 1st arg is to use raw values (0) or rates (1), 2nd arg is debug flag
- Slots 13 and 14 are triplet sectors
- Need to add in rings later

```
FADC250: Slot, channel, time, scalars = 13, 1, 0.97856, 0
FADC250: Slot, channel, time, scalars = 13, 2, 0.97856, 0
FADC250: Slot, channel, time, scalars = 13, 3, 0.97856, 0
FADC250: Slot, channel, time, scalars = 13, 4, 0.97856, 0
FADC250: Slot, channel, time, scalars = 13, 5, 0.97856, 0
FADC250: Slot, channel, time, scalars = 13, 6, 0.97856, 0
FADC250: Slot, channel, time, scalars = 13, 7, 0.97856, 0
FADC250: Slot, channel, time, scalars = 13, 8, 0.97856, 0
FADC250: Slot, channel, time, scalars = 13, 9, 0.97856, 0
FADC250: Slot, channel, time, scalars = 13, 10, 0.97856, 0
FADC250: Slot, channel, time, scalars = 13, 11, 0.97856, 0
```

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Running DAQ

- Sasha has set up fADCs and DAQ so we can take self-triggered data
- Log in to hdops, run rcm.sh; this opens the DAQ GUI
- Configuration files are in /gluonfs1/home/hdops/CDAQ/config/hd_psc/
- Files tpol_pulser.conf and tpol_self.conf
- Final part is for TPOL settings, still need to be set to appropriate values

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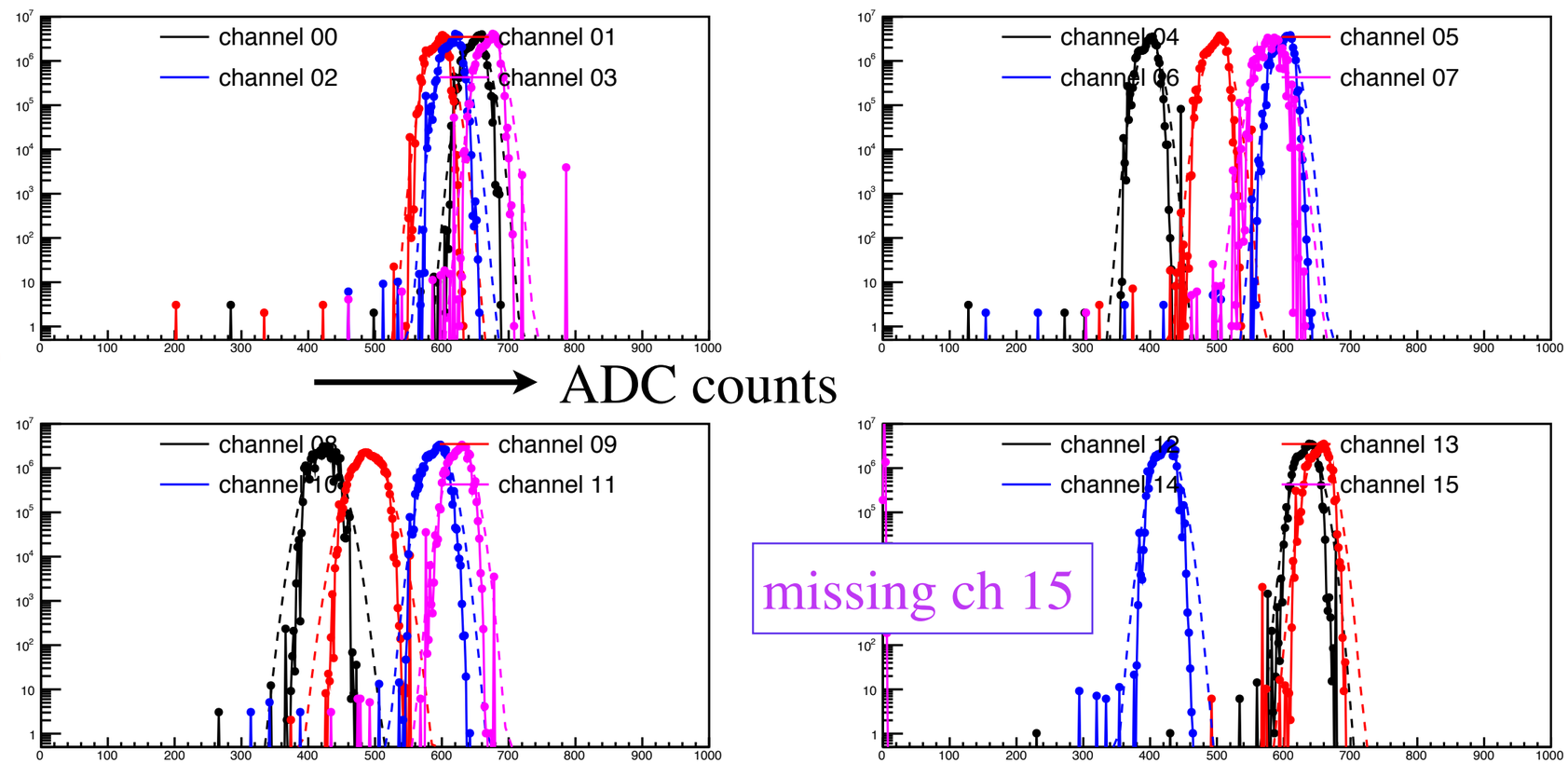
Pedestal Adjustment

- Mark Dalton showed how to adjust pedestals for each channel
- Within config file set DAC values which move the pedestals
- Standard is to have pedestals near 100 ADC counts (max count 4095)

note log scale

For each channel pedestal is cycled through values of 0 - 1000 and scaler rates are read out

channels 0 - 15

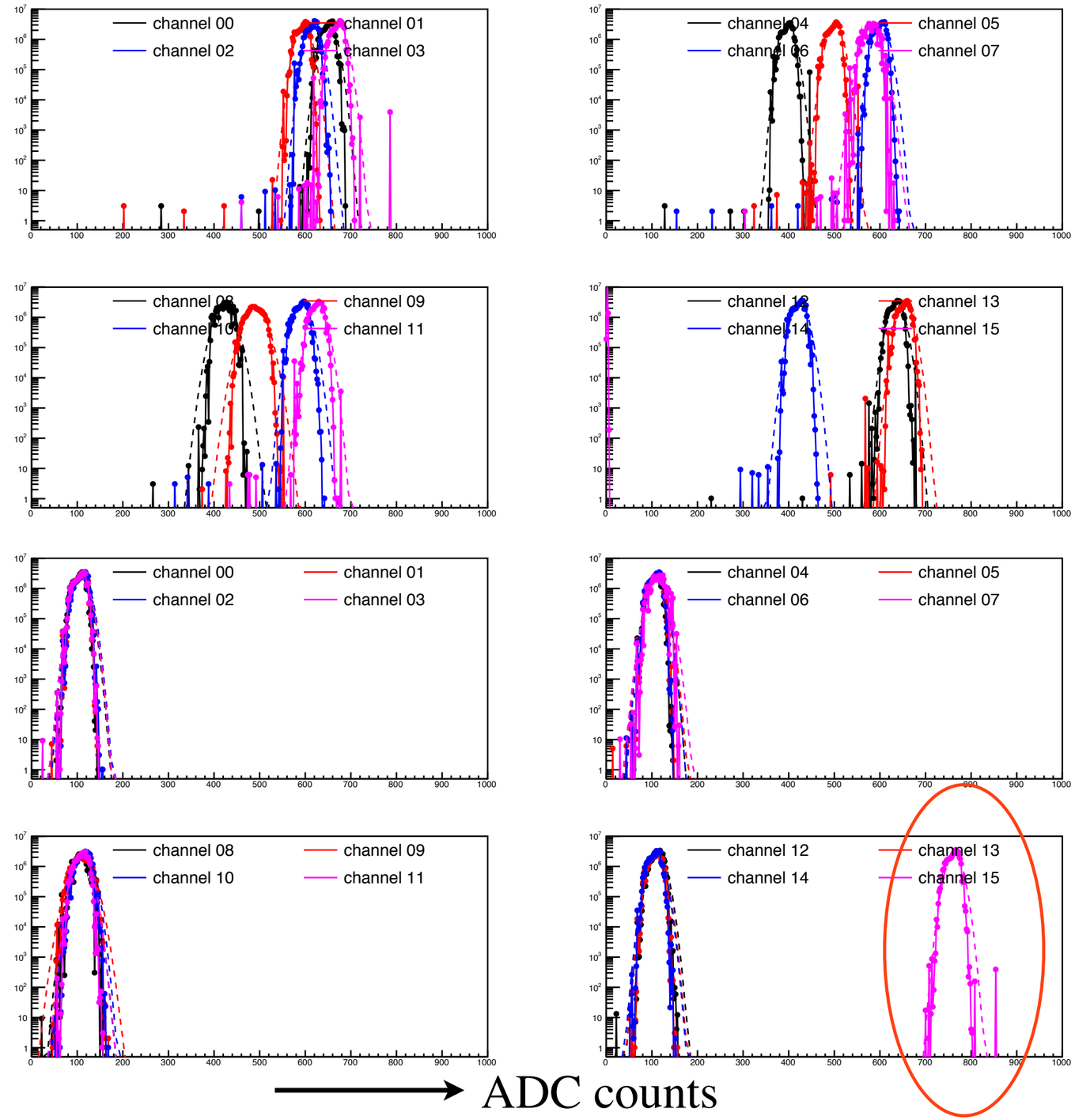


Channels 0 -15

before

- Pedestals now centered at ADC values of 100

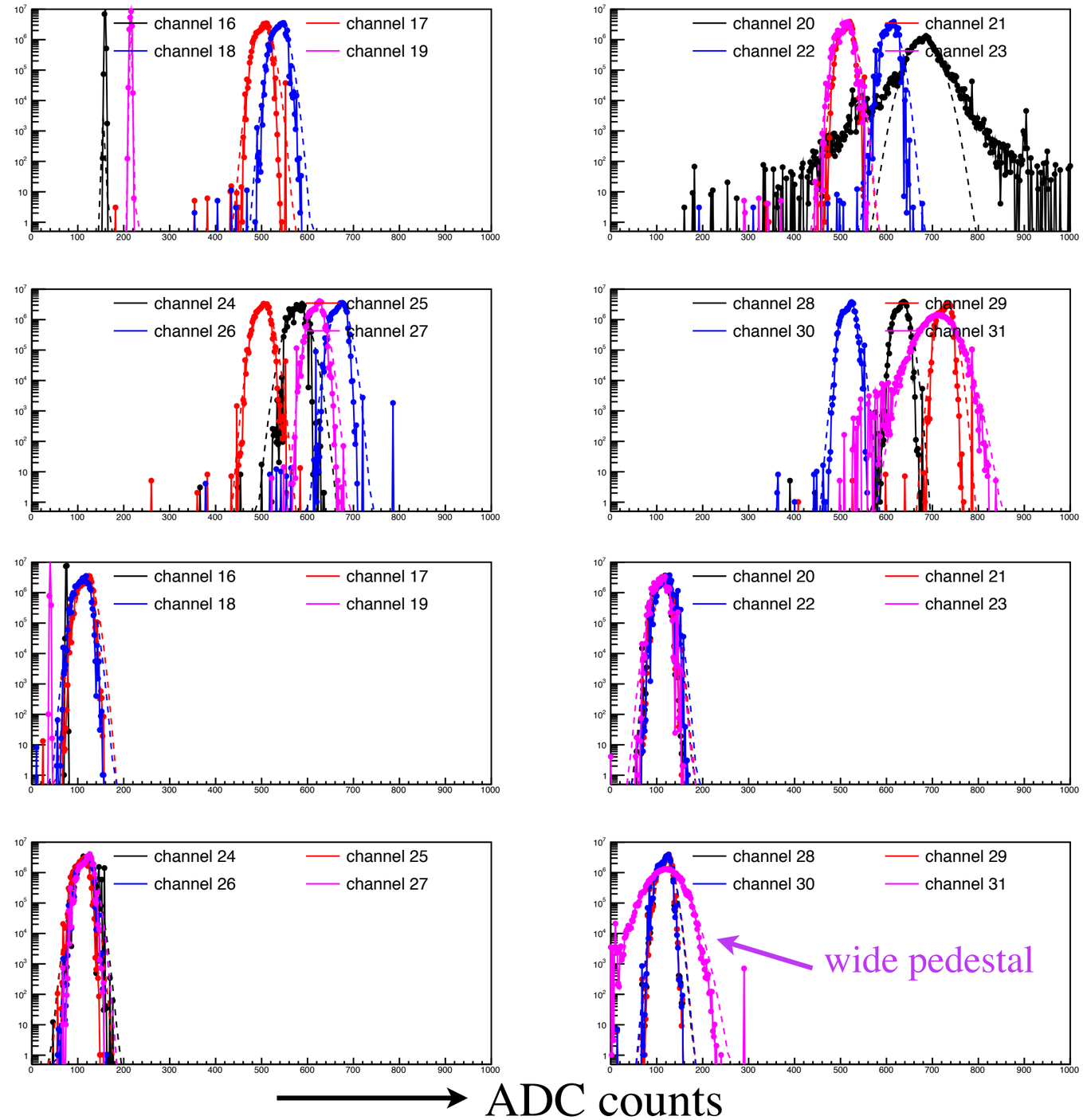
after



Channels 16 -31

before

- Pedestals now centered at ADC values of 100
- Ch 31 had very large (~50 mV) baseline fluctuation on scope

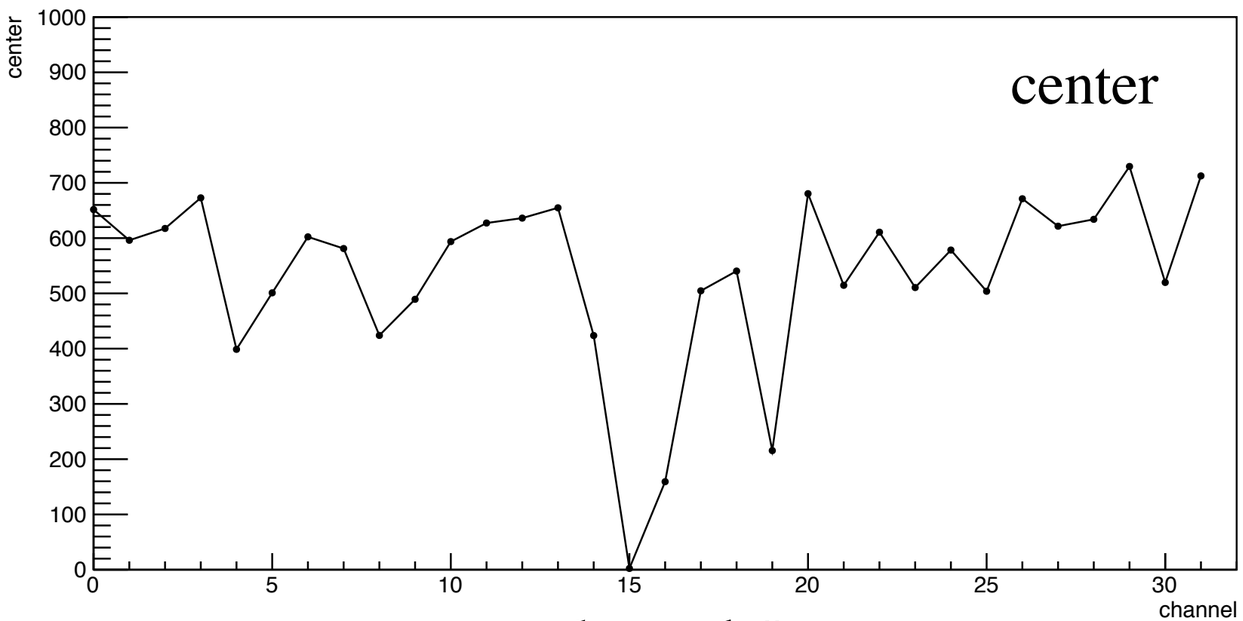


after

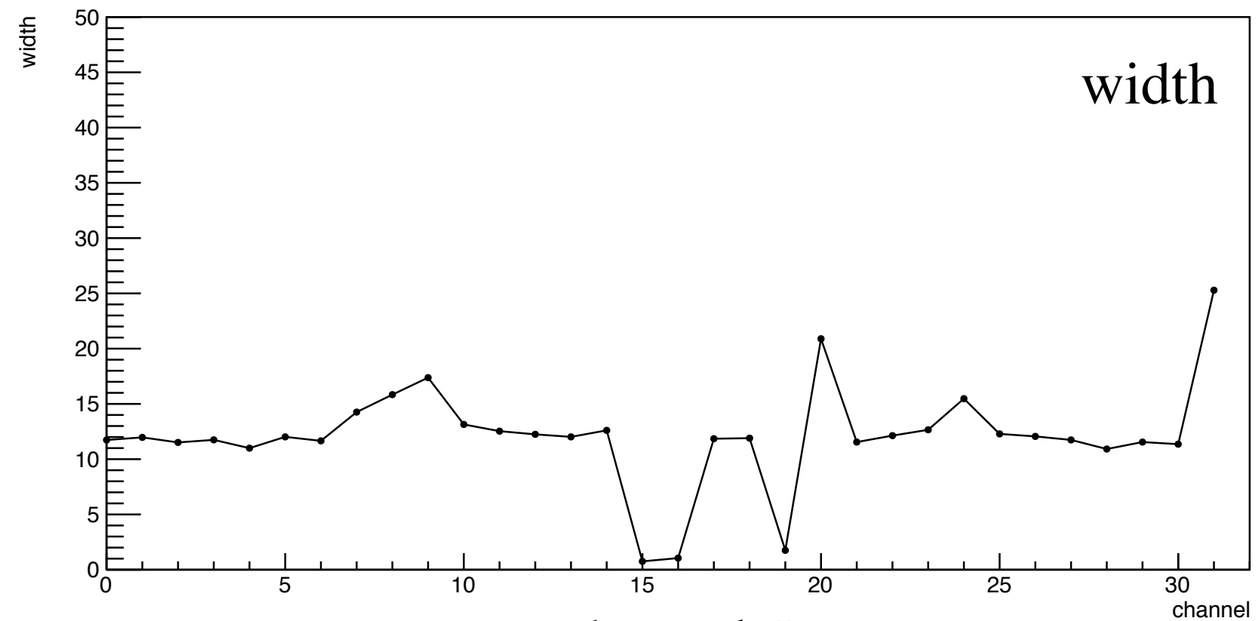
Pedestal Adjustment

- Fit pedestal distributions with Gaussian functions

before adjustment



channel #

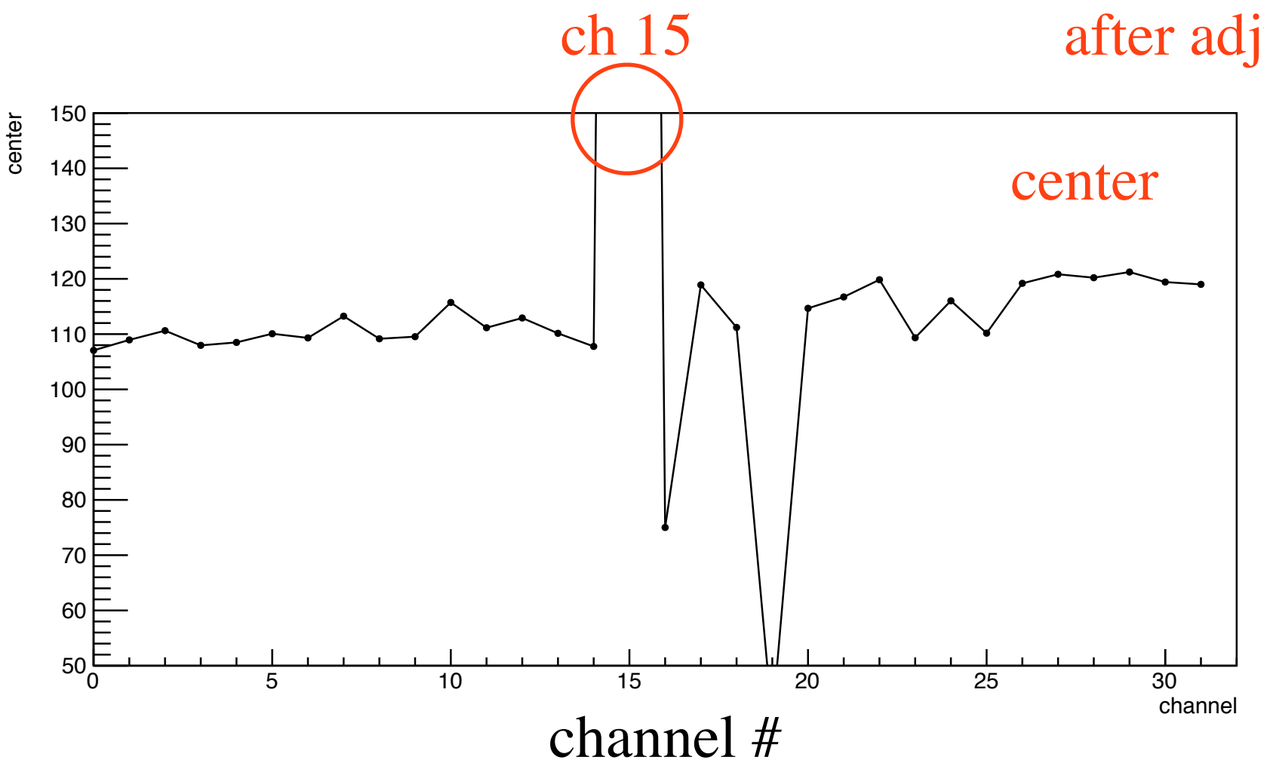


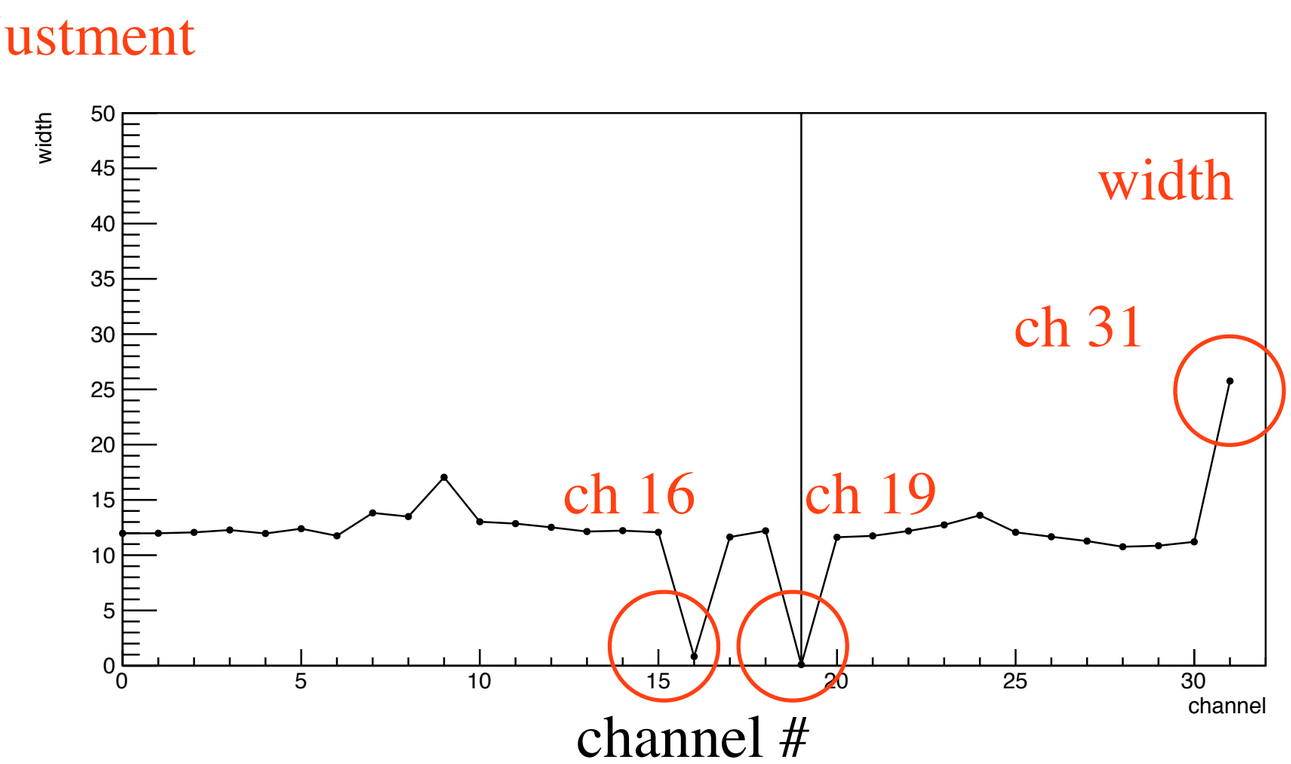
channel #

Width is much wider compared to other detectors,
probably due to baseline 60Hz noise + fluctuation

Pedestal Adjustment

- Fit pedestal distributions with Gaussian functions





- Ch 15 was not adjusted yet (next slides)
- Ch 16 and 19 may not be working (narrowness of distribution suggests this)
- Ch 31 has baseline fluctuations

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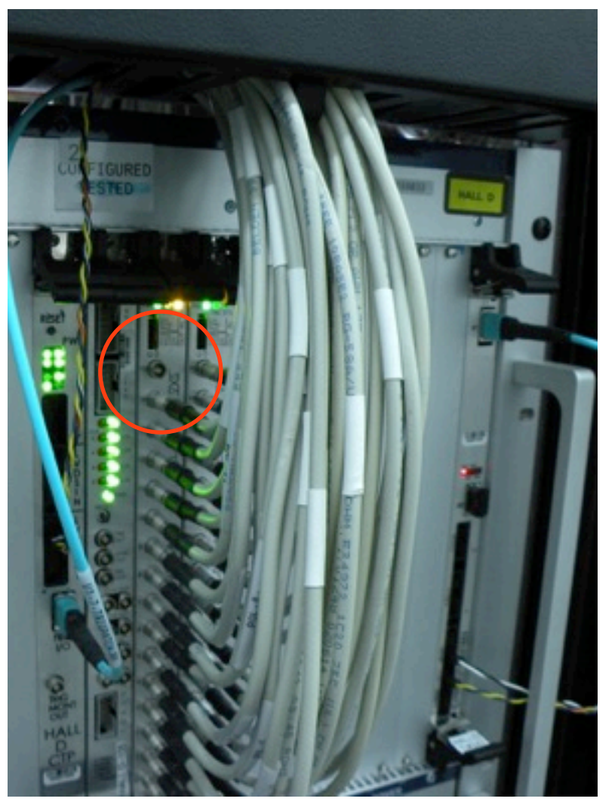
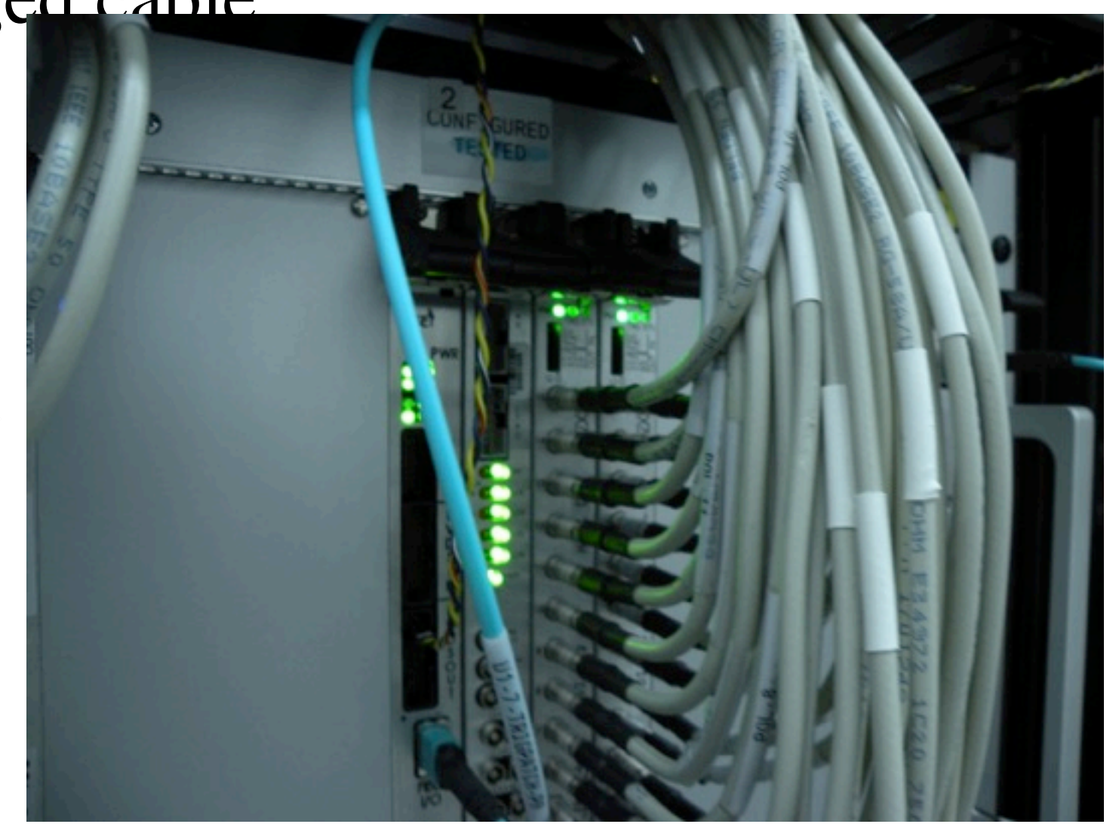
Missing Channel

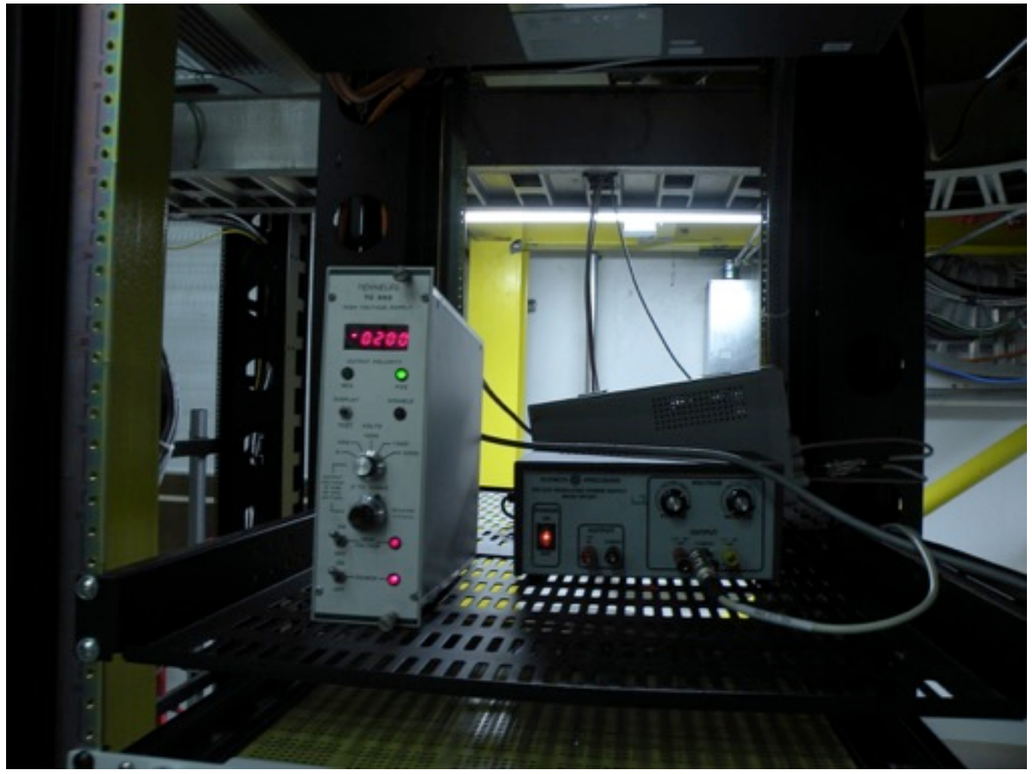
- Pointed out by Sasha that one channel was missing (slot 13, channel 15)
- Confusion in electronics group about where to put RF cable
- Went in during controlled access, plugged cable





Other Checks

- Checked what I could
- HV, LV seem fine, fans are working
- Not sure which vacuum level is for polarimeter



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DATA!!!!

- Sasha started configuring the settings and taking data on Monday night
- Initial look is run 2941, ~20k events
- Grabbing fADC250 pulse integral objects without JANA framework, will work on this when I have time
- Data is from PS trigger (coincidence in left and right arms of coarse PS), 100 samples are read out

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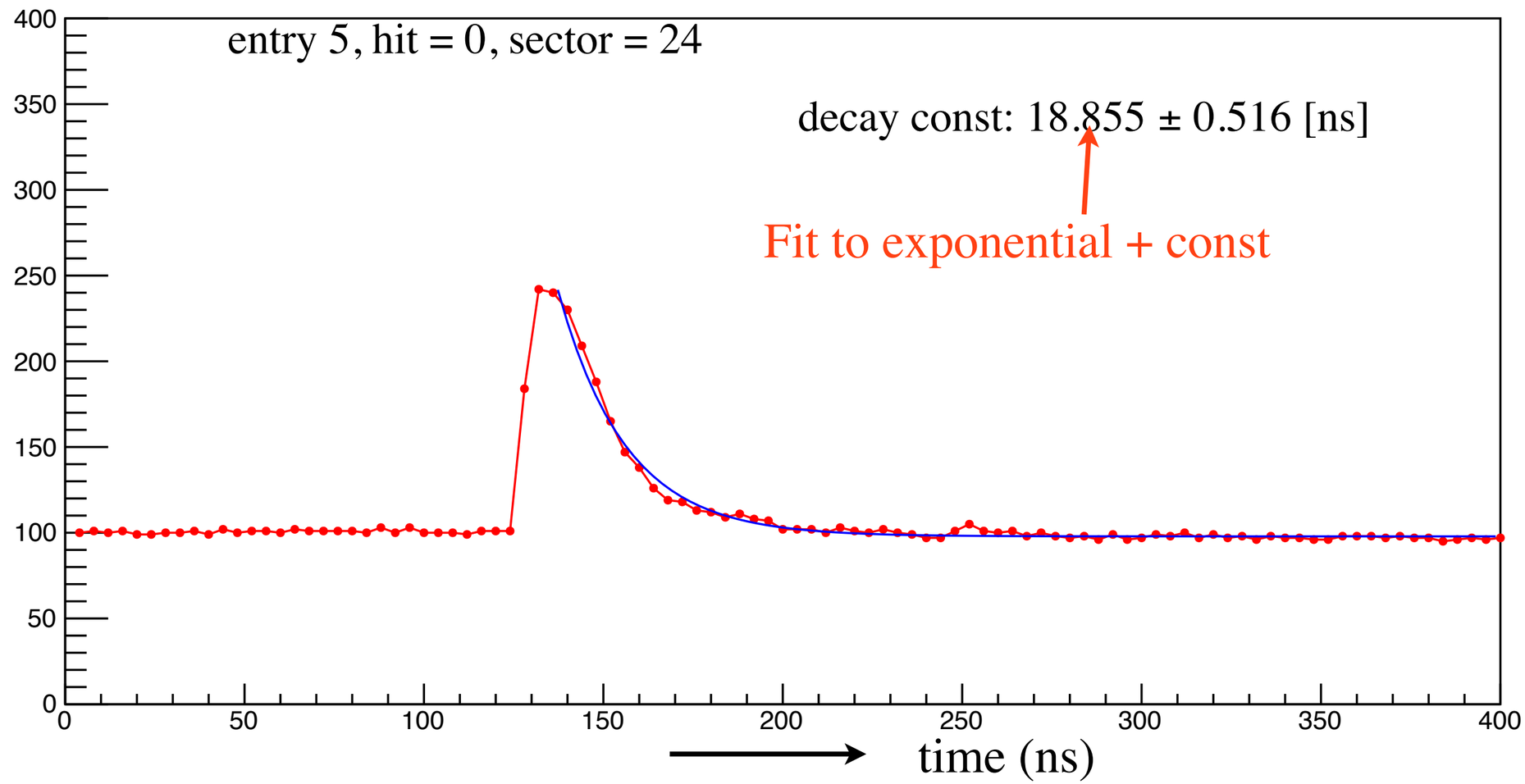
DATA!!!!

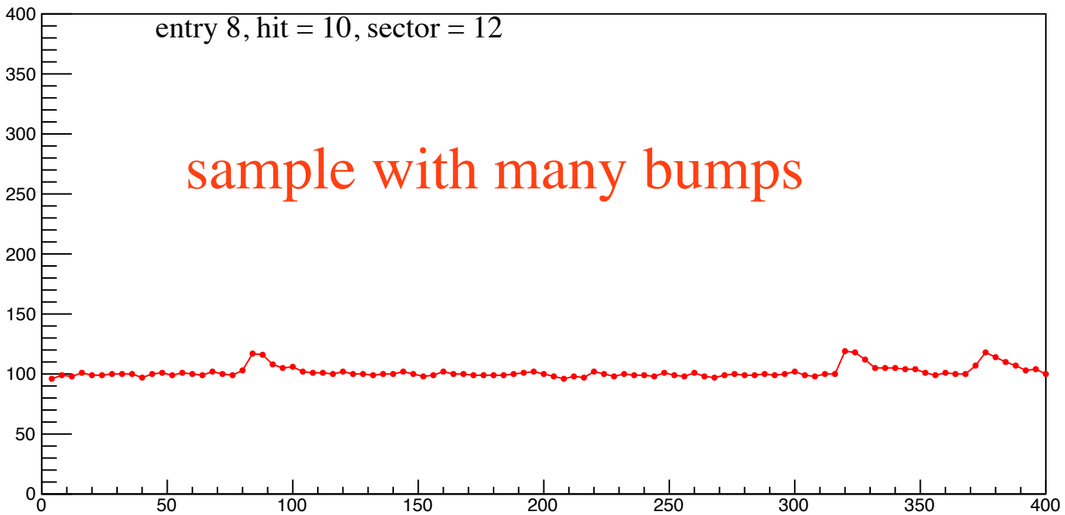
- Raw waveforms from hit (100 samples, 400 ns)
- Decay time is ~20 ns, much shorter than what we are used to

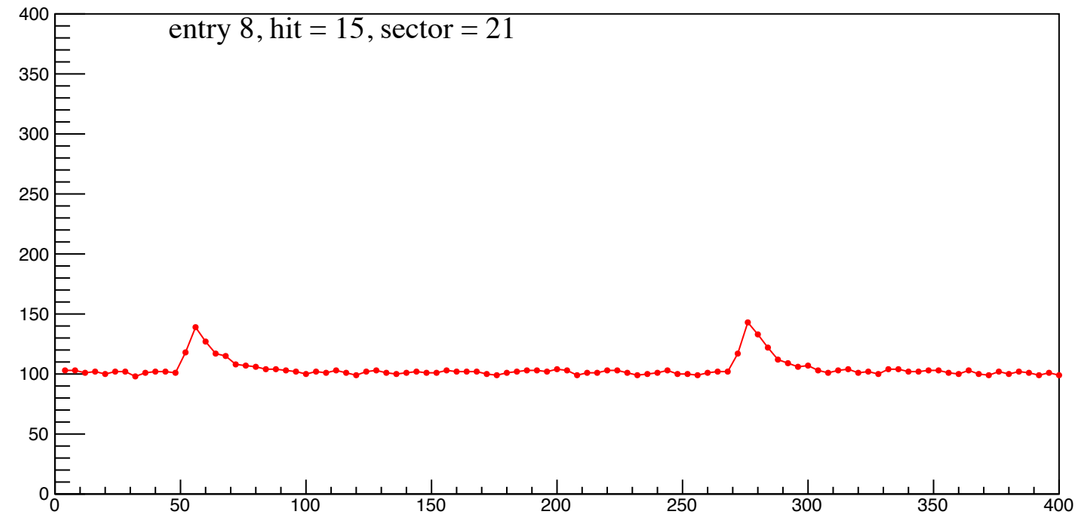
Run 2914

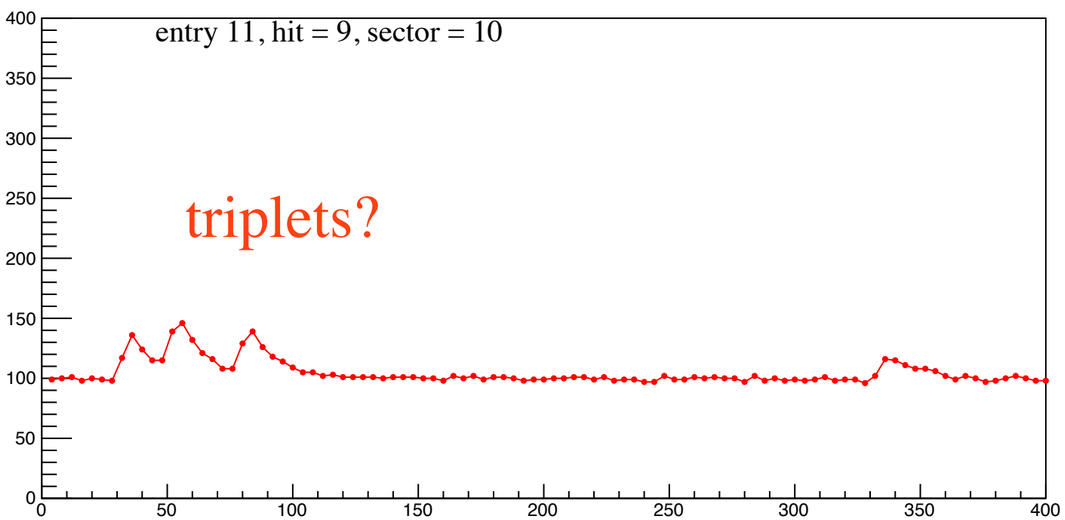


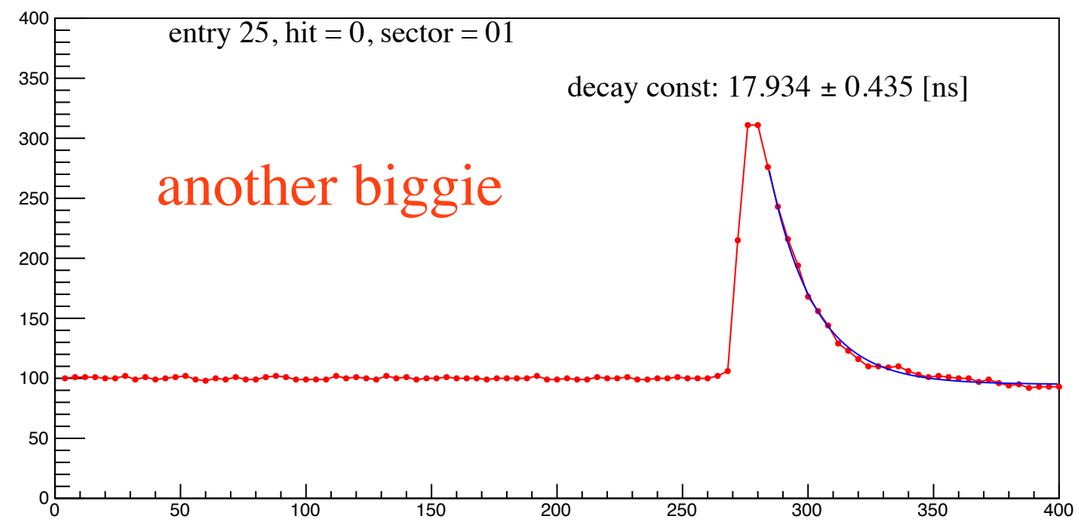
DATA!!!!

Run 2914









More Data

1. https://halldweb.jlab.org/cgi-bin/data_monitoring/run_conditions.pl

- PS trigger data from night of April 28 - 29

run	# events[1]	TPOL converter	radiator
2914	31.8k	none	
3007	202.8k	none	
3012	201.1k	none	
3015	30k	25 μm	
3016	8k	50 μm	
3017	7.5k	50 μm	
3018	2.69M	none	diamond
3019	1.81M	none	diamond
3020	2.18M	none	amorphous
3021	2.34M	none	amorphous
3022	3.42M	none	amorphous
3023	183k	none	amorphous
3024	107k	none	amorphous

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Analysis

- No qualitative difference between runs with and without converter
- Will work on getting TPOL into GlueX framework so that we can relate hits with other systems (PS, tagger)
- Need to understand features

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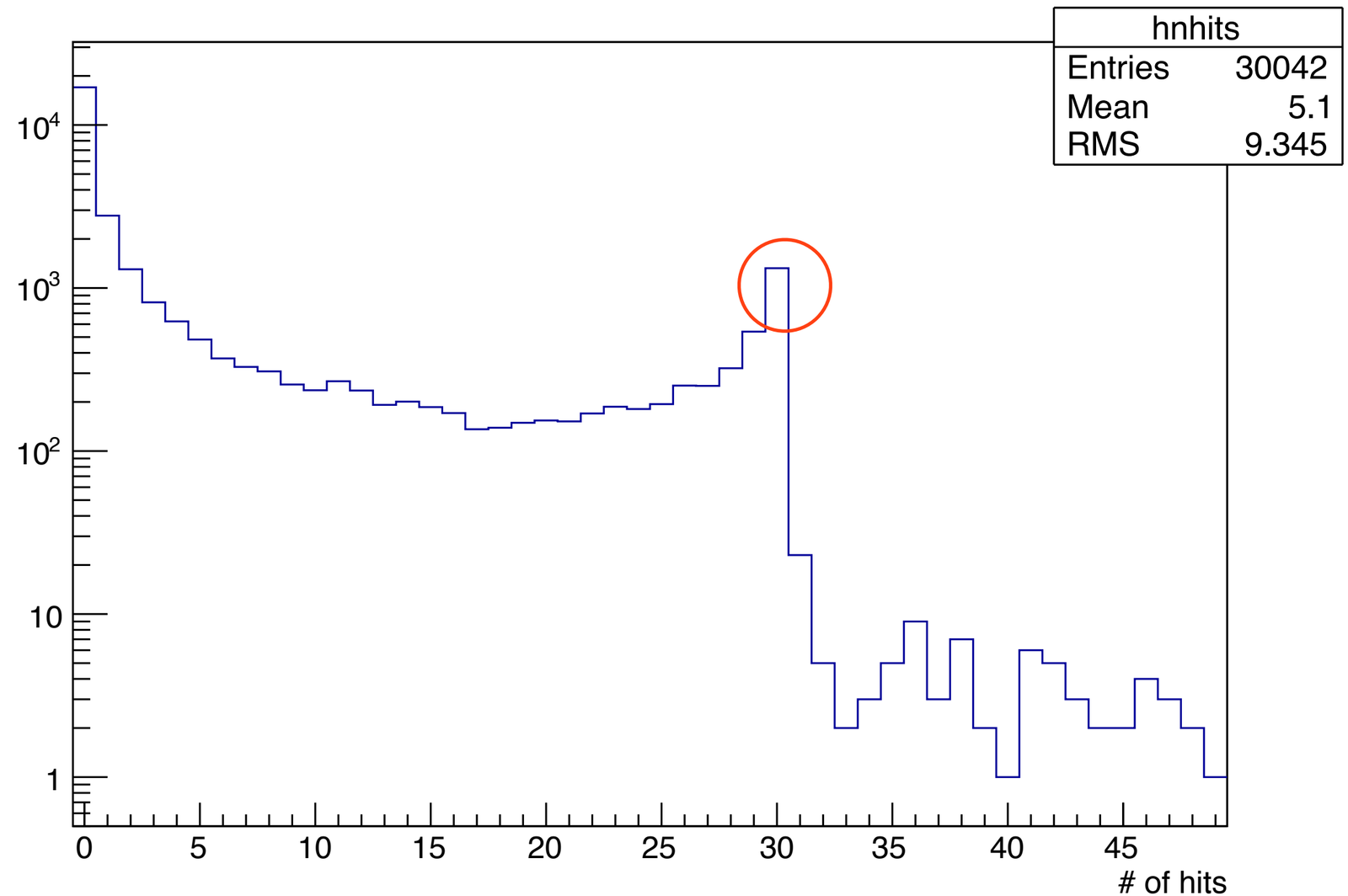
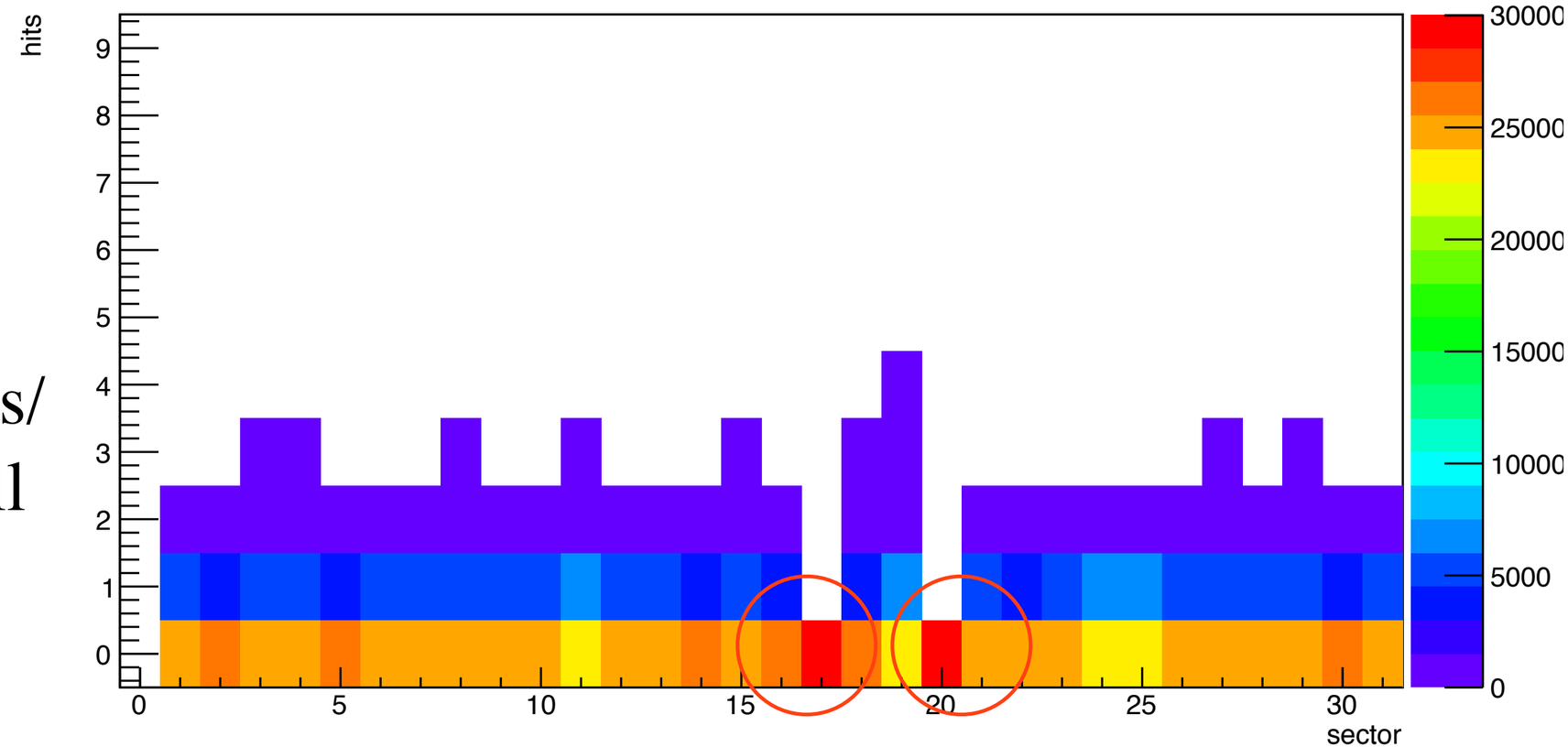
of Hits/Event

- Run 3015
- Same sector can have multiple hits
- Sasha may be trying to read out all channels regardless of pulse heights



of Hits By Sector

- Run 3015
- Missing 2 sectors
- Would partly explain tendency to get 30 hits/ event if reading out all channels that have ADC counts > 110



Looking Forward

- Need to check a few things in hall tomorrow
- Analyze current data, more coming - have requested different converter combinations