

IPMI, SlowControl, DQM

Status, Performance, Lessons learned

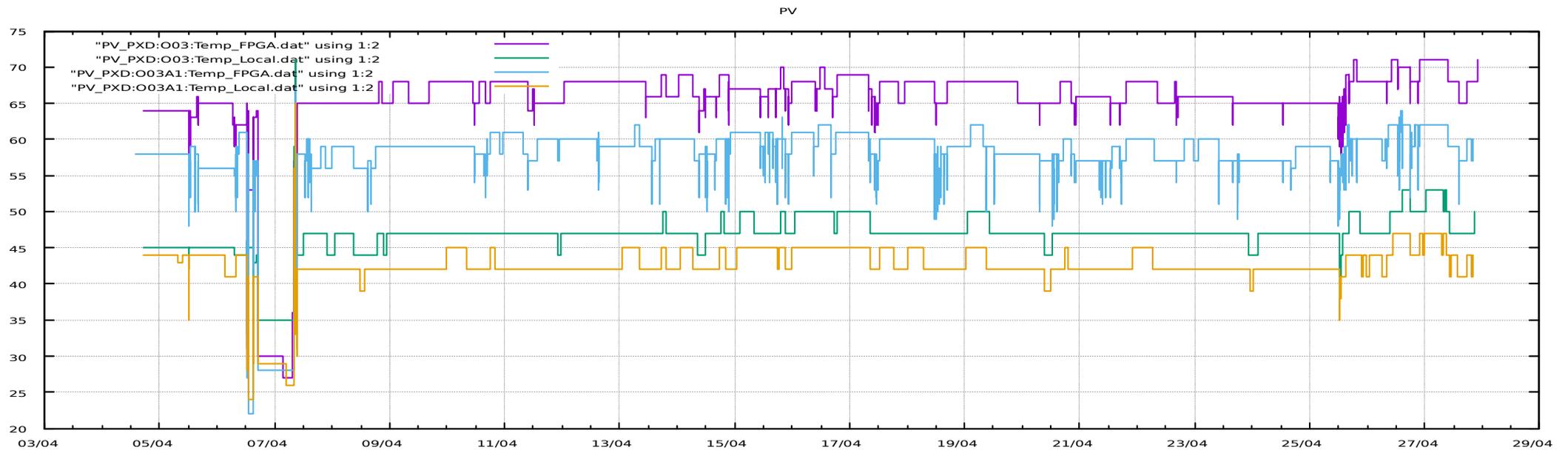
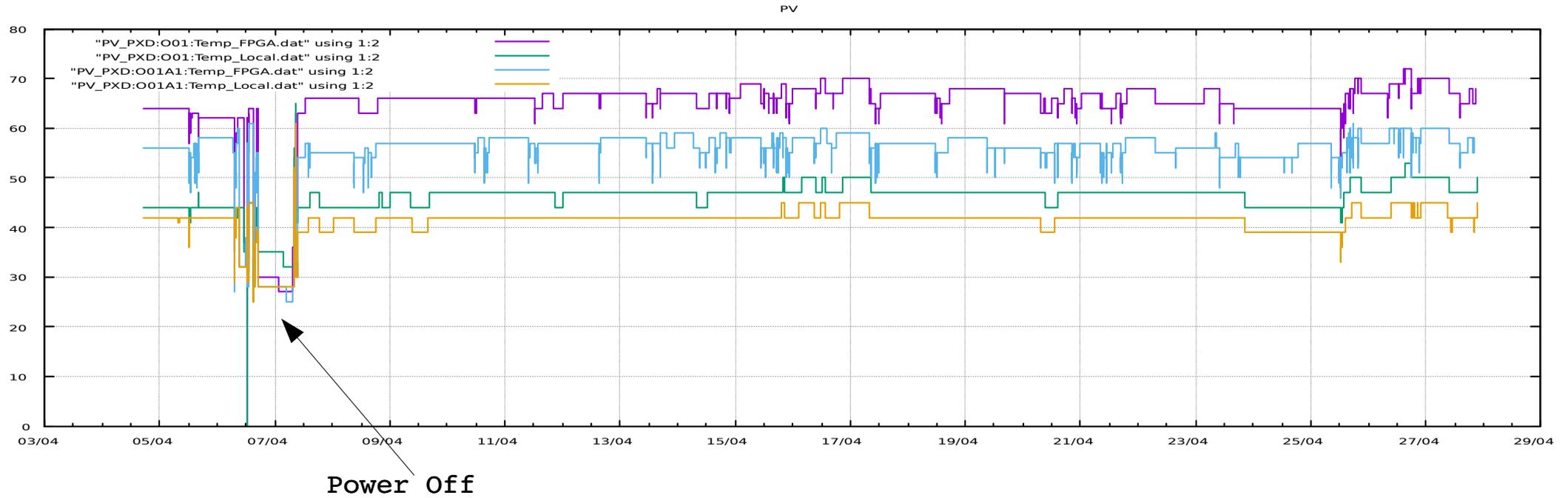
(Seeon, 13.5.2016)

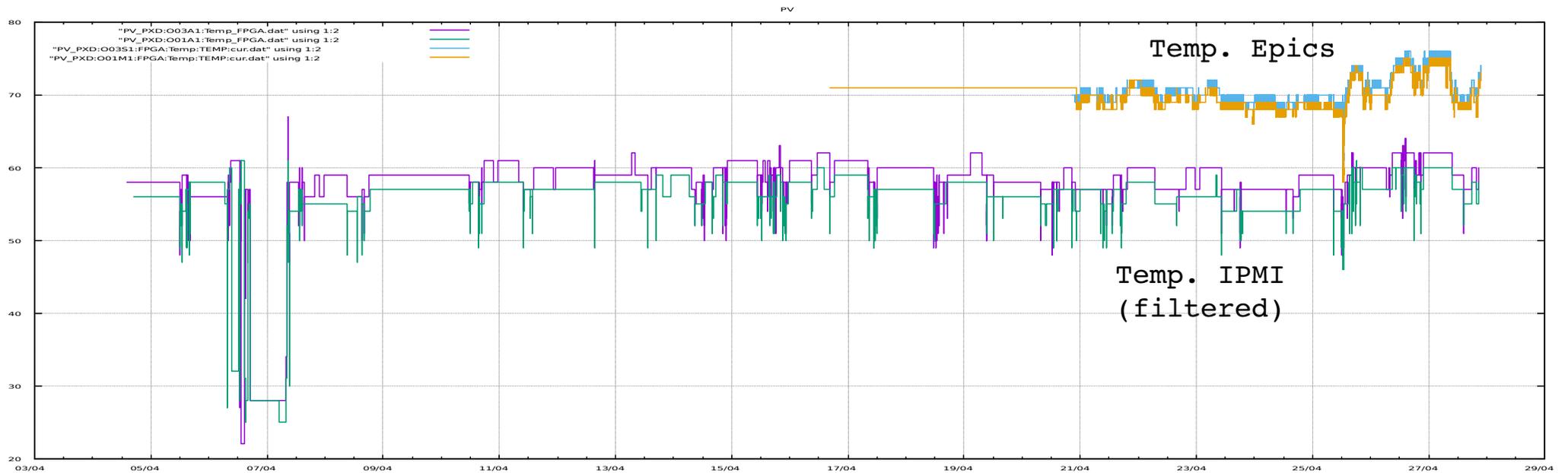
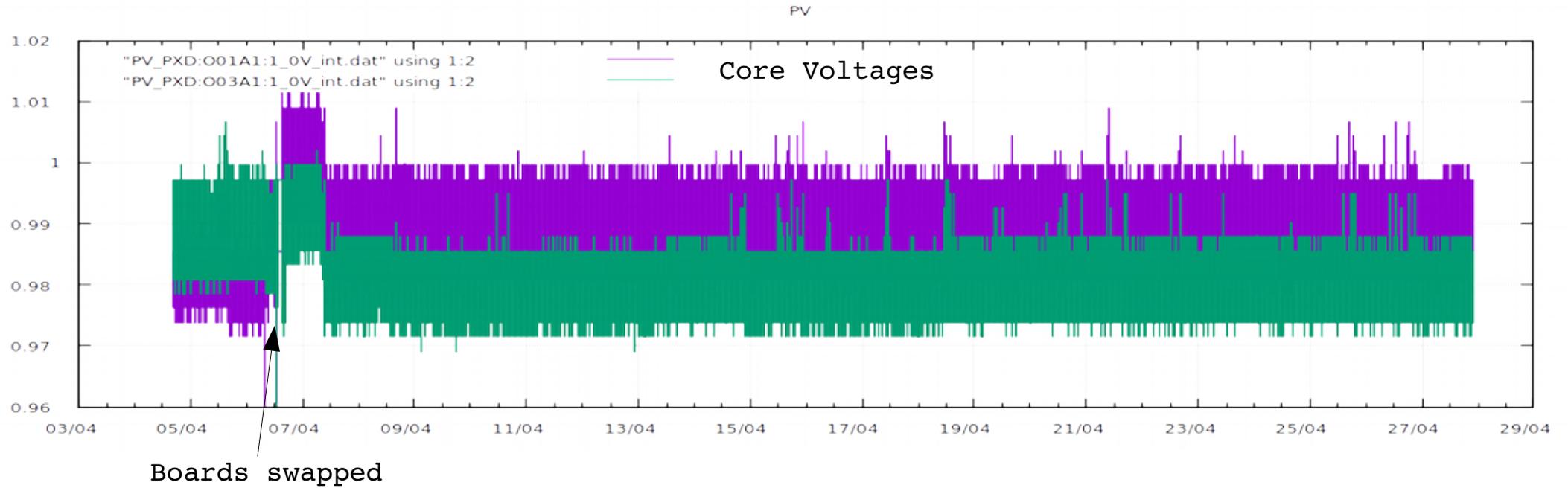
- IPMI – Monitoring and Control Boards
 - 2 IPMC used on ONSEN Carrier
 - 2 MMC used on ONSEN AMC cards
 - (none for DATCON, new shelf was not available yet)
 - ATCA “Pizza” shelf with redundant Shelf Manager (ShM)
 - OPI for shelf, Carrier and AMC, available from repository and web opi.
- Running 24/7; one IOC restart due to changing AMC slots in the first week
- Sensor data (ShM, IPMC, MMC) was archived for the whole beam time
- A few sensors (temperature) were integrated into the alarm system in the last week as test cases.

- Rollout:
 - IPMC/MMC boards provided for KEK test setup

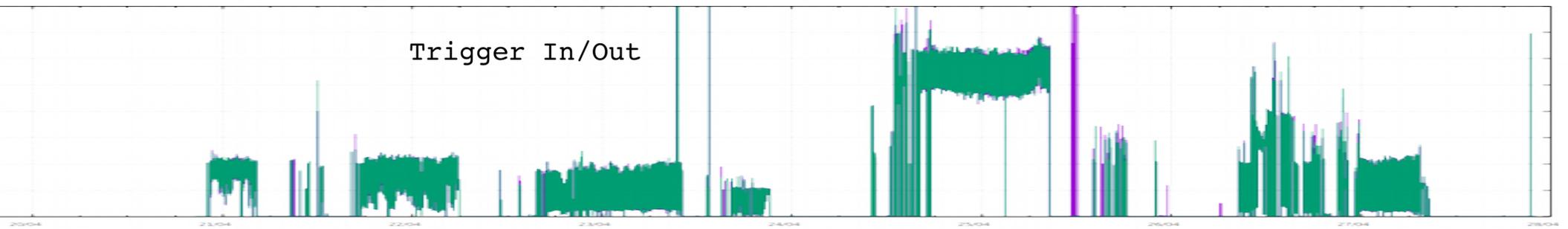
Archived data - Temperatures

(Data is pre-filtered for storage reason, only changes >2 shown)

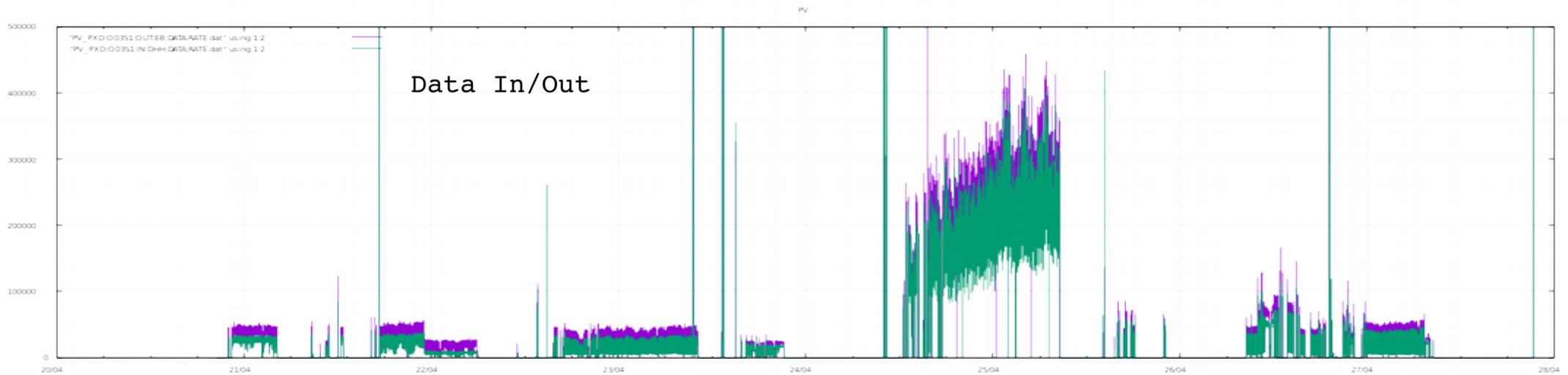




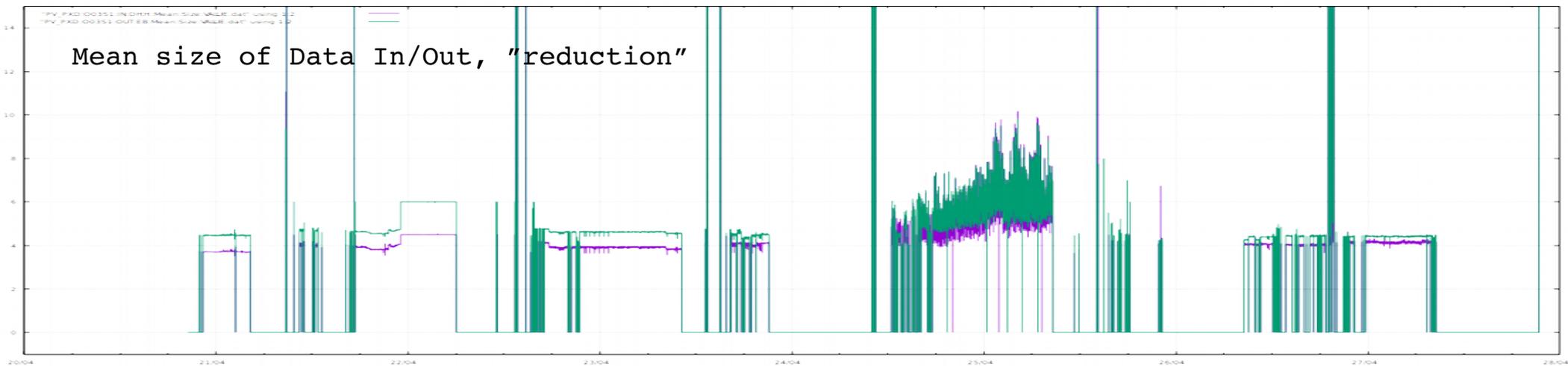
Trigger In/Out

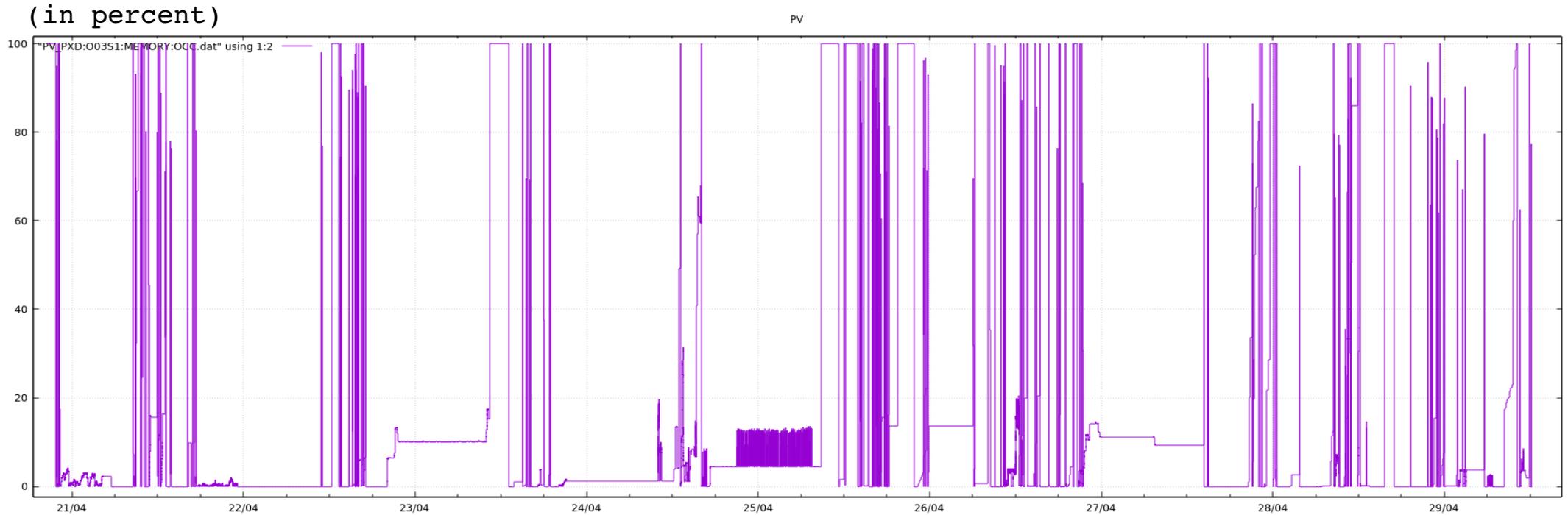


Data In/Out



Mean size of Data In/Out, "reduction"





- Occupancy on Selector – depending on trigger rate and HLT computing time
 - 100% – firmware

- Built CSS GUIs in a way they scale to ~40 ONSEN boards
 - Done by scripting and finally precompiling OPIs
 - Only few OPI were designed specifically for the downsized system
- New Run Control scheme adapted and GUIs changed (decided only few weeks before beam time)
- PXD DQM – Display Histograms from Express Reco within CSS
 - First examples prepared, scales to full system

RC and Merger, Selector OPI

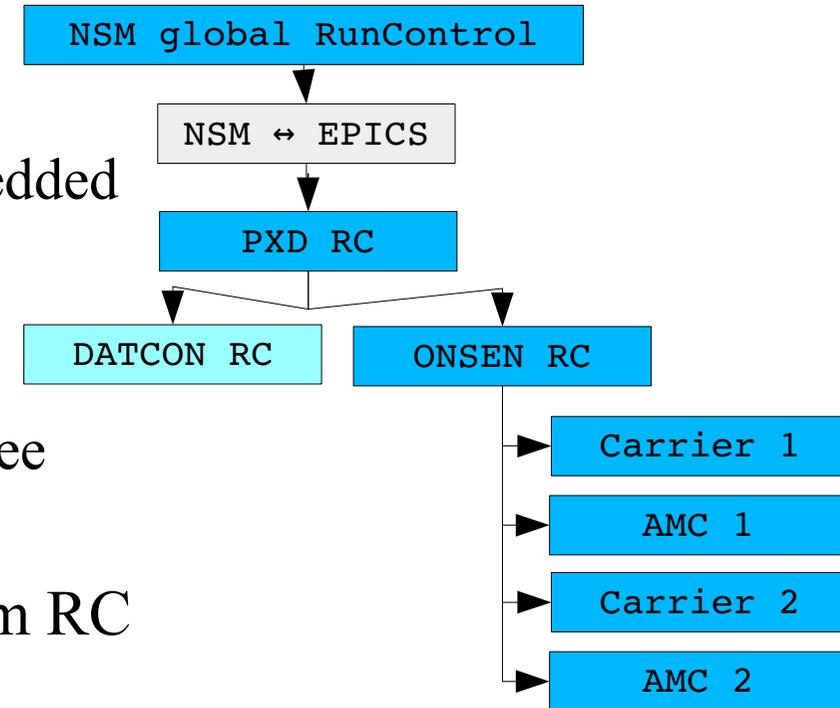
The image displays four overlapping CS-Studio windows. The top-left window shows the 'Run Control' for 'rc_top@RC.opi', with 'Global RC' and 'PXD RC' both in 'RUNNING' status. The top-right window shows 'onsen_rc_top.op' with 'Global RC' and 'PXD RC' also in 'RUNNING' status. The bottom-left window shows 'merger_textonly@O01M1.opi' with a 'Merger Status' overview. The bottom-right window shows 'selector_textonly@O03S1.opi' with a 'Selector Status' overview. A red text overlay in the top-middle window reads: 'Normal operation, ONSEN participates in Global RC and real status is reported back'. Two red circles highlight checkboxes in the 'Global Master' section of the top-middle window and the 'OS CPU Load' value of '156%' in the bottom-right window.

Normal operation, ONSEN participates in Global RC and real status is reported back

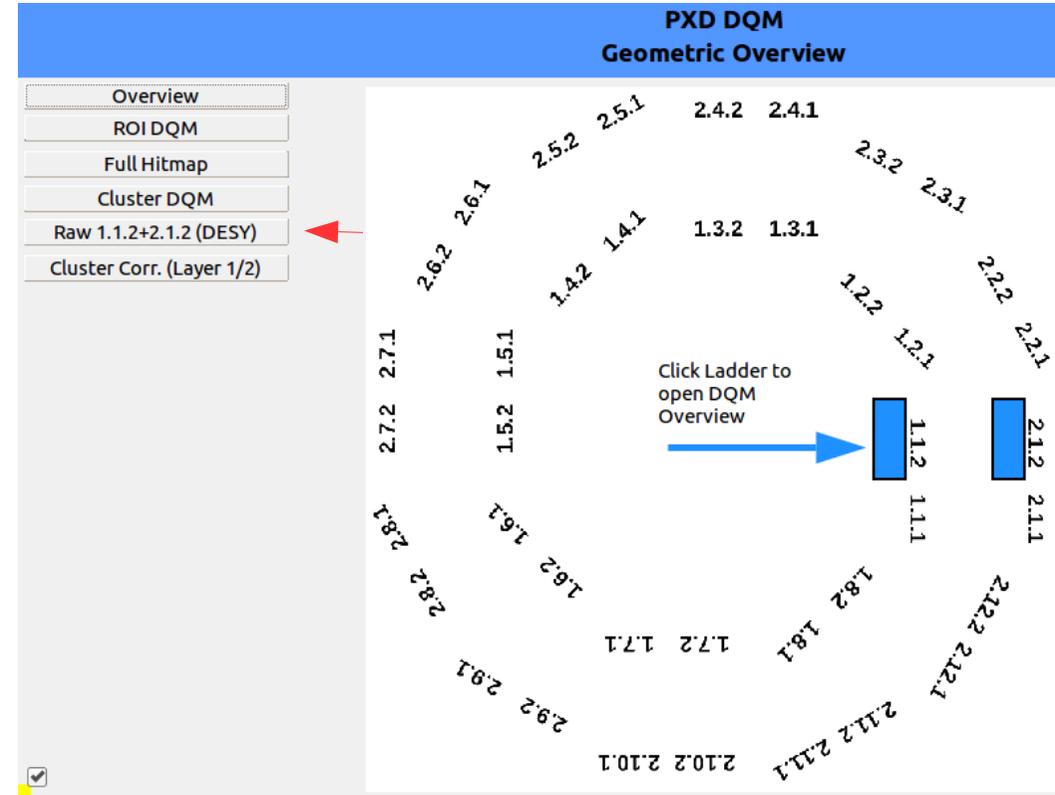
Component	Status	Global Master
Global Run	Running	<input checked="" type="checkbox"/>
Request	Running	<input checked="" type="checkbox"/>
Current	Running	<input checked="" type="checkbox"/>
DATCON	Running	<input checked="" type="checkbox"/>
ONSEN	Running	<input checked="" type="checkbox"/>

Metric	Value
OS IP Address	10.16.3.30
OS MAC Address	02:43:4E:03:30:0
OS CPU Load	156%
OS Memory occupancy	86%

- RC IOCs installed on iocpxd PC
 - ONSEN “board” RC ioc running on the embedded system
- RC connected to global RC
 - Working nicely after some initial problems (see below)
- (DATCON only tested shortly, then removed from RC again)
- Masking system out of global RC turned out to be error prone (esp. switch between local and global mode)
 - Quick fix was done at DESY
 - A better solution is worked on right now, which will be more robust if system drop out unexpectedly (timeouts ...)



- DQM GUI prepared with 40 PXD ladders in mind, removed all but two ladders in GUI
- Histograms filled on Express Reco
- Working (if Exp Reco was running)
 - Bug in clustering → only ROI and RawHits available
- Mainly raw hitmaps were used by operators
- Nearly no response when I asked for histogram wishes before TB.



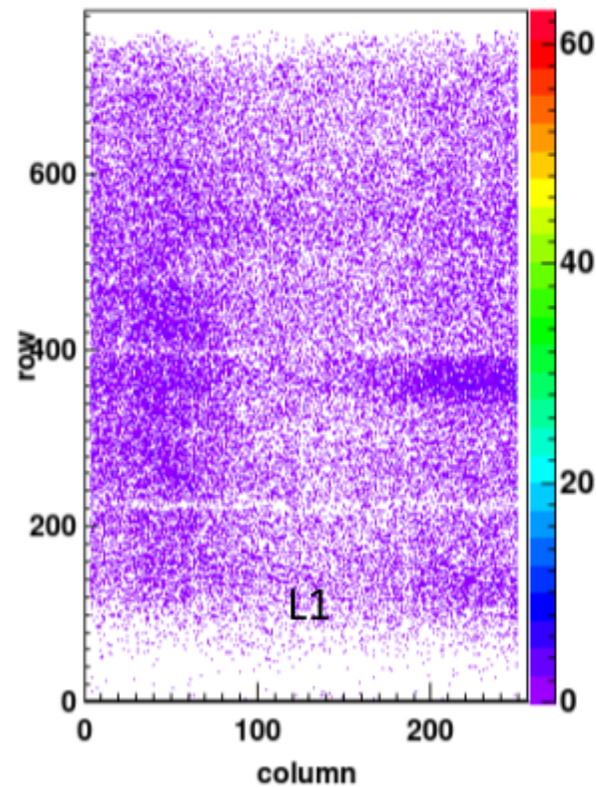
Express Reco

ladder_rawhits_desy@PXDDQM.opi ☒

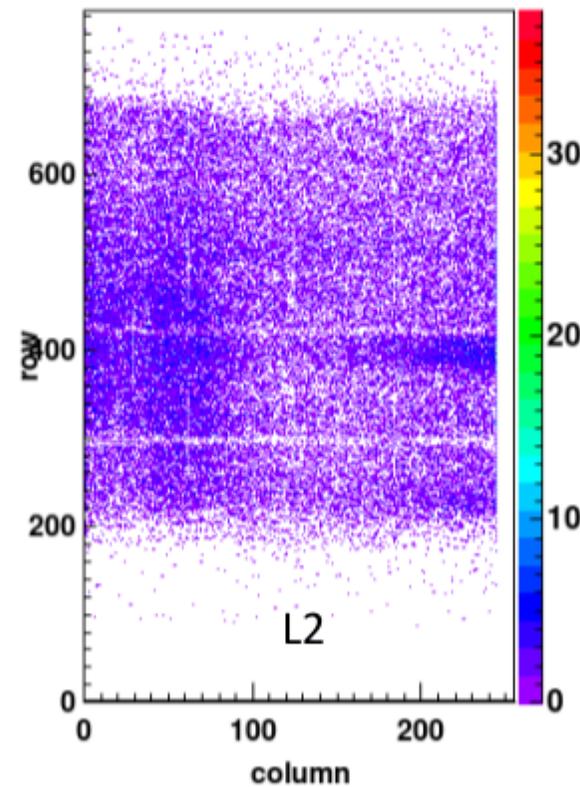
PXDDQM \$(UP)

PXD DQM
TB Ladder 1.1.2/2.1.2 - Raw Hits

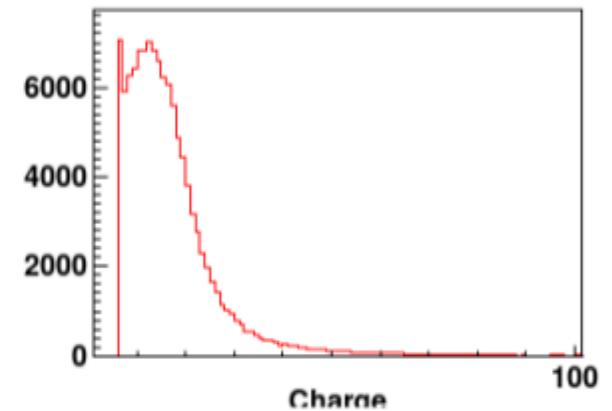
Hit Map Ladder 1.1.2



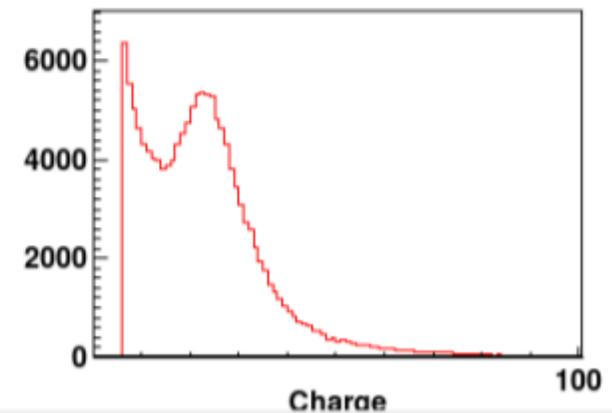
Hit Map Ladder 2.1.2



Pixel Charge for Ladder 1.1.2



Pixel Charge for Ladder 2.1.2



(from Carlos mail)

- Why didn't we notice event mixing, order of data, etc in neither SC nor DQM?
 - We were not looking for it!
 - (a) SlowControl can only monitor/report what is provided by firmware
 - It was detected in unpacking, but ... too late
 - (b) Error messages from Express Reco not available to operator
- Solution for (b) exist in basf2 DQM framework
 - Write out f.e. fit values by nsm to EPICS (example from Konno-san)
 - → monitor pxd unpacker error counters

- IPMI Issues
 - Long term test with 4 AMCs needed.
 - In-place firmware update for IPMC not possible atm
 - Board design prevents this, ugly workaround needed
- More monitoring of independent checks
 - Report error from Exp Reco to nsm → EPICS → CSS/Alarm system
- Collect experiences and opinions
 - Seem minimal elements (text) are preferred over fancy GUI widgets
- Add more monitors to GUI and alarm system when provided by firmware
- Alarm System