

VXD-DAQ & Cosmics

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15.11.2018

Remarks to over all VXD DAQ and PXD Integration

- Now running mostly stable, but it took a very long time to reach that point!
- VXD DAQ “Partitioned DAQ” more difficult & time consuming than expected
 - Looking back now, it might have been a bad idea...
- Configuration (NSM Ports) by hand, several files to be changed, took weeks to find everything
- Interferences with global (Run Control, HV Control, HLT/ROISENDER) not foreseen
 - Restart scripts (global killed/restarted PXDRC, several instances running, ...)
- EPICS misconfiguration copy’n’pasted over from Phase 2 (restart script again)
 - Wrong port settings killed nsm gateway on pxdgw with junk packages
- CSS Shifter GUI, NSM plugin trouble
- nsm-epics bridges prepared and tested in global DAQ end of september ceased functioning middle of october
 - broken by library update, changes not well communicated
- ROISENDER/HLT2OUT crash is not detected on HLT side (nsmd shows running, even so program exited already)

- Still old Phase 2 firmware on DHH
 - → long trigger veto, occupancy problem
- Some module are “unstable”, emergency power down ($O(1)$ /day)
 - If module (and ASICS) go off → error in RC is set in most cases
- We “ignore/mask” several problems arising from that in PXD DAQ/RC to allow for “smooth” running even with missing modules
 - (DAQ restart time is 5 minutes for SVD; thus prefer to keep running even if modules go off, recovery for modules needs currently long time)
- Operation without “ABORT” is still not working reliable
- ROISENDER/HLT2OUT crash is not detected on HLT side → end up to be PXD Error

Recent Problems (Fr 9.11-13.11)

- SVD SC problem (1h)
- Event Builder config file for PXD changed accidentally between Mi and Fr (9h)
- 2x SVD FTSW Busy
- PXD FTSW busy (back pressure from DHC because of event mismatch)
- PXD Error due to aftermath of event mismatch, DHC reset or SALS w/o ABORT (→ stale event in ONSSEN)
 - DAQ continued running in that case (global RC did not check for PXD Errors), but that is no as it should be
- Remarks
 - DHC reset during a run is **not** advised, but used as workaround to cure DHC/DHE problem without lengthy SALS

Operation summary

- ~~Plan: Set up/optimize sensors on Friday, leave running until Monday~~
 - → Lengthy optimization on Saturday and Sunday
- PXD DAQ on-call turned out to be a presence shift for longer periods
 - No official DAQ shift on KEK side, luckily some persons were available during weekend
- Call for last-minute shifters
- PXD shifter did not have “official” access to main DAQ screen
 - Interaction with SVD shifter: Who was supposed to start new runs?
- Manual from phase 2 not yet updated (or only in parts)

3kHz combined DAQ Test

- on Monday morning (no cosmics)
- 3kHz limited by PXD veto 304us
- 400GB files in few hours.
- (screenshot yamada)
- Mostly stable, but PXD busy because of high occupancy “spikes” again.
 - We did not optimize much, low thresholds → high data rate.
 - Close to saturation of one of the Ethernet links to EB.
- One event mismatch on EB (EB or ONSSEN tbf), recovery did not work.

Performance & Problems → see Carsten's Slides

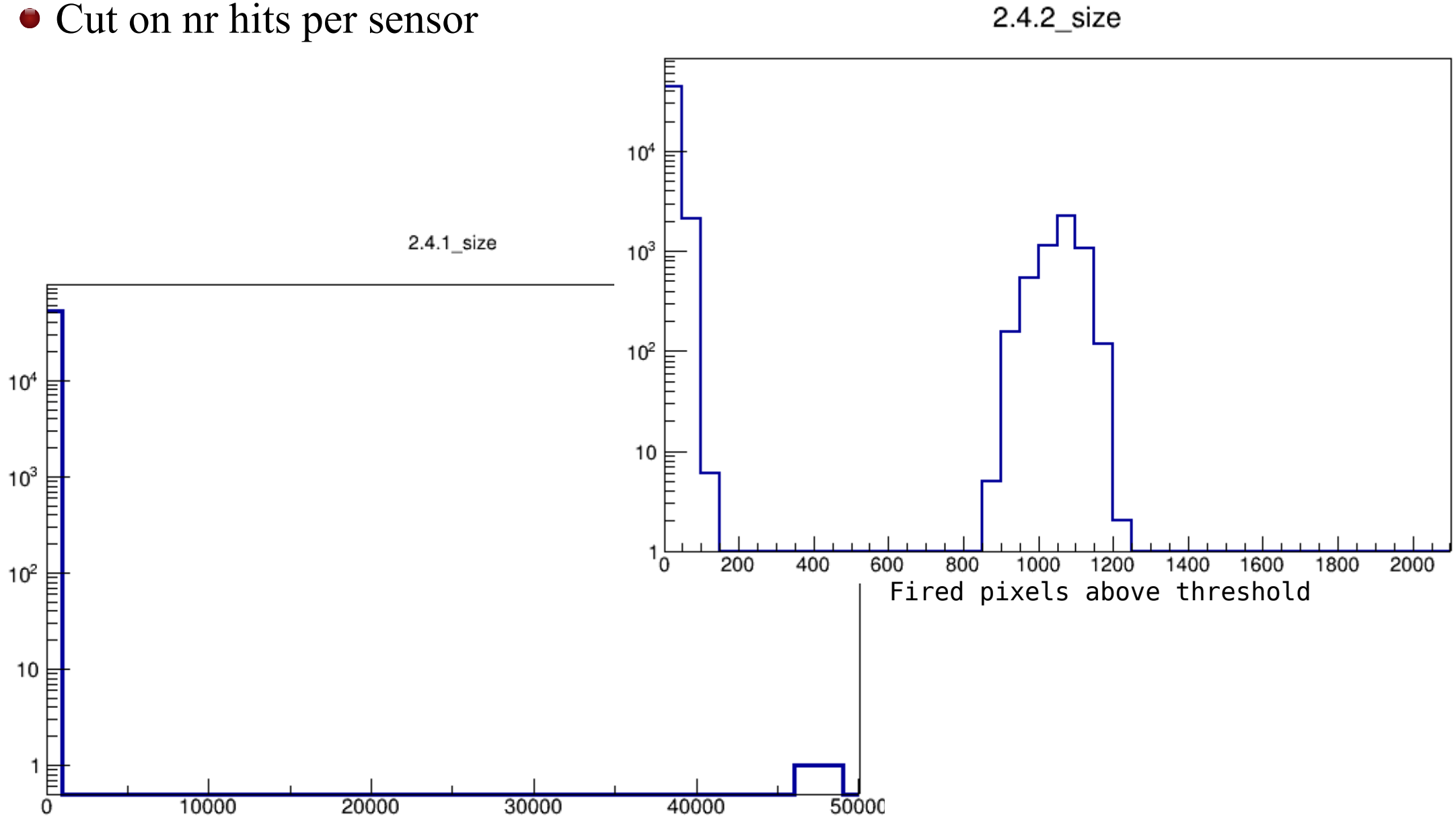
- Occupancy steps, noise from Marco, not well optimized ...
- Reason for occupancy steps? Clock de-sync? Why only in few modules?
- Threshold were too low (5-10 depending on module)
- (do not want to repeat Carsten slides ...)

Summary

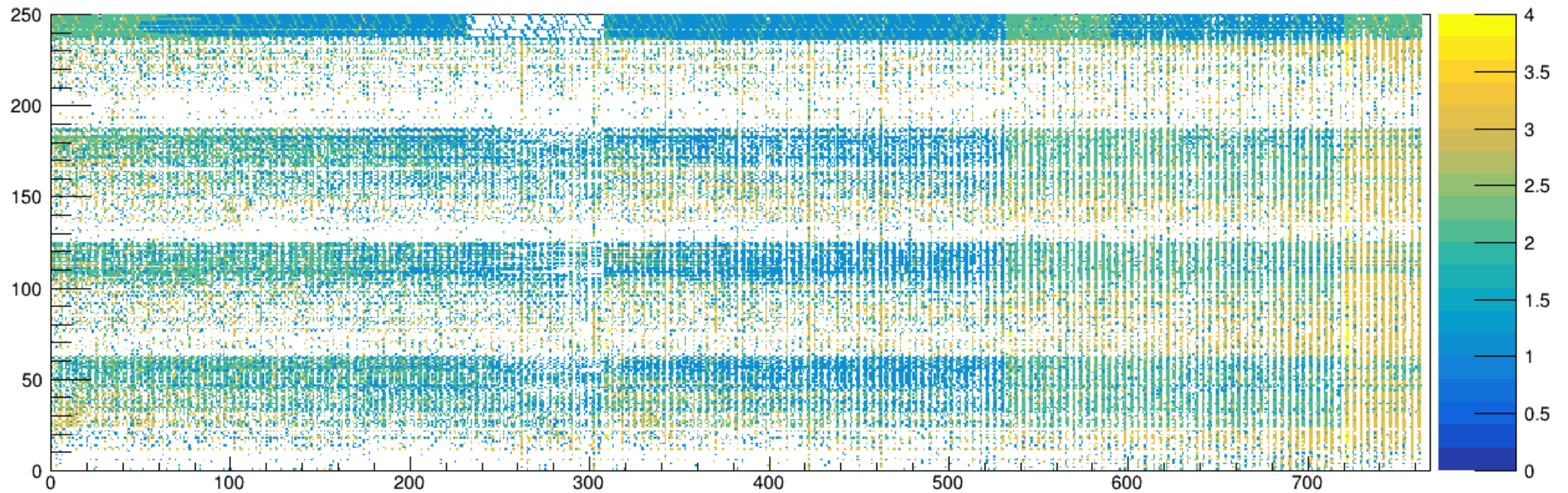
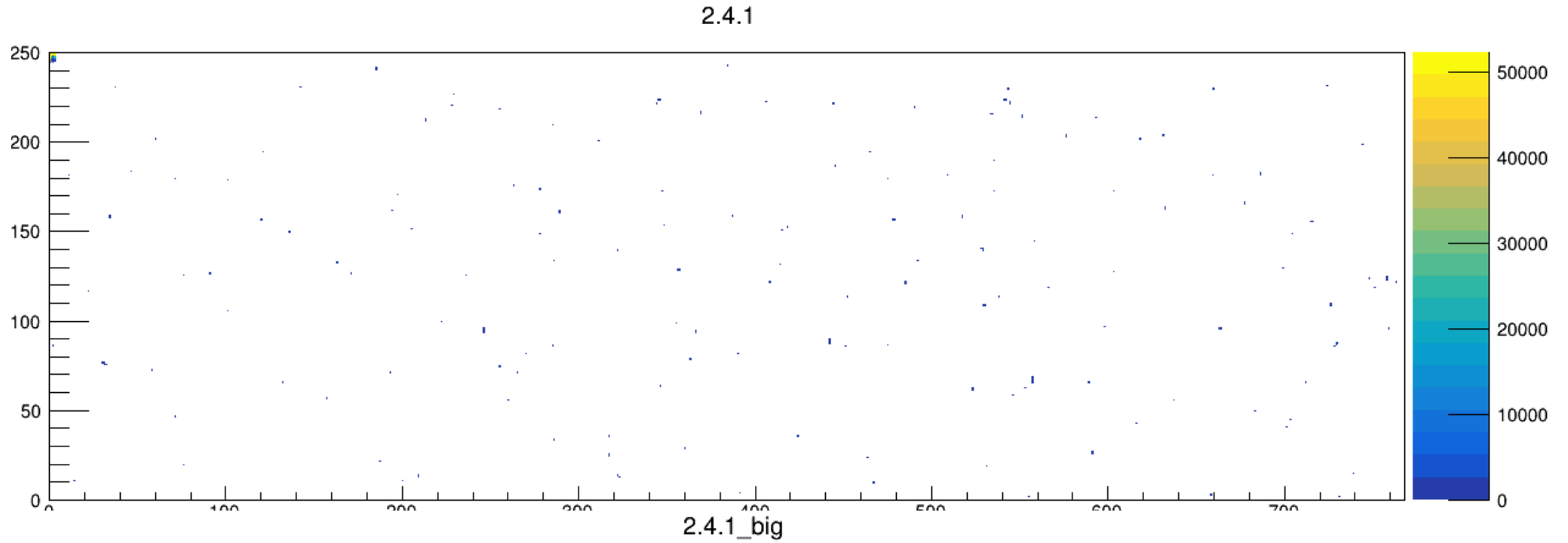
- Software (module calibration etc, bonndaq)
 - update/merge latest development, knowledge transfer, install and configure **in time** before phase3, run as system service, scattered documentation (this is **not** part of a shifters manual)
 - → Stable version/setup latest in mid January!
- SC – Parallel operation?
- PXD DAQ – Decide about acceptable error “levels” (rates)
 - Find reason for EB mismatch
- DAQ – VXD-DAQ setup difficult
 - PXD DAQ integration in global was tested in Sep → broken in Oct.
 - Cosmics working nice on Wednesday → broken again on Friday
- Module testing/optimization was not sufficient
 - Cooling problem etc

Analysis

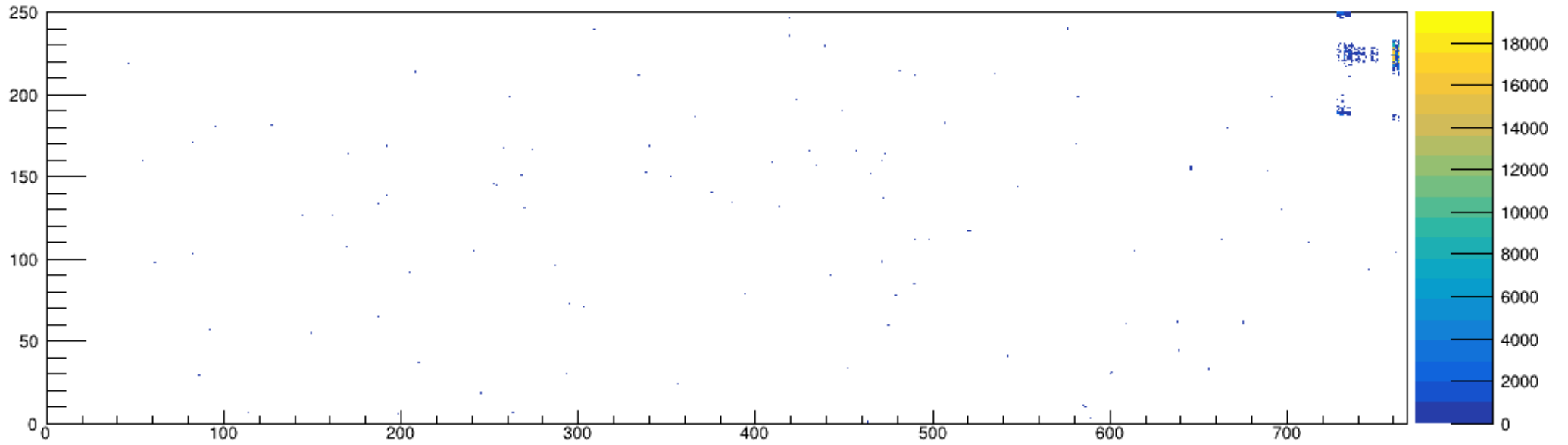
- Cut on threshold > 20 && < 250
- Cut on nr hits per sensor



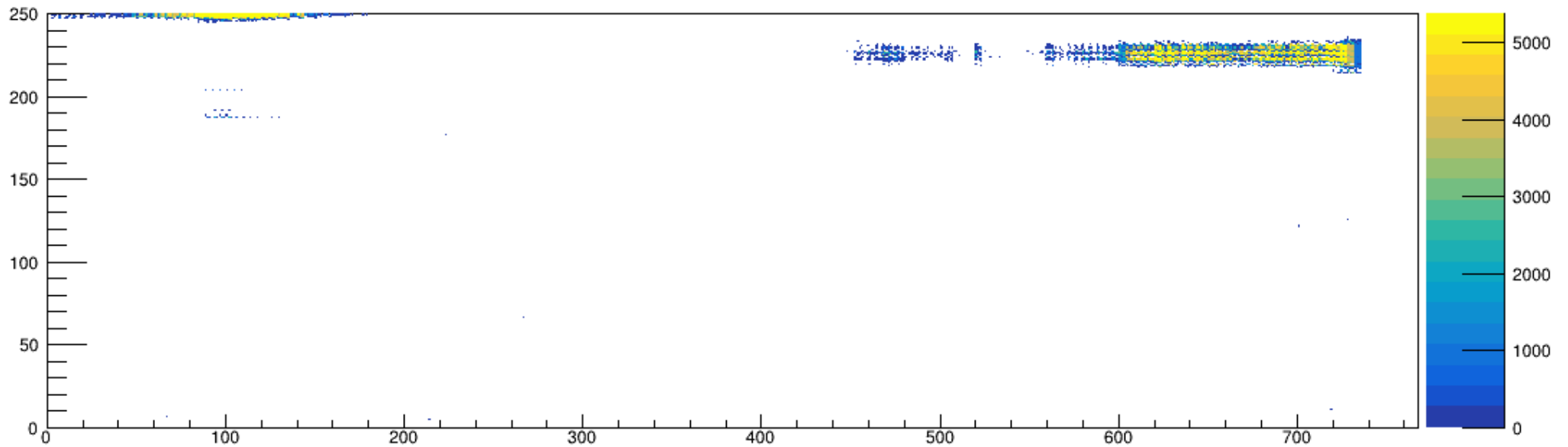
Selection on #nr hits, cut on threshold



2.4.2



2.4.2_big



- Its not (only) a threshold issue
- Its not in every event.
 - Single “upsets” like in 2.4.1
 - Large number of “noise” events like in 2.4.2
- Seem we can filter it out for analysis