

Calo ACR training

TileCal

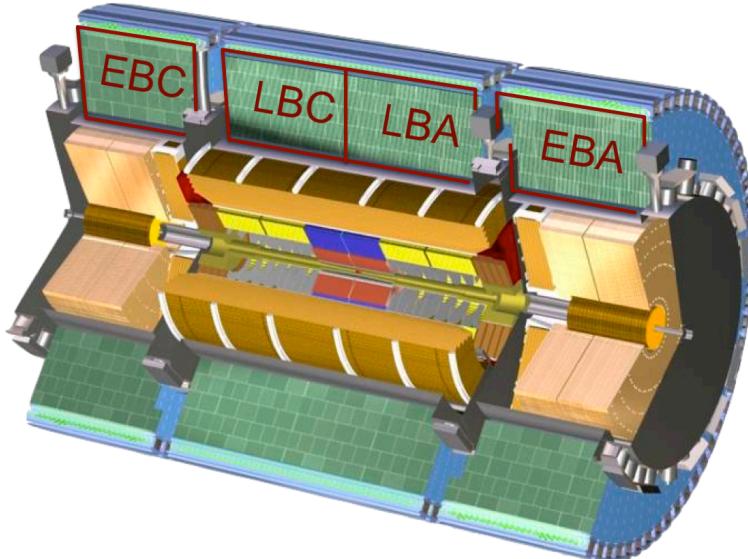
March 2015

Intended for Calo shifters training,
For first beam and collisions

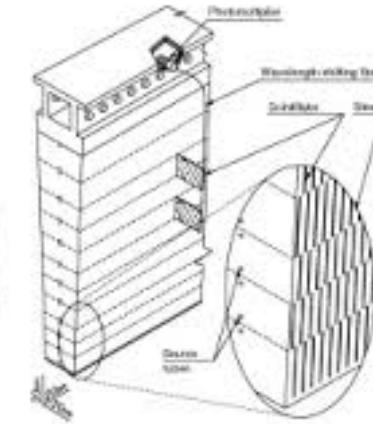
TileCal

4 partitions:

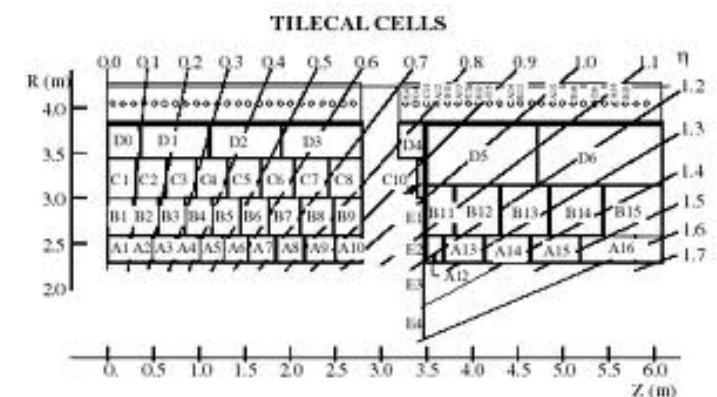
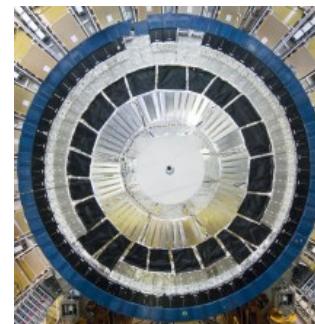
EBA, LBA, LBC, EBC



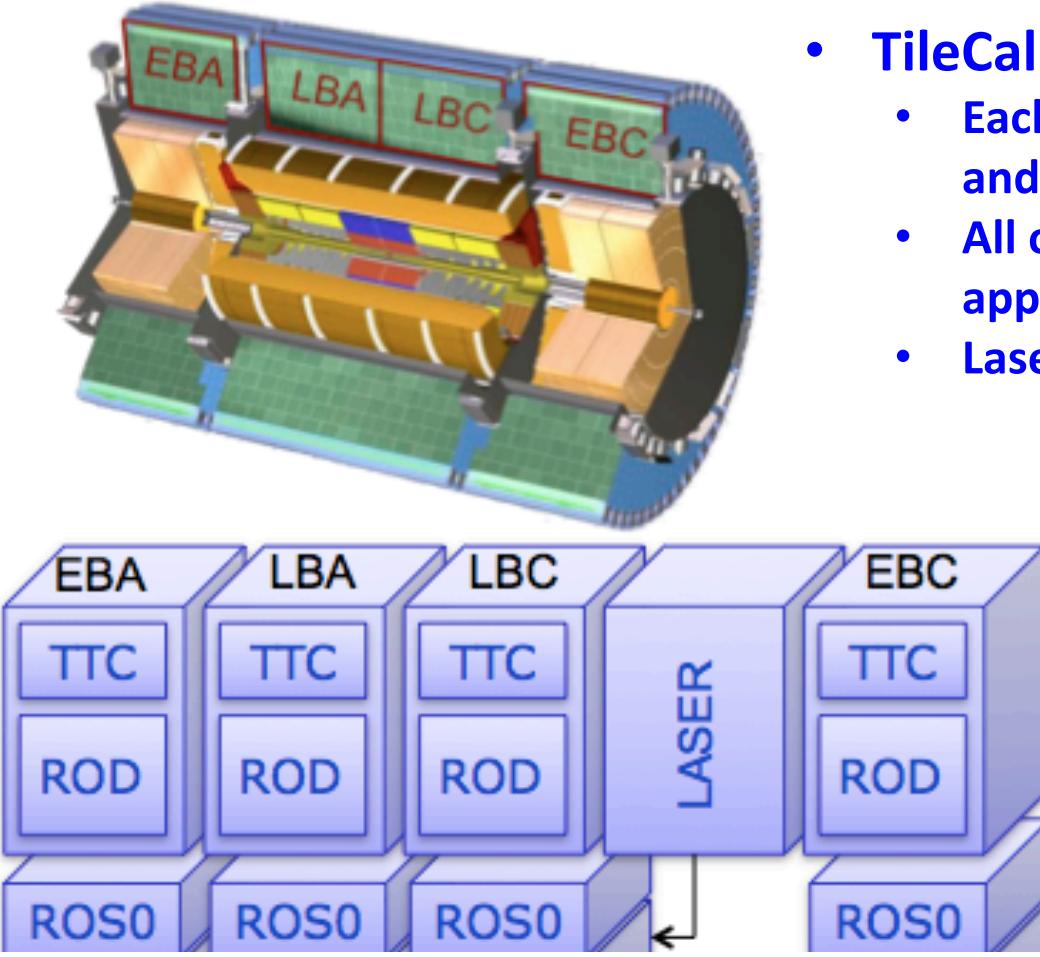
64 modules per partitions
Up to 45 PMTs per module



- LBA/C → Long Barrel A/C
- EBA/C → Extended Barrel A/C
- The PMTs read also signals from:
 - MBTS
 - gap/crack scintillators



TileCal



- TileCal is divided into four partitions
 - Each one with it's own TTC (Trigger Timing and Control), ROD and ROS units
 - All of them have a run controlled application in the Igui.
 - Laser ROD is connected to the LBC ROS.

Tile	
Infrastructure	
TileEBA	RUNNING
TileLBA	RUNNING
TileLBC	RUNNING
TileLBC_TTCRCD	RUNNING
TileLBC_RODRCD	RUNNING
TileLaserRCD	RUNNING
ROS-TIL-LBC-00	RUNNING
TileLBC_MbApplication	RUNNING
TileLBC_MbMonApplication	RUNNING
TileLBC_Daq2Dcs	UP
TileEBC	RUNNING
TileMBM	RUNNING
TileStatelessMonitoring	RUNNING

When things go wrong

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

Tile Emergency Phone 16-2581
(from outside: +41 76 487 2581)

Tile ATLAS Control Room 71408
(from outside: +41 22 767 1408)

Tile Satellite Control Room 70954

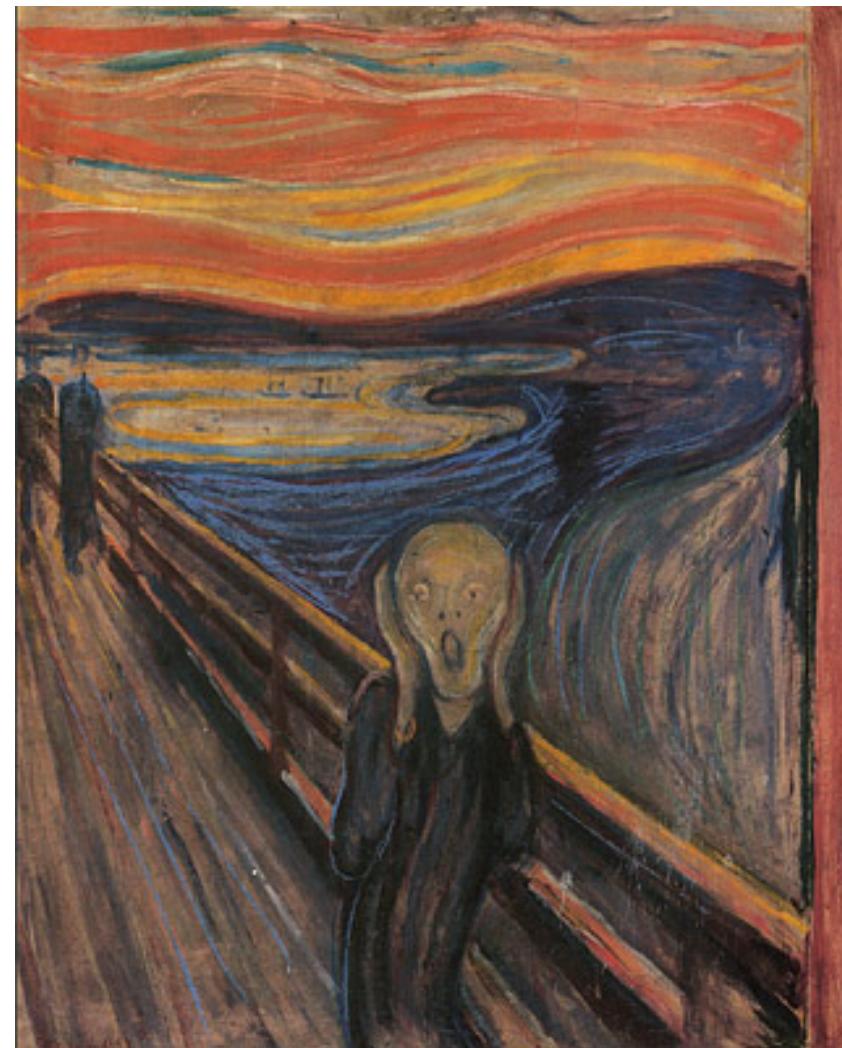
On-call experts:

Tile	DAQ on-call	Luis	16-0418	Oleg
				(163436)

Tile	DCS on-call	Irakli	16-3476	Filipe
				(169659)

Tile	Run Coordinator	Arely	16-3155
------	------------------------	-------	---------

If a big part of the detector is OFF call immediately to the **DCS on-call** and to the **Tile Emergency Phone**.



When things go wrong

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

Tile Emergency Phone 16-2581

(from outside: +41 76 487 2581)

Tile ATLAS Control Room 71408

(from outside: +41 22 767 1408)

Tile Satellite Control Room 70954

On-call experts:

Tile	DAQ on-call	Luis	16-0418	Oleg (163436)
------	--------------------	------	---------	------------------

Tile	DCS on-call	Irakli	16-3476	Filipe (169659)
------	--------------------	--------	---------	--------------------

Tile	Run Coordinator	Arely	16-3155
------	------------------------	-------	---------

Who should you call?

DAQ on-call → DAQ related problems (busy, RODs, ROL...)

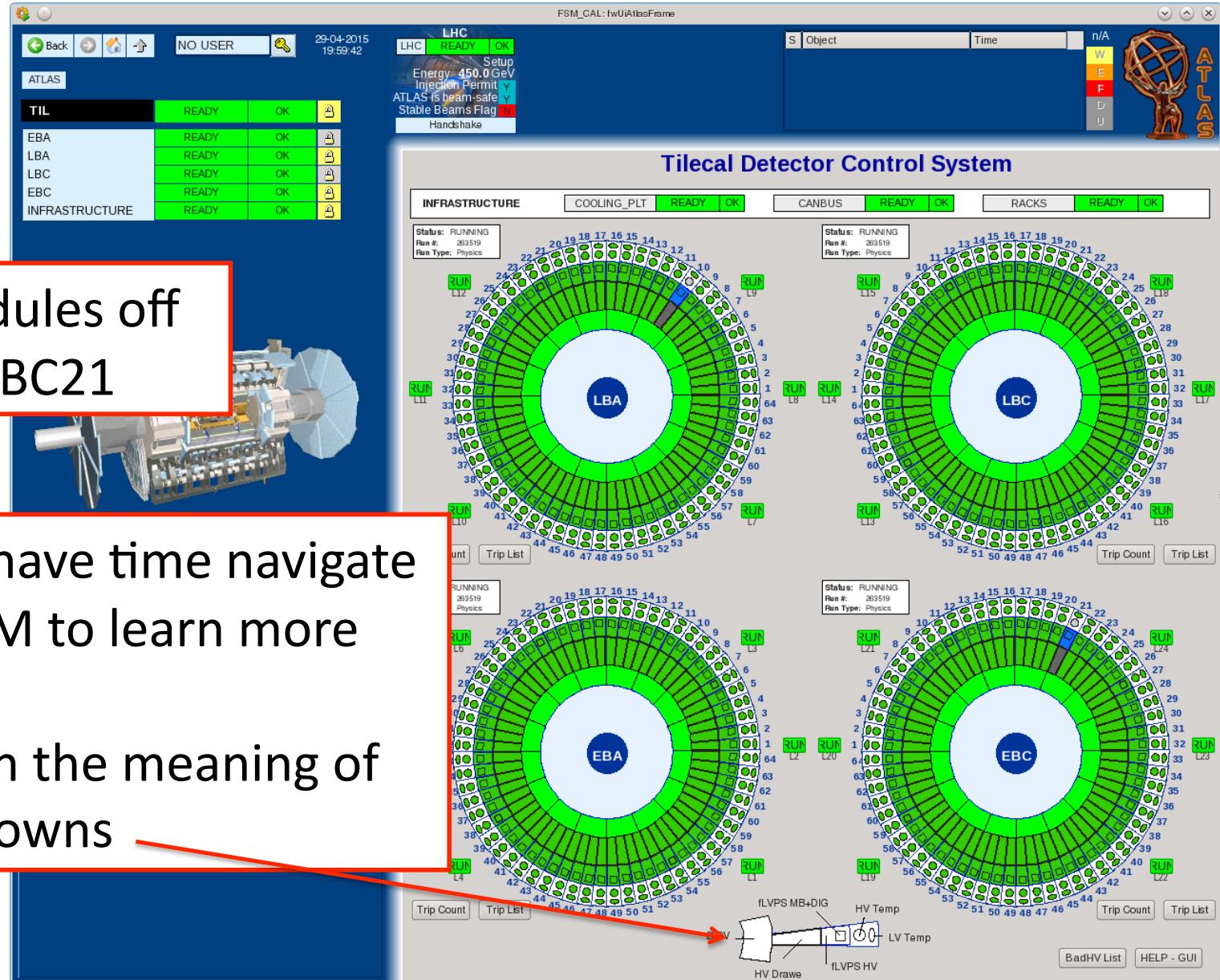
DCS on call → FSM, DCS alarms, HV, power cycle a module...

Run coordinator → calibration, go in and out the combined run, any other problem

(This is different respect to other detectors:
For LAr you always call the RC)

If a big part of the detector is OFF call immediately to the DCS on-call and to the Tile Emergency Phone.

TileCal status in FSM



Two modules off
LBA10, EBC21

When you have time navigate
through FSM to learn more

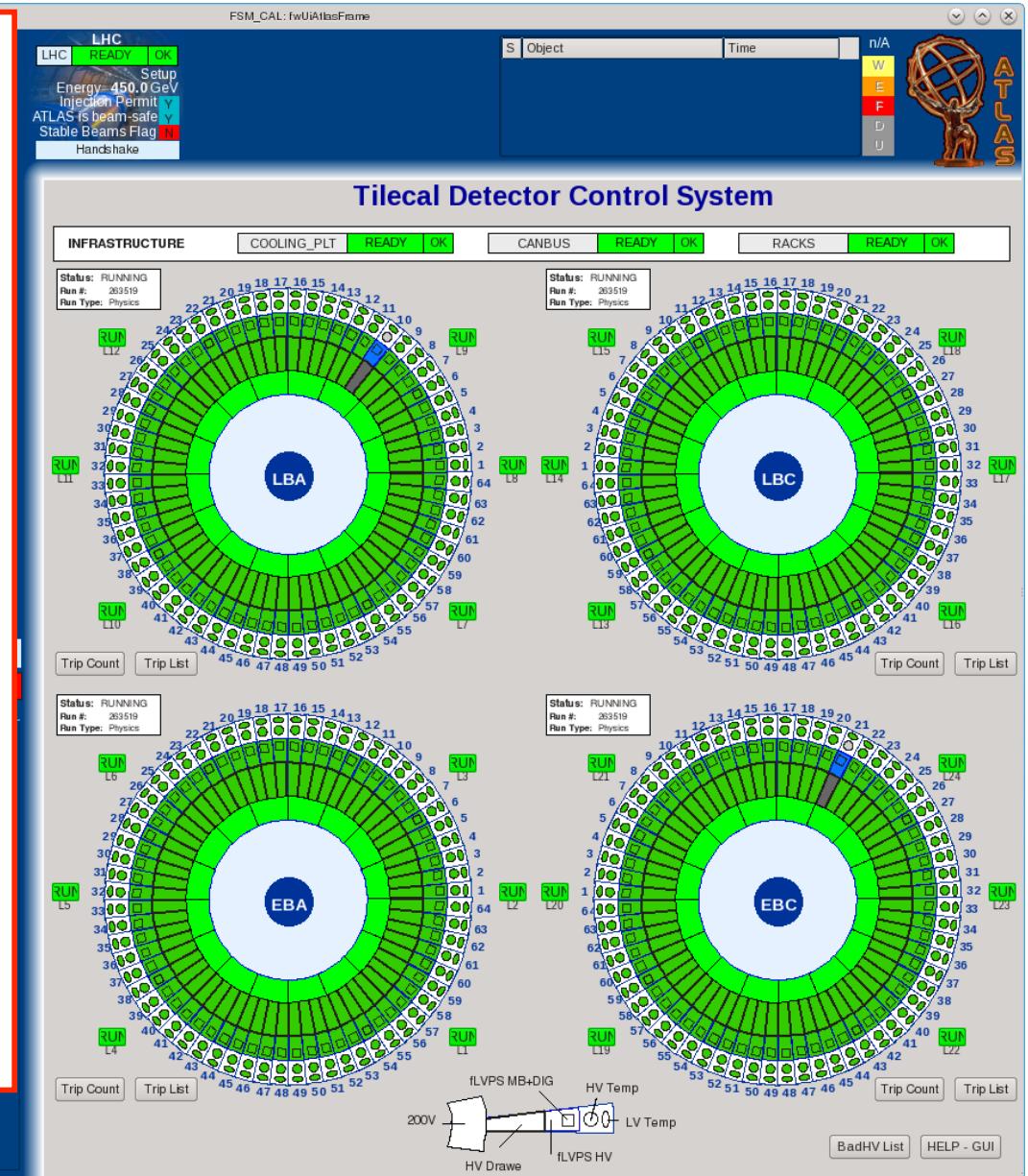
Legend with the meaning of
different crowns

TileCal status in FSM

If you see an alarm in FSM
or in the alarm panel:

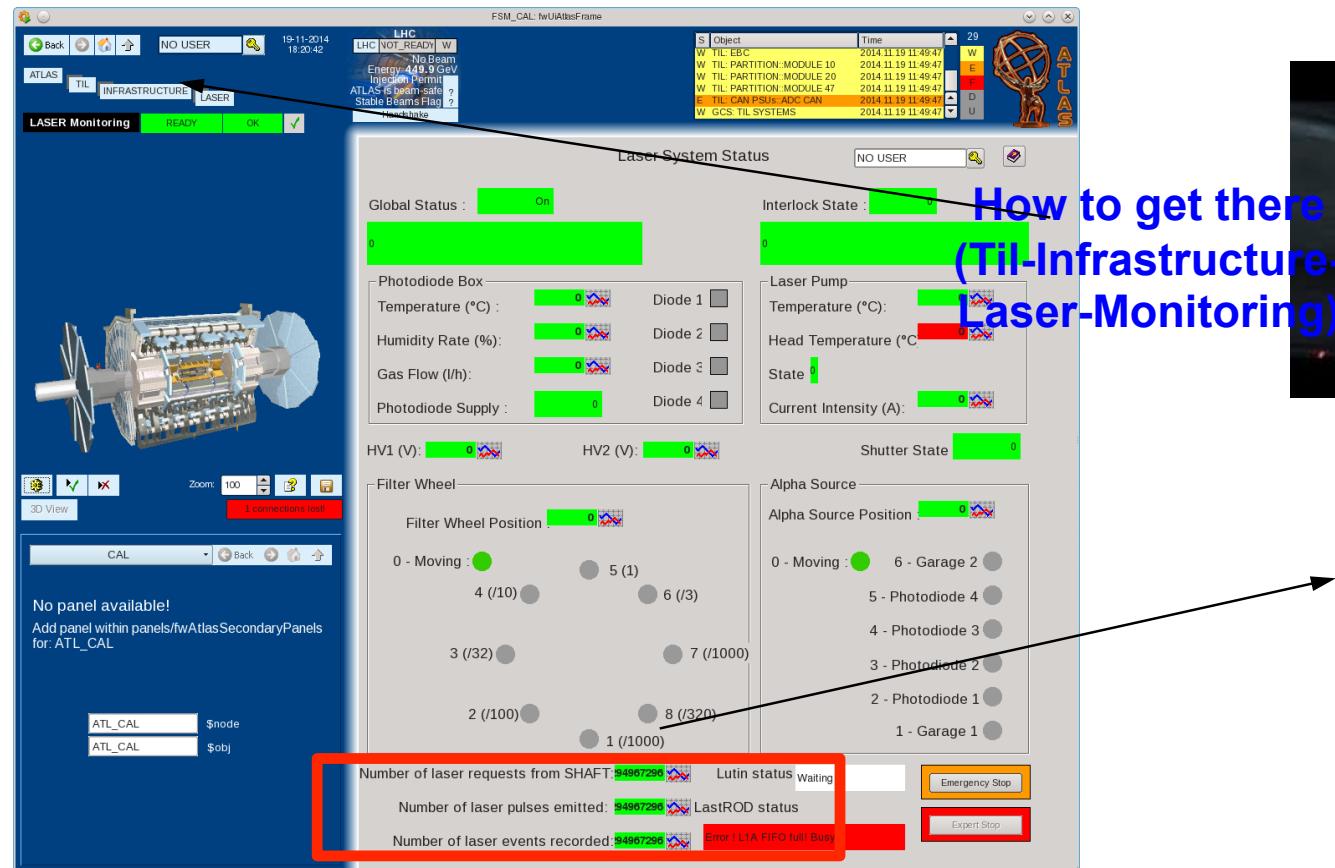
- 1) Check the WhiteBoard
- 2) If it's not in the WB, call the DCS expert

Exception: If there is a Warning alarm that comes and goes, do not call the DCS expert. Write it in the summary Elog.



Laser running during fills!

- In normal stable-beam data taking, you should monitor also the laser.
- The laser is a calibration system. Laser pulses are sent to the PMTs (it can affect L1Calo).
- It can run in laser-calibration runs, or also during cosmics and collisions in BCID of the abort gap (triggered by CALREQ2)



How to get there
(Til-Infrastructure-Laser-Monitoring)



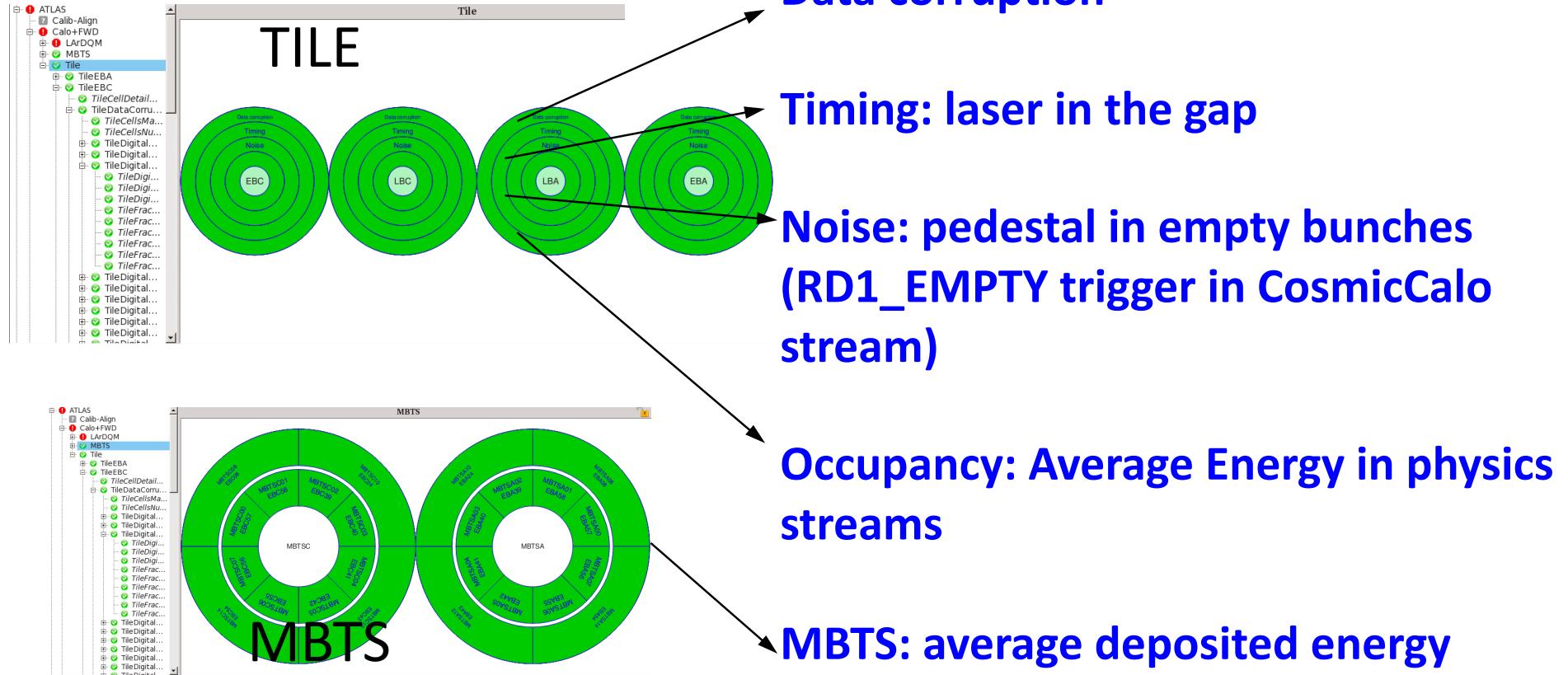
LASER

All three numbers should change and should be equal!
5%-10% event recorded loss is allowed.

DQM monitoring

(Golden rule: wait for statistics before giving an alarm)

Can navigate from DQMTTree



MBTS are important!!!

ATLAS relies on these to trigger on first collisions and deliver first luminosity estimates.

IF YELLOW OR RED CALL THE DAQ ON-CALL !!!



Hot Issues

The most common problems are:

- HV or LVPS trips
 - It was frequent in Run1. It should be rare in Run2.
- Other DCS alarms
- Digital Errors
 - Automatic actions implemented in case of **discarded events**
- Busies for TileCal
- DAQ configuration

HV and LVPS Trips (both MB and HV sides)



- Look for errors in DCS and call the DCS on-call
- LVPS trips can be of the MB side or HV side

DCS message in the ALARM PANEL:

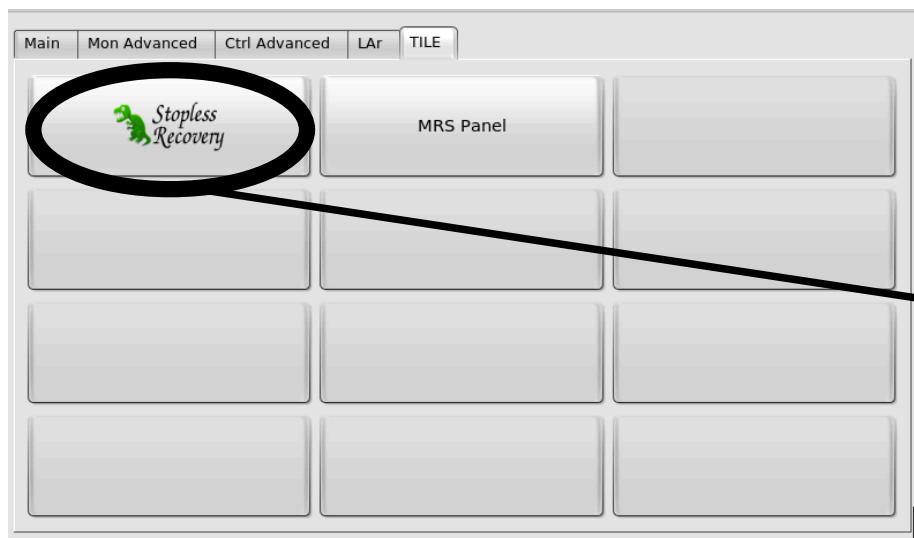
“TIL LBC TRIPPED LVPS_50 MB side” : trip for module LBC50, **MB side LVPS**
“TIL EBC TRIPPED LVPS_9 HV side” : trip for module EBC09, **HV side LVPS**

- DCS DOES NOT RECOVER TRIPPED MODULES
- THE MODULE STAYS NOT_READY, UNTIL ACTION IS TAKEN

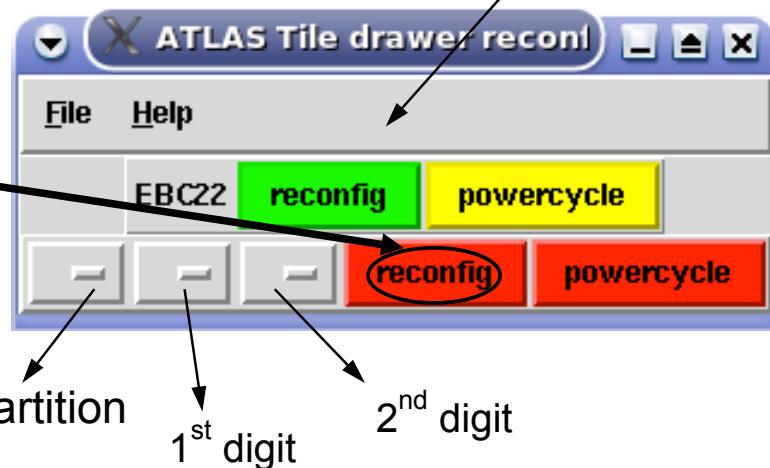
Call the DCS-On-Call!

Re-configure a module

SHIFTER DUTY: When instructed, you should do a manual re-configuration!!



Reconfigured modules will appear in a table above the buttons



If it does not solve the problem, power-cycle the module. This is not a thing to do without care. It can damage the electronics!

Powercycle only once!

If the problem persists after 1 powercycle, call the DCS on-call

Discarded Events

- There are automatic checks and actions for discarded events:
 - **IF** fraction between 5% and 50%:
A warning message is printed in ERS (not all the time, only when fraction increases significantly)
 - **IF** fraction > 50%:
Module is automatically reconfigured and (if still bad) power-cycled

Severity	Message
Warning	LBC05 seems to be off (at least the ROD link is off). [Run #204158 LB #500]
Warning	Drawer TileLBC05 reconfigured, RunNumber 204158, LBN 502
Warning	LBC05 is discarding 65.2002% of events. It will be automatically reconfigured now. Please check the next MRS messages.
Warning	Drawer TileLBC05 reconfigured, RunNumber 204158, LBN 617
Warning	LBC05 is no longer discarding events.
Severity	Message
Warning	EBA29 is discarding 5.40541% of events. It will now be monitored and automatic actions will be taken if the number of discarded events becomes too high.
Warning	EBA29 is discarding 10.34% of events. It will now be monitored and automatic actions will be taken if the number of discarded events becomes too high.
Warning	EBA29 has been discarding <5% of events for a long time, it looks stable now.
Severity	Message
Warning	LBA38 is discarding 99.9611% of events. It will be automatically reconfigured now. Please check the next MRS messages.
Warning	Drawer TileLBA38 reconfigured, RunNumber 204073, LBN 315
Warning	LBA38 is still discarding 99.9671% of events after reconfiguration. It will be automatically power cycled now. Please check the next MRS messages and DCS alarms.
Warning	Drawer TileLBA38 reconfigured, RunNumber 204073, LBN 318
Warning	LBA38 is discarding 99.9598% of events. It will be automatically reconfigured now. Please check the next MRS messages.
Warning	Drawer TileLBA38 reconfigured, RunNumber 204073, LBN 319
Error	LBA38 is still discarding 99.9707% of events after automatic power cycling. The only way to recover it is to wait a few minutes and then manually power cycle it once more.
Warning	Drawer TileLBA38 reconfigured, RunNumber 204073, LBN 322
Error	LBA38 is still discarding 99.9656% of events after automatic power cycling. The only way to recover it is to wait a few minutes and then manually power cycle it once more.
Warning	LBA38 seems to be off (at least the ROD link is off). [Run #204073 LR #3431]
Warning	Drawer TileLBA38 reconfigured, RunNumber 204073, LBN 325
Warning	LBA38 is discarding 99.9694% of events. It will be automatically reconfigured now. Please check the next MRS messages.
Warning	Drawer TileLBA38 reconfigured, RunNumber 204073, LBN 326
Error	LBA38 is still discarding 99.9595% of events after automatic power cycling. The only way to recover it is to wait a few minutes and then manually power cycle it once more.
Warning	LBA38 seems to be off (at least the ROD link is off). [Run #204073 LR #3431]
Error	LBA38 has been off for a long time ! Are you aware of this ? Maybe it tripped and did not restart automatically. Please call the DAQ on-call or the DCS expert.
Warning	LBA38 seems to be on again. It will be automatically configured soon. Please check the next MRS messages.
Warning	Drawer TileLBA38 reconfigured, RunNumber 204073, LBN 328
Warning	LBA38 is discarding 99.9568% of events. It will be automatically reconfigured now. Please check the next MRS messages.
Warning	Drawer TileLBA38 reconfigured, RunNumber 204073, LBN 330
Warning	LBA38 is still discarding 99.9623% of events after reconfiguration. It will be automatically power cycled now. Please check the next MRS messages and DCS alarms.

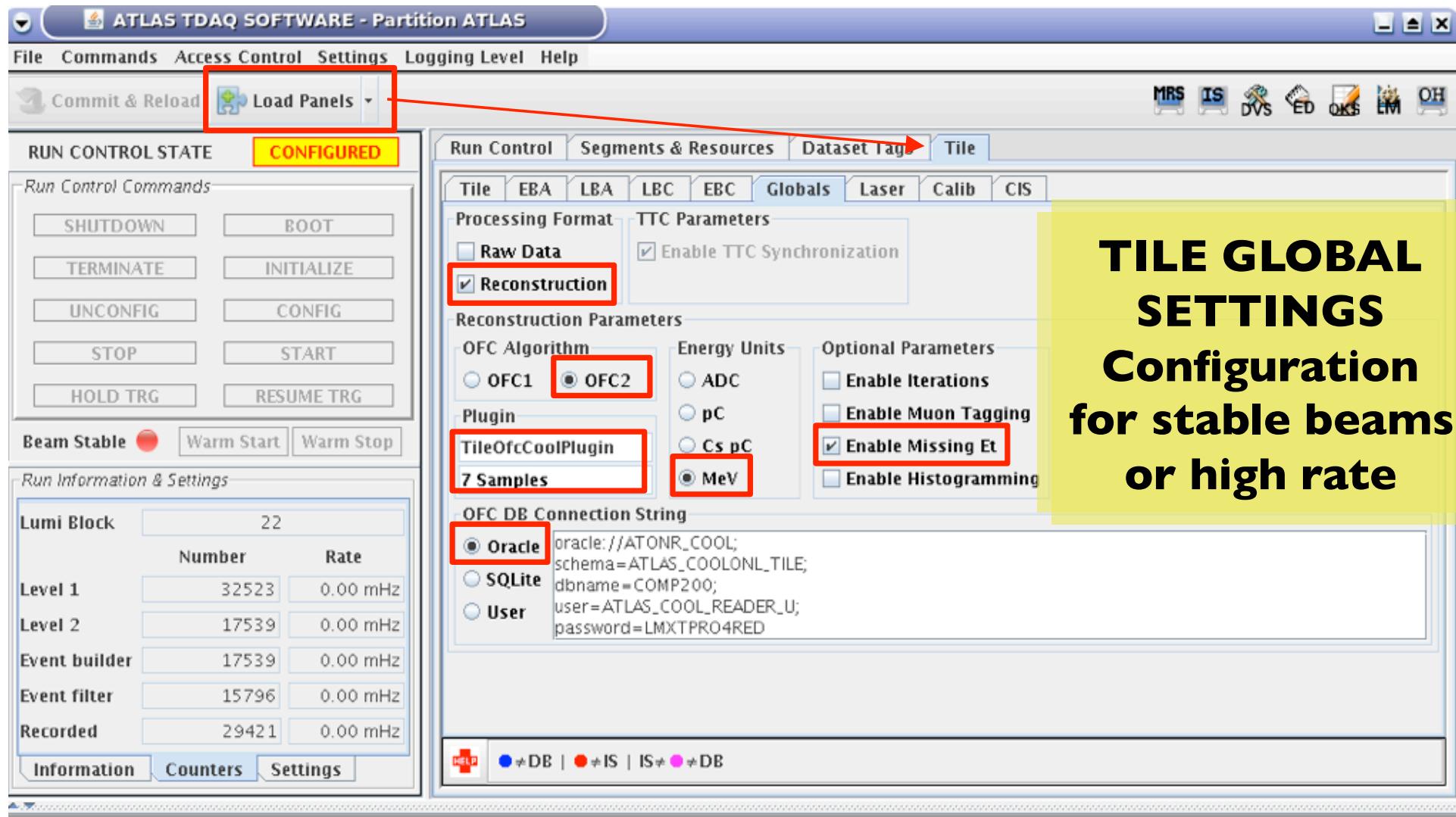
If several modules have discarded events call DAQ on-call

Busies

If it comes from Tile, and we are taking collisions,
Call the Daq-On-Call

- ATLAS may go busy and the system responsible must react
- Check if Tile is giving the busy:
 - 'Busy panel'  or 'DAQ Status Tool'
- What can get Tile Busy e.g.:
 - The wrong Global settings
 - Check that the Global settings are correct (next slides)
 - Through the DAQ Monitor Partition 
 - Interference between applications
 - The wrong DSP settings
 - Missing ECR at the beginning of run

Tile settings(collision)



**TILE GLOBAL
SETTINGS**
**Configuration
for stable beams
or high rate**

Tile settings(cosmics)

ATLAS TDAQ SOFTWARE - Partition ATLAS

File Commands Access Control Settings Logging Level Help

Commit & Reload Load Panels **CONFIGURED**

RUN CONTROL STATE

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	Number	Rate
Level 1	32523	0.00 mHz
Level 2	17539	0.00 mHz
Event builder	17539	0.00 mHz
Event filter	15796	0.00 mHz
Recorded	29421	0.00 mHz

Information Counters Settings

RAW DATA: sending the information of the 7 samples ONLY FOR COSMICS !!!

Run Control Segments & Resources Dataset Tag Tile

Processing Format TTC Parameters

Raw Data Enable TTC Synchronization

Reconstruction Enable Iterations

OFC Algorithm OFC1 **OFC2** Energy Units ADC Enable Muon Tagging

Plugin TileOfcCoolPlugin pC Enable Missing Et

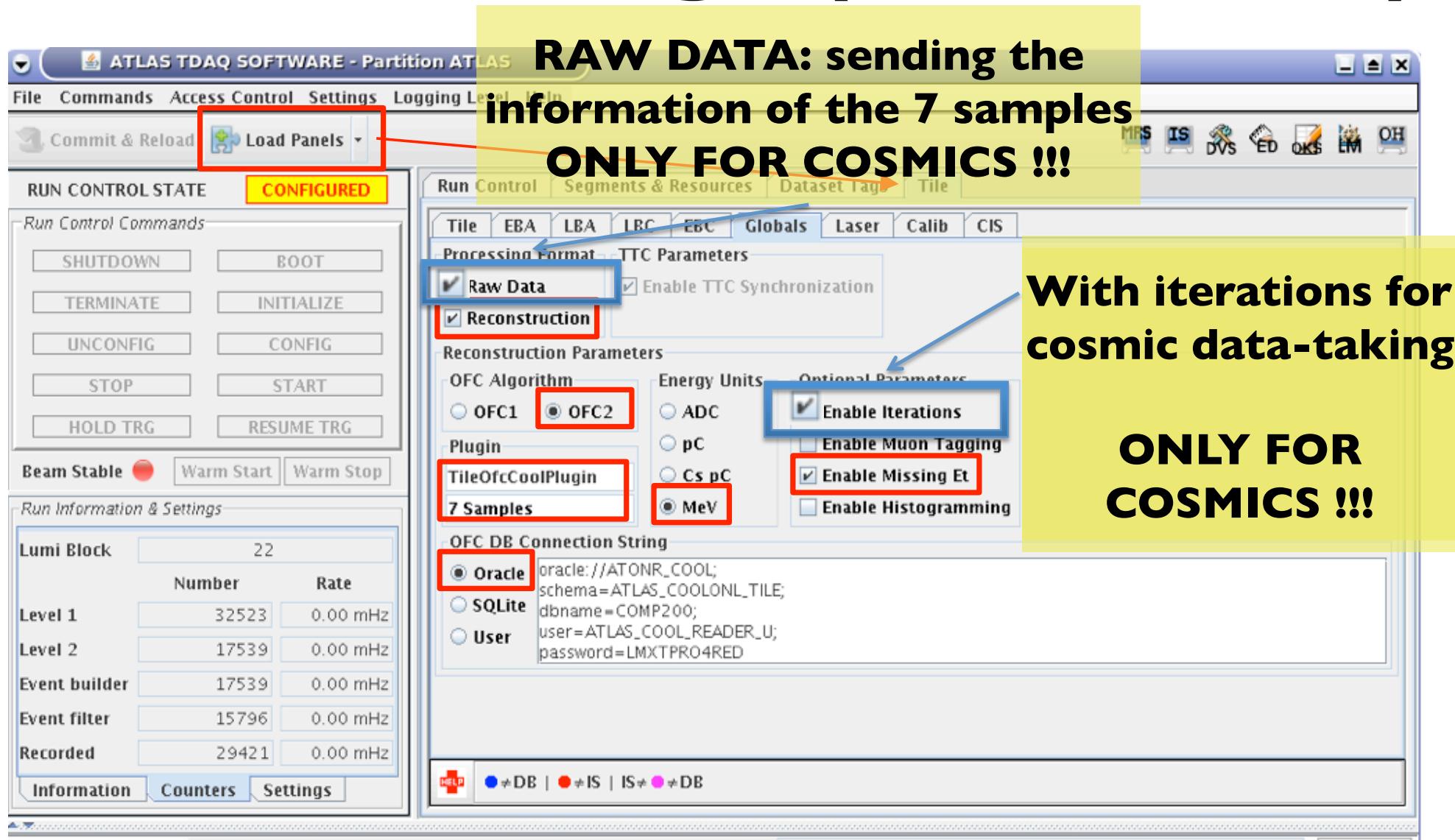
7 Samples Cs pC Enable Histogramming

MeV

OFC DB Connection String

Oracle oracle://ATONR_COOL;
schema=ATLAS_COOLONL_TILE;
 SQLite dbname=COMP200;
 User user=ATLAS_COOL_READER_U;
password=LMXTPRO4RED

With iterations for cosmic data-taking
ONLY FOR COSMICS !!!



Calo status panel

- Summary of many flags for all sub-detectors (DAQ, busy, enabled resources, DQ)
 - **If one of the Tile flags is Red or Yellow call the DAQ on-call!**
 - Some of the information in this panel, it is only visible here (enabled ROLs)
 - Typical use case: if a resource goes busy and it's removed from data-taking, the Run Control will notify you → Call immediately the DAQ on-call

Calo DAQ status [Partition ATLAS] <2>																			
File Help																			
RUNNING		TileCal				LAr								LUCID					
		EBA	EBC	LBA	LBC	FCALA	FCALC	HECA	HECC	EMECA	EMECC	EMBA	EMBC	LCDA	LCDC				
DAQ application		RUNNING				RUNNING								RUNNING	absent				
Busy		0.0000 %		0.0038 %		0.0000 %				0.0000 %		0.2547 %		no rate	no rate				
Enabled resources	FEs	128/128 drawers		128/128 drawers															
	RODs	8/8	8/8	8/8	8/8														
	ROLs	16/16	16/16	16/16	16/16	7/7	7/7	12/12	12/12	138/138	138/138	224/224	224/224						
		1/1 (Laser)																	
Data flow	ROS busy	no	no	no	no	no				no	no	no	no						
	Loss	0 %	0 %	0 %	0 %	0 %				0 %	0 %	0 %	0 %						
Data quality		Tile				LArDQM								LCD					
		TileEBA	TileEBC	TileLBA	TileLBC	FCALA	FCALC	HECA	HECC	EMECA	EMECC	EMBA	EMBC	LCDA	LCDC				

Tile Twikis

In the spare time, don't watch Grey's Anatomy, or other TV series

Look at the documentation (CAL menu → Calo Documentation →)

There are two session of Troubleshooting and How-to, which can be pretty handy

The screenshot shows a web browser window with the URL <http://pc-atlas-www.cern.ch/twiki/bin/view/Main/CaloDetOperationManualShifter>. The page title is "Operation Twiki for Calorimeter Shifters". A navigation bar at the top includes links for Calo Portal, Calo Whiteboard, Shifter Twiki, and Phone numbers. Below the title, there are sections for "Twikis for Shifters" and "Twikis for Experts". The "Twikis for Shifters" section contains a grid of links:

LAr	Forward	Tile
LAr Operation Manual	LUCID Shifter Twiki	Tile Shifter Twiki
LAr Troubleshooting (Physics)	LUCID Calibration	Tile How-To
LAr Troubleshooting (Calibration)	ZDC Shifter Twiki	Tile Troubleshooting

A red circle highlights the "Tile Shifter Twiki" link. Below this, under "Twikis for Experts", are links for LAr Expert Twiki, LUCID Expert Twiki, ZDC Expert Twiki, FWD Expert Twiki, and Tile Expert Twiki. The "Tools for Shifters" section lists various utilities like Shifter Task Overview, ATLAS E-LOG, and LAr ID Translator. The "Phone Numbers" section provides contact information for the LAr Run Coordinator (70136), FD On-Call Phone (71122), and Tile On-Call (Emergency) Phone (16 2581). A "How to call a CERN phone from outside" section is also present.

The documentation will not be at its best from the beginning.

At the end of the summary log, post your suggestions to improve it.

**More information
in the back-up slides.**

Please read them carefully!

Summary: trips

Collision
data-taking

Including
module
in the run

- Look into **FSM** and **ALARM panel** and check if a module auto-recovers.
 - **MODULE IS ON** again (**green**) 1-2 minutes after trip !!
- Check **ERS** that auto-reconfiguration is launched
 - **DONE** 2-3 minutes after a trip !!

Check
module
status

- Check L1Calo map:
 - **IS** the module grey (i.e. not triggering) ?
- Check L2 MET rates **increase** or even **HIGH** Tile MET
- Check **DQDM** for digital errors:
 - **IS** module **RED** ?

Get the tool from
DAQ Panel
(page 5)

1st) Try re-configuration

2nd) If it doesn't help:

Manual power-cycle the module.

If YES,
take an action:

Please, if a module does not properly recovers collect the relevant info and put it in your Shift Summary

Summary: trips

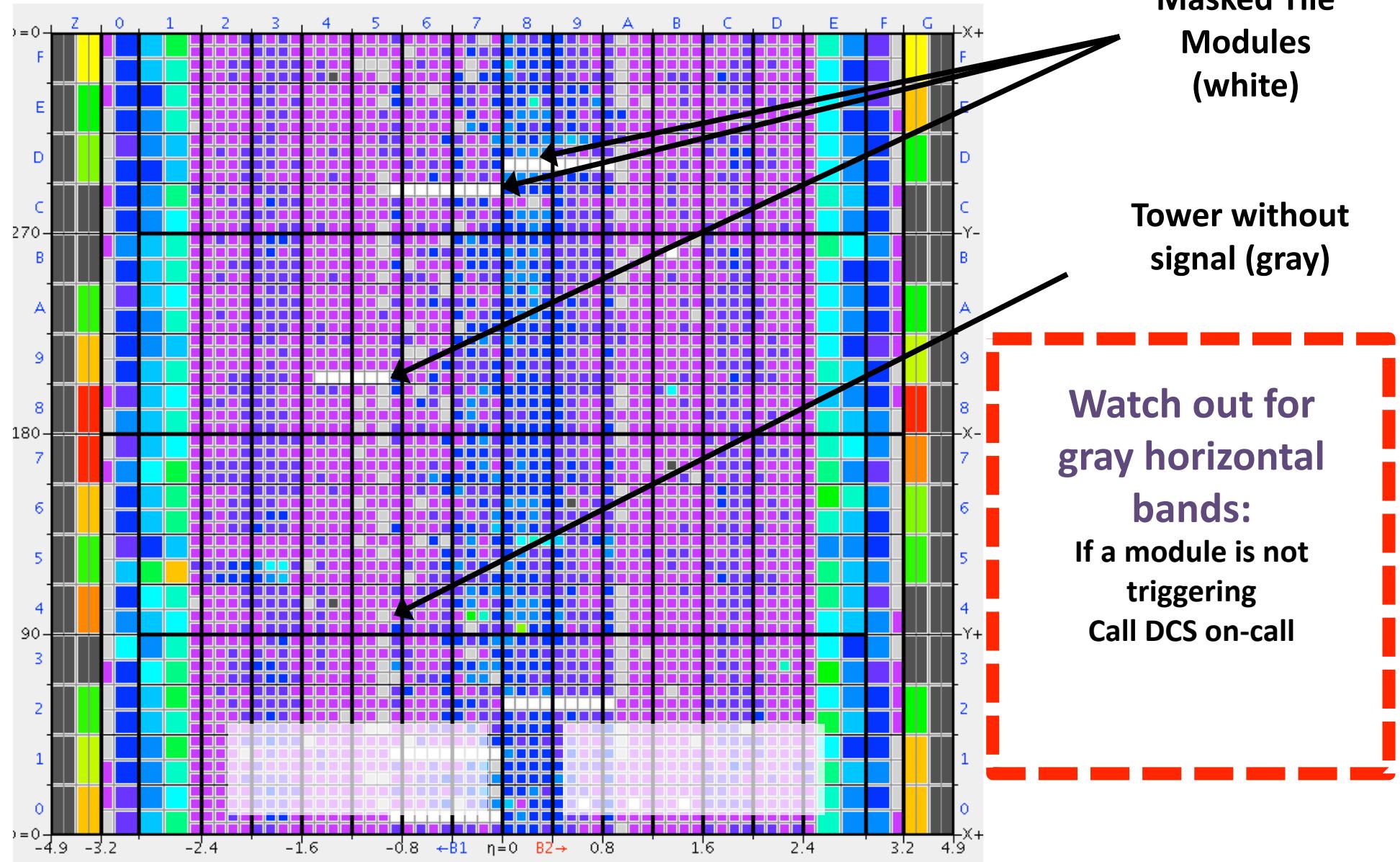
Collision
data-taking

Including module in the run	<ul style="list-style-type: none">Look into FSM and ALARM panel and check if a module auto-recovers. - MODULE IS ON again (green) 1-2 minutes after trip !!Check FPS that auto-reconfiguration is launched
Check module status	<p>Very luckily we will not need such a procedure for Run2</p> <p>During next weeks, you just call the DCS on-call</p>
Get the tool from DAQ Panel (page 5)	<p>1st) Try re-configuration</p> <p>2nd) If it doesn't help: Manual power-cycle the module.</p> <p>if nothing works, take an action:</p>

Please, if a module does not properly recovers collect the relevant info and put it in your Shift Summary

L1Calo map

Check regularly the L1Calo map



How do you know that there was a trip: ERS

- If trip is of the MB side and a reconfiguration is necessary.
- Automatic re-configuration can be enabled (not sure if we will).
- If enabled, you will see for LVPS trips of MB side Tile ERS's like:

TileLBC_RODR...	01 Jun 2012 22:46:18 CEST	Warning	LBC60 seems to be off (at least the ROD link is off). [Run #204240 LB #1151]
TileLBC_TTCRCD	01 Jun 2012 22:48:07 CEST	Warning	Drawer TileLBC60 reconfigured, RunNumber 204240, LBN 1153
TileLBC_RODR...	01 Jun 2012 23:09:48 CEST	Warning	LBC55 seems to be off (at least the ROD link is off). [Run #204240 LB #1174]
TileLBC_TTCRCD	01 Jun 2012 23:11:37 CEST	Warning	Drawer TileLBC55 reconfigured, RunNumber 204240, LBN 1176
TileLBA_RODR...	01 Jun 2012 23:21:19 CEST	Warning	LBA54 seems to be off (at least the ROD link is off). [Run #204240 LB #1186]
TileLBA_TTCRCD	01 Jun 2012 23:22:58 CEST	Warning	Drawer TileLBA54 reconfigured, RunNumber 204240, LBN 1187
TileEBA_RODR...	01 Jun 2012 23:46:58 CEST	Warning	EBA60 seems to be off (at least the ROD link is off). [Run #204240 LB #1211]
TileEBA_TTCRCD	01 Jun 2012 23:48:48 CEST	Warning	Drawer TileEBA60 reconfigured, RunNumber 204240, LBN 1212
TileEBA_RODR...	02 Jun 2012 00:07:39 CEST	Warning	EBA47 seems to be off (at least the ROD link is off). [Run #204240 LB #1231]
TileEBA_TTCRCD	02 Jun 2012 00:09:37 CEST	Warning	Drawer TileEBA47 reconfigured, RunNumber 204240, LBN 1233
TileLBC_RODR...	02 Jun 2012 00:10:38 CEST	Warning	LBC04 seems to be off (at least the ROD link is off). [Run #204240 LB #1234]
TileLBC_TTCRCD	02 Jun 2012 00:12:17 CEST	Warning	Drawer TileLBC04 reconfigured, RunNumber 204240, LBN 1235

WHAT's IMPORTANT!!! : 2-3 minutes after a trip you should see a ERS message about reconfiguration.

If not call DCS-On-Call!

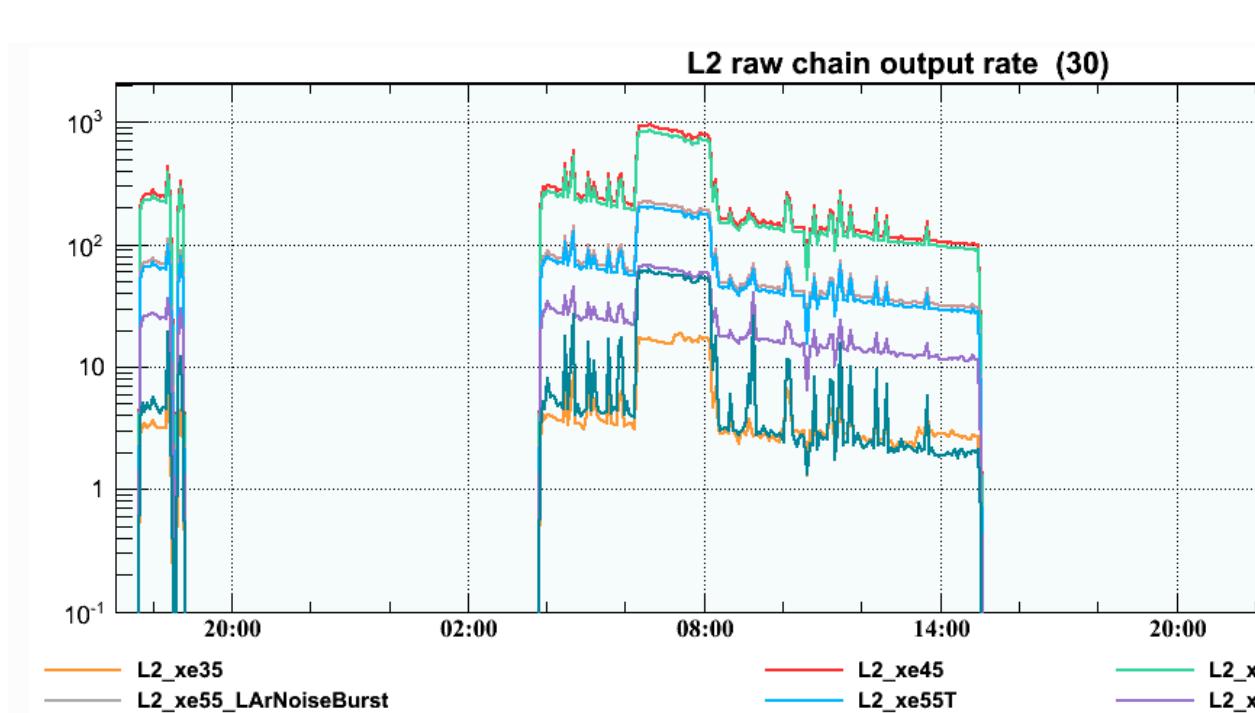
Is the reconfiguration enough?

- ... to guarantee that a module was properly configured?



- More tests are needed:
 - Check for Digital Errors (DQM) !!!
 - L1Calo Map OR ERS's about low rates !
 - L2 Met Rates

L2 rates effects from Tile: L2*xe* L2*xs*



MissingET triggers for L2
Is calculated at the level of
DSP's (4 DSPs / ROD).

It has a real effect on
ATLAS performance by
producing high rates in
L2 Triggers.

It may appear after a trip due
to misconfiguration

If this happens:
Reconfigure the module
If it fails!?
Power cycle the module

During stable beams resources can be disabled automatically

TileROD goes busy after module reconfiguration and is stoplessly removed

time ↑

12:13:42	WARNING	TileEBC_RODRCD	TileRCD::Issue	Enable HW = TileEBC_ROD7_Chан2_EBC49-EBC52_ROL12 by TileCalEBC_RODModule_7
12:13:41	WARNING	TileEBC_RODRCD	rc:HardwareReco...	TileEBC_ROD7_Chан2_EBC49-EBC52_ROL12 TileEBC_RODRCD
12:13:35	WARNING	TileEBC_RODRCD	rc:ReadyForHard...	TileEBC_ROD7_Chан2_EBC49-EBC52_ROL12 TileEBC_RODRCD
12:13:25	WARNING	TileEBC_RODRCD	TileRCD::Issue	TileEBC_ROD7_Chан2_EBC49-EBC52_ROL12 will be automatically recovered in 10 seconds. Please stay tuned.
				A stopless removal has been done (TileCalEBC_RODModule_7: hw TileEBC_ROD7_Chан2_EBC49-EBC52_ROL12 has been disabled).
12:13:23	ERROR	TileEBC_RODRCD	TileRCD::Issue	That means that 4 Tile consecutive modules are disabled. This is a big fraction which will affect physics data quality. Call IMMEDIATELY Tile Run Coordinator (16-2581) and DAQ expert (16-0418).
12:13:23	ERROR	TileEBC_RODRCD	TileRCD::Issue	TileEBC_ROD7_Chан2_EBC49-EBC52_ROL12 has been disabled by TileCalEBC_RODModule_7
12:13:07	ERROR	TileEBC_RODRCD	rc:HardwareError	TileEBC_ROD7_Chан2_EBC49-EBC52_ROL12 TileEBC_RODRCD

**IF A ROL IS DISABLED
THEN 4 MODULES IN SEQUENCE ARE NOT RECORDING DATA.**

A ROL CORRESPONDS TO THE OUTPUT TO THE ROS OF HALF A ROD.

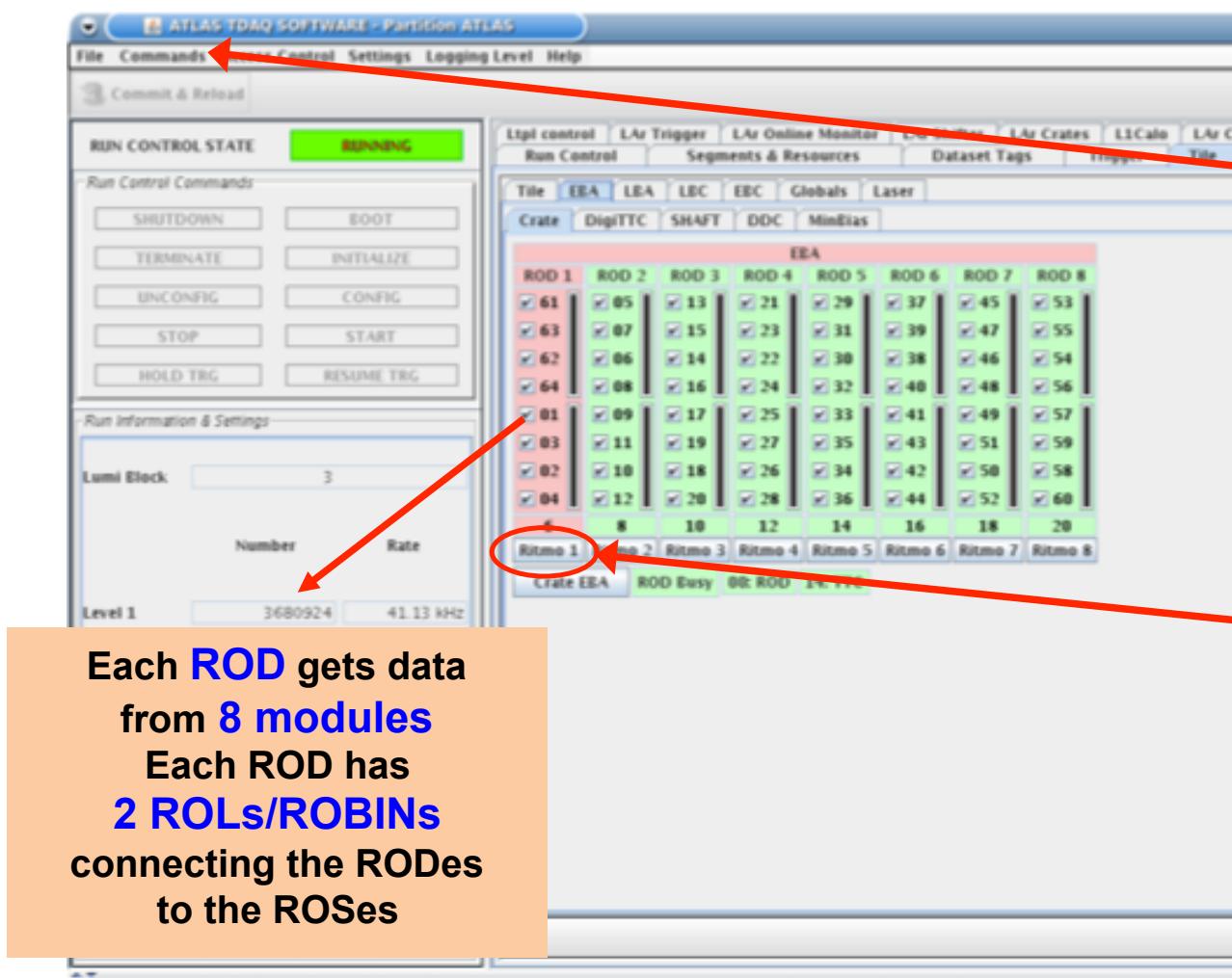
FOR EACH PARTITION WE HAVE 8 RODS (16 ROLs) : 8 Modules x 8 Rods = 64 Modules.

**A STOPLESS REMOVAL OF A ROL IS ALWAYS SERIOUS!
EVEN MORE DURING A PHYSICS RUN!**

Look out for...

- Is Tile **BUSY**? It is a serious incident. YOU can see:

https://atlasop.cern.ch/twiki/bin/view/Main/TroubleShooting#TileCal_is_BUSY



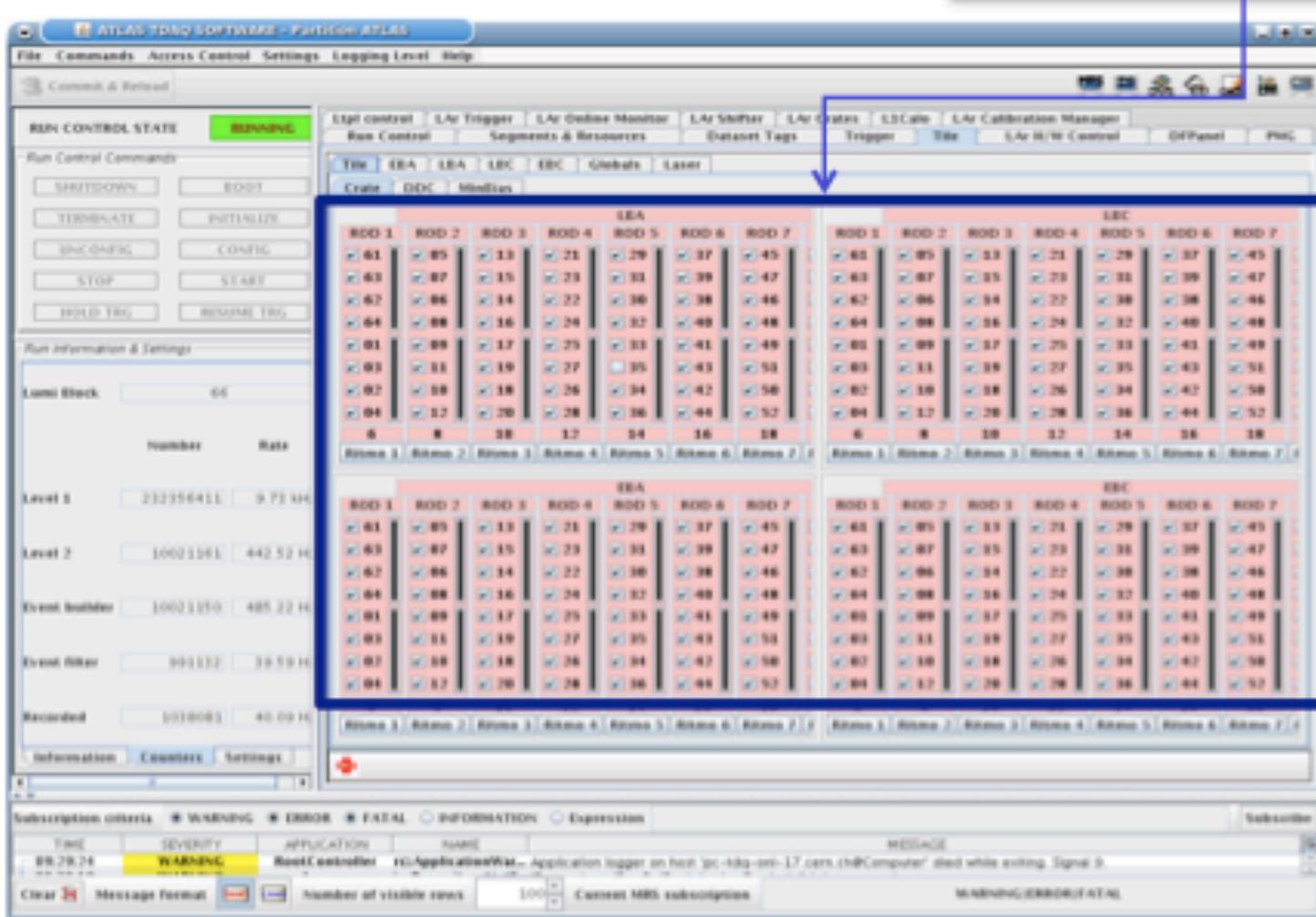
Please re-load this panel if all crates are in RED and no busy is shown in the BUSY panel

Can also check the RITMO panel for the ROD which is Busy

ECR Mismatch

- If there is an extra Event Counter Reset (ECR) in one TTC partition, the Event Builder won't be able to build data coming from it.
- What to do? Restart the run!!

ECR mismatch may manifest setting all TTC partition busy!



Tripped LV examples as seen in FSM/DCS

S/N	E323	HV side trip		Last update 2010.08.23 16:07:07					
		Input	Output	Senses	Temp1	Temp2	Temp3		
3.3 V DIG	194.8 V	01 A	3.5 V	5.0 A	3.3 V	28.0	39.9 C		
5 V DIG	196.4 V	01 A	5.2 V	5.6 A	5.0 V	32.4	36.9 C		
5 V MB	195.5 V	03 A	5.4 V	13.1 A	5.2 V	45.3	58.0 C		
-5 V MB	198.1 V	01 A	-5.1 V	6.2 A	-5.0 V	31.9	39.3 C		
15 V MB	196.4 V	00 A	14.5 V	0.2 A	14.5 V	30.2	28.1 C		
5 V HV	195.7 V	-0.0 A	0.0 V	0.1 A		21.0	20.3 C		
15 V HV	196.2 V	00 A	0.1 V	0.2 A		20.5	20.5 C		
-15 V HV	195.3 V	00 A	-0.1 V	0.3 A		21.1	20.0 C		

S/N	E380	MB side trip		Last update 2010.08.05 06:19:44					
		Input	Output	Senses	Temp1	Temp2	Temp3		
3.3 V DIG	198.5 V	-0.0 A	0.1 V	2.3 A	0.0 V	18.9	19.2 C		
5 V DIG	195.9 V	-0.0 A	0.1 V	2.4 A	0.1 V	20.7	18.9 C		
5 V MB	198.4 V	-0.0 A	0.0 V	3.4 A	0.1 V	21.1	19.9 C		
-5 V MB	197.8 V	-0.0 A	-0.1 V	1.1 A	-0.1 V	20.2	21.0 C		
15 V MB	196.5 V	-0.0 A	0.1 V	0.1 A	0.2 V	20.9	20.6 C		
5 V HV	198.6 V	-0.0 A	5.0 V	0.1 A		27.9	24.2 C		
15 V HV	195.6 V	0.0 A	14.5 V	0.1 A		30.4	27.1 C		
-15 V HV	197.6 V	0.0 A	-14.5 V	0.3 A		30.4	26.7 C		

A message in the alarm panel of the type “brick tripped” will appear!
In case you see any of these two situations, call DCS ON-CALL!