

Module & Calibration Summary

Hua Ye

DESY PXD Workshop,
2019.09.23-24

Module Calibration

Local Run Practice

- We will make a practice to take local runs for all the sub-system.
- The local run data taking should finish in 20 minutes.
- Then, sub-system should go back to the global mode.
- Feb. 18 : the 1st test day. Please get ready.
 - ARICH should be integrated by this date.

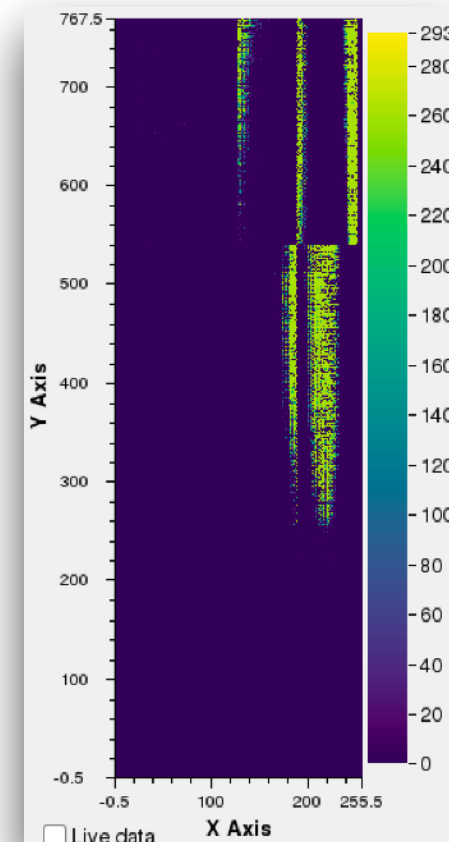
From Adachi-san in 2019 Feb B2GM

Module Calibration

- Pedestals
 - To speed up: skip PV dump, plotting, Elog uploading.
 - Routine updating: after power cycle, after each physics run.

```
[pxdbonndaq3:~]$ cd /data/commissioning/runs/all/EXP0008/pedestal/run3090/  
[pxdbonndaq3:~/EXP0008/pedestal/run3090]$ ll *dat  
-rw-rw-r--. 1 b2pxd b2pxd 69M Jun 25 14:20 H30rawframe_data.dat  
-rw-rw-r--. 1 b2pxd b2pxd 77M Jun 25 14:20 H40rawframe_data.dat  
-rw-rw-r--. 1 b2pxd b2pxd 80M Jun 25 14:20 H50rawframe_data.dat  
-rw-rw-r--. 1 b2pxd b2pxd 69M Jun 25 14:20 H60rawframe_data.dat
```

- Verification of uploaded pedestals
 - pedestal/update.py —verify
 - not activated in calibrationIOC
- Track the pedestals in use.
 - Defined in calibrationIOC, updated in pedestal/update,
 - E.g.
 - PXD:M:H1011:pedestalmmap,
 - PXD:M:H1011:last-pedestal-update
 - PXD:M:H1011:last-pedestal-path
- synchronization
 - Otherwise

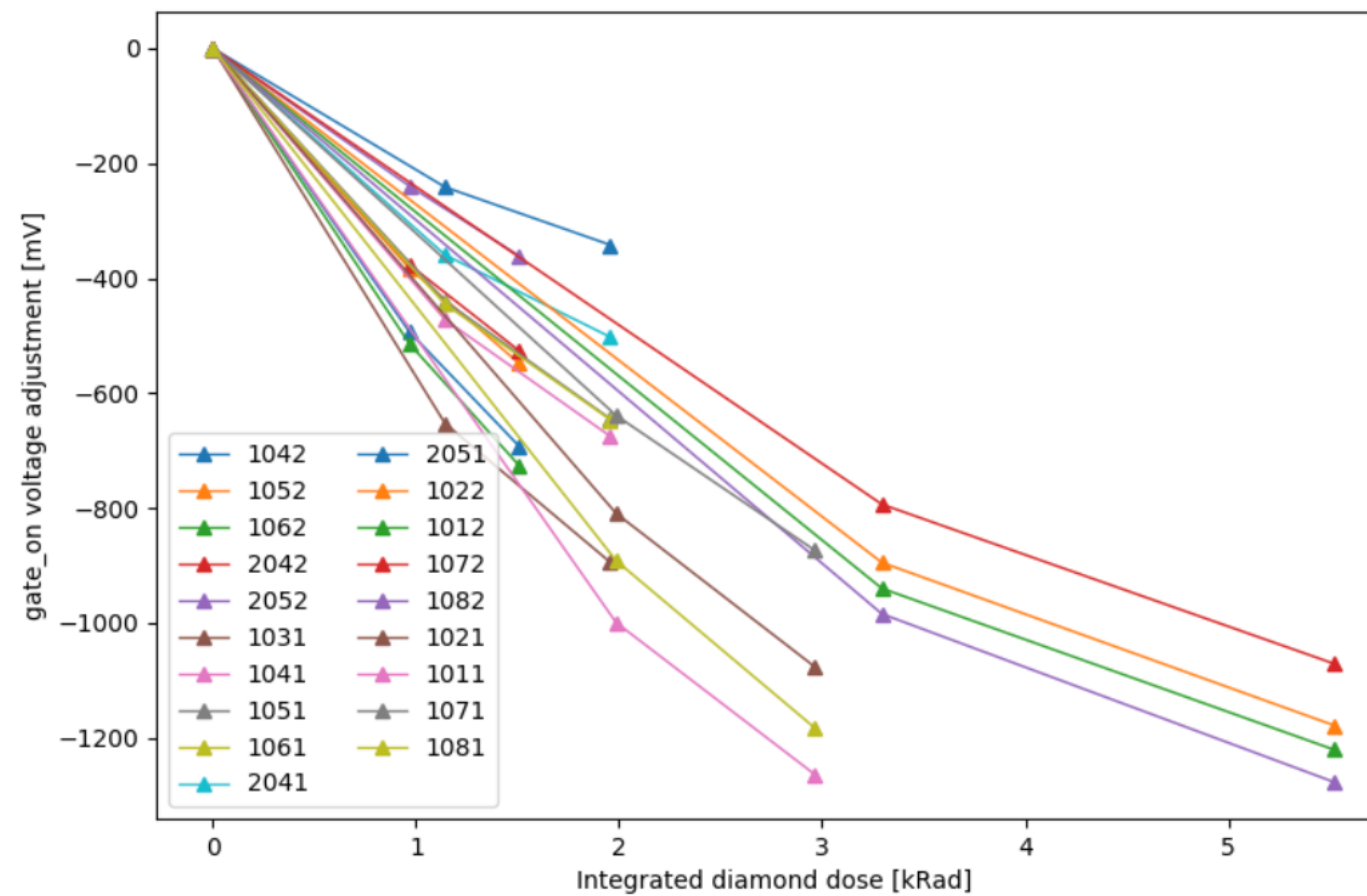


Module Calibration

- Masks in pedestal analysis:
 - Unconnected DCD channels
 - Noisy pixels ($>$ threshold) and zero noise pixels
 - Hot pixels/gates
 - Manually updated in /home/b2pxd/lab_framework/calibrations/pedestal/masks/maskW*.npy, and summarized in JIRA tickets.
- Total mask included in pedestal analysis results.

Module Calibration

- Threshold voltage shift



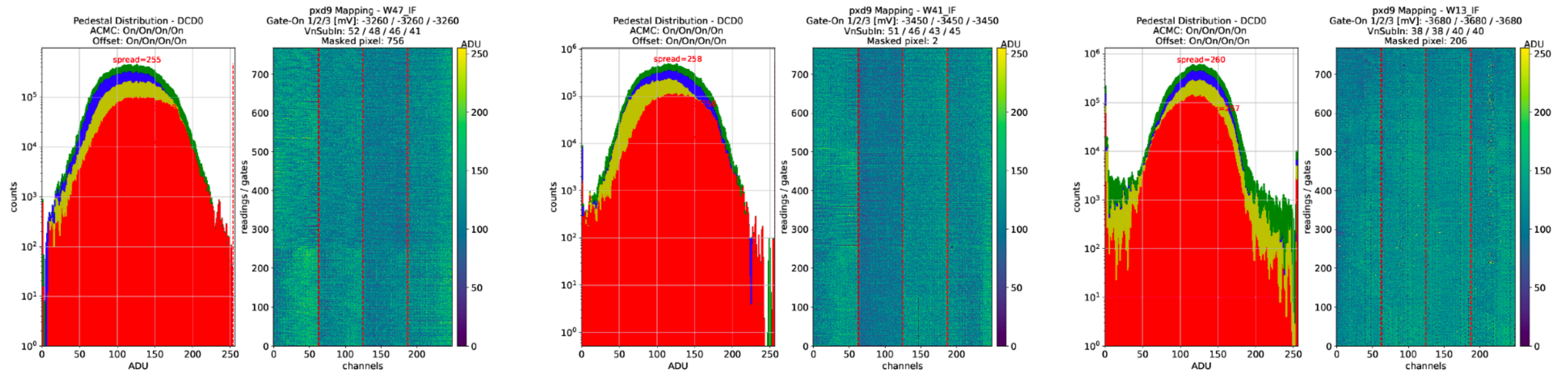
- Integrated dose: no updates since May.10

Module Calibration

- Offset calibration
 - Modules calibrated in parallel
 - Calculates the Offset values and the IPDAC value per gate
 - Underflow detection for offsets calibration
 - Adjust the position of pedestals after calibration
- Workaround of DHP bug
 - Mask the last gate or >2 firing pixels in the last but one row.
- Voltage sweep with beam (HV, drift, clear-off)

Module Calibration

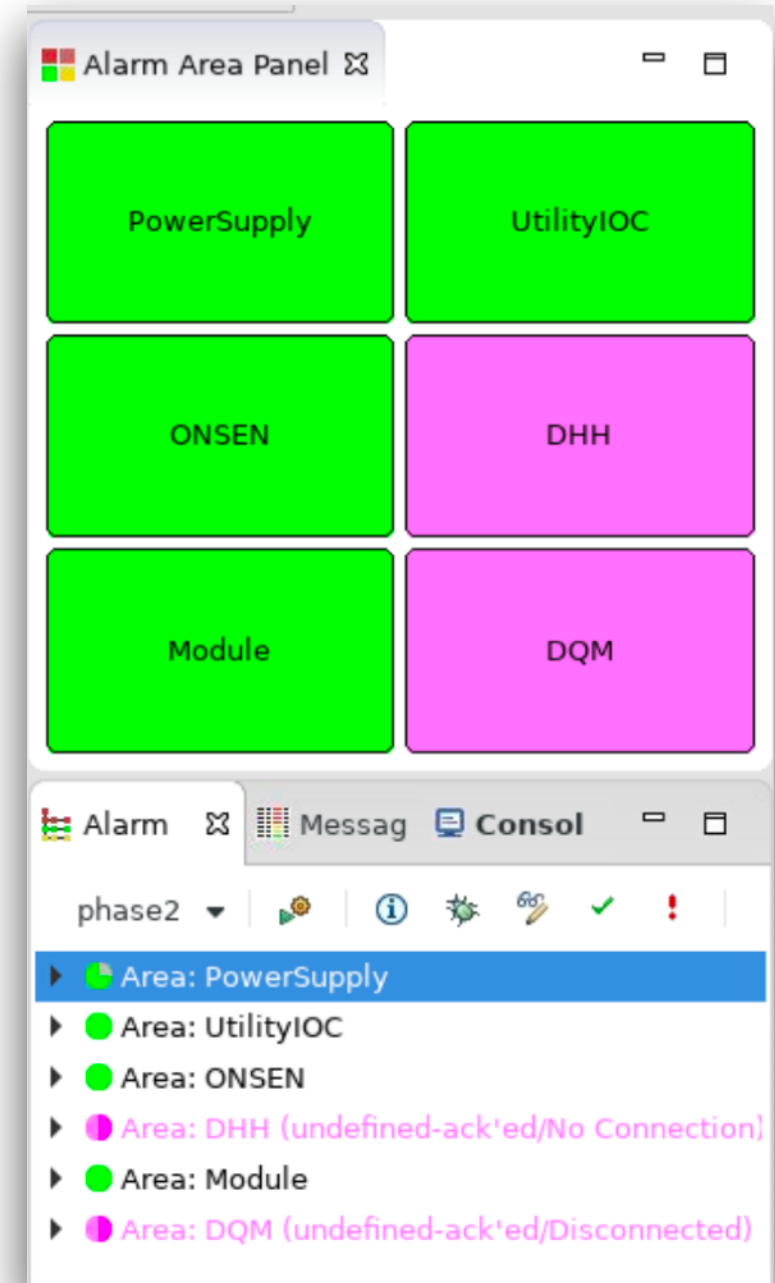
- Calibrations were carried out after summer shutdown
- <https://elog.belle2.org/elog/PXD-Commissioning-KEK/5439> - 5456
- Some modules still not very satisfying, H1071, H1061, H1041



Backup

Module Operation

- IOCs
 - configApp
 - 4 DHC, 20 DHE, 4 DHI master,
 - DHHseq,
 - psApp, PS-control,
 - Onsen, Datcon, ...
- Alarms & Interlock
 - VLHI
 - SVD dock chiller
 - PS
 - Regulator
 - OVP
 - Temperature (utilityIOC)
 - Synchrotron Radiation.
 - System synchronization.
 - Occupancy drop.
 - DQM
- IOCs: calibrationIOC, OnlineMonitor...



Incidents, Issues, Errors...

- QCS quenches
- H2041 JTAG communication issue
 - Solved by excluding other ASICs while writing JTAG.
- PXD related errors which stopped the beam runs
 - Occupancy drop, need to request for SALS