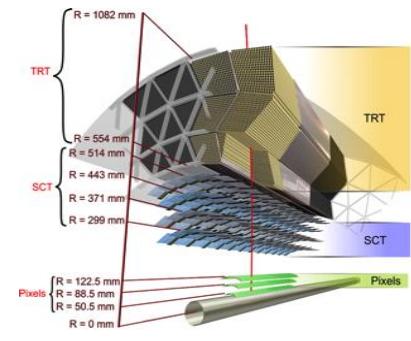
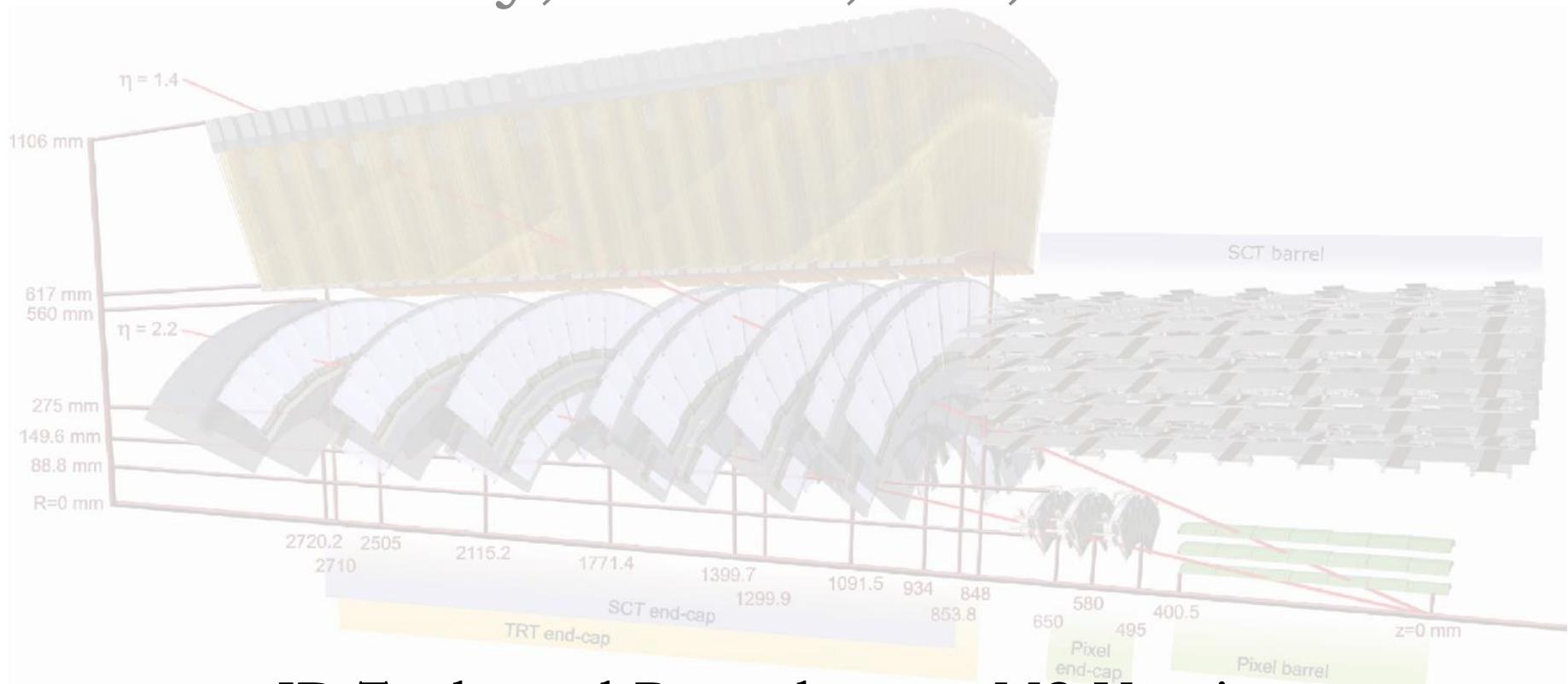




ATLAS Inner Detector Combined Shift Tutorial



Adapted from Run1 Tutorial by
Andrey, Kerstin, Per, Dave

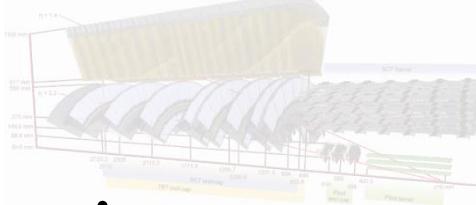


ID Tools and Procedures – M9 Version
2015

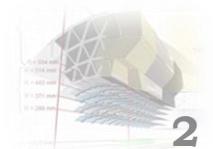




Caveats

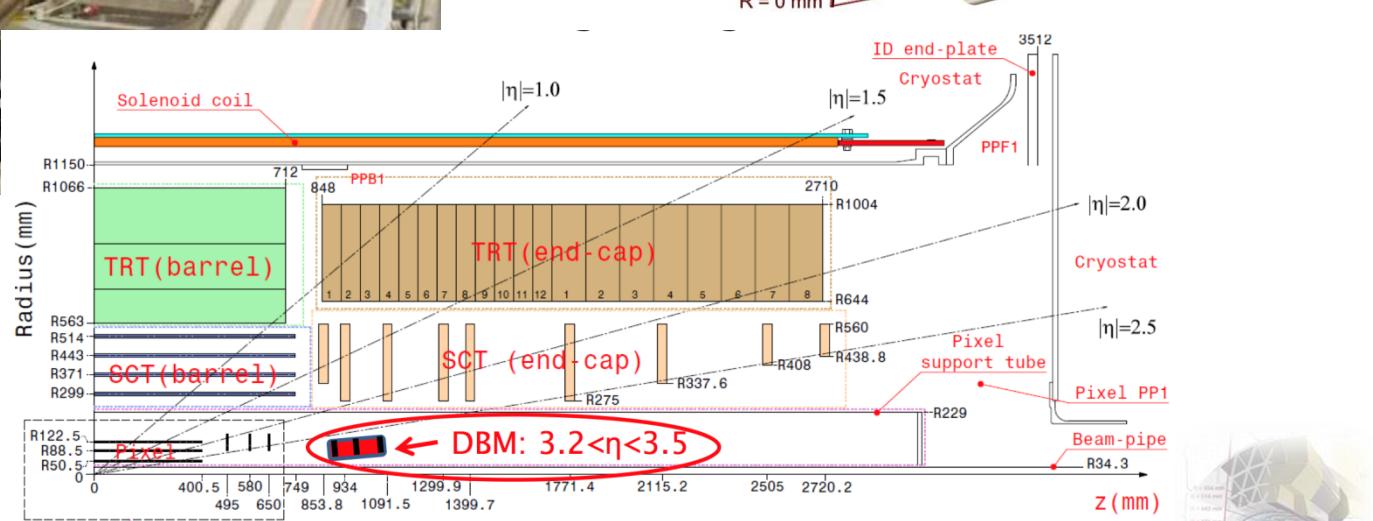
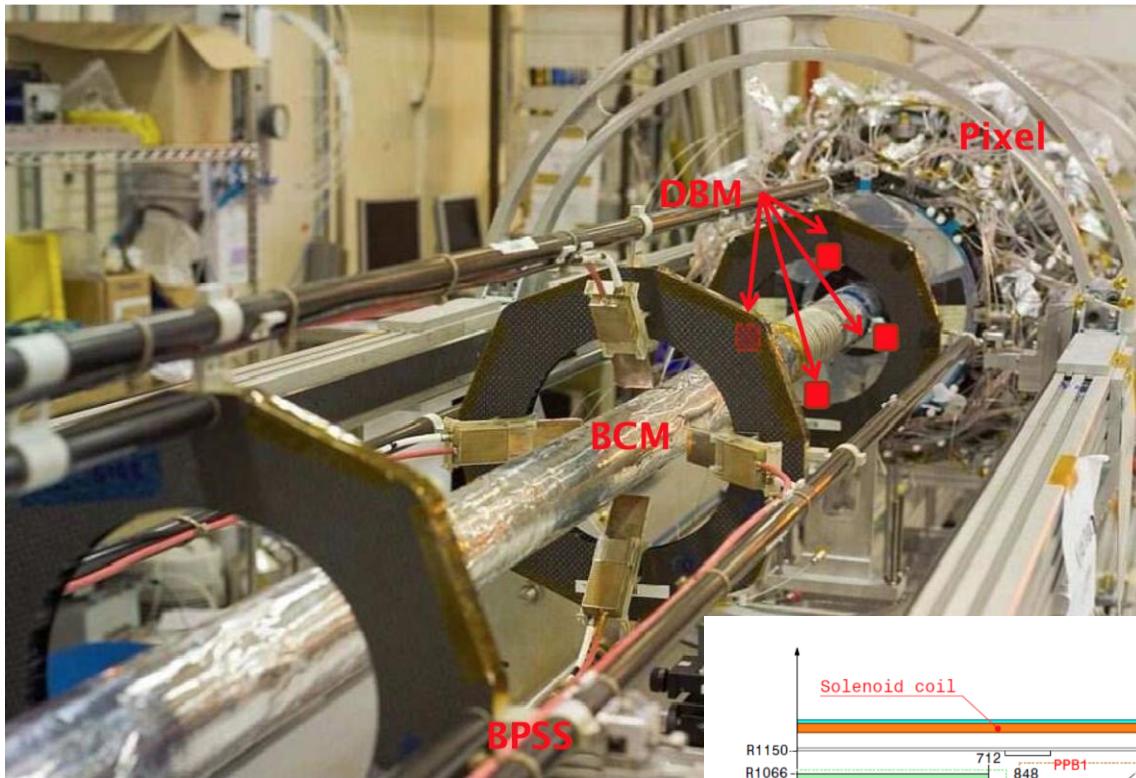


- This training will be evolving over time
 - **This specific version is still work in progress**
- Many shifter tools & utilities are still under development, so please be patient and tolerant of “imperfections”
 - Things may continue to evolve during your shifts
 - Your feedback is most welcome!
- Twiki with shifter instructions and links is located [here](#)



Inner Detector

- **PIX + SCT + TRT + IDGen** (services) + **DBM** (diamond beam monitor) + **BCM** (beam conditions monitor)

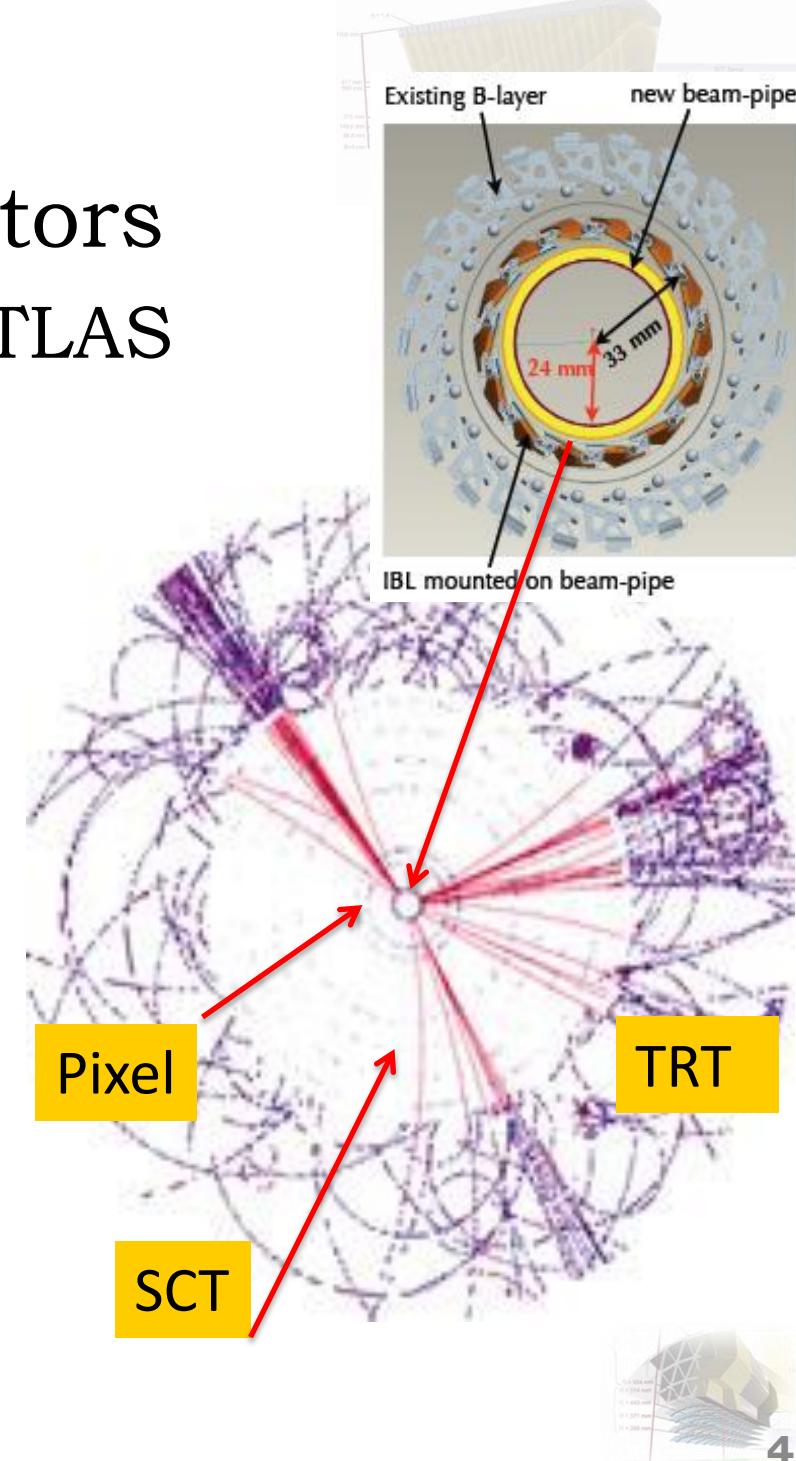
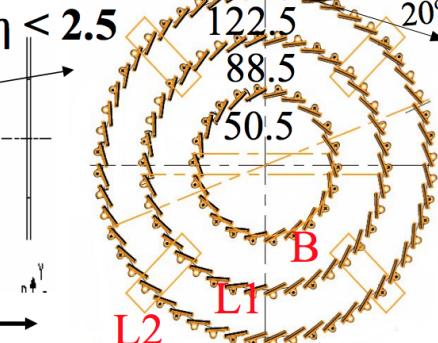
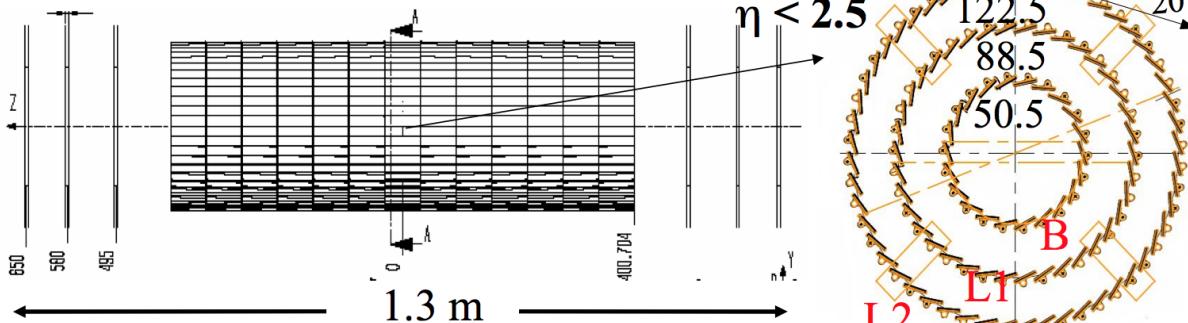


Pixel and IBL

- The innermost silicon detectors
 - IBL was just added to Pixel/ATLAS

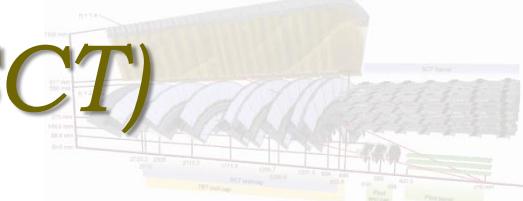
- Pixel:

- 3 Barrels, 2x3 disks
- Total of 1744 Modules, organized in Staves and Sectors
- 46080 channels per Module, total ~80 million channels
- minimize confusion in pattern recognition
(Occupancy 10^{-4} , Noise 10^{-6})
- good impact parameter resolution due to B-Layer at 5 cm

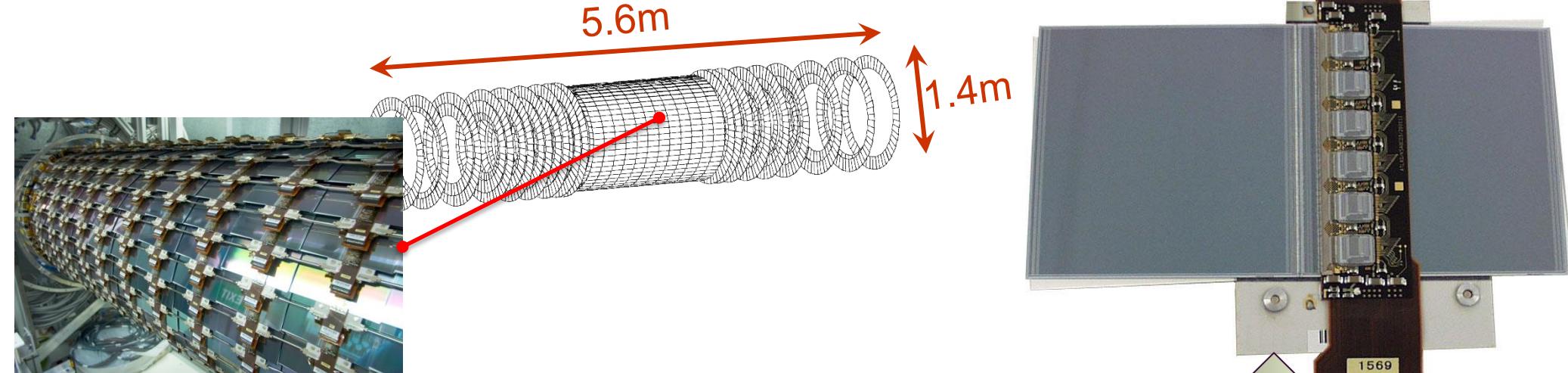




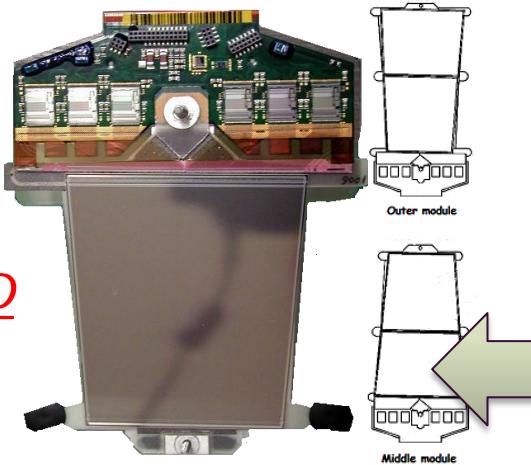
The Semi Conductor Tracker (SCT)



- 61 m² of silicon with 6.2 million readout channels
- 4088 modules arranged in 4 Barrels and 18 Endcap discs
- C₃F₈ Cooling (-7°C to +4.5°C silicon) to limit radiation damage



- 2 pairs of back-to-back sensors
- 1536 channels (768 @ each side) readout by 12 readout chips(6 each side)
- 5.6W/module=>**MUST BE COOLED**
- Each module is individually powered and read out



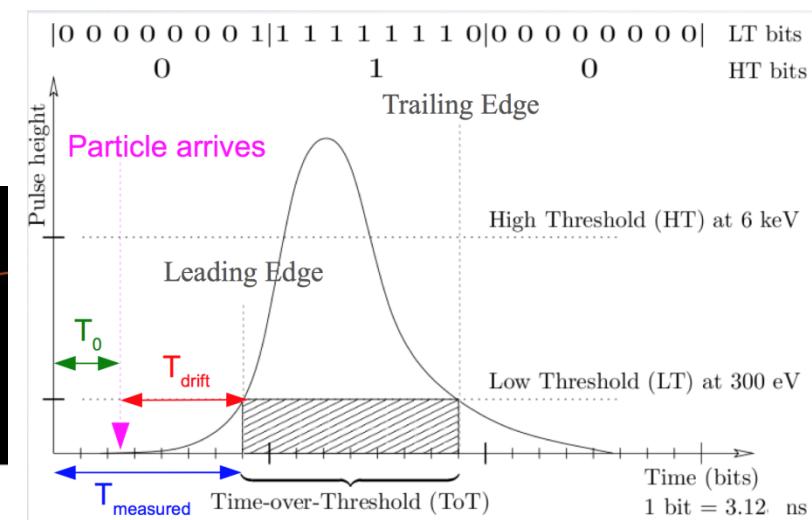
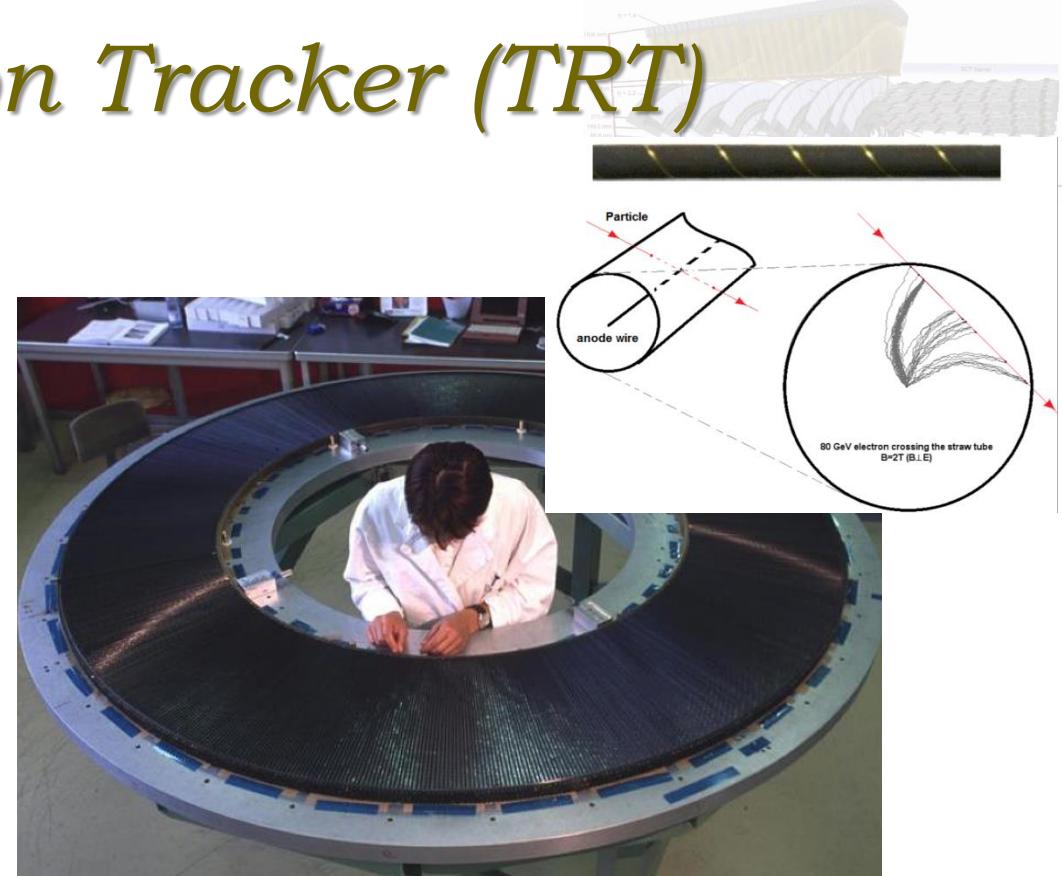
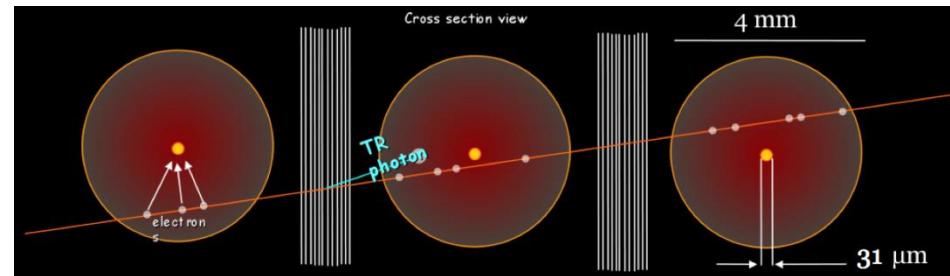
- 2112 barrel modules
- one shape

- 1976 end-cap modules
- 3 shapes



Transition Radiation Tracker (TRT)

- Multi-tube gaseous detector
 - Separated to barrel and 2 endcaps
 - Transition Radiation (TR) functionality
- For cosmics and special runs provides trigger
 - FastOR





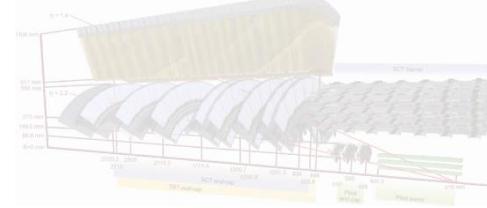
ID General



- IDEEVCOOL – evaporative cooling
 - Pixel and SCT loop status and control
 - Cooling plant status
- IDEENV – ID Environment
 - Heaters, services, temperature and humidity monitoring, etc
- IDETEH – ID Thermal Heaters
 - Heater system that keeps the ID subsystem at the right temperatures
 - Eg between a cooled SCT and a warmer TRT
- BCM and DBM
 - Beam monitors



Operation conditions



■ TRT

- Gas multi-wire detector => need stable gas and HV conditions
- Operates warm => make sure it doesn't cool down/overheat
- Granularity
 - 6 HV crates. 1 is OFF => lose ~1/6 of the detector
 - 20 LV PS (Maratons). 1 LV PS is OFF => lose ~1/20 of the detector
 - 12 channels per Maraton

■ Pixel

- does not like thermo cycling

■ IBL

- Sensitive to humidity

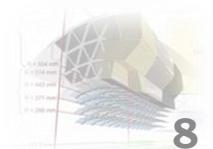
■ Pixel and SCT

- react on beam conditions

■ In case of **multiple problems** at the same time, need to act **according to severity**

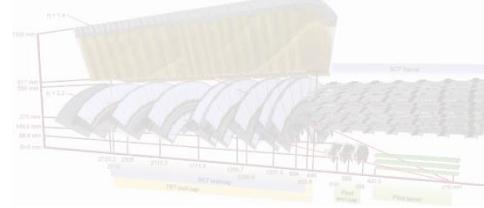
■ For instance

- If one SCT channel trips and TRT HV crate trips, what will you do?

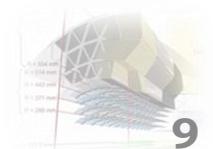




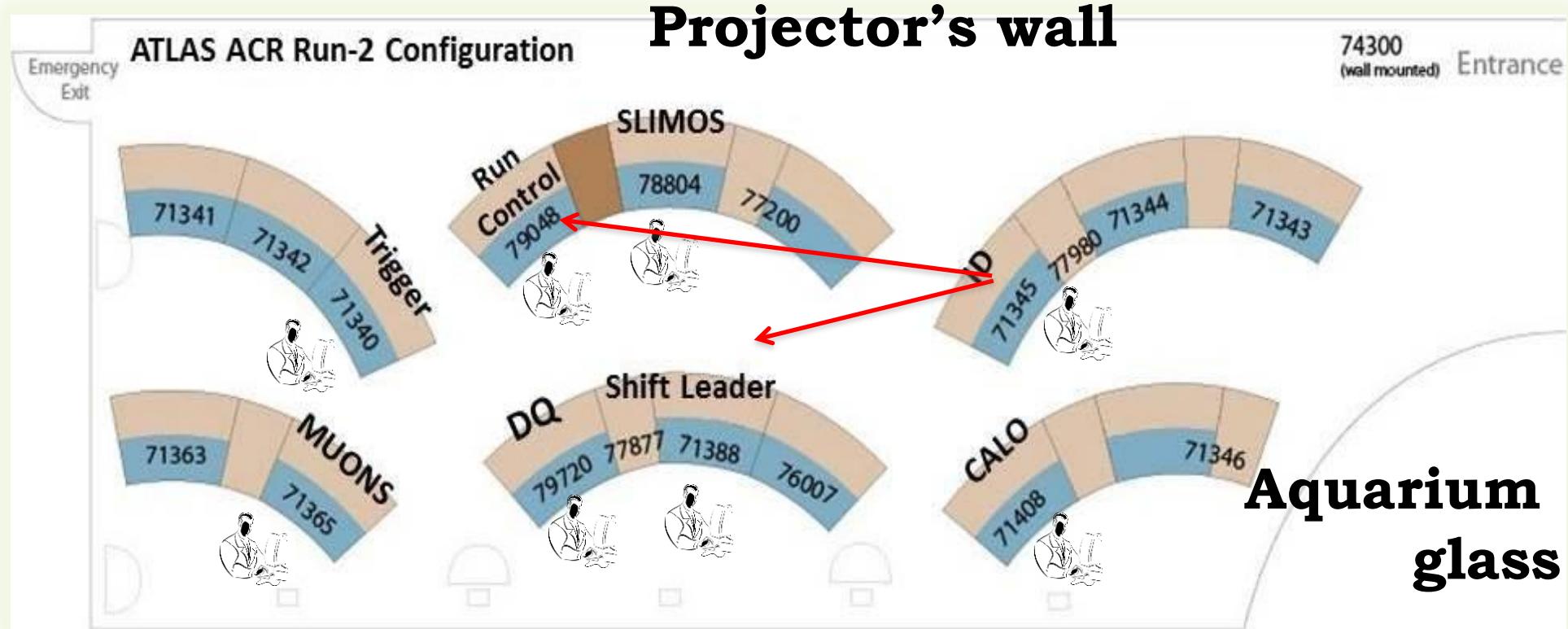
Main purpose of ID shifts



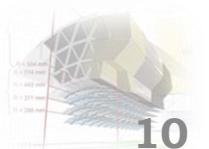
- Keep PIX, SCT, TRT, (BCM, DBM) safe
- Take data with highest efficiency and best quality
- During M9 and beam commissioning – Pixel, SCT and TRT are ON by default
 - Exceptions because of experts' work/interventions
- Different duties when on shifts
 - No ATLAS run
 - **Watch DCS**
 - ATLAS is in combined run = real data taking shift
 - **Watch DCS, DAQ and Data Quality**
 - In any case, follow up problems
 - **Stay in touch with experts/system coordinators**
 - Always be aware of what ATLAS is doing
 - **Communicate with your shift leader, DQ shifter, etc**
 - **Look at projector screens**



ID Shifter in ATLAS control room (ACR)



- Interact **in person** with: shift leader, run control (especially at run start), data quality shifter
- Interact **by phone** with subsystem experts. If you are not sure, call subsystem Run Coordinators



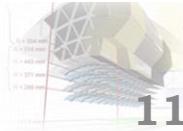


Subsystem experts



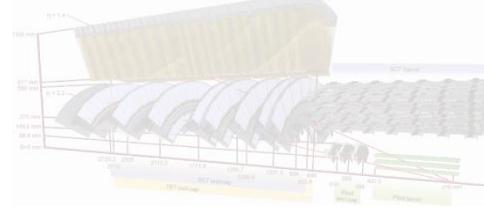
- The list of phones is available on the [ID WhiteBoard](#)

	Pixel	SCT	TRT	BCM
Run Coordination	160032	162749	160547	163881
DAQ	165359	162034	160531	163881
DCS	165897	162034	160242	163881
Other	—	160609 FSI 162449 Cooling, ID Gen	160412 High Voltage 163713 Active Gas	
Monitoring	163352	167414	160543	--
ID Monitoring			167413	
Reserve shifter			160772	
ID shifter in ACR			71345	
ID Satellite Control Room			62940	





DO's and DON'T's @ ID shift

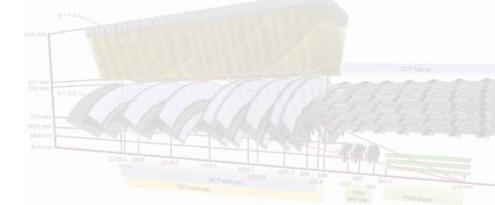


- **Do** watch what ATLAS is doing
- **Participate** actively in data taking: be pro-active
- **Interact** with the rest of the ATLAS shift crew: YOU are part of the ATLAS team
 - introduce yourself to Shift Leader and to the run control shifter
 - The run control shifter starts and stops ATLAS runs, watch over global DAQ. Handle removal of busy RODs from subsystem.
- **Stay focused** on shift duties
 - Programming and running jobs is allowed, but your shifter duties have much higher priority
 - e-mail / social networking are tolerated, but do not stay distracted
- **Do not** watch videos
- **Do not** sleep
- **Do not** connect via vidyo to meetings, don't give presentations while on shift
- **Do not** wear earplugs on both ears
 - There are audible alerts in ACR





Efficient ID shifts



- General strategy of dealing with problems
 - Be aware what happens in ACR
 - Always check alarm help (DCS), problem database (DCS, DAQ, DQ, etc), shifter Assistant, and whiteboard (most recent issues)
 - Follow instructions
 - If there are no instructions, always call the subsystem RC (if you are not sure, call your favourite RC)
 - Document any new / unexpected things in the elog for experts and your fellow shifters until we can properly document them
- Don't spend TOO much time looking for help
 - Call a RC/expert any time
- Be pro-active
 - Checklists will help you to see features / issues before the problem occurs
- E-log (aka elisa)
 - We recommend to write the end-of-shift summary elogs in a text editor and save it frequently or post things as they happen and then edit the entry (the e-log had a tendency to crash)
 - Make dedicated elog entries for anything that requires attention from experts

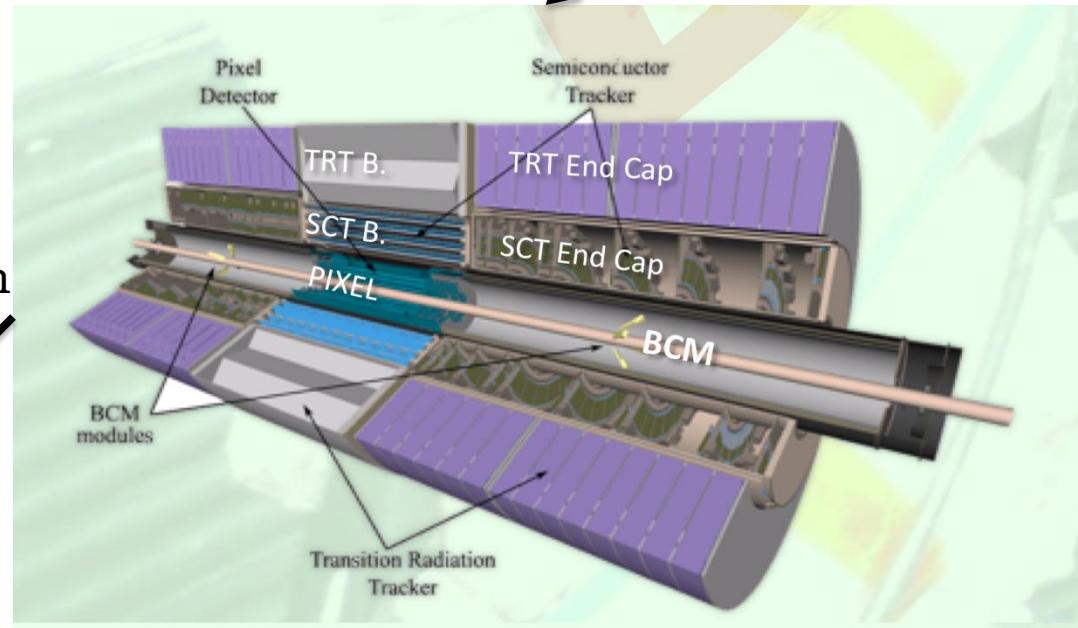
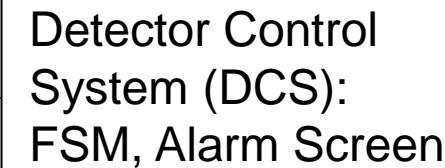
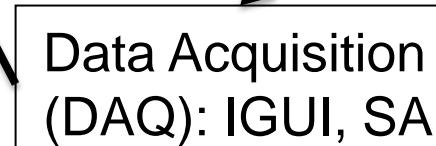




System and Tools

▪ Abbreviations

- **DQMD** – Data Quality Monitor Display
- **OHP** – On-line Histogram Presenter
- **SA** – Shift Assistant
- **IGUI** – DAQ panel
- **DDC** – DAQ-DCS Communication





ID DCS



- **Finite state machine (FSM)** and **Alarm screen**
 - As you have learned at the DCS training
- **ID (DCS) subsystems**
 - Inner Detector Environment (**IDE**)
 - Evaporative cooling (**EVCOOL**)
 - Beam Conditions Monitor (**BCM**)
 - Diamond Beam Monitor (**DBM**)
 - Thermal Enclosure Heaters (**TEH**) aka “heater pads”
 - **Pixels** (including IBL), **SCT**, **TRT**
- **FSM** states
 - **READY**
 - TRT and IDE should always be READY
 - Pixels and SCT should be READY when there are stable beams
 - **STANDBY**
 - Pixels and SCT should be in STANDBY when no stable beams
 - **NOT_READY**
 - Should not happen during nominal conditions (except for one case for Pixels)
 - **SHUTDOWN, TRANSITION, UNKNOWN, DEAD**
 - Most probably these are caused by experts' interventions – check with subsystem DCS on-call experts or directly with RC if you are not sure





ID DCS: FSM panel

FSM_NOACR_IDG: fwUiAtlasFrame

Back Home Up NO USER 22-08-2011 21:33:46

ATL_IDG	NOT READY	WARNING	🔒
IDE	READY	OK	✓
PIX	STANDBY	OK	✓
SCT	STANDBY	WARNING	✓
TRT	READY	OK	✓

LHC IDE PIX SCT TRT

LHC READY OK
Injection Probe Beam Energy = 450.1 GeV
Injection Permit Y
ATLAS is beam safe Y
Stable Beams Flag N
Handshake

IDE PIX SCT TRT

EV COOL READY OK
GAS READY OK
RACKS READY OK
PLANT RUN OK
Level 795.64 kg
Compressor Priority

EV COOL READY OK
ENV READY OK
Flow 361.69 P(in) 1.18
T(out) 41.20 P(out) 15.18

INNER DETECTOR

EV COOL READY OK
ENV READY OK
Flow 361.69 P(in) 1.18
T(out) 41.20 P(out) 15.18

MAX SCT ROS OCC. LAST 2 MIN
Barrel 0.0000 Disk 0.0000
EndCapA 0.0000 Barrel 0.0000
EndCapC 0.0000 B-Layer 0.0000

MAX BCM BKG IN LAST 2 MIN
BkgA 0.0 BkgC 0.0
Thrd per bunc 20 Thrd per bunc 20

MAG READY OK

MONITORING OFF Stable Beam FALSE

3D View Zoom: 100 All connected

ATL_IDG Back Home Up

INNER DETECTOR

SCT STANDBY W
ECC STANDBY OK
Q1 PS STANDBY OK
ENV READY OK
Q2 PS STANDBY OK
ENV READY OK
Q3 PS STANDBY OK
ENV READY OK
Q4 PS STANDBY OK
ENV READY OK
ROD READY OK

BAR STANDBY OK
Q1 PS STANDBY OK
ENV READY OK
Q2 PS STANDBY OK
ENV READY OK
ROD READY OK

ECA STANDBY OK
Q1 PS STANDBY OK
ENV READY OK
Q2 PS STANDBY OK
ENV READY OK
Q3 PS STANDBY OK
ENV READY OK
Q4 PS STANDBY OK
ENV READY OK
ROD READY OK

PIX STANDBY OK
D3C STANDBY OK
D2C STANDBY OK
D1C STANDBY OK
L2 STANDBY OK
L0 STANDBY OK
D3A STANDBY OK
D1A STANDBY OK
INF AM_INTERLC OK

INF AM INTERLC OK

PS STANDBY OK
ENV READY OK
PS STANDBY OK
ENV READY OK
PS STANDBY OK
ENV READY OK
INF READY OK

INNER DETECTOR

IDE EV COOL R OK
ENV R OK B
TEH R OK B
RADMON R OK B
MAGNET R OK B
INF R OK B
BCM R OK B

PIX BARREL S OK B
B LAYER S OK B
DISKS S OK B

SCT BARREL S OK B
ENDCAP A S OK B
ENDCAP C S OK B

TRT BARREL A R OK B
BARREL C R OK B
ENDCAP A R OK B
ENDCAP C R OK B

TRT READY OK

ECC READY OK
LV TEMF READY OK
HV READY OK

BC READY OK
LV TEMF READY OK
HV READY OK

GGSS to HV
BAR ENABLED OK
ECA ENABLED OK
ECC ENABLED OK

BA READY OK
LV TEMF READY OK
HV READY OK

ECA READY OK
LV TEMF READY OK
HV READY OK

TRT READY OK
INF READY OK
RCK OK
COOL OK
BULB OK
VME OK
CAN OK
HWI OK
ALR OK
GAS OK
GGSS OK
PVSS OK

BLM READY OK
RAD READY OK

SCT AUTOMATIC TURNON AUTOMATON AM_PRESENT W

Beam Abort St 2011.08.17 09:48:19.789

BCM READY OK
ROD1 State 6 Last PM: 11-08-22 18:04:1
ROD0 State 6 Last PM: 11-08-22 18:04:1

Hardware Injection Permit
Safe for Beam Inj./adj./dum

BCM BLM Pixel SCT

Permit without masking:
BCM BLM Pixel SCT
yes yes yes yes

DCS FSM Consistency
PIX SCT

PLC Connection



ID DCS: FSM panel

ID FSM Tree.
Navigation, commands,
state/status.

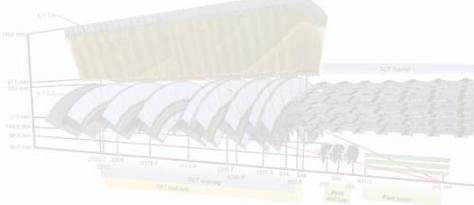
Secondary Panel.
Detailed vs general information
in primary/secondary

The screenshot displays the ATLAS ID DCS FSM panel with the following sections:

- Top Left:** Your user name (NO USER), Fast Navigation, and Alarm Summary (can also be used for fast navigation).
- LHC Handshake Status:** Shows status for LHC, IDE, PIX, SCT, and TRT modules.
- Environmental cooling:** Monitors flow, pressure, and temperature for barrel, endcap, and disk components.
- Background conditions:** Shows monitoring off and stable beam status.
- Compressor:** Monitors pressure and flow for Compressor Priority and various stages (Q1-Q6).
- Evaporative cooling:** Monitors pressure and flow for various stages (Q1-Q6).
- SCT:** Monitors PS ENV, ROD, and INF modules.
- PIX:** Monitors PS ENV, ROD, and INF modules.
- TRT:** Monitors LV TEMP HV, RCK, COOL, and BULK modules.
- INNER DETECTOR:** Monitors various sub-modules like EV COOL, ENV, RADMON, MAGNET, INF, and BCM.
- GGSS (Gas Gain Stabilization System):** Monitors BA, ECA, and GGSS to HV modules.
- Bottom Right:** SCT Automatic Turnon, Hardware Injection Permit (AUTOMATON), Safe for Beam Inj./adj./dum, Permit without masking, DCS FSM Consistency, and PLC Connection.
- Bottom Left:** Detailed status for BARREL, B LAYER, DISKS, ENDCAP A, ENDCAP C, BARREL A, BARREL C, ENDCAP A, and ENDCAP C modules.
- Bottom Center:** Beam Abort Start time (2011.08.17 09:48:19.789) and ROD1/ROD0 status.



Alarm screen



ALARMS_IDG: ATLASAlarmScreen

ATLAS
Alarm Screen

Group Acknowledgement

Acknowledge

Sh	Dir.	Description	Alarm text	Online Value	Ack	Time	Co
W	CAME	ATLIDETEH:TEH_Crate_04.SW_Card_01	SumAlert:ATLIDETEH:TE	TRUE		2011/07/15 14:12:35.598	
W	CAME	IDE TEH SCT Endcap SideA OTE_L_04 3	SumAlert:ATLIDETEH:TE	TRUE		2011/07/15 14:12:35.598	
W	CAME	IDE TEH SCT Endcap SideA OTE_L_04 3 Temperature	Temperature Warning LOV	15.3		2011/07/15 14:12:35.598	
W	CAME	ATLIDETEH:TEH_Crate_01.SW_Card_03	SumAlert:ATLIDETEH:TE	TRUE		2011/07/15 14:12:37.598	
W	CAME	IDE TEH SCT Endcap SideC OTE_M_05 1	SumAlert:ATLIDETEH:TE	TRUE		2011/07/15 14:12:37.598	
W	CAME	IDE TEH SCT Endcap SideC OTE_M_05 1 Temperature	Temperature Warning LOV	14.9		2011/07/15 14:12:37.598	

Sort According to Severity

Right click On Alarm for details (for summary alerts), help, and trends

Your user name

List of systems shown

Displayed: 8 Unacknowledged: 0 Masked: 21 Masked Alerts

Filter settings

Systems: ATLRTTHVC, ATLRTLCS1, ATLRTTPPA1, A2, C1, C2, CS

Severity: W, E, F

Description: *
Alert Text: *
DPE Name: *

Acknowledgment: All Acknowledged Unacknowledged Not Acknowledgeable Pending

NO USER

Filter Preset: Default

Lock Line Position: Deselect Settings Close

Apply filter if you updated it



Alarm screen: alarm help



- All alarms shall be logged
 - In the summary elog or in a dedicated elog entry
 - Errors and Fata ls shall be followed by a call to the expert, if **alarm help** does not state otherwise
 - Alarm twiki help: details along with actions to be taken
 - Report any missing help pages!

Insert Directly to elog

Get Alarm Details

Right click on alarm to see options

**Open Alarm Help (Twiki page)
before taking further actions**

Sh	Dir.	Description	Alarm text	Online Value	Ack	Time	Co
W	CAME	ATLIDETEH:TEH_Crate_01.SW_Card_03	SumAlert::ATLIDETEH:TE	TRUE		2011/07/15 14:12:37.598	
W	CAME	IDE TEH SCT Endcap SideC OTE_M_051	SumAlert::ATLIDETEH:TE	TRUE		2011/07/15 14:12:37.598	
W	CAME	IDE TEH SCT Endcap	Temperature	Warning LOV 14.8		2011/07/15 14:12:37.598	



Alarm screen: actions / recap

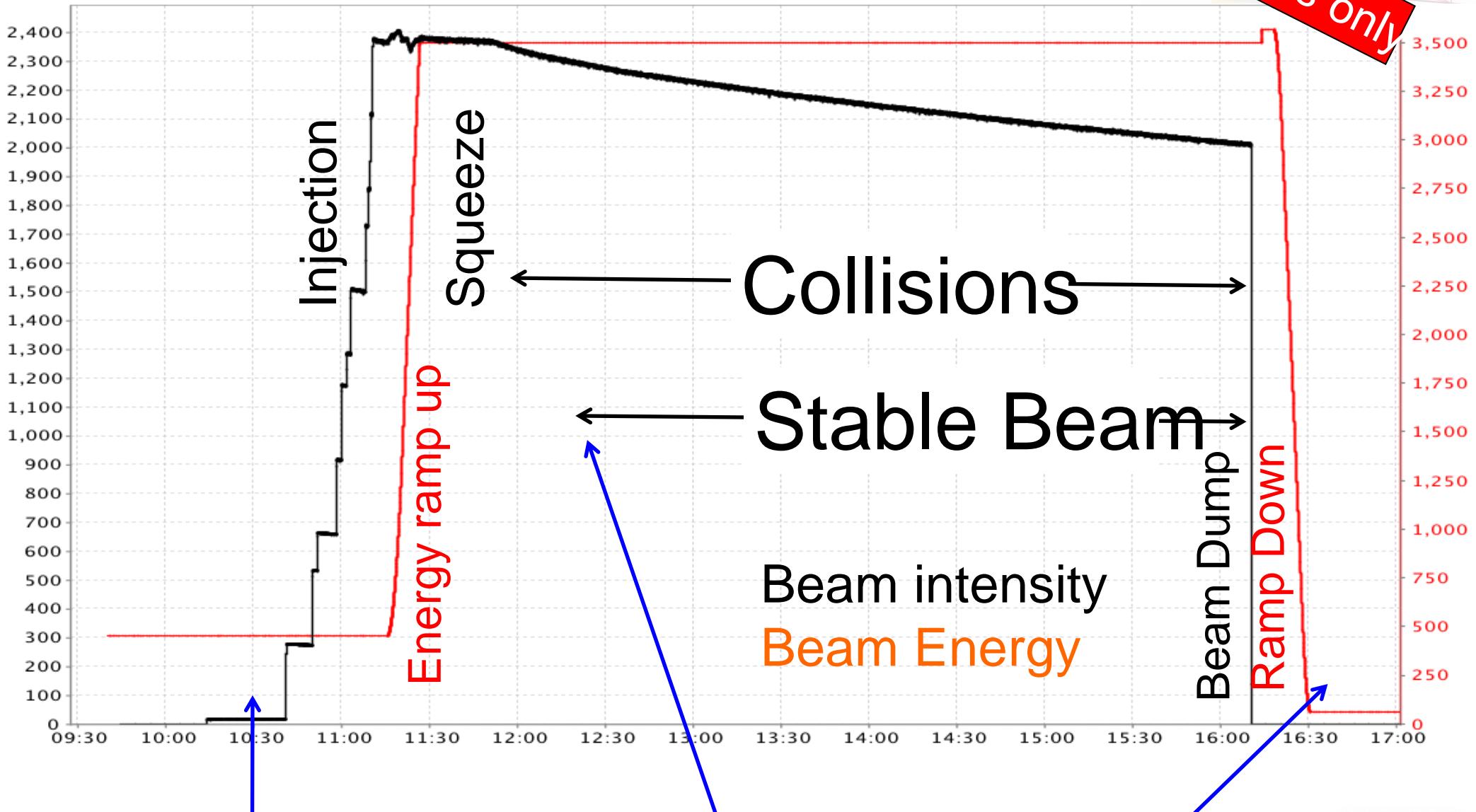


- Watch for DCS alerts and FSM state/status change
 - **Warnings:** check alarm help, follow instructions and write e-log / mask
 - **Error & Fatal:** check alarm help, follow instructions and call the relevant expert / write e-log
- Keep checking the ID WhiteBoard
- In case of (partial) power cut
 - Call all run coordinators ASAP
- In case of evaporative cooling fatal
 - For example loop(s) going to standby or off
 - Call IDGen then the affected system RC





LHC Operations and ATLAS



Start ATLAS Run

Warm start

Stop ATLAS Run

LHC operation: Modes



- State of the LHC is described by *machine mode* and *beam mode*
 - For reference:

Machine Modes

SHUTDOWN

BEAM SETUP

MACHINE DEVELOPMENT

PROTON PHYSICS

PROTON-NUCLEUS PHYSICS

Beam Modes

NO BEAM

[CYCLING]

SETUP

INJECTION PROBE BEAM

INJECTION PHYSICS BEAM

PREPARE RAMP

RAMP

FLAT TOP

SQUEEZE

ADJUST

STABLE BEAMS

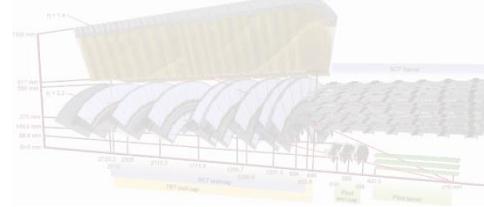
BEAM DUMP

RAMP DOWN





LHC operation

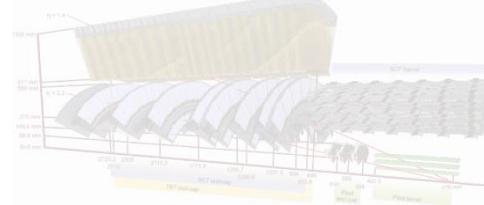


- Typical LHC operation cycle can be divided in **five phases** that have distinctive tasks to ID shifters:
 - preparation for beam injection
 - **INJECTION HANDSHAKE**: *check safe detector state*
 - physics fill **ramp-up**
 - *watch beam conditions*
 - **stable beam**
 - WARM START, *check DQ*
 - beam dump or adjust
 - **DUMP HANDSHAKE, ADJUST HANDSHAKE**: *check safe detector state*
 - BEAM LOSS: *check BCM Post Mortem analysis ("PM")*
 - no beam
 - *inform your RunCo's/ On-calls if there is time for calibration*
 - *Watch DCS*
 - **No beam != No problems are expected**





Beam Conditions in the FSM



- Make yourself familiar in your shadow shift how to check beam conditions and where to find the panels with the detailed information.
 - **Collimators:**
 - IDE → “IP1 Collimator Check” Tab
 - **Background rates:**
 - IDE → “Beam Rates” Tab → BCM rates
 - **Occupancies:**
 - SCT, PIX: FSM main panel
 - PIX rates will only be available after the warm start
 - **SCT AutomatON state:**
 - FSM main panel (“Monitoring active”)
 - more detail in SCT → AUTOMATON





Beam Injection

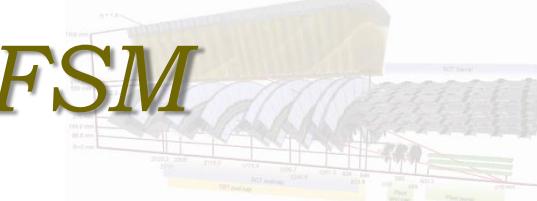


- Beam Injection is the **most dangerous** phase in terms of potential beam loss!
- Before LHC can inject the beam (**pilot bunch**), the experiments have to signal first that they are in a safe state.
 - This is accomplished by the **INJECTION HANDSHAKE**, where the ATLAS shiftleader finally gives the **INJECTION PERMIT** by physically turning the **INJECTION KEY**
 - Before giving the injection permit, the shift leader **must** come to you and **verify with you that ID is in the appropriate state** (*so be sure to check in time/proactively!*):
 - **BCM ready to abort the beam/last post mortem analysis finished**
 - **Pixel and SCT in STANDBY state:**
 - Pixel without High Voltage and preamplifiers off
 - SCT with reduced high voltage (50 V)
 - **Pixel, SCT and BCM give the hardware injection permit**
 - **Pixel, SCT and BCM give the software “safe-for-beam” flag**
 - **The hardware injection permit is not masked** for PIX and SCT





INJECTION handshake in the FSM



- Check in the FSM main panel:
 - **the BCM ROD states:**
 - 6 means “ready”
 - 5 means “reading out buffers”
 - takes ~3 minutes after the last Post-Mortem (PM)
 - **PIX and SCT state**
 - STANDBY
 - Never rely *only* on the FSM state. Nodes could be masked.
 - Not STANDBY
 - investigate! (*Could* be OK. Or not.)
 - **Hardware Injection permit**
 - Masked
 - if not announced, call RunCo as early as possible! Even if the actual signal is “green”.
 - given
 - not given
 - **Safe for Beam Flag**
 - present
 - not present

BCM	READY	OK

ROD1		
State 6 Last PM: 11-08-22 18:04:1		

ROD0		
State 6 Last PM: 11-08-22 18:04:1		

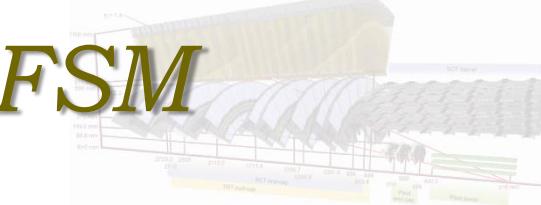
IDE	READY
PIX	STANDBY
SCT	STANDBY
TRT	READY

Hardware Injection Permit			
BCM	BLM	Pixel	SCT

Safe for Beam Inj./adj./dum		
PIX	SCT	BCM



INJECTION handshake in the FSM



- Check in the FSM main panel:
 - **the BCM ROD states:**
 - 6 means “ready”
 - 5 means “reading out buffers”
 - takes ~3 minutes after the last Post-Mortem (PM)
 - **PIX and SCT state**
 - STANDBY
 - Never rely *only* on the FSM state. Nodes could be masked.
 - Not STANDBY
 - investigate! (*Could* be OK. Or not.)
 - **Hardware Injection permit**
 - Masked
 - if not announced, call RunCo as early as possible! Even if the actual signal is “green”.
 - given
 - not given
 - **Safe for Beam Flag**
 - present
 - not present

BCM	READY	OK

ROD1	State 5	✗ Last PM: 11-08-22 18:04:1

ROD0	State 6	✓ Last PM: 11-08-22 18:04:1

IDE	READY
PIX	✗ READY
SCT	✓ STANDBY
TRT	READY

Hardware Injection Permit			
X			
BCM	BLM	Pixel	SCT

Safe for Beam Inj./adj./dum		
PIX	SCT	BCM
✗	✓	✗



RAMP-UP



- After the beams are injected, LHC will ramp up the beam energy, set up the optics and adjust for stable beams.
In this phase, the **ID shifter should check the following items** that can prevent automatic ramp-up once stable beams are declared:
 - **Collimator and Absorber positions**
 - Collimators in their final position during SQUEEZE
 - Absorbers in their final position during ADJUST
 - Position may be out of warning threshold, or data might not be available → **CALL**
 - **Background rates**
 - **Spikes** in the background rate
 - single event(s) near stable beams
 - noisy BCM module (taken out of the calculation? **Check with BCM RunCo**)
 - needs to be evaluated by PIX/SCT RunCo → **CALL**
 - Constantly **high background rates**
 - to be evaluated by PIX/SCT RunCo and understood with SL/CCC → **CALL**
 - **Occupancy**
 - SCT: checked by script
 - PIX: manual check for now
 - problem with trigger setup → check with Run Control/Trigger Desk, **CALL RunCo**
 - high background → **CALL**
 - If you notice during the ramp-up any potential problem → **CALL**



RAMP-UP



- After the beams are injected, LHC will ramp up the beam energy, set up the optics and adjust for stable beams.
In this phase, the **ID shifter should check the following items** that can prevent automatic ramp-up once stable beams are declared:
 - **Collimator and Absorber**
 - Collimators in their final position
 - Absorbers in their final position
 - Position may be out of view
 - **Background rates**
 - **Spikes** in the background
 - single event(s) near start of fill
 - noisy BCM module (take off)
 - needs to be evaluated by PIX
 - Constantly **high background**
 - to be evaluated by PIX
 - **Occupancy**
 - SCT: checked by script
 - PIX: manual check for noise
 - problem with trigger settings
 - high background → **CALL**
 - If you notice during the ramp-up any potential problem → **CALL**

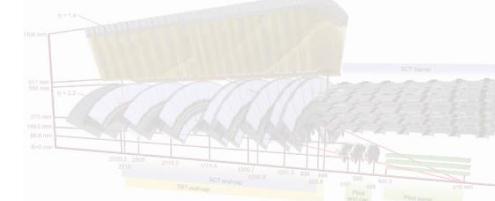
Manual Pixel Ramp-Up:

At the start of Run2, the Pixel Ramp-Up will still happen manually like in Run 1.

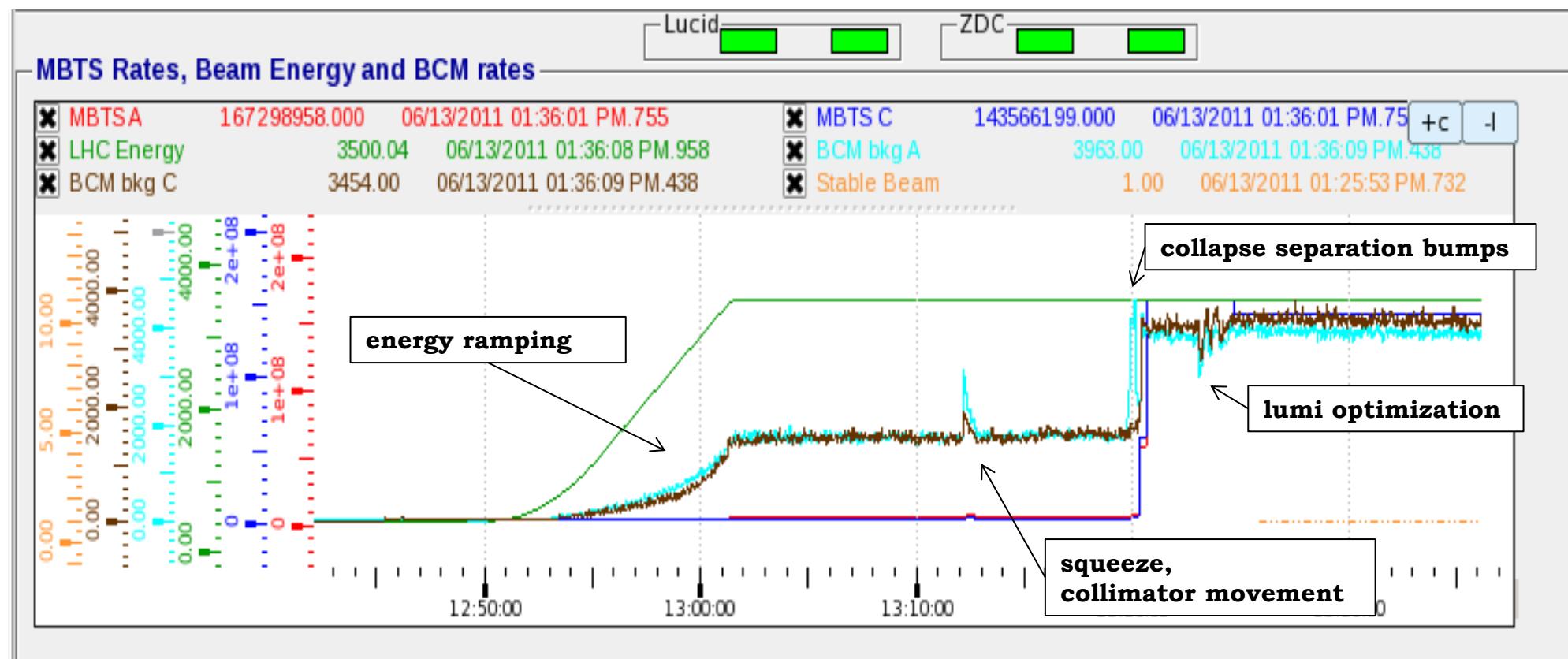
Call the Pixel Run Coordinator each time LHC goes to SQUEEZE in a fill for physics!

(to be updated ASAP – at around first beams...)

BCM rates



- You can also monitor in the BCM rates (to some degree) what LHC is doing ;)





Stable Beams



- After the beams are injected, LHC has ramped up the beam energy, set up the optics and adjusted for stable beams:
 - When reaching stable beams (announced by an acoustic signal), ATLAS starts to take physics data. This transition is called the **“warm start”**:
 - triggers are **on hold**
 - **IF** all beam condition checks have been OK:
 - **SCT will ramp up automatically** their high voltage
 - **Pixel will ramp up** their high voltage (**manually for now**)
 - Pixel will get reconfigured (“PREAMPS_ON”)
 - Triggers will be resumed with the physics trigger settings (automatically), when SCT and PIX are READY.
 - ATLAS is now **ready to take good physics** data (or not)
 - Check that SCT and Pixel have moved into **READY state!**
 - If PIX or SCT is NOT READY a few minutes into STABLE BEAMS, **call RunCo NOW**
 - Delay means loss of physics data!
 - During stable beams, monitor continuously the data quality
 - More details in DQ presentation





Stable Beams: the end

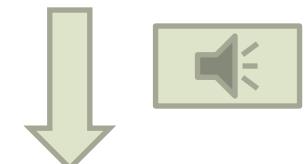


- There are three possible ends to a stable beams period:
 - LHC dumps the beam on purpose, e.g. because the beam intensity has decreased below a certain percentage of the starting value, or due to a scheduled intervention
 - This is preceded by a **DUMP HANDSHAKE** to give the experiments time to move into a safe state.
(Not a real handshake: automatic dump after 5 min if no VETO from experiments)
 - LHC wants to remove the stable beams signal to **do beam adjustments** that are outside the allowed range of stable beams
 - Before removing the stable beams signal and starting the beam adjustment, the experiments have to signal they are in a safe state via the **ADJUST HANDSHAKE**. Can be followed by another stable beams period for physics, beam dump, or machine activities.
(LHC has to wait for OK of experiments)
 - LHC loses the beam
 - **unscheduled BEAM DUMP**



ADJUST and DUMP HANDSHAKE

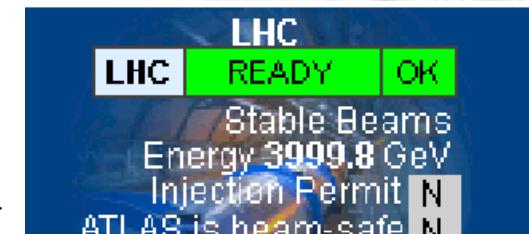
- When LHC initiates a **handshake**
 - a sound will be played in ACR (**siren sound**)
 - Handshake message will go to WARNING
- **PIX and SCT** will immediately and automatically start to **go into a safe state** (TRANSITION in the FSM)
- The shiftleader **must** check with you (or himself) that ID is in a safe state, before he publishes READY to the LHC. Check:
 - SW safe for beam flag
 - FSM state
 - injection permit (recently changed policy)If safe state is not reached → **CALL!**
- If it happens that ATLAS publishes READY before SCT and PIX are in a safe state, make this known to the SL and/or your RunCo's
- The dump handshake does not require the OK from the experiments: after 5 min LHC can dump the beam, if no VETO is issued.





ADJUST and DUMP HANDSHAKE

- When LHC initiates a **handshake**
 - a sound will be played in ACR (**siren sound**)
 - Handshake message will go to WARNING
- **PIX and SCT** will immediately and automatically start to **go into** FSM)
- The shiftleader that ID is in a READY to the beam
 - SW safe for beam
 - FSM state
 - injection permitIf safe state is reached
 - If it happens to happen before SCT and is known to the Shiftleader
 - The dump handshake from the experiment will dump the beam



VETO-ing the Handshake:

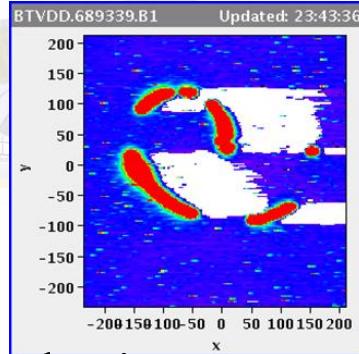
In ATLAS, Pixel will automatically raise a VETO to the dump handshake if either

- HV is not ramped down completely (DCS action) or
- the Preamplifiers have not been turned off (DAQ action).

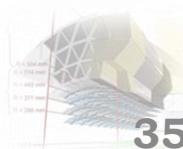
In this case, most probably a manual intervention is required to allow LHC to continue!

CALL PIX RunCo immediately.

Beam Dump + Post Mortem (PM)

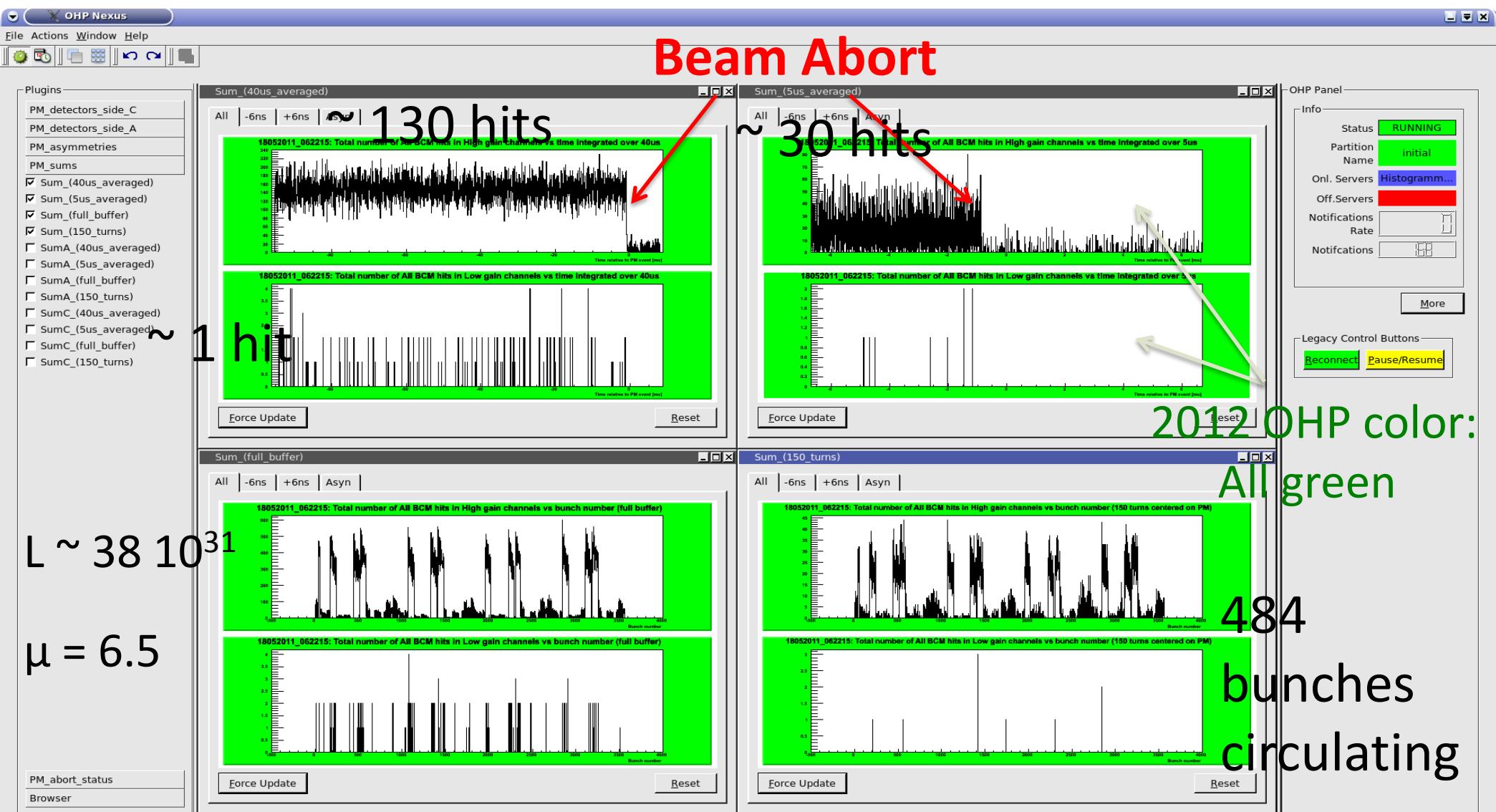


- After each unscheduled beam dump, BCM provides PM analysis of the last 1120 LHC cycles.
- The ROD state goes from
 - 6 (“recording”) -> 12 (“freeze buffers”) and 5 (“read out buffers”) back to 6 after ~3 minutes
- The histograms are available in OHP
 - Green: Inform the shiftleader that PM is ok.
 - Red: Inform the shiftleader that PM is NOT ok, call BCM on-call
- Things to watch for:
 - **All timestamps should be consistent:** time of beam dump, PM counter in BCM RODs, histogram in OHP
 - Was the beam dumped by ATLAS? BCM or BLM?
 - Call BCM RunCo
 - check FSM main page
 - For more detail check beam permits (BCM) and beam abort status (BLM)



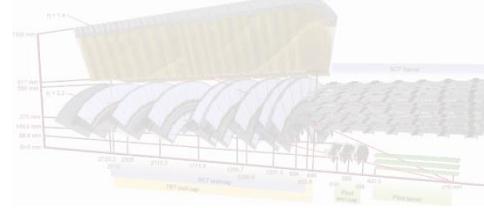


Clean PM histograms (May 2011)

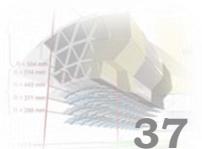




DAQ Tools



- **Shifter Assistant - SA (info only)**
 - Alerts the shifter to specific DAQ error conditions that require shifter action
 - Eg ROD busy or disabled, etc
 - Complements IGUI panel indicators
 - Includes instructions for the shifter
- **IGUI Panels (info+commands) (“ID tab”)**
 - Indicates DAQ-related alerts and warnings
 - Provides shifter tools to take the appropriate action
 - **For M9, SCT and TRT are in the tab**
- **ERS (info only, shown at bottom of IGUI panel)**
 - Warnings/Errors/Fatals from DAQ applications
 - Eg missing essential files, application crashes etc
 - Usually require expert actions, but shifter should monitor ERS for ERRORS or FATALS





DAQ Panel

Started from DAQ menu



DAQPanel

Main Mon_Advanced Ctrl_Advanced

Start Partition Monitor Partition RC Status ERS

DBE DVS Log Manager

Busy DQM Display Trigger Presenter SFO Display

OHP OHP

Get Default Read Info Get Partition

Log Messages

oks_data_editor options --->
ohp options ---> -c
TriP options ---> -c
BUSY options --->
OMD options --->
Event Dump options --->
ERS filter --->
Executing start_DQM_Display.sh with the command line: source /det/tdaq/scripts/setup_TDAQ_tdaq-05-04-00.sh; exec start_DQM_Display.sh ATLAS
STDOUT: Setting up TDAQ Common SW release "tdaq-common-01-28-00"
STDOUT: Setting up DQM Common SW release "dqm-common-00-26-02"
STDOUT: Setting up DAQ SW release "tdaq-05-04-00"

Resize Clear Log Change role Exit

You are davidr and your role is expert

Opens the IGU

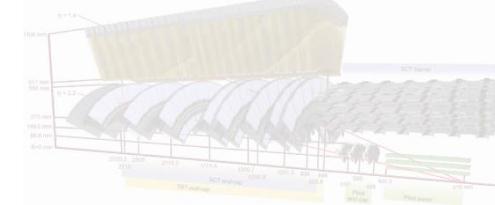
Gets the correct setup

**Opens the SA
Found under the
Ctrl Advanced tab**





Shifter Assistant



home RunControl AAL **Detectors** Trigger

+ SCT

- TRT -- 1 new alerts!

[Mark all as read](#) [Unmask](#) [Domain](#)

Show 10 ▾ entries

ID	Date	Name	Message	Action	Details	Severity	Read
35161	Mon, 22 Aug 2011 21:26:56	TRT_Resync	TRT is trying to resync.	Watch for error messages. Click here for details.	+	INFORMATION	<input type="checkbox"/>
34470	Mon, 22 Aug 2011 12:45:36	TRT_Resync	TRT is trying to resync.	Watch for error messages. Click here for details.	+	INFORMATION	<input type="checkbox"/>
34324	Mon, 22 Aug 2011 11:07:40	TRT_Resync	TRT is trying to resync.	Watch for error messages. Click here for details.	+	INFORMATION	<input type="checkbox"/>
30965	Thu, 18 Aug 2011 11:36:53	TRT_Resync	TRT is trying to resync.	Watch for error messages. Click here for details.	+	INFORMATION	<input type="checkbox"/>
30961	Thu, 18 Aug 2011 11:36:12	TRT_Resync	TRT is trying to resync.	Watch for error messages. Click here for details.	+	INFORMATION	<input type="checkbox"/>
30959	Thu, 18 Aug 2011 11:35:30	TRT_Resync	TRT is trying to resync.	Watch for error messages. Click here for details.	+	INFORMATION	<input type="checkbox"/>
30854	Thu, 18 Aug 2011 10:08:11	TRT_Resync	TRT is trying to resync.	Watch for error messages. Click here for details.	+	INFORMATION	<input type="checkbox"/>
30445	Thu, 18 Aug 2011 05:30:54	TRT_Resync	TRT is trying to resync.	Watch for error messages. Click here for details.	+	INFORMATION	<input type="checkbox"/>
30124	Thu, 18 Aug 2011 01:32:21	TRT_Resync	TRT is trying to resync.	Watch for error messages. Click here for details.	+	INFORMATION	<input type="checkbox"/>
30000	Thu, 18 Aug 2011 00:54:55	TRT_Resync	TRT is trying to resync.	Watch for error messages. Click here for details.	+	INFORMATION	<input type="checkbox"/>

After reading and dealing with
an alert mark as Read

Search all columns:

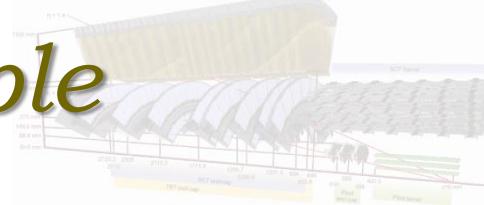


- Info messages can be ignored
- For **Warnings, Errors and Fata**ls:
 - Check details, problem database and whiteboard and follow instructions
 - If none or unclear call relevant expert!





Shifter Assistant – Detail example



24007	Fri, 12 Aug 2011 17:14:03	SCT_ManyRODsDisabled	More then one ROD was removed from SCT! DAQ is fully compromised!	Check the crate and ROD IDs, and invoke stopless recovery. If such state persists, ask to stop the run and to reconfigure SCT.	+	FATAL	
-------	---------------------------	-----------------------------	---	--	---	-------	--



SCT_ManyRODsDisabled

Alert ID	24005
Name	SCT_ManyRODsDisabled
Message	More then one ROD was removed from SCT! DAQ is fully compromised!
Action	Check the crate and ROD IDs, and invoke stopless recovery. If such state persists, ask to stop the run and to reconfigure SCT.
Detail	Event: Crate: 3
Severity	FATAL





ATLAS DAQ IGUI

To open the ID tab



ATLAS TDAQ SOFTWARE - Partition ATLAS <2>

File Commands Access Control Settings Logging Level Help

Commit & Reload Load Panels

RUN CONTROL STATE NONE

Run Control Commands

SHUTDOWN	BOOT
TERMINATE	INITIALIZE
UNCONFIG	CONFIG
STOP	START
HOLD TRG	RESUME TRG

Beam Stable (Red) Warm Start Warm Stop

Run Information & Settings

Run type	Physics
Run number	185595
Super Master Key	1163
LHC Clock Type	BCref
Recording	Enabled
Start time	15-Jul-2011 13:32:17
Stop time	15-Jul-2011 13:45:10
Total time	0 h, 12 m, 53 s

Information Counters Settings

Run Control Segments & Resources Dataset Tags

RootController

ABSENT	TDAQ:pc-tdq-onl-68
ABSENT	Pixel
ABSENT	SCT
ABSENT	TRT
ABSENT	BCM
ABSENT	LArg
ABSENT	Tile
ABSENT	TGC
ABSENT	MDT
ABSENT	RPC
ABSENT	CSC
ABSENT	LUCID
ABSENT	ZDC:pc-tdq-mon-60
ABSENT	DQMController
ABSENT	Monitoring-Combined-ID-SCT:pc-atla
ABSENT	GlobalMonitoringSegment:pc-tdq-mon

RootController

- HW
- PMG
- Infrastructure

ERS Panel

Show Online Segment Find: Match Case Repeats

Subscription criteria

<input checked="" type="checkbox"/> WARNING	<input checked="" type="checkbox"/> ERROR	<input checked="" type="checkbox"/> FATAL	<input type="checkbox"/> INFORMATION	<input type="checkbox"/> Expression
---	---	---	--------------------------------------	-------------------------------------

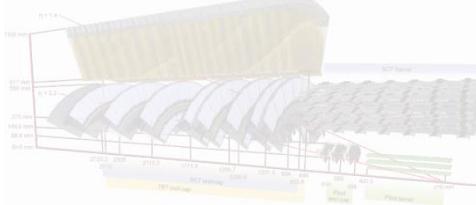
TIME SEVERITY APPLICATION NAME MESSAGE

14:24:06	INFORMATION	IGUI	INTERNAL	All done! IGUI is going to appear...
14:24:05	INFORMATION	IGUI	INTERNAL	Waiting for the "Dataset Tags" panel to initialize...
14:24:05	INFORMATION	IGUI	INTERNAL	Waiting for the "Segments & Resources" panel to initialize...
14:24:04	INFORMATION	IGUI	INTERNAL	Waiting for the "Run Control" panel to initialize...
14:24:04	INFORMATION	IGUI	INTERNAL	Creating panel "Igui.DSPanel"...
14:24:04	INFORMATION	IGUI	INTERNAL	Creating panel "Igui.SegmentsResourcesPanel"...
14:24:04	INFORMATION	IGUI	INTERNAL	Creating panel "Igui.RunControlMainPanel"...
14:24:04	INFORMATION	IGUI	INTERNAL	Waiting for the "Elong-Dialon" panel to initialize...

Clear Message format SHORT LONG Visible rows 100 Current MRS subscription WARNING|ERROR|FATAL



ERS Panel



- For Warnings, Errors and Fatals
 - Check details, problem database and whiteboard and follow instructions
 - If none or unclear call relevant expert!





The ID Tab

ID DAQ Status
shows the
combined Status of
the whole tree
Green, yellow, Red

And same for the
individual systems.

If yellow or red, click
on the sub-tree
component to see
the origin of the
warning/alarm and
the tools to resolve
the problem

Here the SCT control
and Status Panel is
selected and shown

TIME	SEVERITY	APPLICATION	NAME	MESSAGE
13:28:15	WARNING	ddc_sct_endcapC...	ddc:AppWarning	SCT_ECA_Warning: DCS: SCT_ECA is not READY/STANDBY.
13:28:15	WARNING	ddc_sct_endcapA...	ddc:AppWarning	SCT_ECA_Warning: DCS: SCT_ECA is not READY/STANDBY.
13:17:13	WARNING	ddc_sct_barrels...	ddc:AppWarning	SCT_BAR_Warning: DCS: SCT_BAR is not READY/STANDBY.
13:16:45	WARNING	ddc_sct_barrels...	ddc:AppWarning	SCT_BAR_Warning: DCS: SCT_BAR is not READY/STANDBY.
13:14:29	WARNING	SctApiCrat...	sctapi:RodMonito...	Slink down status: ROD 15 = good (0x949e66)

Configuration problem: ignore 3 component(s) not referenced by partition, but including partition segments and/or resources:



SCT Control and Status Panel



Control Mode: Enables recovery tools
Only one TDAQ IGUI has control mode enabled (if someone opens another IGUI and takes control mode, this IGUI will have control mode disabled)

Module Recovery:
Automatic recovery of link errors
Should be enabled by default
If Control Mode is disabled, module recovery gets disabled too.

Global Reconfiguration:
Time between automatic global reconfiguration of the SCT to counteract chip configuration corruption by SEUs

SCT Control & Status

Control Mode: Enabled
Module Recovery: Enabled
Global reconfiguration every 30 minutes

Disabled RODs: 0
Busy RODs: 0
Link Errors: 12

Reconfigurations: 5 Last one at: 13:35:26

Number of disabled/Busy RODs and Link Errors across the full SCT
If any of these indicators are not green go to the non-green crates to perform recovery actions

MESSAGE
Warning SCT_ECA_Warning: DCS: SCT_ECA is not READY/STANDBY.
Warning SCT_ECA_Warning: DCS: SCT_ECA is not READY/STANDBY.
Warning SCT_BAR_Warning: DCS: SCT_BAR is not READY/STANDBY.
Warning SCT_BAR_Warning: DCS: SCT_BAR is not READY/STANDBY.
Monito... Slink down status: ROD 15 = good (0x949e66)
Configuration problem: ignore 3 component(s) not referenced by partition, but including partition segments and/or resources:

Clear Message format SHORT LONG Visible rows 100 Current MRS subscription WARNING|ERROR|FATAL



SCT ROD Recovery Actions



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File Commands Access Control Settings Logging Help

Commit & Reload Load Panels

RUN CONTROL STATE RUNNING

Run Control Commands

SHUTDOWN **ROOT**

ID DAQ STATUS

TRT

Recovery

CRATE0 **CRATE1** **CRATE2** **CRATE3** **CRATE4** **CRATE5** **CRATE6** **CRATE7**

SLOT 5 **Busy %** **Link Errors**

SCT_CRATE1 ACTIVE

Slot 6 **0** **0**
Slot 7 **0** **0**
Slot 8 **0** **0**
Slot 9 **0** **0**
Slot 10 **0** **0**
Slot 11 **0** **0**
Slot 12 **0** **0**
TIM **0** **0**
Slot 14 **0** **0**
Slot 15 **0** **0**
Slot 16 **0** **0**
Slot 17 **0** **0**
Slot 18 **0** **0**
Slot 19 **0** **0**
Slot 20 **0** **0**
Slot 21 **0** **0**

Yellow: Disabled
ACTION: Right mouse click on disabled ROD and select 'Invoke Stopless recovery'
 Then recover modules (next slide)

Red: ROD is Enabled, but it is BUSY
ACTION:
 -Ask RC shift to invoke stopless removal
 -If RC shifter clicked NO by mistake, right mouse click on the red ROD and select 'Invoke Stopless Removal'

Event builder **30630** **18.94 Hz**
Event filter **28644** **21.13 Hz**
Recorded
Information **Counters**
Subscription criteria
TIME **SEVERITY**
 13:28:15 WARNING
 13:28:15 WARNING
 13:17:13 WARNING
 13:16:45 WARNING
 13:14:29 WARNING

Clear **Message format** **SHORT** **LONG** **VISIBLE ROWS** **100** **Current MRS Subscription** **WARNING|ERROR|FATAL**
Subscribe
but including



SCT Link Recovery Actions

Link Errors per ROD

Should be ideally 0

If non-zero the modules with errors are reconfigured automatically

Green <10

Yellow <20 – Start to worry!

Red >20 – recoveries failed – TAKE ACTION

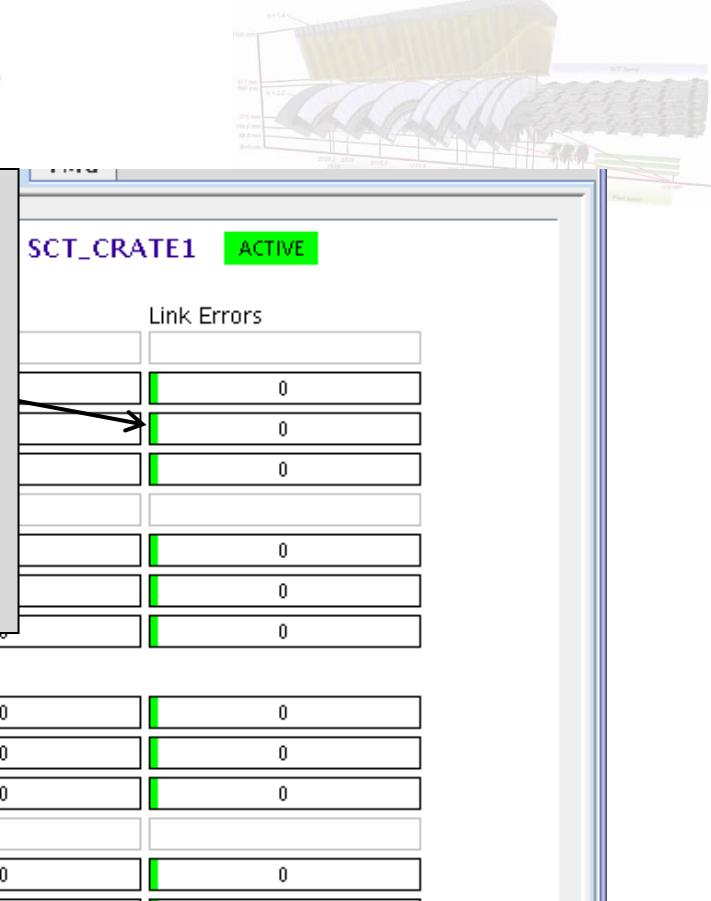
Run Information & Settings

Yellow:

ACTION: Data ok, but call
SCT DAQ/DCS expert on
162034 during normal
hours, make elog

Recorded	0	0.00 mHz
Information	Counters	Settings

Subscription criteria		
TIME	SEVERITY	APPLICATION
13:28:15	WARNING	ddc_sct_endca
13:28:15	WARNING	ddc_sct_endca
13:17:13	WARNING	ddc_sct_barrels... ddc:AppWarning SCT_BAR_Warning: DCS: SCT_BAR is not READY/STANDBY.



Red:

ACTION:

- Right mouse click and select 'Recover all modules'
- If no improvement:
 - call SCT DAQ/DCS expert on 162034
 - invoke stopless ROD removal, then stopless ROD recovery, then again select 'Recover all modules'



TRT Tab and Recovery Panel

ATLAS TDAQ SOFTWARE - Partition ATLAS

RUN CONTROL STATE RUNNING

Run Control Commands

- SHUTDOWN
- BOOT
- TERMINATE
- INITIALIZE
- UNCONFIG
- CONFIG
- STOP
- START
- HOLD TRG
- RESUME TRG

Beam Stable Warm Start Warm Stop

Run Information & Settings

Lumi Block	28	
Number	Rate	
Level 1	31349	22.05 Hz
Level 2	31059	22.23 Hz
Event builder	31059	22.23 Hz
Event filter	29155	20.83 Hz
Recorded	0	0.00 mHz

Information **Counters** **Settings**

ID DAQ STATUS

- TRT
 - TRTRecovery
- SCT
 - SCT_CRATE0
 - SCT_CRATE1
 - SCT_CRATE2
 - SCT_CRATE3
 - SCT_CRATE4
 - SCT_CRATE5
 - SCT_CRATE6
 - SCT_CRATE7
- PIX

Run Control **Segments & Resources** **Dataset Tags** **ID** **PMG**

TRT Recovery Panel

This panel is still under development. Please report any issues you find.

Common Tools

Current # of sync prob... **0** **Request Resync**

Current # of disabled R... **0** **Recover Disabled RODs**

Specific ROD Recovery

ROD Address: ROD Address Here **Request ROD Recovery**

Status:

No commands issued from panel

Subscription criteria WARNING ERROR FATAL INFORMATION Expression **Subscribe**

TIME	SEVERITY	APPLICATION	NAME	MESSAGE
13:28:15	WARNING	ddc_sct_endcapC...	ddc:AppWarning	SCT_ECA_Warning: DCS: SCT_ECA is not READY/STANDBY.
13:28:15	WARNING	ddc_sct_endcapA...	ddc:AppWarning	SCT_ECA_Warning: DCS: SCT_ECA is not READY/STANDBY.
13:17:13	WARNING	ddc_sct_barrels...	ddc:AppWarning	SCT_BAR_Warning: DCS: SCT_BAR is not READY/STANDBY.
13:16:45	WARNING	ddc_sct_barrels...	ddc:AppWarning	SCT_BAR_Warning: DCS: SCT_BAR is not READY/STANDBY.
13:14:29	WARNING	SctApiCrate2	sctapi::RodMonito...	Slink down status: ROD 15 = good (0x949e66)

Configuration problem: ignore 3 component(s) not referenced by partition, but including partition segments and/or resources:

Clear Message format **SHORT** **LONG** Visible rows **100** Current MRS subscription **WARNING|ERROR|FATAL**



ID operations and Problem Database

Web interface opened via ID menu on desktop:
ID – InnerDetector – ID Operations DB

The screenshot shows the 'ID Operations/Problems Database' web page. At the top, there are search filters: 'System : TRT', 'Category : Any', and an 'Optional Search String :'. Below these filters is a table of database entries. A tooltip 'Click on a row' is shown over the first entry. The table rows are color-coded: red for DAQ, green for DCS, yellow for ACR, and white for others. The first few rows are:

System	Category	Description
DAQ	Any	More than 100 RODs are busy.
DAQ	Any	SCT is BUSY but ROD is not busy.
DCS	Any	PS subtrees state is BUSY but ROD is not busy.
DAQ	Any	SCT is still busy after a ROD removal.
DAQ	Any	BOC uninitialized.
ACR	Any	HV channel trips and cannot recover.
DCS	Any	Automatic turnon of the SCT does not work.
DCS	Any	FSM stuck in command, state grayed out.
DCS	Any	How to restart the SCT FSM.
DAQ	Any	Run control shifter makes a stopless removal of an SCT ROD.
DCS	Any	When trying to persistify clock select change, dialog box says dbConnection error.
DAQ	Any	How to configure TIM to not use L1A delay in TIM.
DCS	Any	One crate starts having channels going unknown, or channels changing state randomly.
DAQ	Any	How to change the sampling rate for the ROS monitoring?
DCS	Any	How to start the SCT FSM from the command line?
MRS	Any	WARNING SctApiCreateX sctapi::RodMonitoringFlag ROD busy status: ROD 14 = off/on.
MRS	Any	WARNING SctApiCreateX sctapi::RodMonitoringFlag ROD busy status changed 1 times: ROD XX = on/off.
IDGEN	FATAL	FATAL.

Below the table, a specific entry is expanded:

Description Problems seen during Channel Delay scans during PrepareForRun. Some RODs may have corrupted data or go busy.
Author Jonathan Stahlman on 2011-05-16 14:42:21
Severity Medium (Action needed, but no or minimal impact on data taking)
Explanation During the ROD channel delay scan, a number of chips responded very much out of time, causing the chips to be assigned the wrong delay value. This can lead to data corruption for these chips. There are two known problematic ROD's for which this sometimes happens, 340201 and 332001. If this occurs mid-run, the resync procedure automatically reacts and re-does the resync to correct the delay values.

However, at the beginning of run, this problem cannot be corrected automatically because the automatic resync is not available. In this case, the above error is generated and the shifter must take an action.
Solution A manual resync ([instructions here](#)) will repeat the channel delay scans, fixing the problem. If the error appears again after a manual resync, call the DAQ on-call expert.

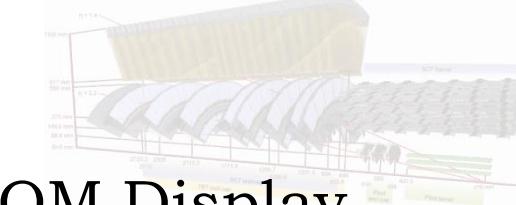
Specify system

Specify category

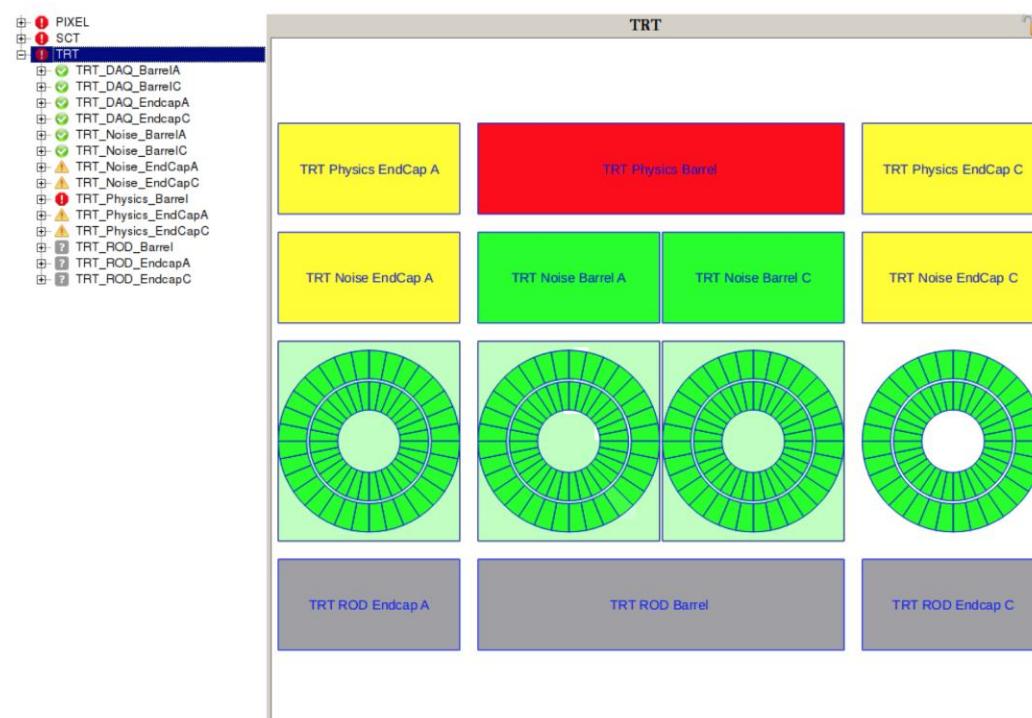
Enter search string

Click on DB entry for detailed information and instructions

Data Quality and Monitoring



- The Data Quality is Monitored by using the DQM Display
 - The DQM uses histograms published by the ID monitoring applications, applies limits on parameters and presents them to the shifter.
- The OHP is used to look at all the available histograms not only the ones used for the DQM
 - More detailed information might be needed to debug a problem showed in the DQM
- TRT example:





Checklist(s)

Open from the General screen tab

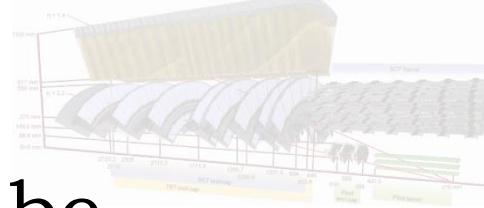


Instruction	Status	Comments
Check the ID Whiteboard for any special instructions. Help	<input checked="" type="radio"/> Not Done <input type="radio"/> Worked <input type="radio"/> Failed	Look at "Latest Information". Browse... No files selected.
Login to the IDG DCS FSM, the IDG FSM Alarm Screen, and the PIX, SCT, TRT, and BCM Alarm Screens. Help	<input checked="" type="radio"/> Not Done <input type="radio"/> Worked <input type="radio"/> Failed	Glance at the FSM and Alarm Screens. Follow up any existing warnings and alarms with the previous shifter. Browse... No files selected.
Login to the e-log using your CERN account. Help	<input checked="" type="radio"/> Not Done <input type="radio"/> Worked <input type="radio"/> Failed	Read the latest ID shifter entries. Browse... No files selected.
Make sure the TDAQ IGUI is open and visible. You will need to view MRS messages, keep yourself informed of the run state, and view the ID DAQ panel. Help	<input checked="" type="radio"/> Not Done <input type="radio"/> Worked <input type="radio"/> Failed	Use the "Monitor Partition" button in the DAQ Panel to open it. Keep it visible and glance at it regularly throughout your shift. Browse... No files selected.
Set up the MRS filtering in the lower half of the TDAQ IGUI. Help	<input checked="" type="radio"/> Not Done <input type="radio"/> Worked <input type="radio"/> Failed	Use the filter expression given on the ID Whiteboard and click on "Subscribe". Set the number of lines to 1000. Browse... No files selected.
Open the ID Panel in the TDAQ IGUI if not already open. Help	<input checked="" type="radio"/> Not Done <input type="radio"/> Worked <input type="radio"/> Failed	If the ID Panel is not already present, select "IDShifterGui" in the "Load Panels" list. Browse... No files selected.
Open the Shifter Assistant web interface, if not already open. Help	<input checked="" type="radio"/> Not Done <input type="radio"/> Worked <input type="radio"/> Failed	Use the TDAQ menu at the bottom of the screen and select "Shifter Assistant", then click on "Detectors". Browse... No files selected.
Make sure that OHP and DQMD are open. Help	<input checked="" type="radio"/> Not Done <input type="radio"/> Worked <input type="radio"/> Failed	Open them with the respective buttons in the DAQ Panel. Browse... No files selected.

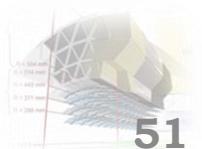




Elog



- The ATLAS logbook should always be opened, and you should be logged in
 - Check out this [template](#)
 - Use a simple text editor to write entries, or start an e-log entry at start of shift and use the edit option, for the summary elog to be posted at the end of shift under the category “Shift Summary” and “IDGen”
 - Record everything that happens in your shift.
 - Include ATLAS activities (e.g. run starts and stops, calibration time, etc) and any issues related to the ID
 - For example ROD busies/recoveries, channel trips/recoveries, etc.
 - Make dedicated entries for specific problems
 - As for example from instruction in the alarm help to make it easier for the expert to identify and solve the problem quickly





ID Whiteboard

The Whiteboard should always be open

<https://atlasop.cern.ch/twiki/bin/view/Main/InnerDetectorWhiteBoard>

AVG Secure Search

Jump Search

ATLAS

Main

o perjohanssoncernch

reate personal sidebar

click to Logout

Main Web

Create New Topic

Index

Search

Changes

Notifications

RSS Feed

Statistics

Preferences

bs

DcsAlarmHelp

DcsFsmHelp

DcsHelp

Main

LAwWebTools

Sandbox

SysAdmins

TWiki

ATLAS > Main Web > AtlasOperation > InnerDetectorWhiteBoard (2014-12-05, dhayakaw)

Edit Attach

- ↓ What is ID White Board for?
- ↓ Phones
- ↓ Latest Information
 - ↓ M7 Operation Conditions
 - ↓ Data Quality Monitoring
- ↓ DAQ Panel Configuration for ATLAS
- ↓ Run Plan of the Day
 - ↓ Overall Program:
 - ↓ Meetings (from next week Feb 2nd)
 - ↓ On call phones
 - ↓ Run manager: 75870 [Call this first to get in touch with Run Coordination]
- ↓ Archive

Inner Detector Whiteboard

What is ID White Board for?

The ID White Board reviews latest issues and items which should be known to the current **ID shifter** in the ACR. Read it carefully at the start of your shift. For guides and documentation for your shift, read the [ID Shifter links and instructions](#).

Emergency Quick Links: [BCM Post-Mortem](#) • [Heater Pads](#) • [Cooling](#) • [Cooling Failure](#) • [SCT Warm Start](#) • [SCT Power Cut Recovery](#) • [elog Template](#)

Phones

For **PIX** and **TRT** issues: when in doubt, **always call the Run Coordination** phone. If you are experiencing a specific problem, you may call the system expert. For **SCT** issues: please **call the expert on call for all DAQ and DCS problems**; call **Run Co** for beam-related issues. Your desk phone number is **71345**.

	Pixel	SCT	TRT	BCM
Run Coordination	160032	162749	160547	163881
DAQ	165359	162034	160531	163881
DCS	165897	162034	160242	163881
Other	—	160609 FSI 162449 Cooling, ID Gen	160412 High Voltage 163713 Active Gas	—
Monitoring	163352	167114	160543	—

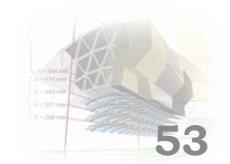
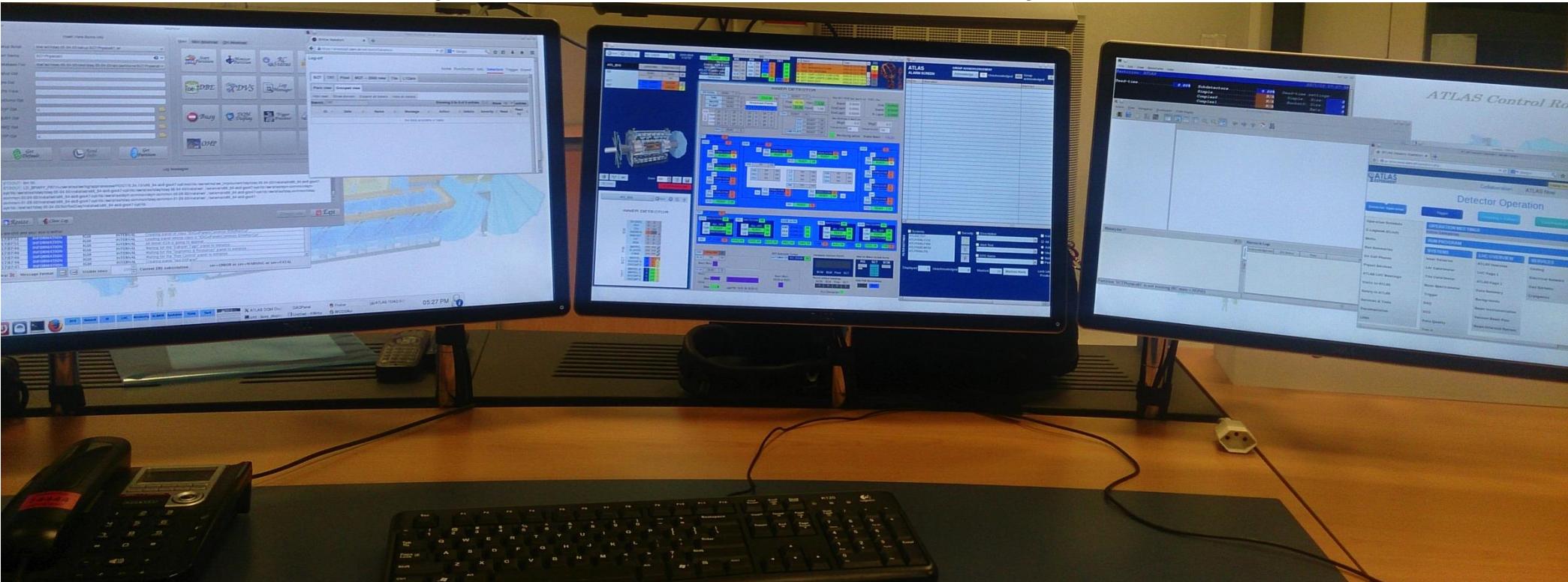
Updated regularly
Please check it for new information
at the start of your shift





ID PC @ ACR

- Have 3-display setup in ACR
 - 4-display setup installed today!

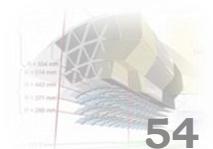




At start of shift



- Make sure you have **the essential tools up and running** and are logged in
 - DAQ Panel with the **default settings**
 - The **IGUI** and do not forget the **ID Panel**
 - **DQM Display** and **OHP**
 - **Shifter Assistant** and the **Problem DB**
 - The **IDG FSM** and **alarm screens**
 - **Whiteboard** and the **Elog**
- **Talk** to previous shifter about issues
- **Read** the whiteboard and recent e-logs
 - You should be **aware of activities** in ID and ATLAS





In case of problems



- Read **alarm help**, check **whiteboard**, look for it in the **Problem DB** and **follow instructions**
 - If no instructions or unclear **call relevant expert/RC**
 - For problems seen in DCS: find the problem in the relevant FSM and check it out
 - **Navigate the tree** to see exactly what's going on
 - **Check the trends** in case of a warning
 - Might be just **a couple of SCT modules that have tripped** or got into a manual/unknown state
 - **No worries try recover once or twice**
 - If you are allowed to **recover things** - try it!
 - You are not supposed to have rights to do anything bad
 - Might be something more serious **affecting a large part of a detector** as one or more TRT LV/HV supply
 - Knowing **the extent of the problem** and exactly **where it is** when calling the expert **is good**





Summary

- Don't Panic! And Enjoy your shifts ;)
 - Provide any feedback that might be useful in your opinion
- Questions?

WHEN ENJOYING YOUR **ATLAS ID SHIFTS**
DONT PANIC
READ ALARM HELP, CHECK WHITEBOARD,
LOOK FOR IT IN THE PROBLEM DB
AND **FOLLOW INSTRUCTIONS**

Albert Einstein

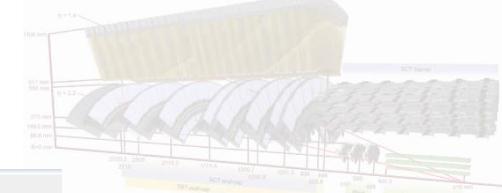


BACKUP SLIDES

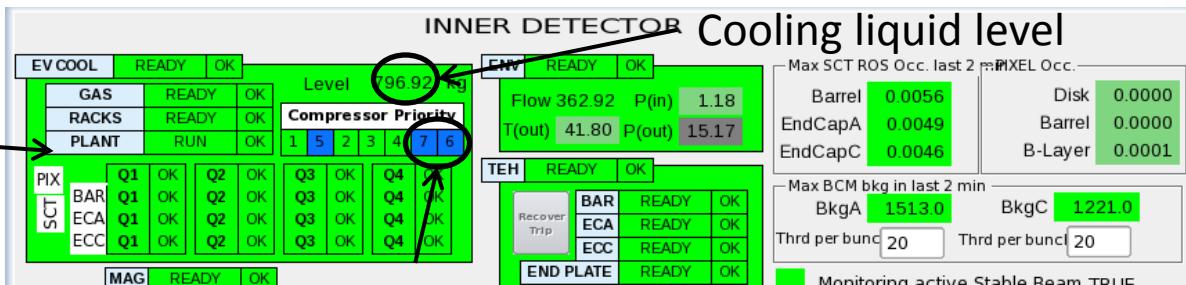




ID FSM Main Panel - Details



ID Environment



Cooling liquid level

Max SCT ROS Occ. last 2 min

Max BCM bkg in last 2 min

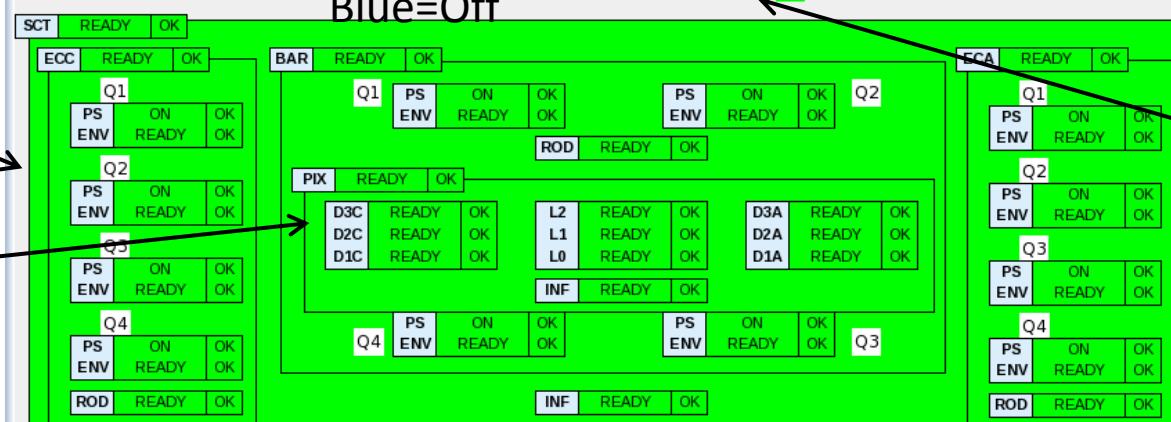
BkgA 1513.0 BkgC 1221.0

Thrd per bunc 20 Thrd per bunc 20

Monitoring active Stable Beam TRUE

Background conditions

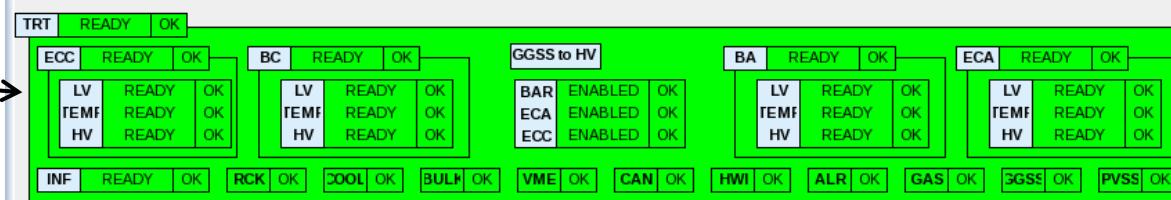
SCT



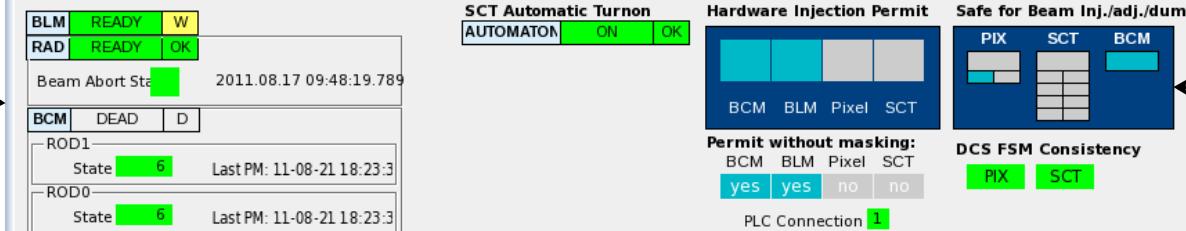
Pixel

Thermal Heater Status

TRT



BCM

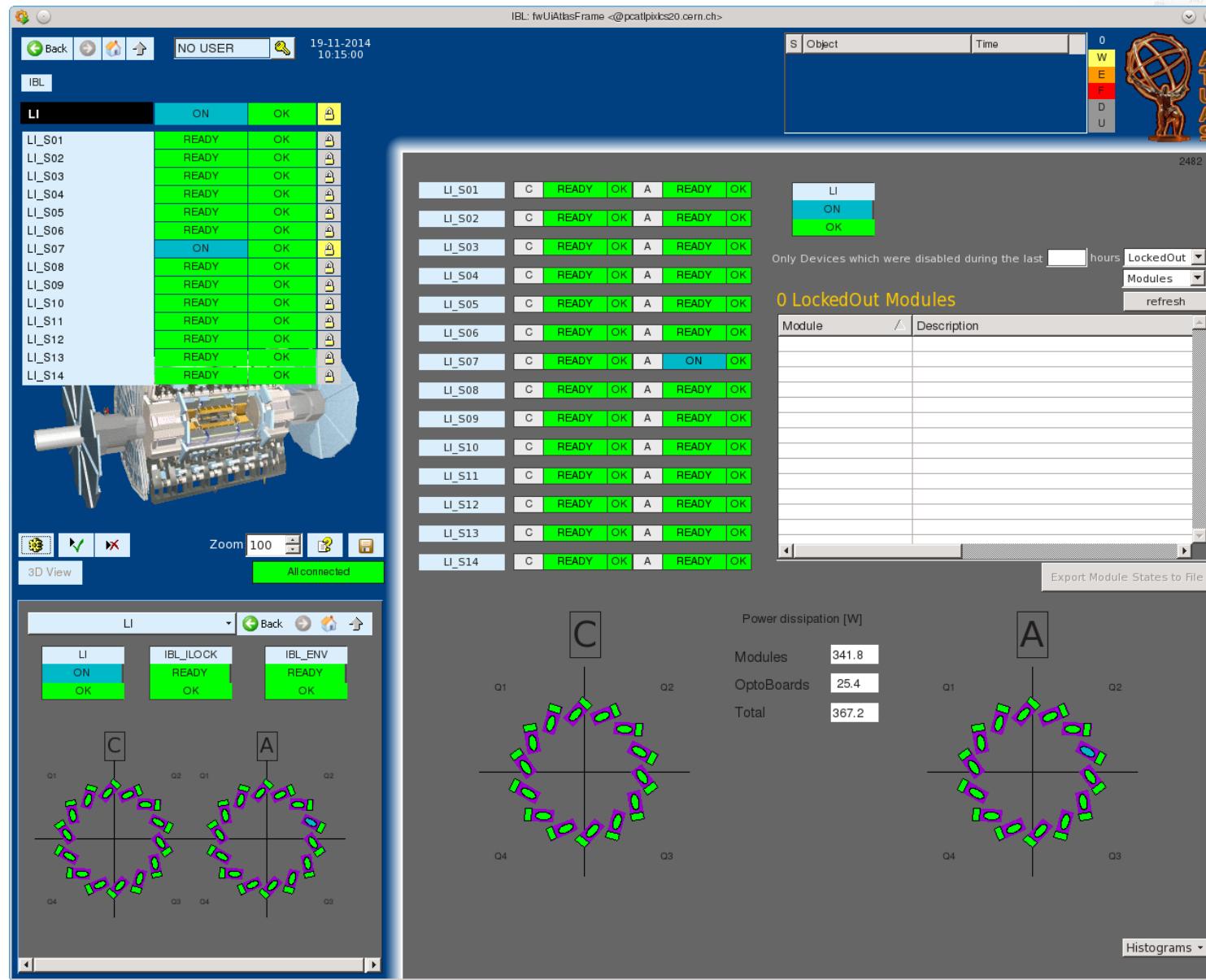


Injection Permit and Safe for Beam





IBL – To Be Integrated into Pixel FSM





IDE(nvironment) FSM

Reached via IDE button

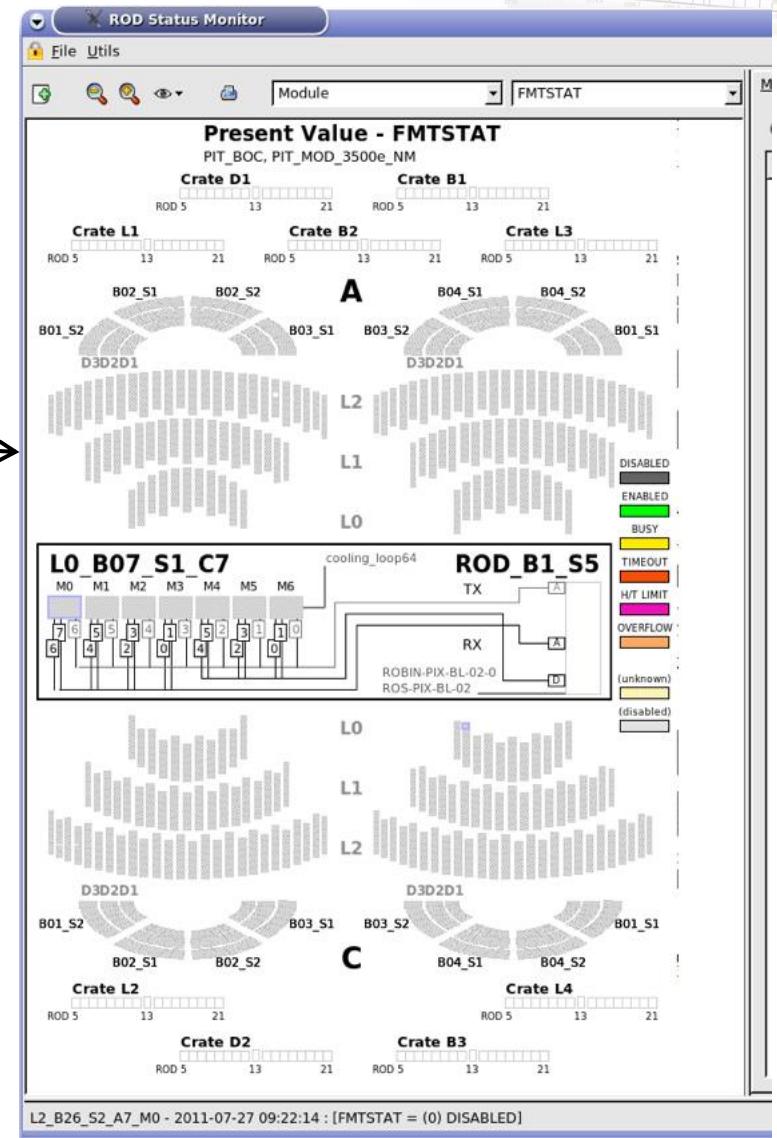
Useful for more detailed look at ID environment & beam conditions, eg in preparation for warm start

The screenshot displays two main windows from the IDE(FSM) interface:

- Left Window (IDE(FSM): fwUiAtlasFrame):**
 - Header:** NO USER, 27-07-2011 11:14:51.
 - ATLAS Status:** Shows various subsystems like IDE, ATLIDEEVCOOL, ATLIDEEV, etc., all in **READY** state with **OK** status.
 - LHC Status:** LHC NOT READY OK, with details about Injection Physics Beam Energy = 450.1 GeV, Injection Permit Y, ATLAS is beam-safe Y, Stable Beams Flag Y, and Handshake.
 - ID Status:** Shows sub-systems PIX, SCT, TRT, IDE all in **OK** state.
 - Bottom:** A 3D view of the ATLAS detector with a "Zoom: 100" button and a "All connected" status indicator.
- Right Window (INNER DETECTOR GENERAL OVERVIEW):**
 - Header:** INNER DETECTOR GENERAL OVERVIEW.
 - Sections:**
 - EVCOOL:** PLANT STATUS (RUN), COMPRESSORS, Liquid level 838.02.
 - GAS:** DataStatus BAD FALSE, Co₂ area, N₂ area, ENV, Hex heater, MANAGER, Update in 8[s].
 - MAG:** Running TRUE, SIDE A (PST), SIDE B (PST), SIDE C (PST).
 - RAD:** SIDE A (PST), SIDE B (PST), SIDE C (PST).
 - BCM:** BCM is **READY**, to abort the beam !, Low Horizontal ROD, Low Vertical ROD, Beam Injection Permit, Beam Permit.
 - TEH:** Manager, Update in 8[s].
 - BLM:** Side C, Side A.



Pixel ROD Mon

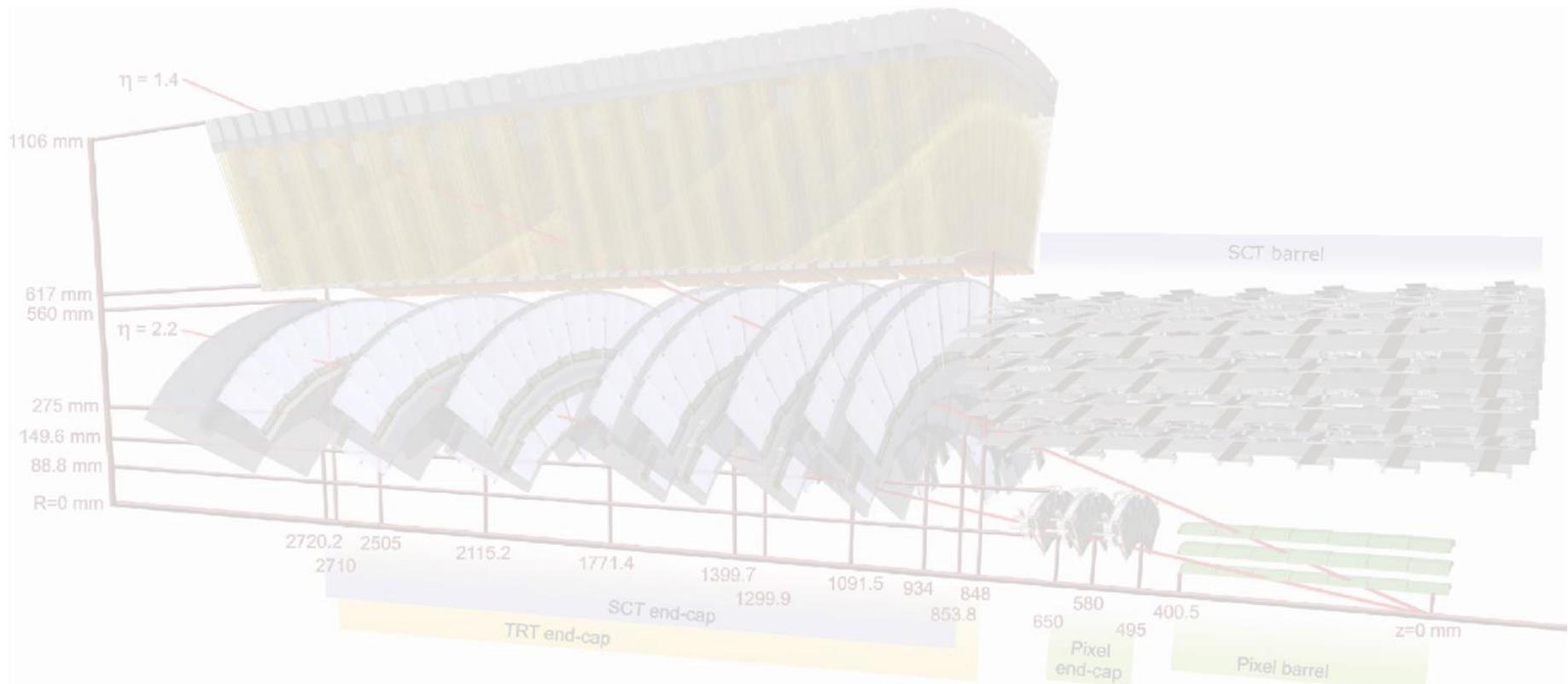
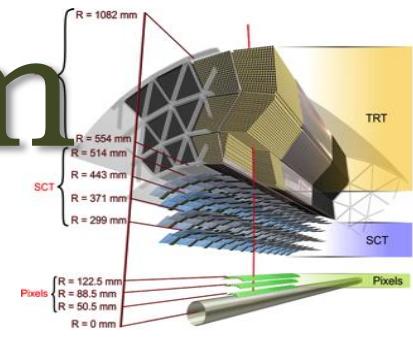


Not supposed to be an ID shifter tool



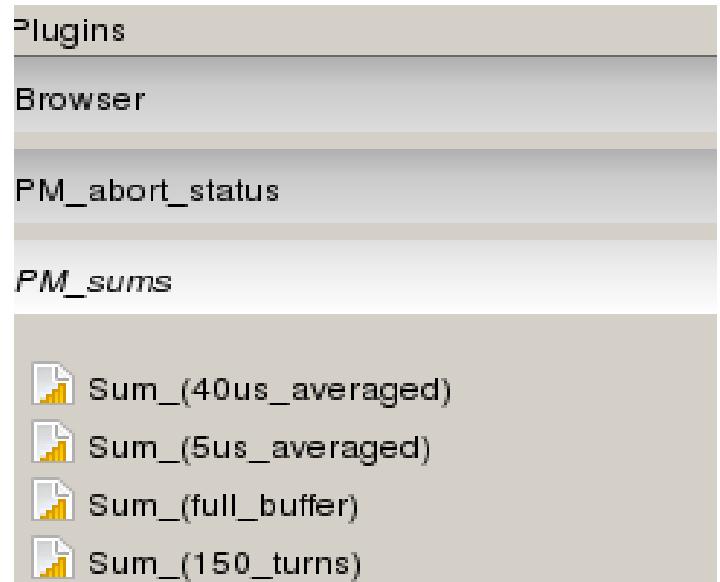


BCM Post Mortem Histograms

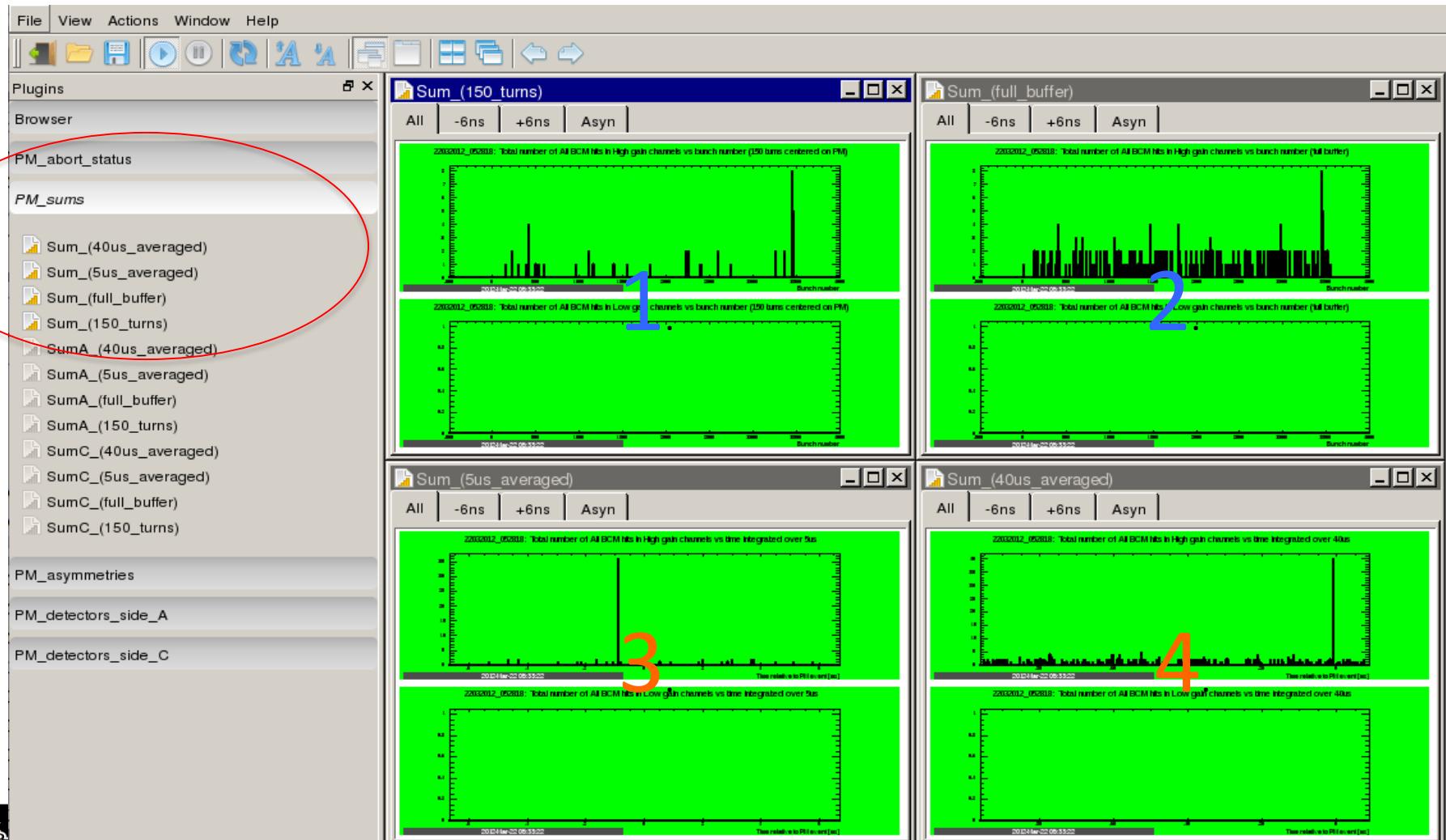


PM Analysis

- After each **Beam Abort** the BCM buffers are analyzed
- PM analysis takes ~ 4 min in between status is 5 (in yellow)
- The information stored in the buffers contain hits of last 1120 LHC turns
- The result of the **PM analysis** is shown as **OHP histograms**:



Where the PM histograms are in OHP:



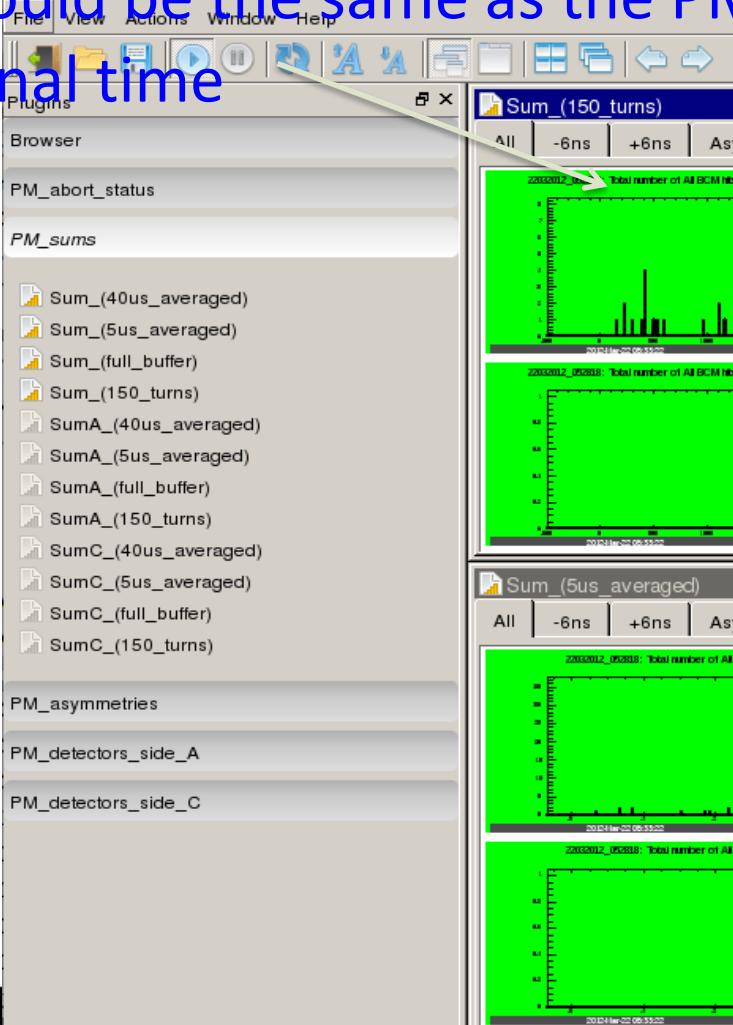
PM SUMS histograms

1. Total number of all **BCM hits** in HG/LG channels **vs bunch number** (150 LHC turns centered on PM)
2. Total number of all **BCM hits** in HG/LG channels **vs bunch number** for the full buffer (last 1110 LHC turns)
3. Total number of all **BCM hits** in HG and LG channels **vs time** integrated over 5 micro seconds bins
4. Total number of all **BCM hits** in High Gain (HG) and Low Gain (LG) channels **vs time** integrated over 40 micro seconds bins

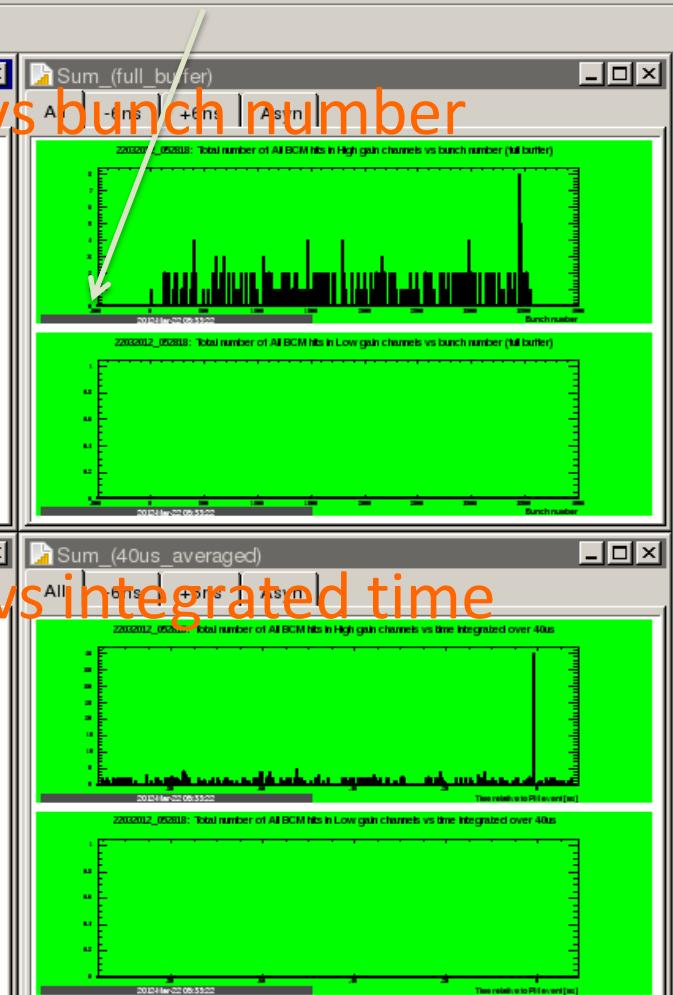


How PM histograms look like in OHP:

Time stamp of the histograms
should be the same as the PM
signal time



Time stamp of the histogram
creation i.e: \sim 4 min after PM signal time



HG

LG

HG

LG

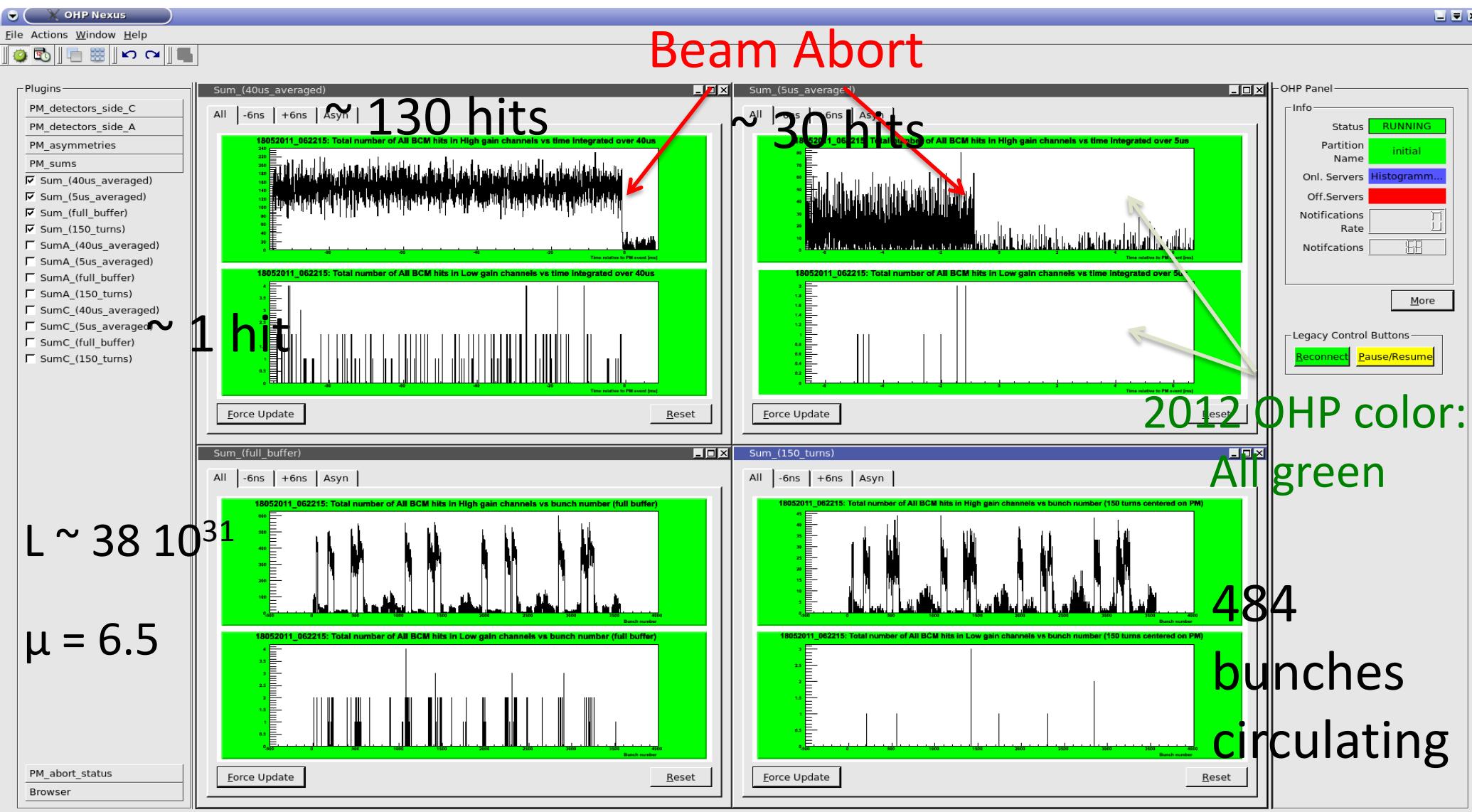


Clean PM histograms

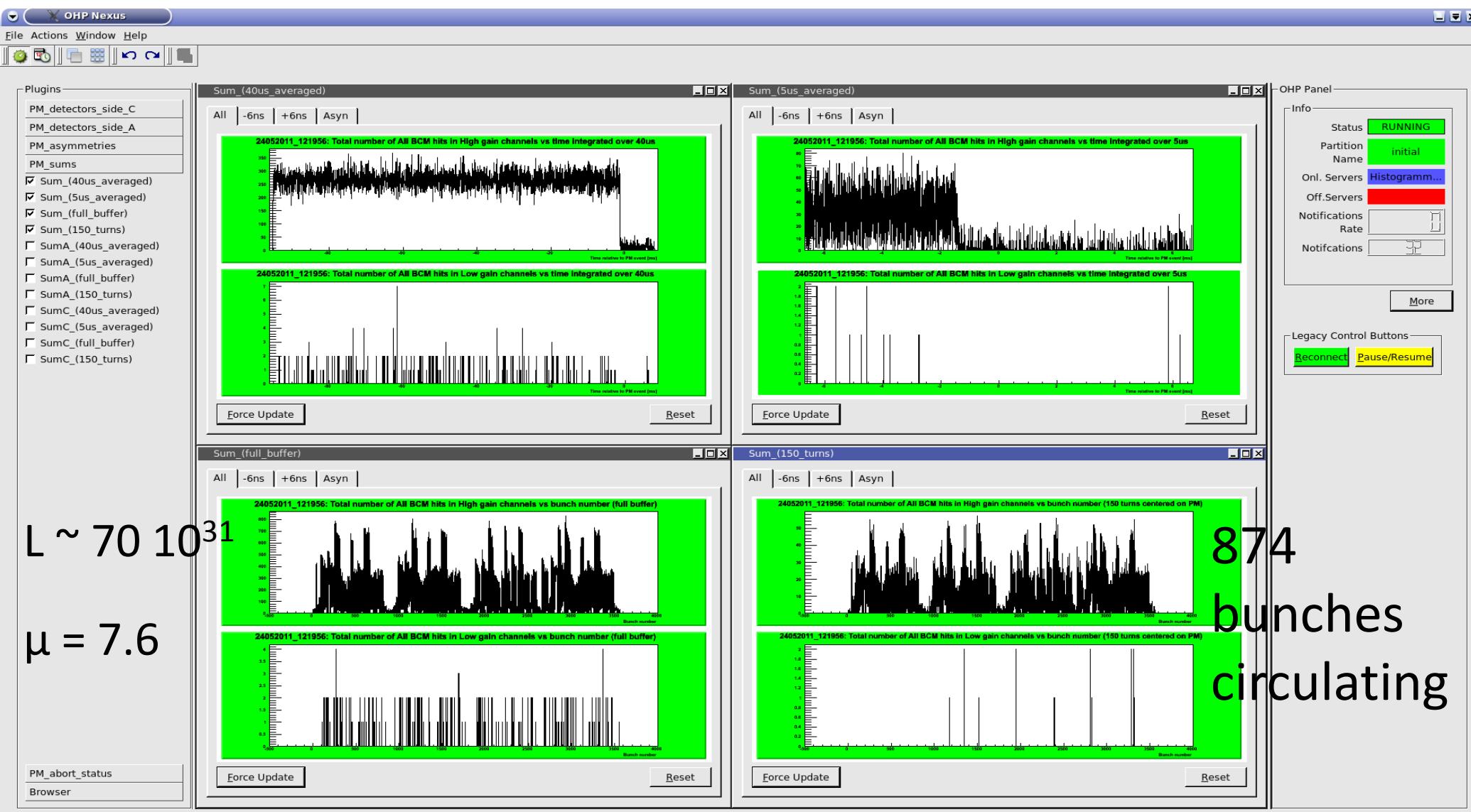
- All 8 histograms are colored **GREEN**
- Steady hits in the HG channel histograms (vs time) before beam abort
- Hits strongly reduced after beam abort
- LG channel histograms (vs time) have fewer hits compared to HG during collision
- LG channels hits almost absent after beam abort



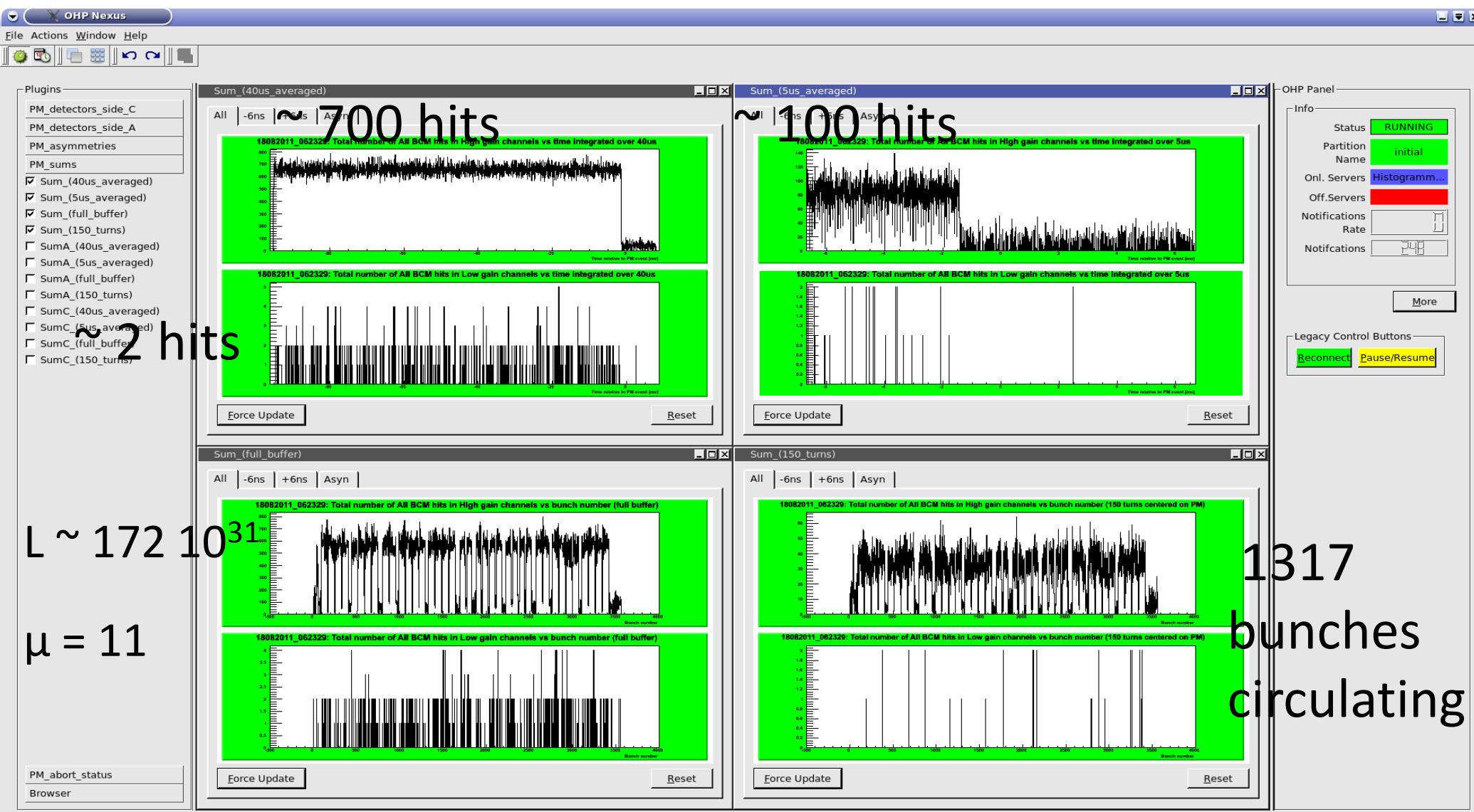
Clean PM histograms (May 2011)



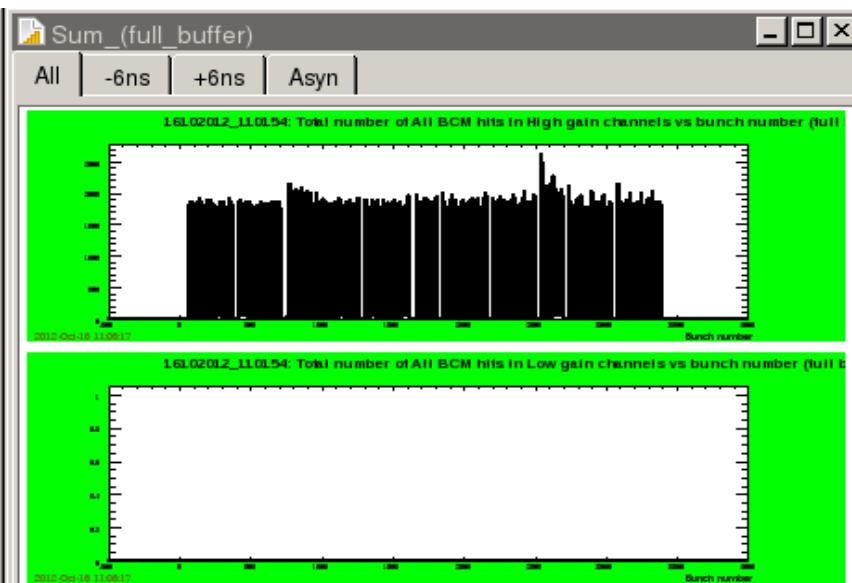
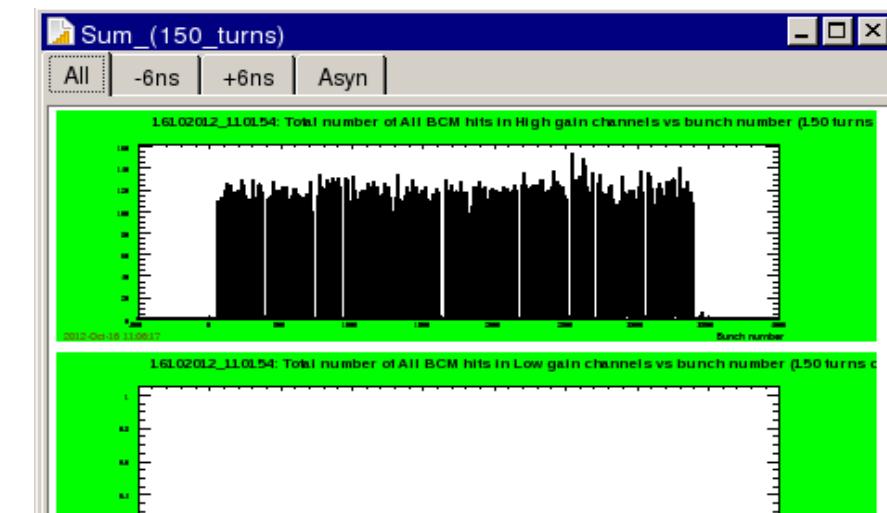
Clean PM histogram (May 2011)



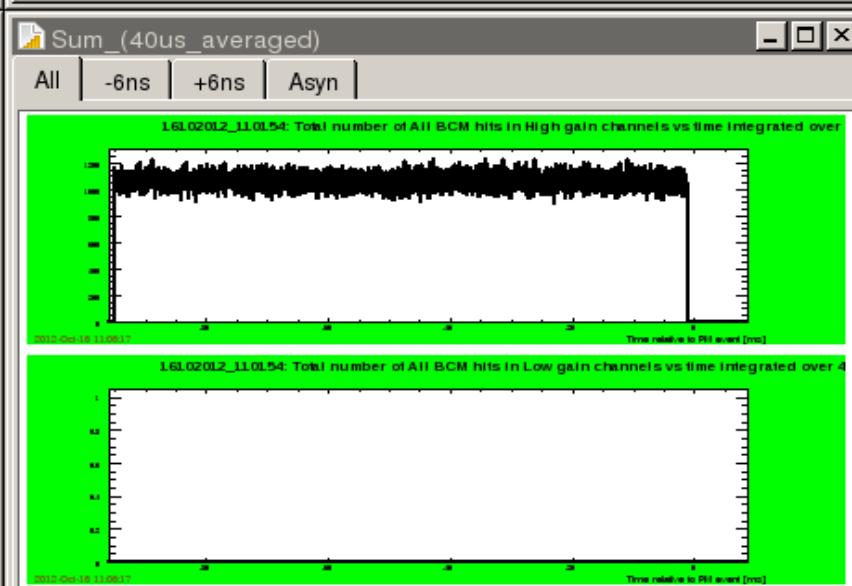
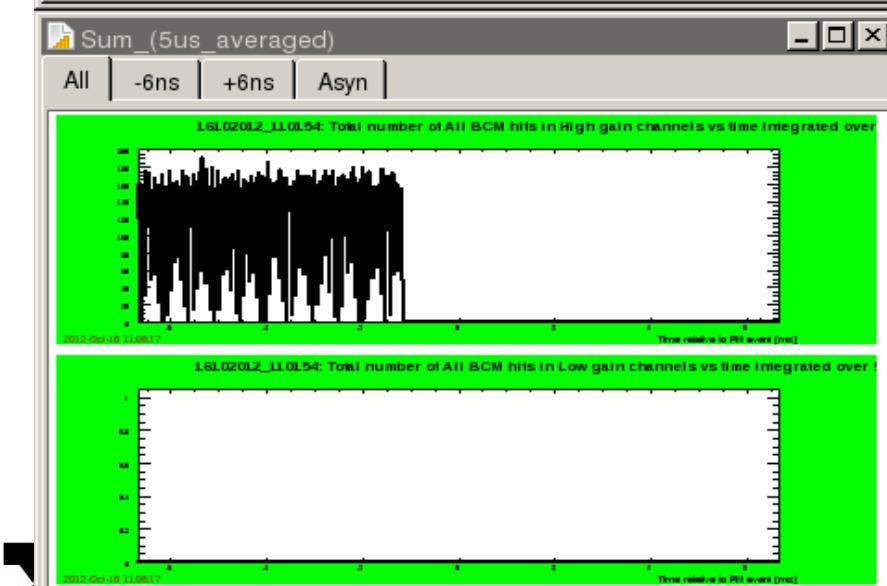
Clean PM histogram (Aug 2011)



Clean PM histogram (October 2012)



LG
channels
Wit no HITS



LG
channels
Wit no HITS

Not Clean PM histograms

- PM histograms are colored **RED** if at least one of the bin in the histogram exceeds the threshold value
- The PM histograms vs time spot potential beam losses
→ great increases of the rates (see next slide)
- Histograms vs bunch number show the potential losses over the full beam structure

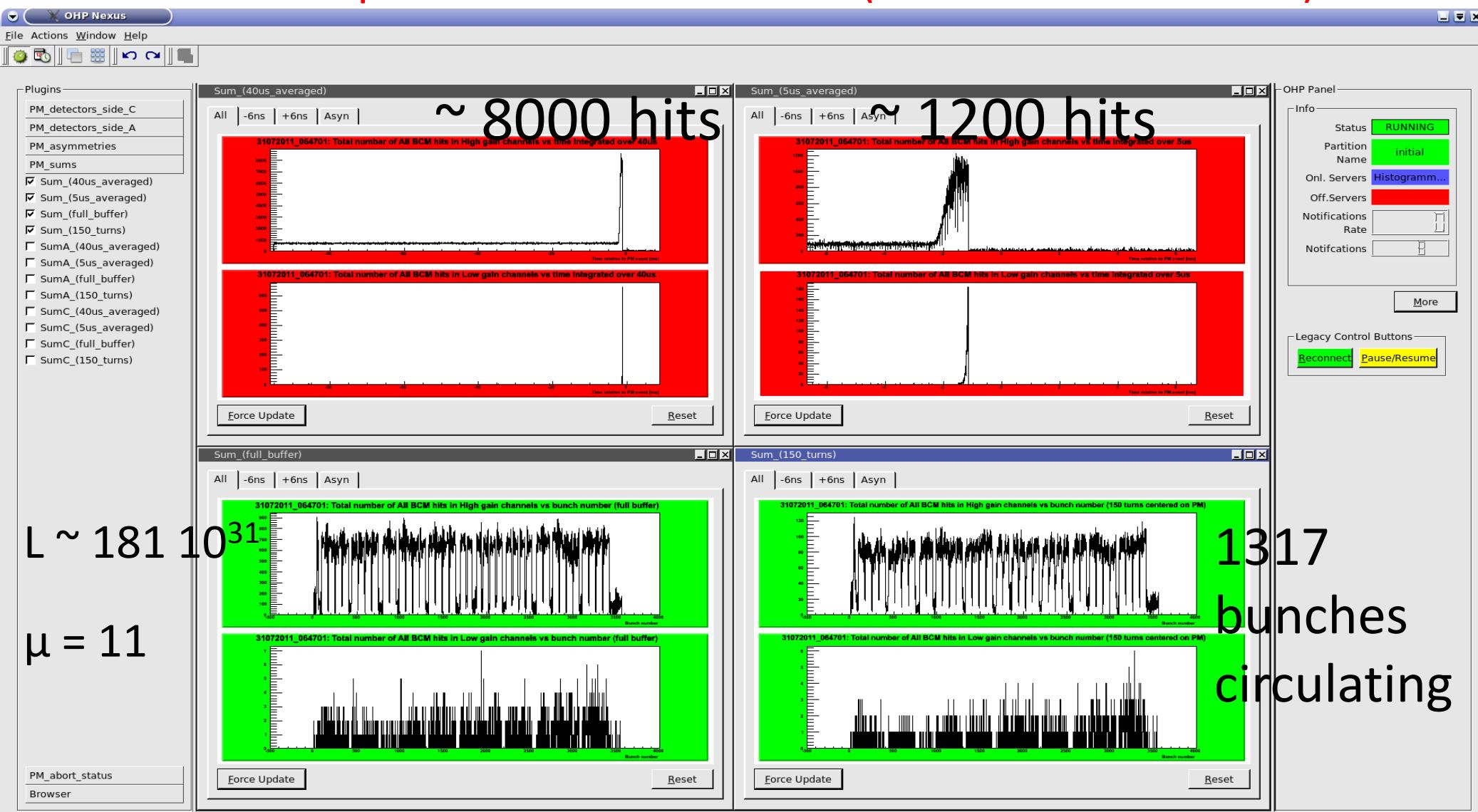
PM histogram red -> call BCM on-call expert



31st July 2011: ATLAS BLM Beam

Abort

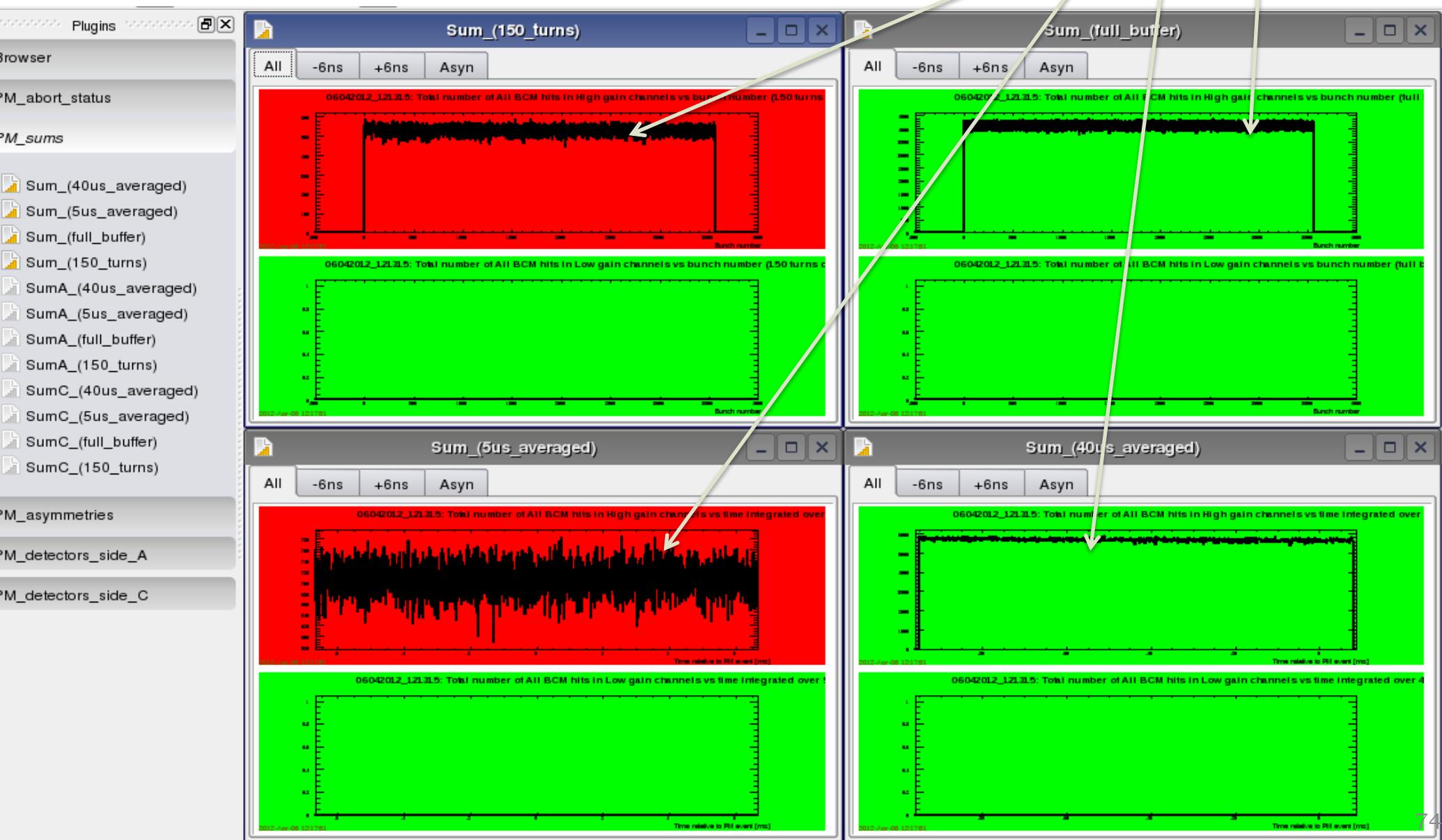
UFO caused spike in the BCM hits rate (also BLM beam abort)



Full Buffer PM

Can happen that the PM histogram have a full buffer ->
No PM information – call on-call (163881)

Full hits in HG channels



Summary

- BCM provides PM analysis information after each beam dump
- 4 sets of PM histograms are published in OHP (PM_SUMS)
- The PM histograms have to be CHECKED after each beam dump:
 1. If all histograms are **green** then the injection permit can be given
 1. If one of the PM histogram is **red** -> call bcm expert and notify SL
 1. Check the time-stamp of the PM histograms that should be the same as the PM time stamp. If **not updated** -> call bcm expert

