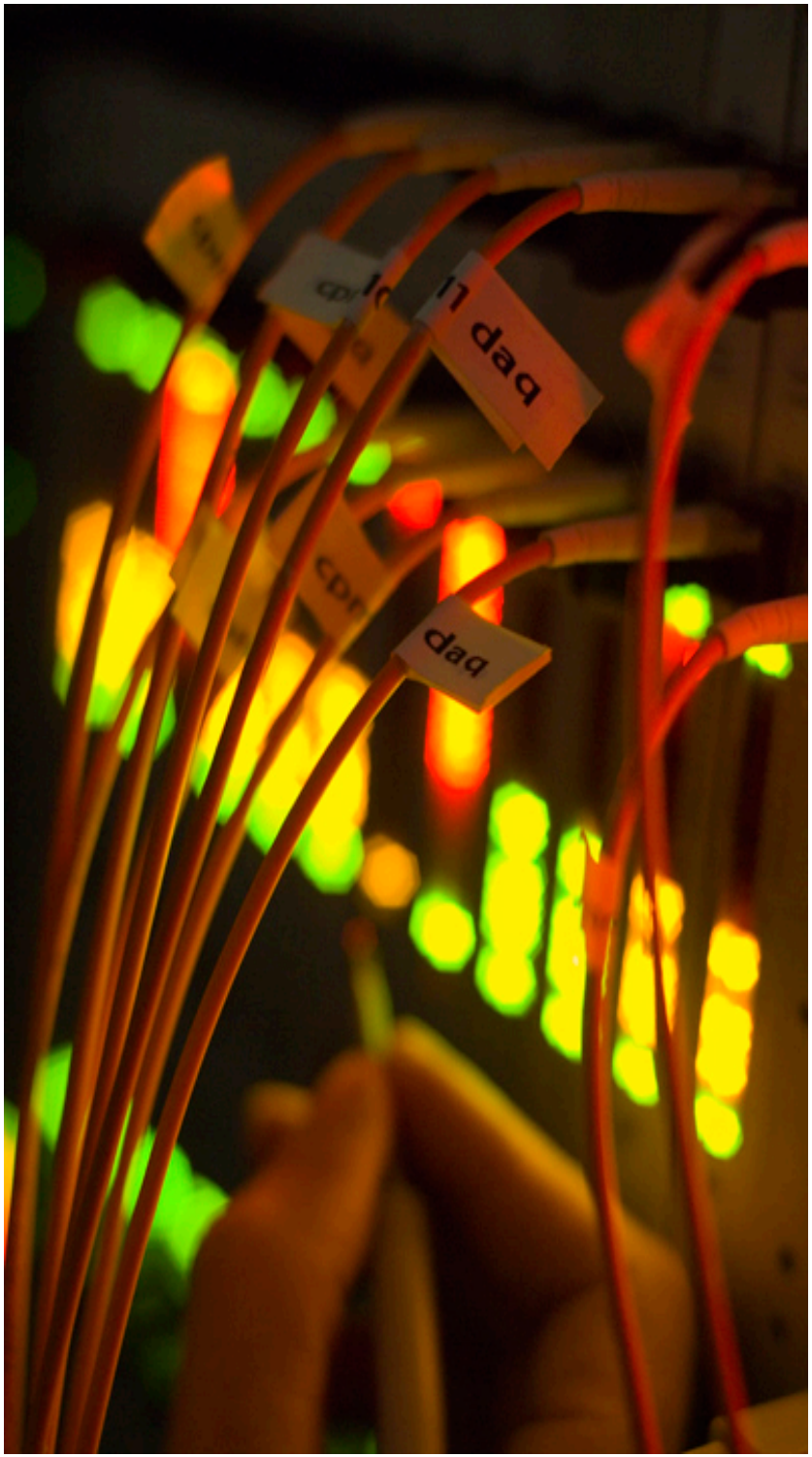
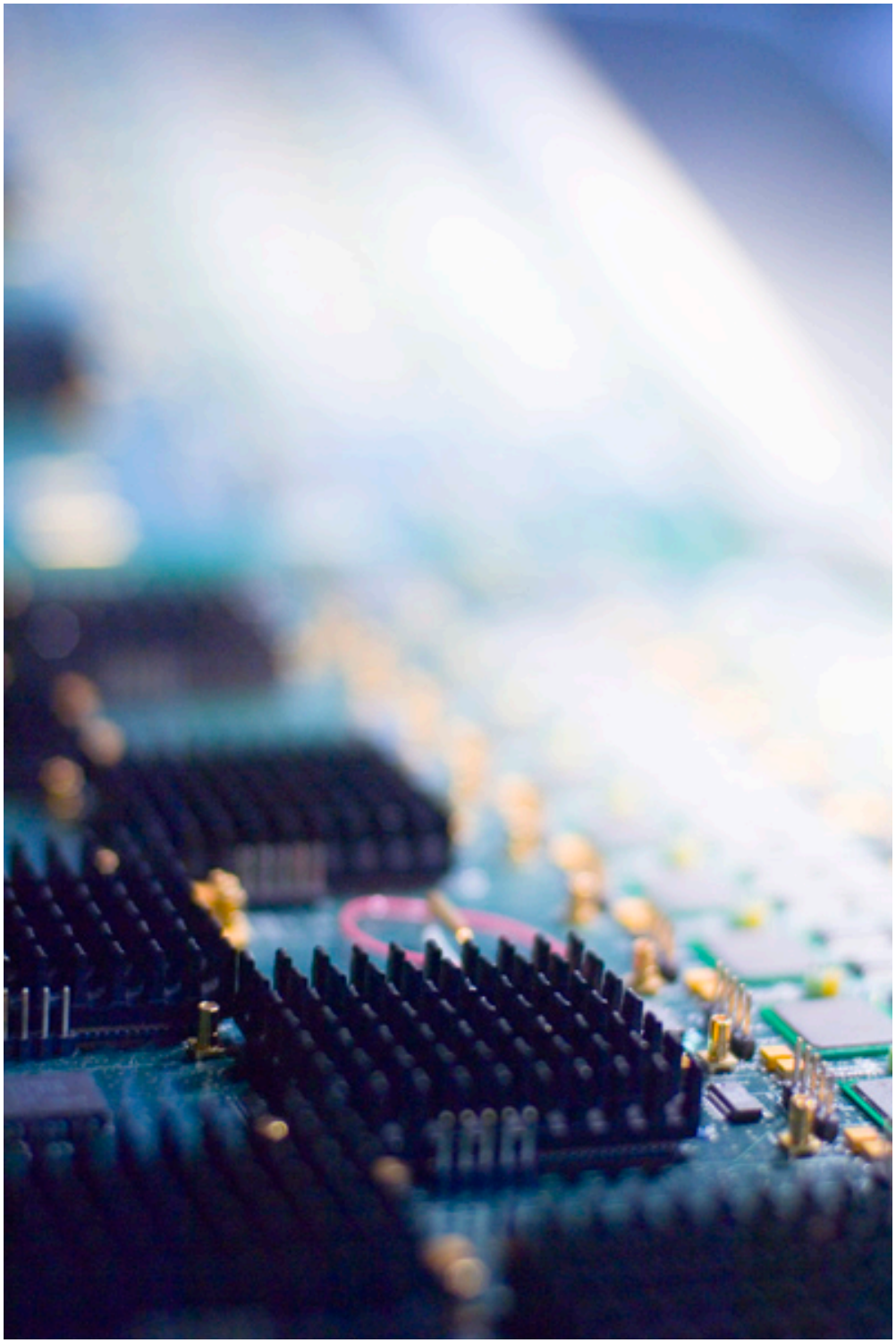


Offline Trigger Monitoring

TDAQ Training
5th November 2010

Ricardo Gonçalo
On behalf of the Trigger Offline Monitoring Experts team

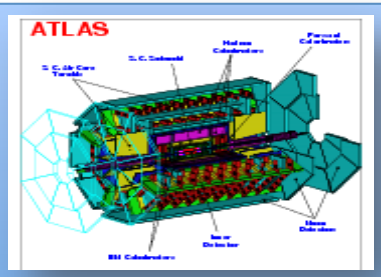


Introduction

- Aims:
  - The offline trigger monitoring shifter has two main tasks:
    - Monitor the **DEBUG STREAM analysis** and recovery
    - Monitor the **trigger DATA QUALITY**

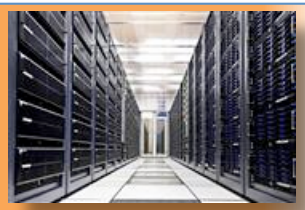
- Practicals:
  - The trigger shifter is in constant contact with a **Trigger Offline Expert** on call
    - A small team of experts rotate to make sure there is always someone on call
    - Will also be able to answer the shifter's questions/doubts
    - The expert will direct the shifter's work
      - Especially in case non-standard operations are needed
  - One shift per day from **9am to 5pm CERN time**
    - Currently in the TDAQ SATELLITE CONTROL ROOM (SCR)
    - Look for category "TRIGGER OFFLINE MONITORING SHIFTER" (task 46640) in OTP
    - It will be possible to do this shift remotely once the all the tools are available and the LHC is running smoothly – starting in early 2011

- Organization:
  - The activity is overseen by Alessandro Di Mattia and is an essential part of the **TRIGGER OPERATIONS** area
    - It makes sure that the trigger is working without problems and that the data collected is good for analysis



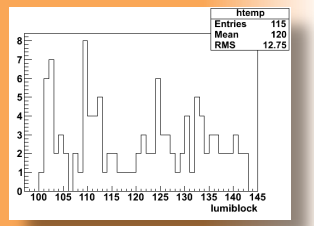
ATLAS Trigger/DAQ

DEBUG Streams

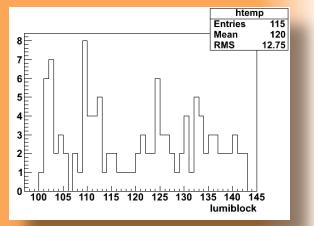


Trigger Reprocessing in Tier0

CASTOR



Pre-reprocessing Analysis

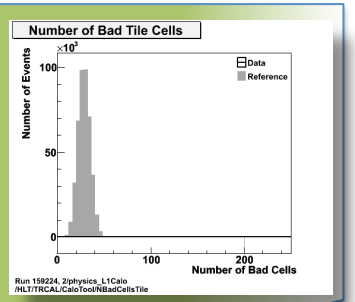


Post-reprocessing Analysis

PHYSICS Streams

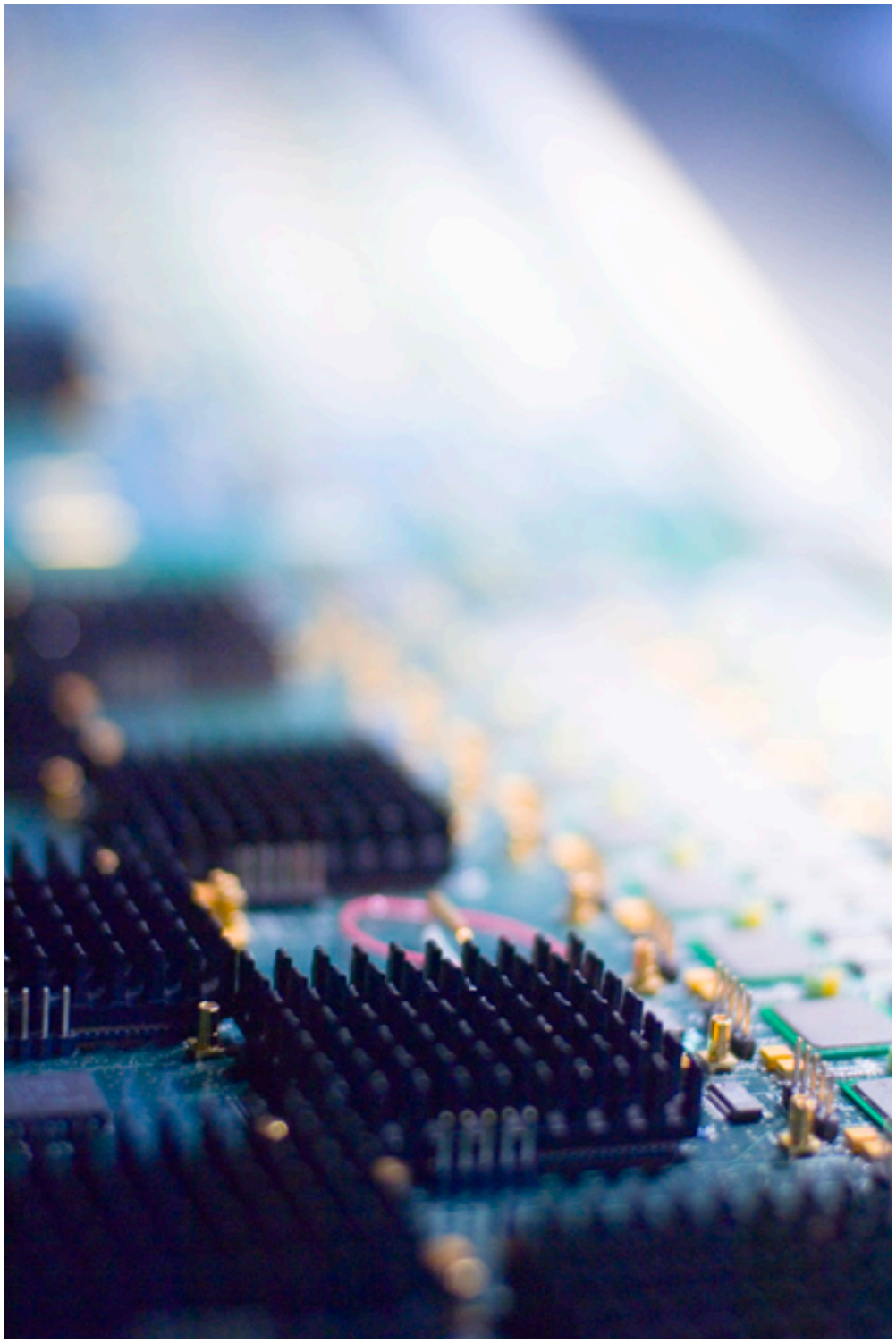
Offline Monitoring and Reconstruction in Tier0

Data Quality from Tier0 Histos

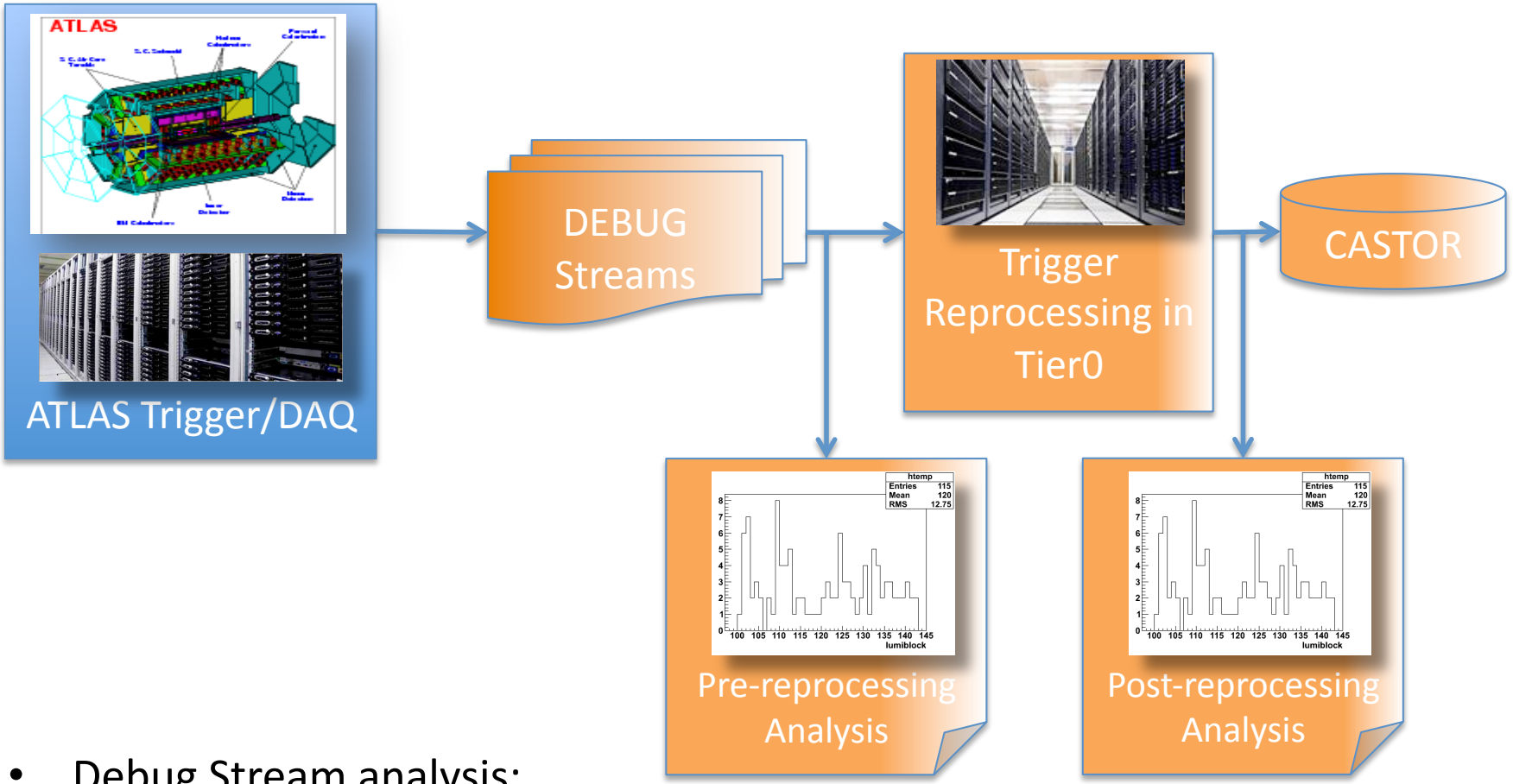


DEBUG stream analysis

Trigger DATA QUALITY

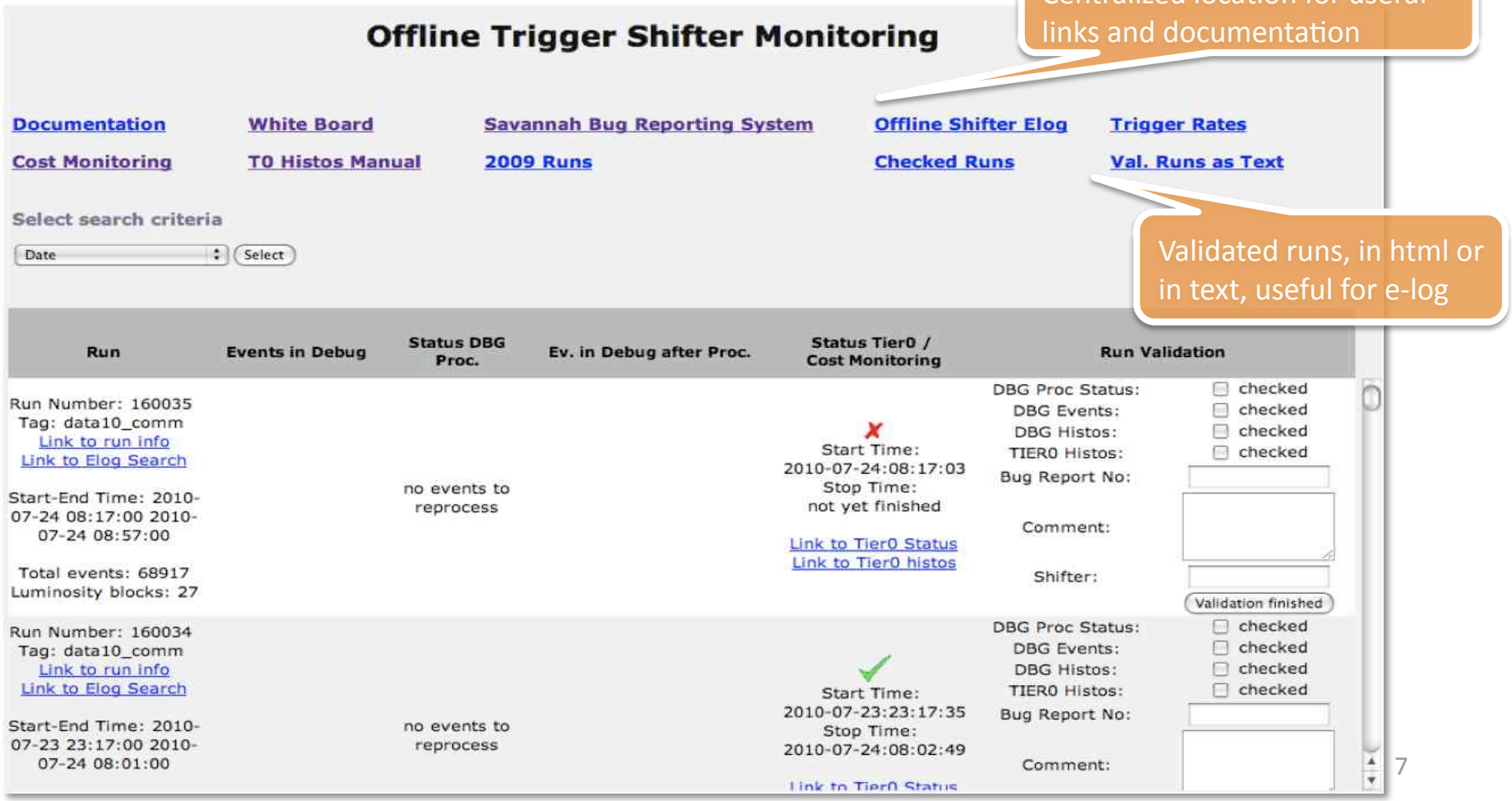


Debug Stream Monitoring

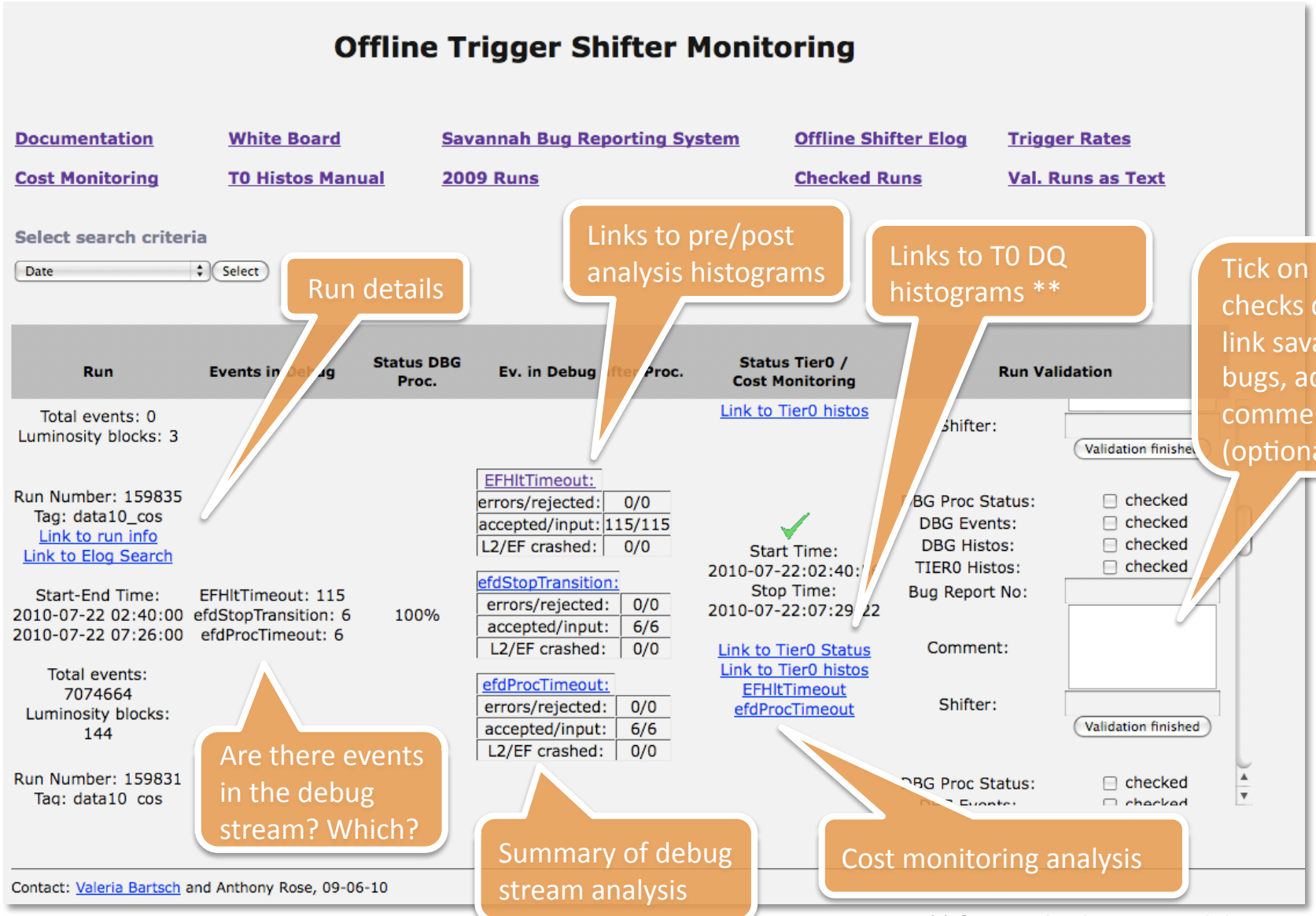


- Debug Stream analysis:
- Events generating failures either in the **DAQ infrastructure** or the **HLT software**, and for which the HLT can't make a decision, are sent to debug streams:
  - **Timeouts:** debug_EFHltTimeout, debug_efdProcTimeout, debug_L2HltTimeout, etc
  - **Crashes:** debug_efdPTCrash,debug_L2ForcedAccept
  - **Algorithm errors** that abort processing: debug_EFHltError, debug_L2HltError
- They are **reprocessed** in the Tier0
  - A set of tables and analysis histograms are produced **pre-** and **post-reprocessing** to help diagnose the error and monitor the recovery.

- Debug Stream Monitoring: https://voatlas17.cern.ch/offmon_new/offlineshifter.php
- Webpage dedicated to the use of the offline shifter and expert on call
- Automatically displays the recorded runs and provides a nice way to **keep the information** about past runs
- Provides access to the debug stream contents and to **analysis histograms** before and after **reprocessing**

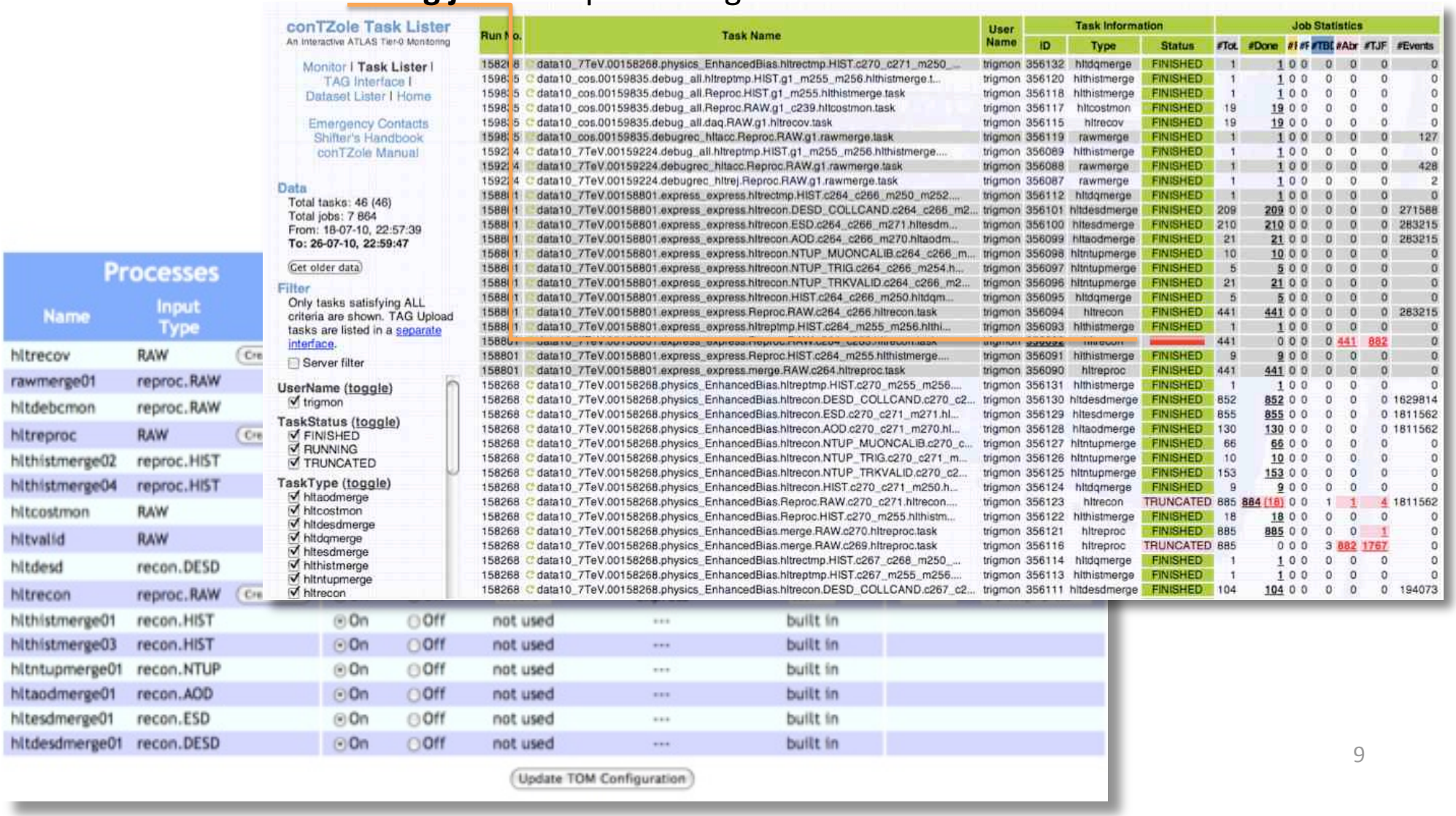


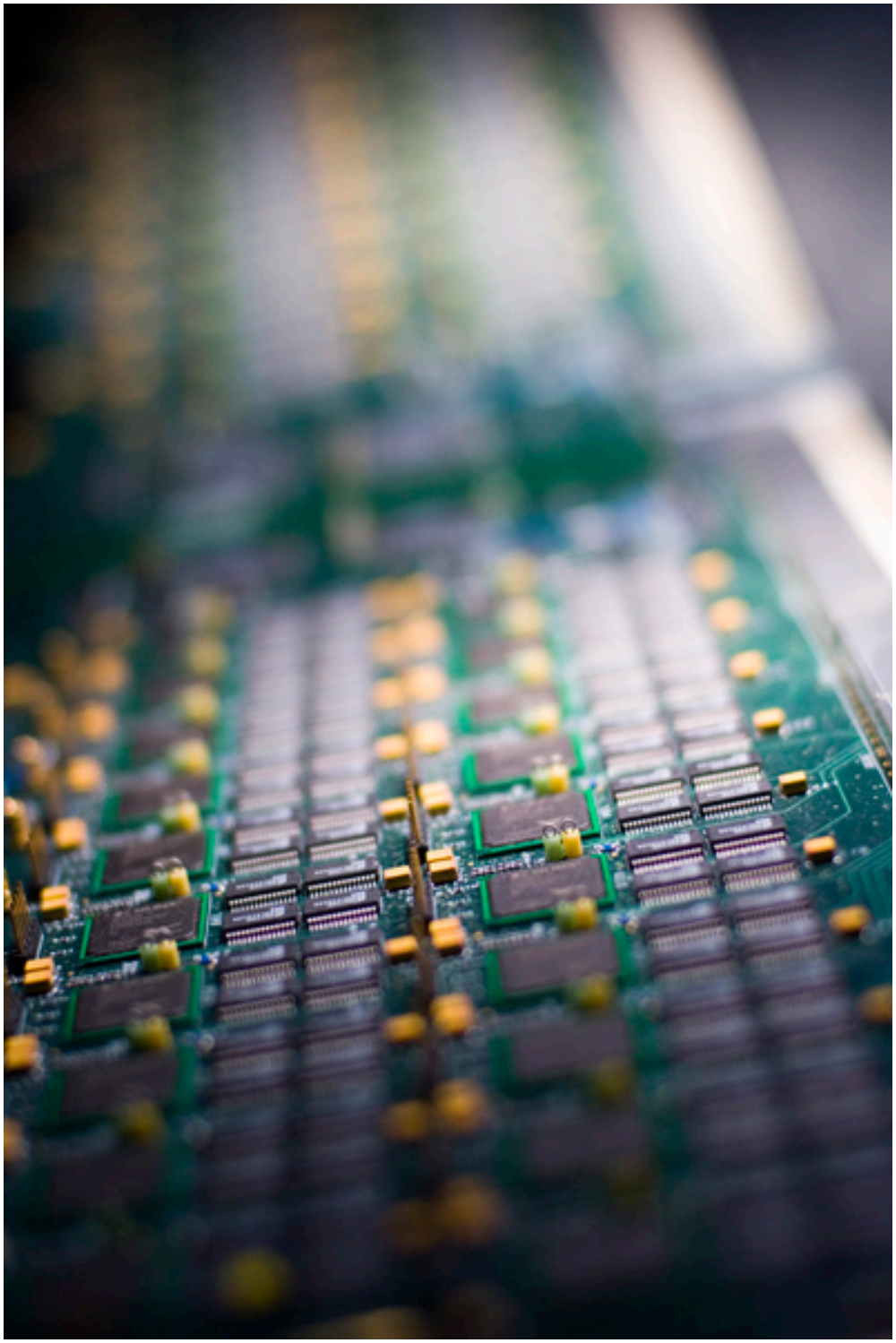
- Debug Stream Monitoring: https://voatlas17.cern.ch/offmon_new/offlineshifter.php
- Guides the checks to be done by the shifter for each run.



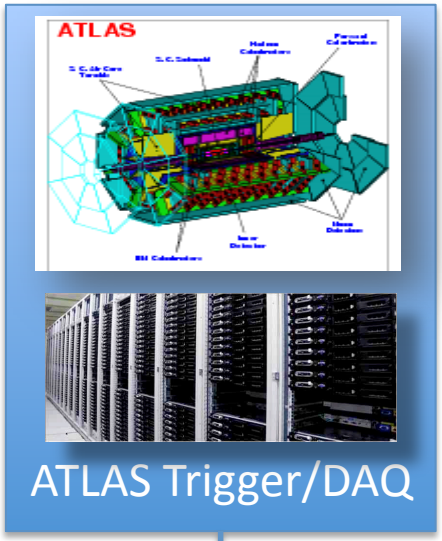
** for DQ checks, in next slides

- The HLT reprocessing is controlled by the TOM interface which is also used to **do ad-hoc re-processings** of old runs to test new software, debug errors, etc. At times do special checks on these reprocessings
- Running jobs can be monitored in the conTZole Task Lister: https://atlas-tz-monitoring-caf.cern.ch/taskLister.html
- Shifter must check **failing jobs** in reprocessing

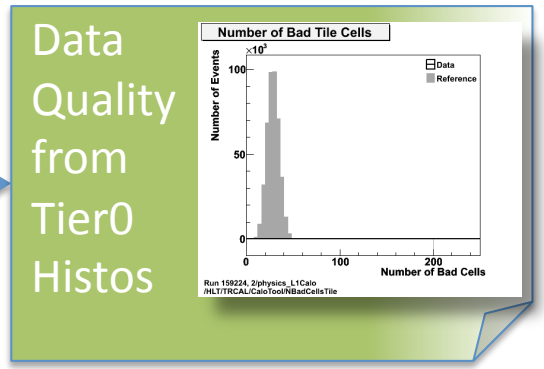




Trigger Data Quality Assessment

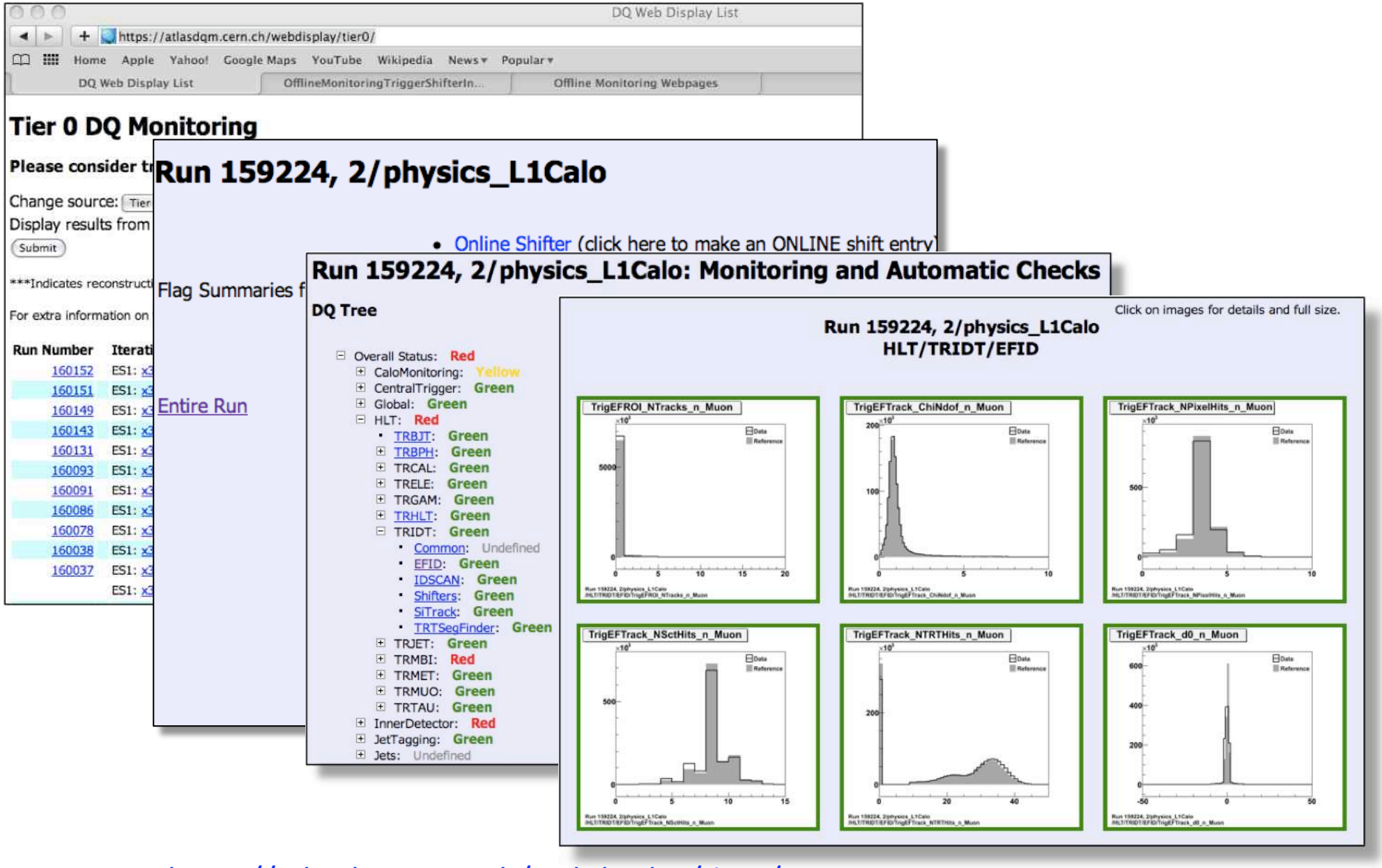


PHYSICS Streams



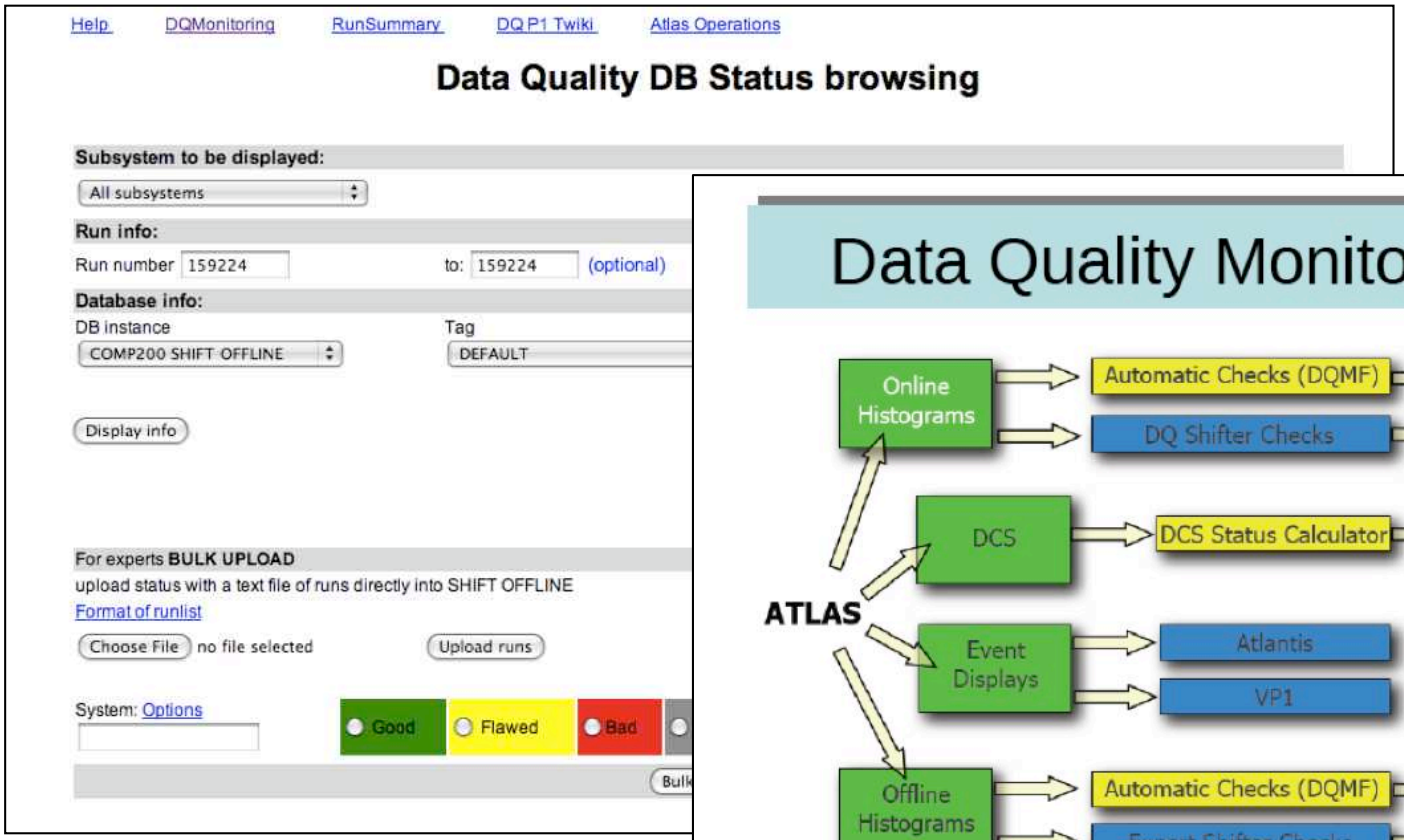
- The trigger software is monitored **online** – each trigger algorithm running on each working node publishes monitoring histograms
- …and **offline** – monitoring algorithms run in **Tier0** during event reconstruction and produce histograms from online trigger data and comparisons from offline, etc
- Trigger Slice experts take care of checking the monitoring data from each run at the moment
- **But this will be increasingly the task of the offline trigger shifter… i.e. YOU**

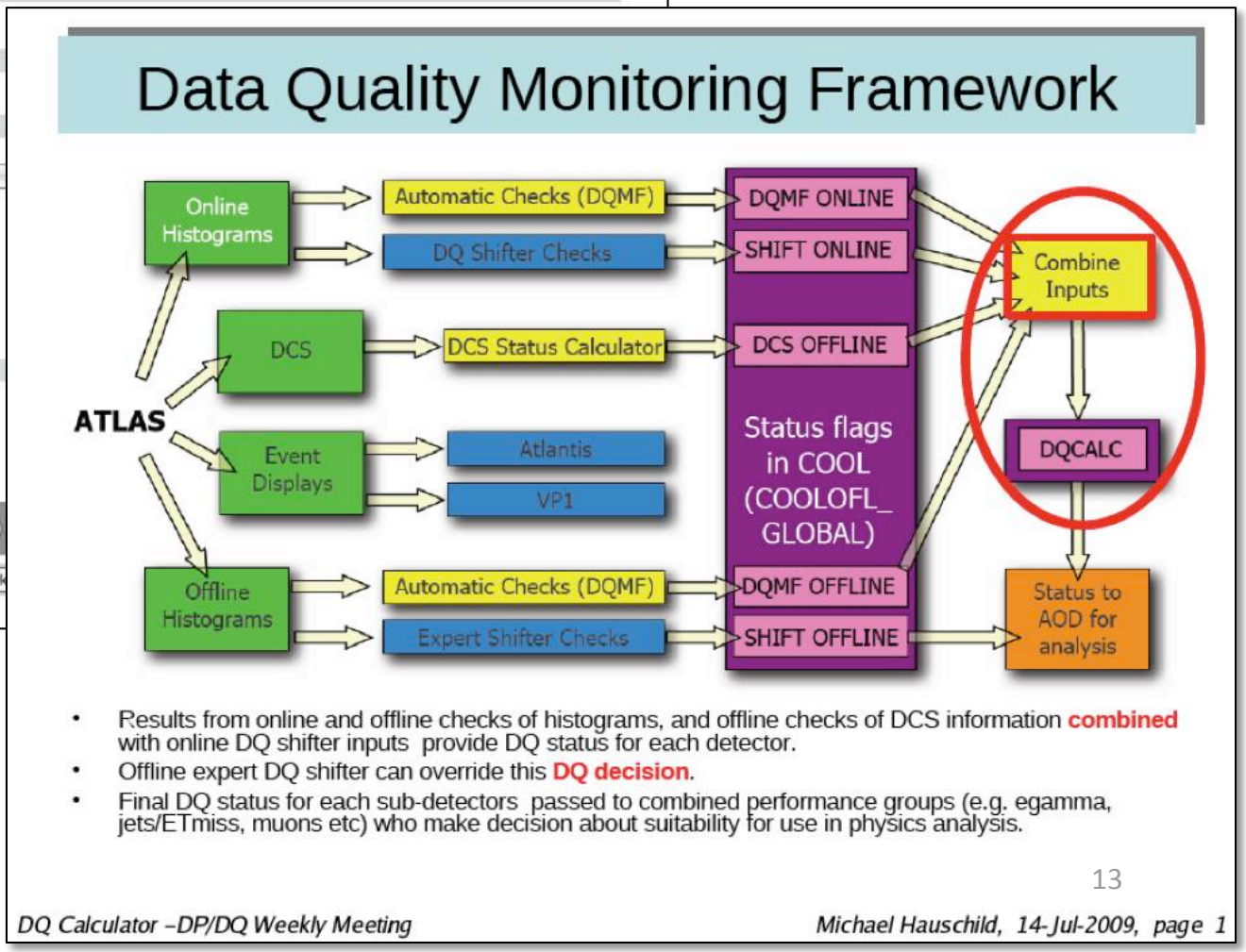
Trigger DATA QUALITY



- Go to https://atlasdqm.cern.ch/webdisplay/tier0/
- Click on the stream and run that you like, e.g. 159224/L1Calo
- Look under HLT: each link corresponds to a trigger domain: e.g. HLT->TRIDT->EFID

- Once you determine if a run is good or bad, update the corresponding **Data Quality (DQ) flags** – only the "**ShiftOFFLINE**" flags are updated by the shifter
- To update DQ flags go to: https://atlasdqm.web.cern.ch/atlasdqm/DQBrowser/DBQuery.php



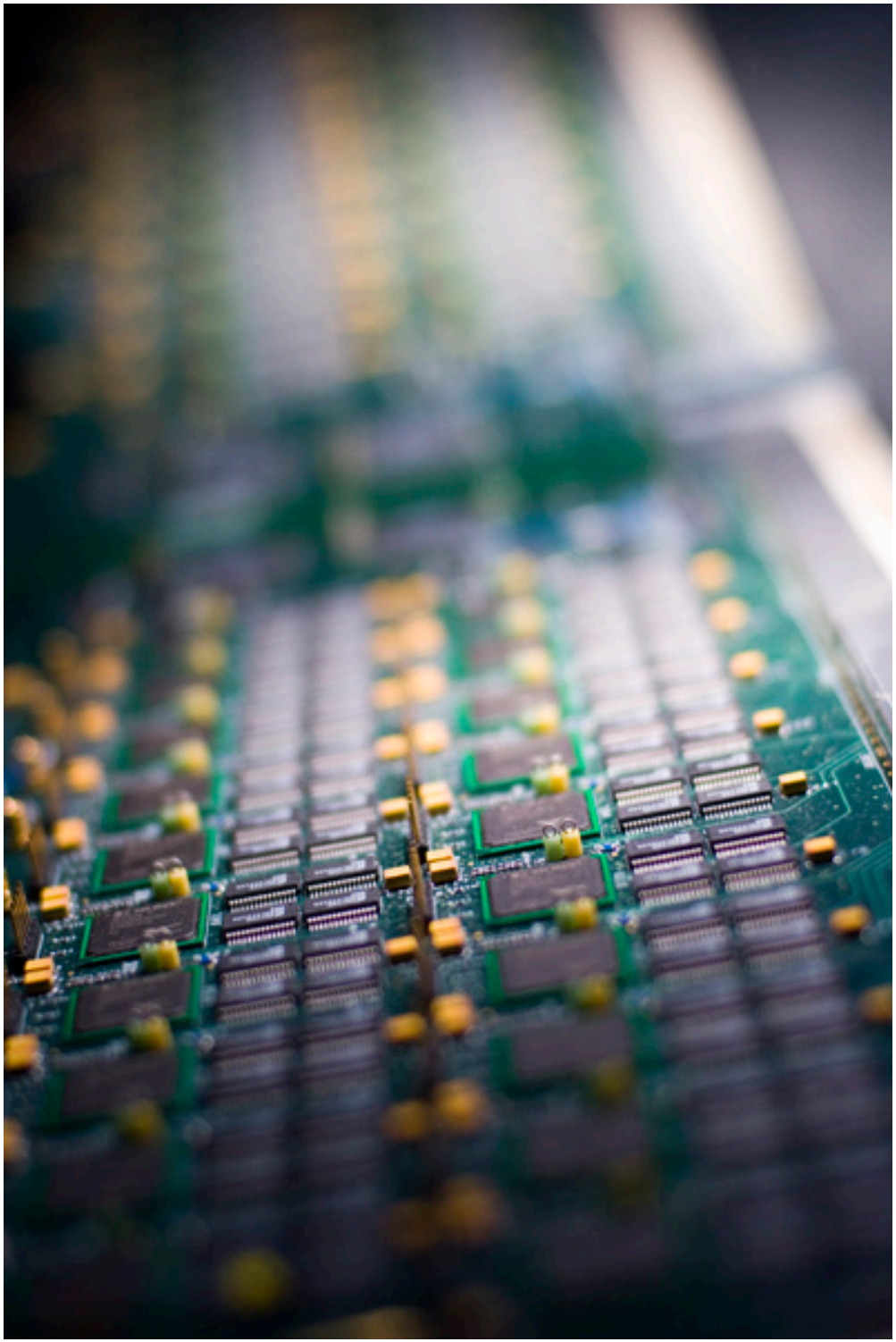


- The flags are then combined with the DQ flags set online and automatically by DQMF and used to select data for analysis using the Good Run Lists
- The shifter can also choose different flags for different luminosity blocks according to stable beams/hlt active.

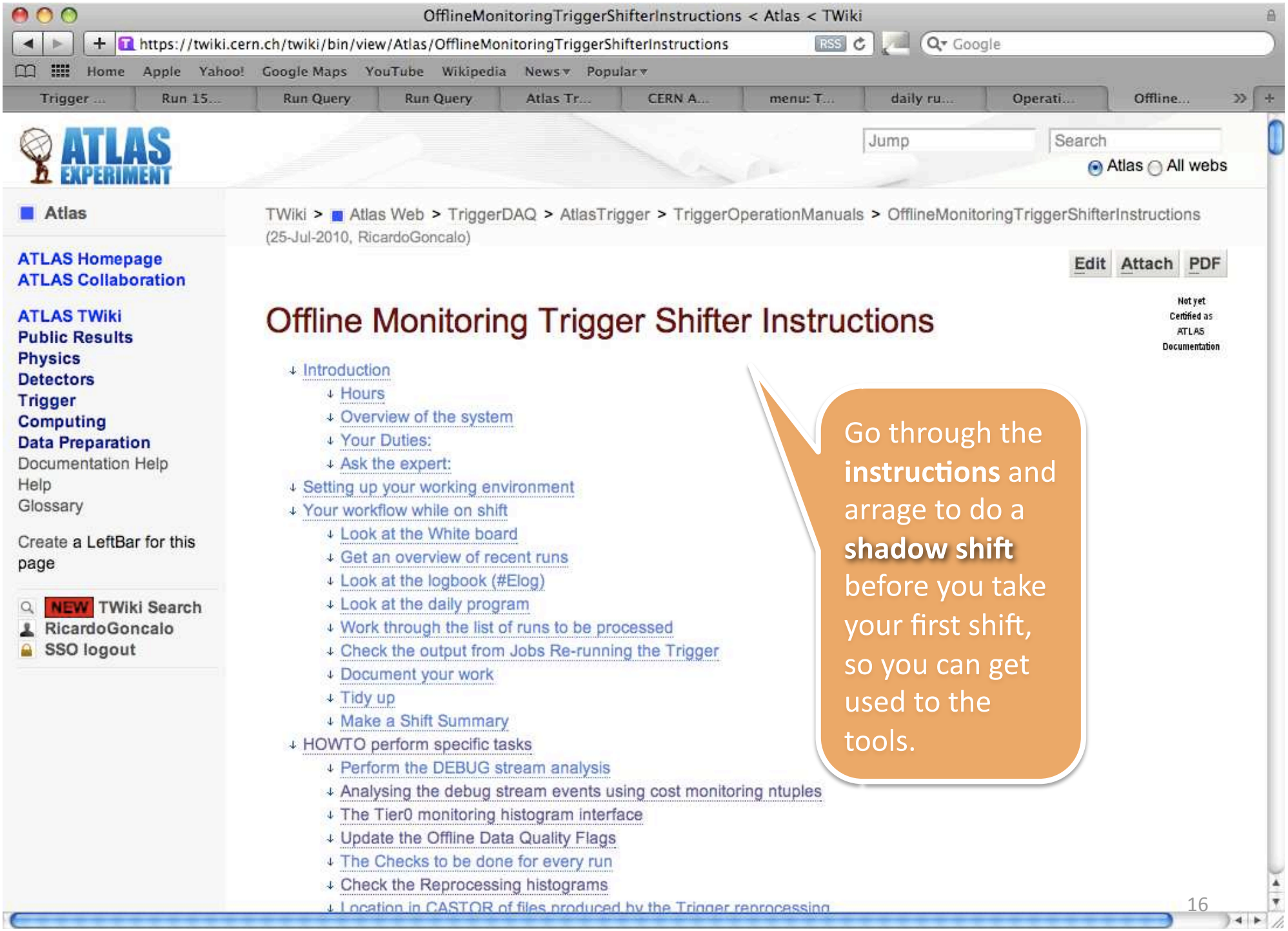
Search Result

Selection rule: find run 159796, 159810, 159814, 159821, 159831, 159835, 159950 / show dq tr and str debug/ nodef
Query command: [Click to expand/collapse command...]
Selection sequence: Checking for runs in run range [[159796, 159796], [159810, 159810], [159814, 159814], [159821, 159821], [159831, 159831], [159835, 159835], [159950, 159950]]
No. of runs selected: 7
Total no. of events: 24,218,715
Execution time: 2.2 sec

					Data quality (SHIFTOFL)														
Run	Links	#LB	Start and endtime (CEST)	#Events	TRTB (SHIFTOFL)	TRTEA (SHIFTOFL)	TRTEC (SHIFTOFL)	TRTTR (SHIFTOFL)	TRCAL (SHIFTOFL)	TRBJT (SHIFTOFL)	TRBPH (SHIFTOFL)	TRCOS (SHIFTOFL)	TRELE (SHIFTOFL)	TRGAM (SHIFTOFL)	TRJET (SHIFTOFL)	TRMET (SHIFTOFL)	TRMBI (SHIFTOFL)	TRMUO (SHIFTOFL)	TRTAU (SHIFTOFL)	TRIDT (SHIFTOFL)
159950	DS, RS, BS, AMI, DQ, NEMO, ELOG, DCS:SoR/EoR	327 (116 s)	Thu Jul 22 2010 23:51:24 – Fri Jul 23, 10:25:55	891,784 (23.4 Hz)	U	U	U	n.a.	B	B	B	n.a.	R	G	B	B	B	B	R	B
159835	DS, RS, BS, AMI, DQ, NEMO, ELOG, DCS:SoR/EoR	144 (118 s)	Thu Jul 22 2010 04:40:57 – 09:26:28	7,074,664 (413.0 Hz)	U	U	U	n.a.	B	B	U	n.a.	B	B	B	B	B	G	B	B
159831	DS, RS, BS, AMI, DQ, NEMO, ELOG, DCS:SoR/EoR	134 (119 s)	Thu Jul 22 2010 00:00:13 – 04:27:25	9,251,152 (577.1 Hz)	U	U	U	n.a.	B	B	B	n.a.	B	B	B	B	B	B	B	B
159821	DS, RS, BS, AMI, DQ, NEMO, ELOG, DCS:SoR/EoR	50 (115 s)	Wed Jul 21 2010 21:52:03 – 23:28:29	3,243,182 (560.5 Hz)	U	U	U	n.a.	B	B	B	n.a.	B	B	B	B	B	B	B	B



Documentation


OfflineMonitoringTriggerShifterInstructions < Atlas < TWiki
https://twiki.cern.ch/twiki/bin/view/Atlas/OfflineMonitoringTriggerShifterInstructions
Google
Home Apple Yahoo! Google Maps YouTube Wikipedia News Popular
Trigger ... Run 15... Run Query Run Query Atlas Tr... CERN A... menu: T... daily ru... Operati... Offline...
ATLAS EXPERIMENT
Jump
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Atlas All webs
Atlas
ATLAS Homepage
ATLAS Collaboration
ATLAS TWiki
Public Results
Physics
Detectors
Trigger
Computing
Data Preparation
Documentation Help
Help
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TWiki > Atlas Web > TriggerDAQ > AtlasTrigger > TriggerOperationManuals > OfflineMonitoringTriggerShifterInstructions
(25-Jul-2010, RicardoGoncalo)
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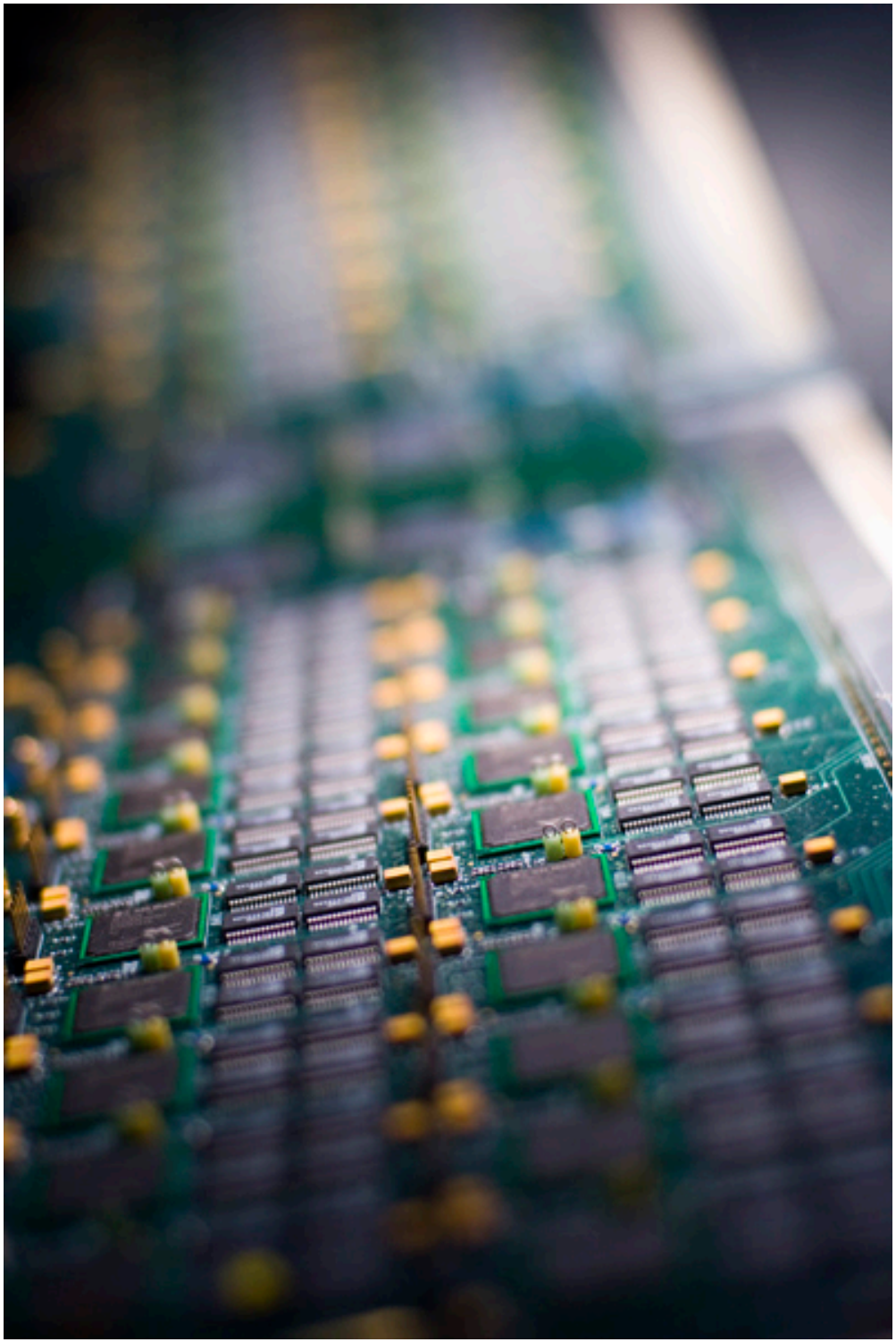
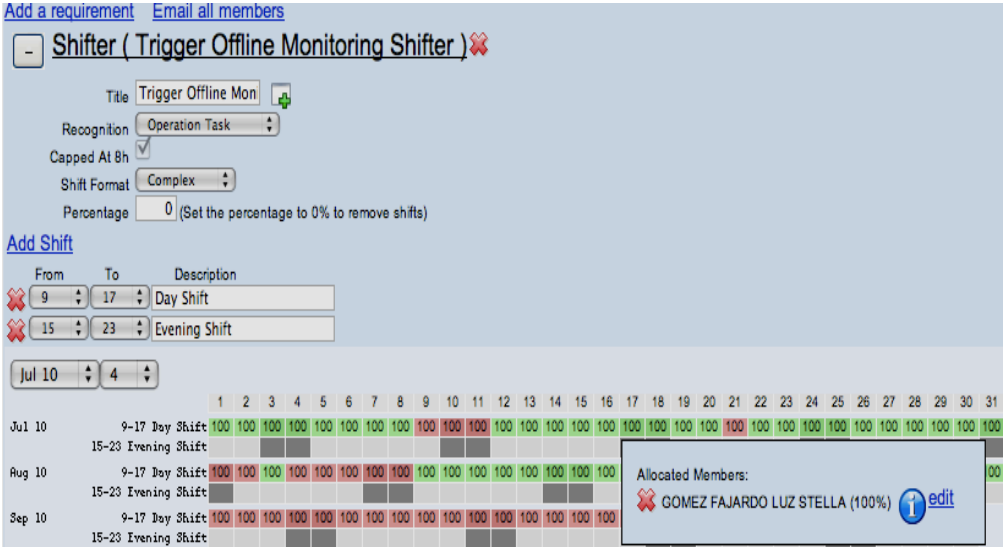
Not yet Certified as ATLAS Documentation
Offline Monitoring Trigger Shifter Instructions
Introduction
Hours
Overview of the system
Your Duties:
Ask the expert:
Setting up your working environment
Your workflow while on shift
Look at the White board
Get an overview of recent runs
Look at the logbook (#Elog)
Look at the daily program
Work through the list of runs to be processed
Check the output from Jobs Re-running the Trigger
Document your work
Tidy up
Make a Shift Summary
HOWTO perform specific tasks
Perform the DEBUG stream analysis
Analysing the debug stream events using cost monitoring ntuples
The Tier0 monitoring histogram interface
Update the Offline Data Quality Flags
The Checks to be done for every run
Check the Reprocessing histograms
Location in CASTOR of files produced by the Trigger reprocessing
Go through the instructions and arrage to do a shadow shift before you take your first shift, so you can get used to the tools.

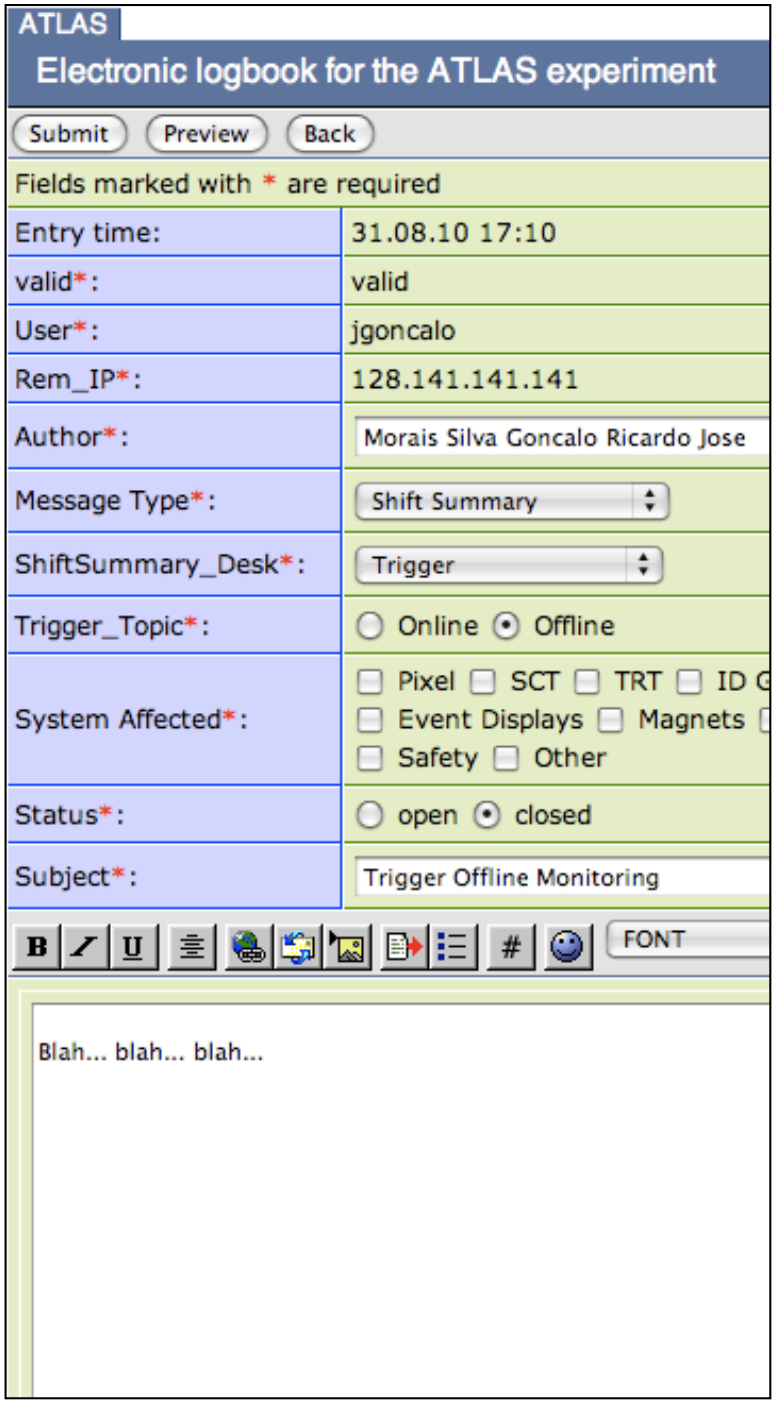


SUMMARY

- What do you need in order to do this shift?
  - Follow **this training**
  - Get a **savannah** account
  - Go over **the instructions twiki**
  - After the training you'll be able to **book your shift in OTP**
    - Look for "Trigger Offline Monitoring Shifter" (task 46640) in your OTP page
  - **Shadow someone** before you do your first real shift



- What will you do during the shift?
  - Check reprocessing and analysis of **DEBUG STREAM**
  - Check TIER0 Trigger histograms for **OFFLINE DQ**
  - Check results **of ad-hoc reprocessings** if necessary
  - Always be **in contact with the offline trigger expert** – inform her/him of what you find



- What will you do at the end of your shift?

1. Write an **informative** e-log summary
   - Remember to specify in the subject that this is trigger offline monitoring

2. Write anything new in the Offline monitoring **Whiteboard** for the next shifter

- And remember, **all ATLAS data is important!**
  - Good Data Quality Monitoring is essential for good physics data
  - Data reprocessings are essential to maintain and improve the trigger
  - The debug stream analysis is essential to debug the trigger… and it may even show new physics!