



TOF Quality Assurance status

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Overview

1. TOF QA tasks summary

2. TOF QA Code update


- Status of AliTOFQADataMakerRec class
- Further changes planned for AliTOFQADataMakerRec class
- Preliminary estimation of QA data size
- Examples of QA results on p-p raw data

3. Reference data status

- MC QA data: different productions ready to be committed
- Reconstructed pp data: new code version needed

4. “To do” list and conclusions

TOF QA tasks summary

Work	Task Name	Task Owner	Assigned Users	Start Date	Done Date	Expected Finish Date	Last Update
!	 Quality Assurance (1395)	Silvia.Arcelli	Silvia.Arcelli (100%)	01/01/2006	-	31/03/2010	-
✓	↳ Reference distribution (2324)	Silvia.Arcelli	Silvia.Arcelli (100%)	23/05/2008	10/12/2009	15/10/2009	-
✓	↳ Implementation of run type (2450)	Silvia.Arcelli	Annalisa.DeCaro (60%) (+1)	16/03/2009	16/12/2009	15/10/2009	-
➔	↳ Implementation of reference data (2453)	Silvia.Arcelli	Bellini (100%)	16/03/2009	-	31/03/2010	-
!	↳ Extract QA data from large Monte Carlo production (2652)	Silvia.Arcelli	Silvia.Arcelli (40%)	08/07/2009	-	31/01/2010	-
✓	↳ Implement method virtual Double_t* Check(AliQAv1::ALITASK_t /*index*/) (2668)	Silvia.Arcelli	Silvia.Arcelli (100%)	27/07/2009	15/10/2009	15/10/2009	-
✓	↳ Geometry (1407)	Annalisa.DeCaro	-	01/01/2006	27/06/2008	29/02/2008	-

Preliminarily to the remaining tasks completion some important changes to the QA code were necessary (see next slides).

AliTOFQADataMakerRec class status

AliTOFQADataMakerRec class updated for **Raw Data**: on 02/03/2010 changes have been **committed** in AliRoot trunk and v4-18-Rev-07

- deprecated method for reading raw data substituted with the method used in reconstruction
- added expert histograms (especially electronics-oriented histograms)
- changed histograms ranges
- inserted check on noisy channels (connect to OCDB and read noise runs maps)

Some further changes have been **tested but not committed** yet:

- inserted check on enabled TOF channels (connect to OCDB and read configuration maps) and “spare” channels
- added filter for LTM data (OR trigger signal, not physics)
- corrected a few axis labels typos

AliTOFQADataMakerRec: further changes

Improvements **still to be implemented** for raw data i.e. add information about

- TOF matching window (MW) width to set time spectra range accordingly

As MW is going to be smaller than the actual, this will also allow to reduce number of bins while keeping the same time resolution. QA data size is reduced by ~38% and ~47% if number of bins is reduced to the 25% and 10% of the actual.
- electronics configuration changes during a run
- time information about the duration of the run
- monitor decoding errors

Changes in QA code for **RecPoints** has been **tested but not committed**, changes for **ESDs** are **under test**:

- added expert histograms
- changed histogram ranges

Thanks to the new electronics-oriented histograms for raw data, QA gives us information about TOF performances (at both hardware and software level) and constitutes a debugging tool for experts.

QA data size – preliminary estimation

QA task	Code version	N. general histos	N. experts histos	N. total histos	Expected QA data size (kB) *
Raws	old	4	0	4	130
	trunk	10	12	22	570
	pro	10	15	25	580
Rec Points	old	5	0	5	140
	trunk	5	0	5	140
	pro	10	4	14	590
ESDs	old	5	0	5	140
	trunk	5	0	5	140
	pro	6	3	9	340
Total	old	14	0	14	410
	trunk	20	12	32	850
	pro	26	22	48	1510

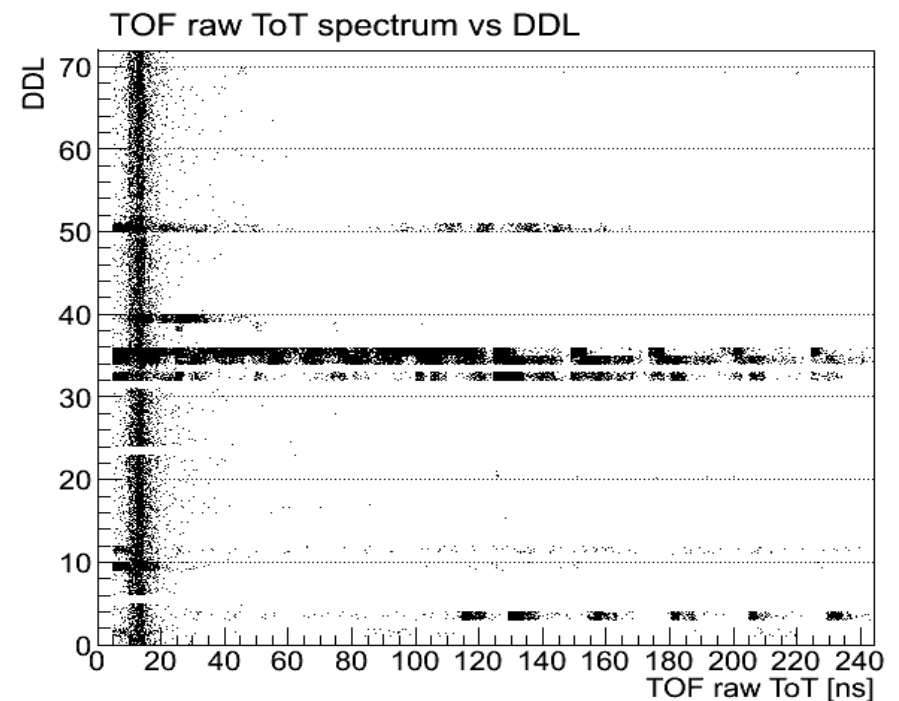
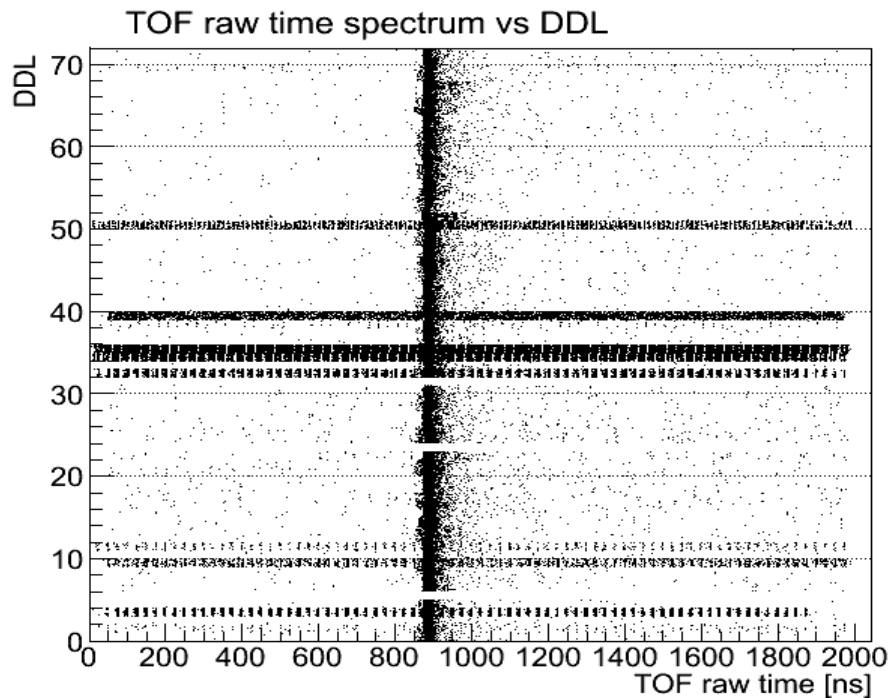
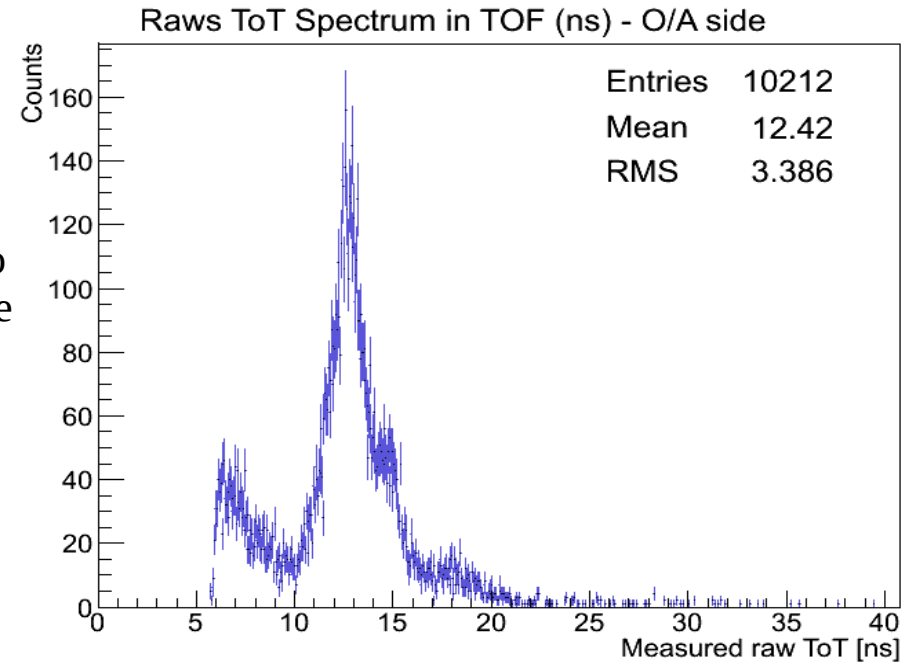
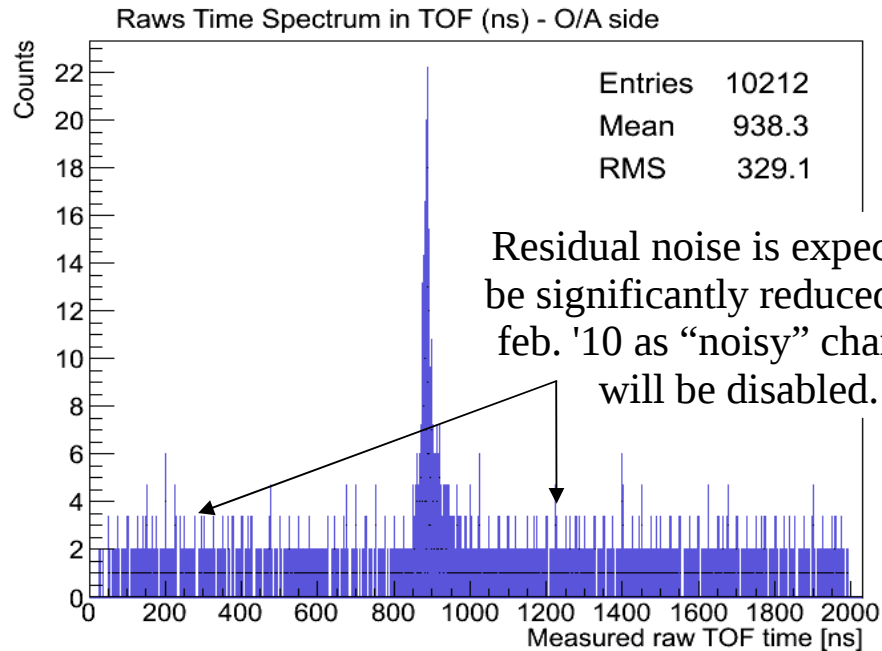
(*) Expected QA data size is intended for single task and single chunk.

These values come from an *a posteriori* QA analysis of december run 104824 (~ 6k events) and **have to be considered as upper limit** estimations.

In fact they do not take into account the rebinning option which is aimed to reduce QA data size on disk.

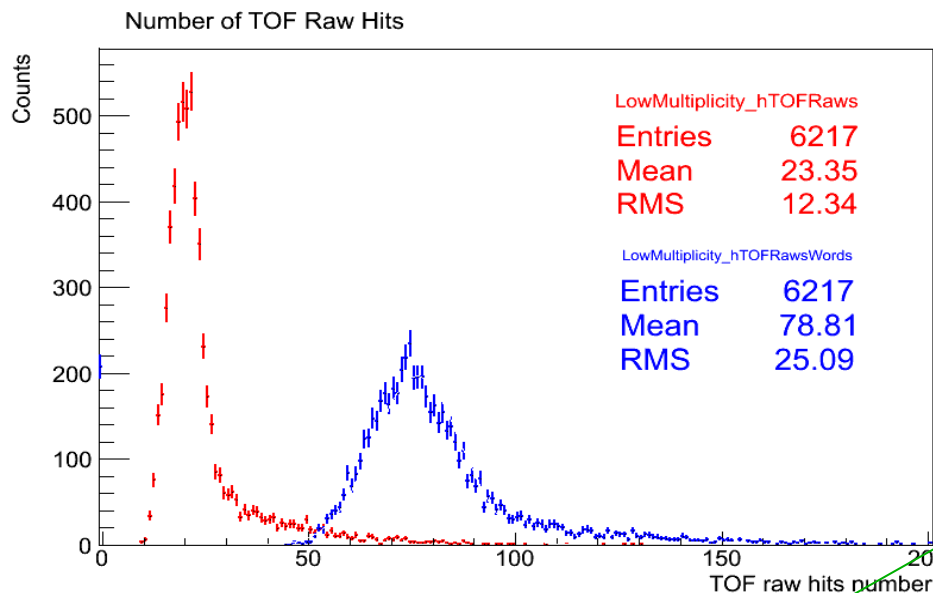
QA histograms for raw data (1)

Dec '09 – pp run 104824



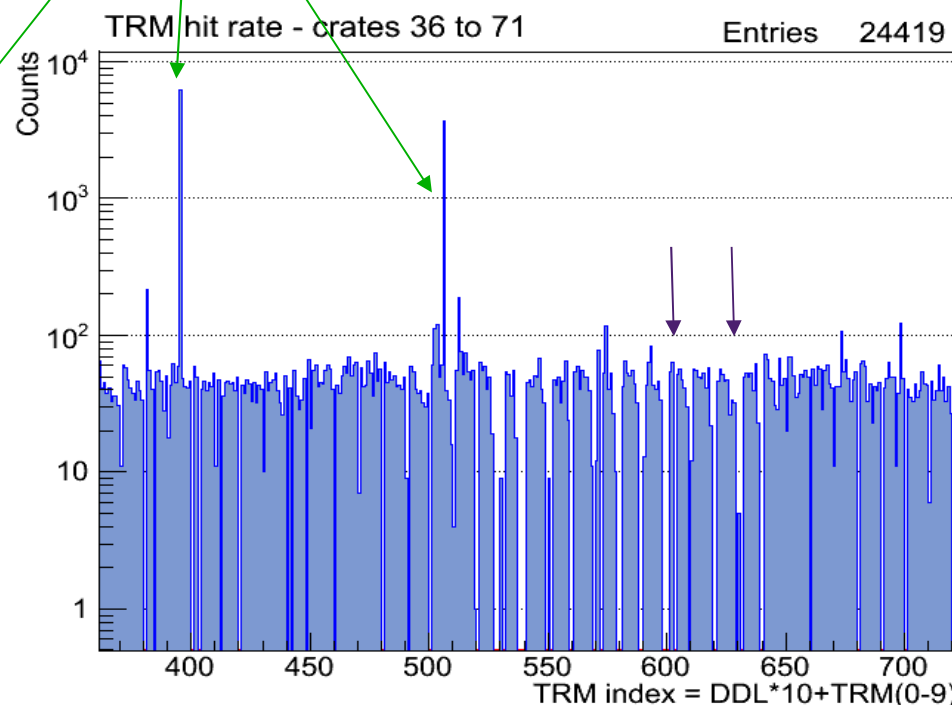
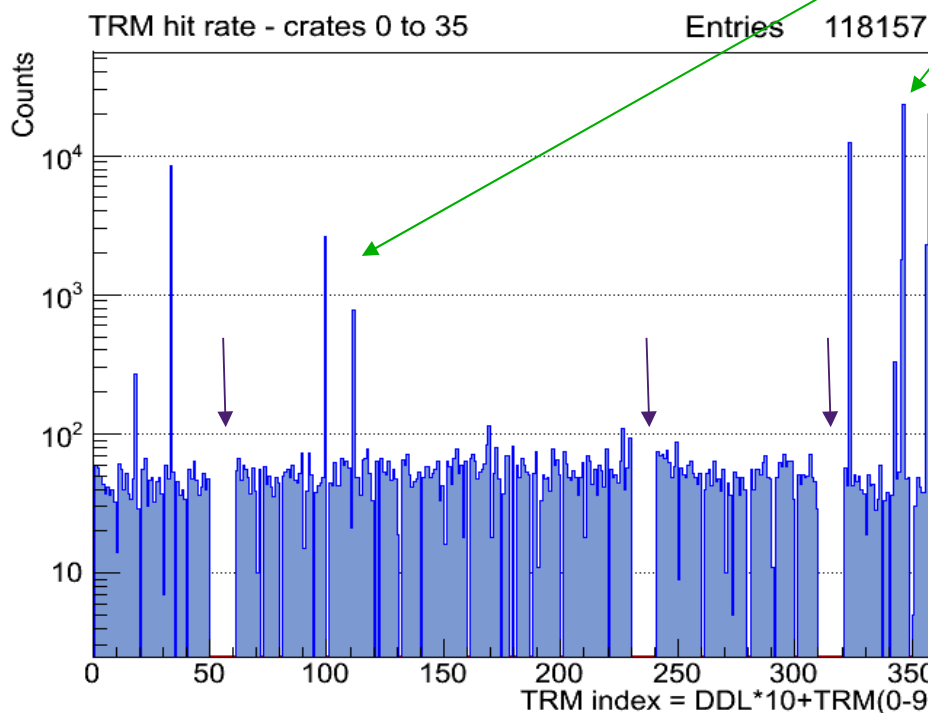
QA histograms for raw data (2)

Dec '09 – pp run 104824



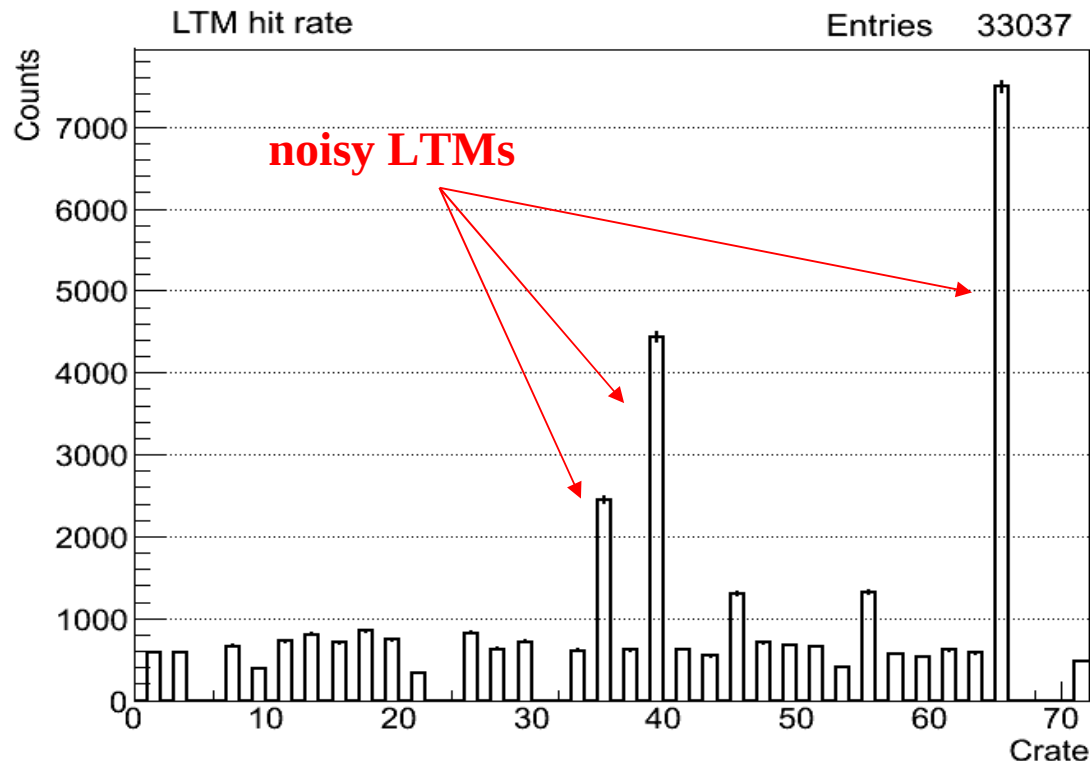
Hits on TOF are defined only if we have both TOF time and ToT measurements. **Words** number gives information about total data size.

Peaks are due to residual noise.
“Holes” are due to disabled channels in readout configuration for known hardware related issues.



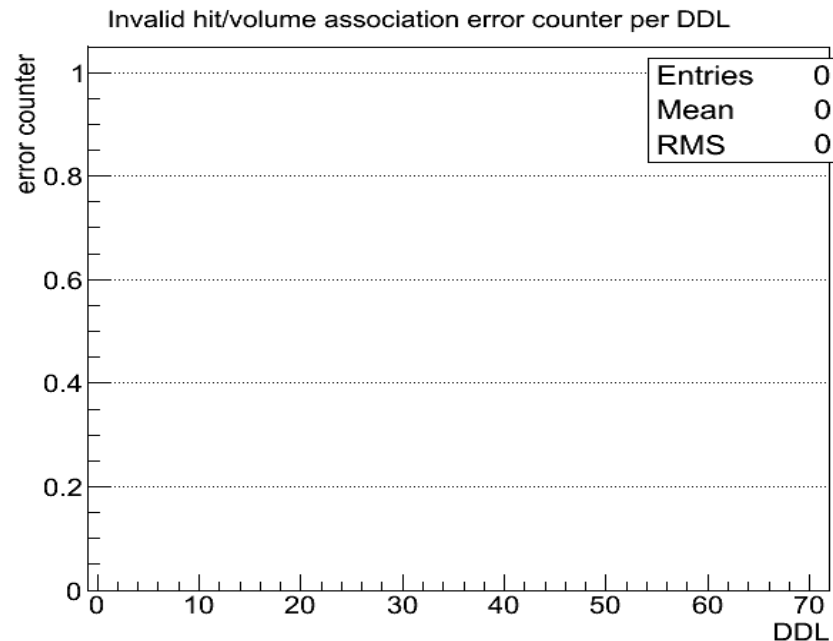
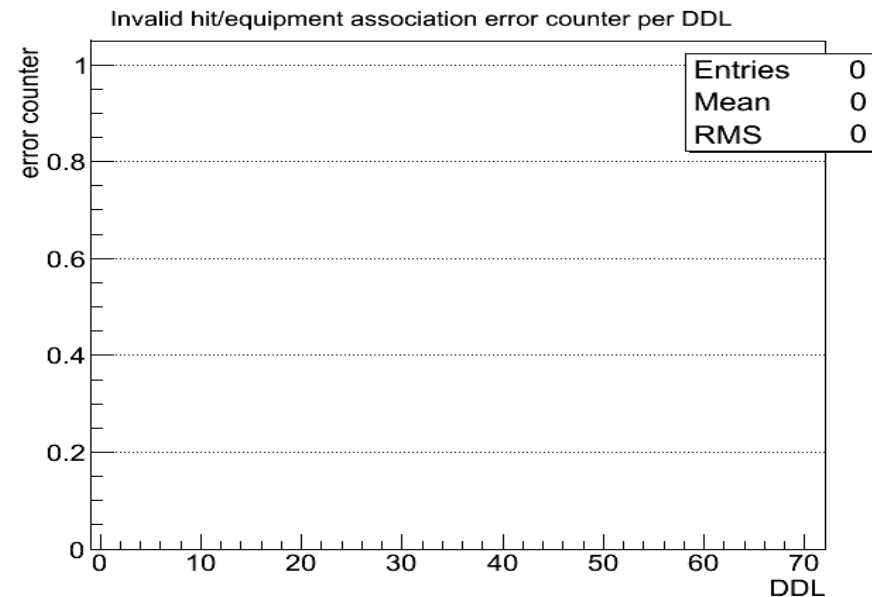
QA histograms for raw data (3)

Dec '09 – pp run 104824



A LTM hit represents a trigger OR signal.

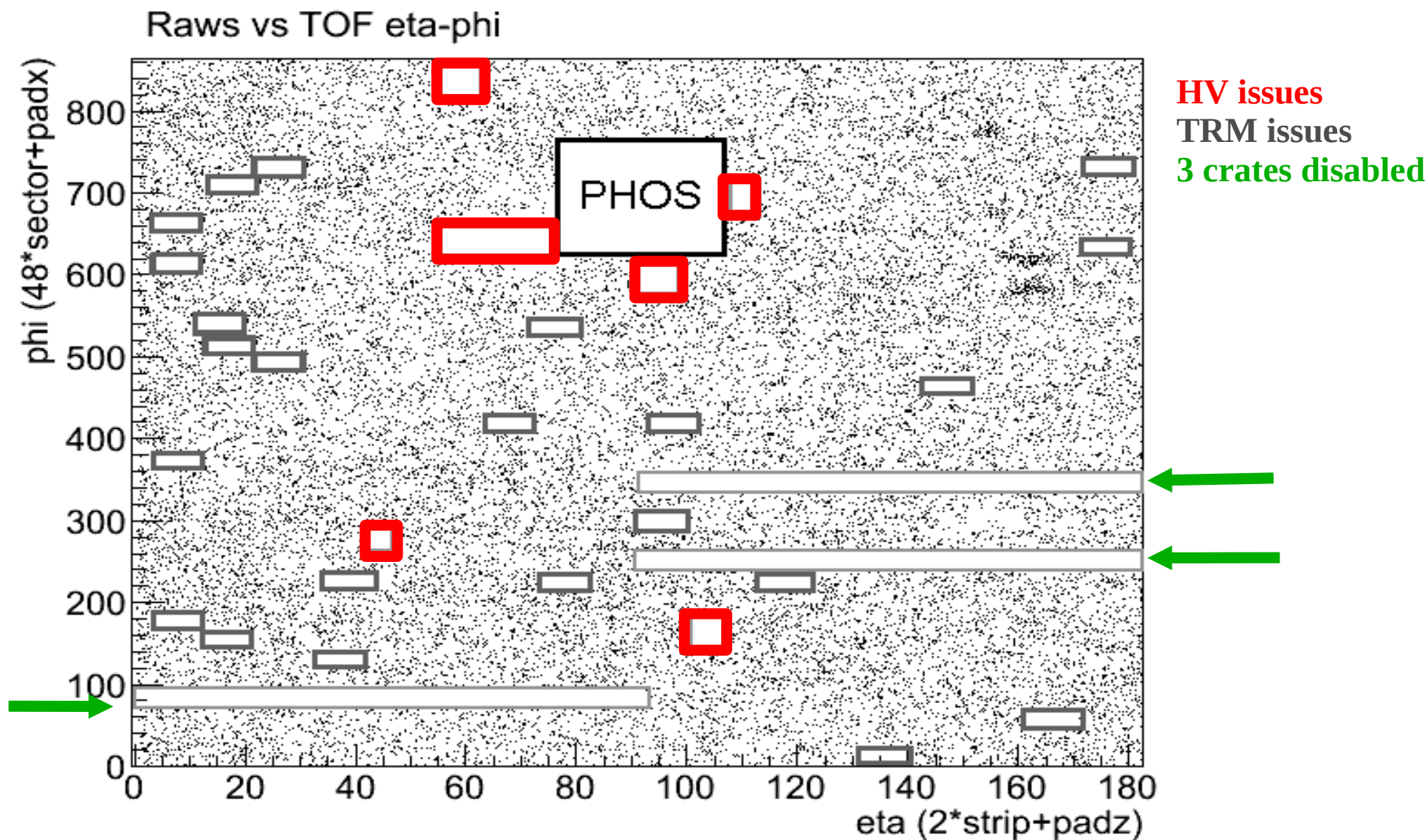
Hit/Equipment and hit/volume association error monitoring histograms are empty as they should be! If not empty they could spot configuration errors. They are also useful for debugging purposes.



QA histograms for raw data (4)

Dec '09 – pp run 104824

Hits spatial map reflects known dec'09 HW configuration issues



QA reference data from MC productions

Extract QA data from large Monte Carlo production (task #2652): TOF QA Data for Hits, Digits, SDigits and ESDs coming from the following productions of p-p data at different energies have been merged.

Production	Energy (TeV)	B (T)	Statistics (Evts)
LHC09d10	0.9	0.5	4650600
LHC09d2	0.9	0	352600
LHC09d1	0.9	0.5	379400
LHC09b13	7	0	59600
LHC09b12	7	0.5	175800
LHC10a10	2,36	0.5	573300
LHC09a4	10	0.5	1730000

These were obtained with the actual version of AliTOFQADataMakerSim class. This class has still to be modified accordingly to the changes made to the AliTOFQADataMakerRec class for consistency reasons. **We will set this MC QA data as reference for MC productions until new version of the code is ready.**

Implementation of Reference Data

MC reference data will then come from merged QA data previously mentioned.

Reference data for p-p collisions will come from official QA data.

For this purpose we need to commit changes of the code first.

We would like the first reference data to come from december '09 runs. Unless they will be produced during a new reconstruction pass, **they have to be obtained by running *a posteriori* QA task (work in progress...)** because of the recent code updates.

As the comparison between MC and pp data would lead to very weak constraints on real data quality because of noise, time slewing and other “real world” issues, we don't plan to compare the two for the moment.

Reconstructed reference data will be stored in local AliRoot DB:
\$ALICE_ROOT/QAref/TOF/QA/LowMultiplicity

→ ***What about MC reference?***

→ ***Is there any other DB in which they have to be stored?***

“To do” list and conclusions

1. Commit AliTOFQADataMakerRec class changes that have already been tested successfully

→ *quite urgent and preliminary to extraction of pp reference data. A few more test can be performed but this could be done before the end of the week.*

2. Modify AliTOFQADataMakerSim class accordingly.

→ *Not urgent and quick to get done.*

3. Commit MC QA data as reference data and close task #2652.

→ *Ready to do that.*

4. Run QA over december'09 pp data to extract reference data for collisions, commit results and close task #2453.

→ *Preparation of the task is a work in progress...*

5. Implement QA checker in simulation and reconstruction

→ *depending from task #2453: longer term issue...*

Backup

DQM

Summary view as seen by the DQM shifter @ P2

