HMPID offline status

D. Di Bari, A. Mastroserio, L.Molnar, G. Volpe

HMPID Group

HMPID

CALIBRATION STATUS

Offline Condition DataBase

DONE

- Matrices with values of sigma pedestal (DaqSig).
- Mean value of C_6F_{14} refractive index (Nmean). It depends on the temperature and transparency.
- Value of charge threshold to distinguish MIP clusters from photoelectron clusters (Qthre).

To be done

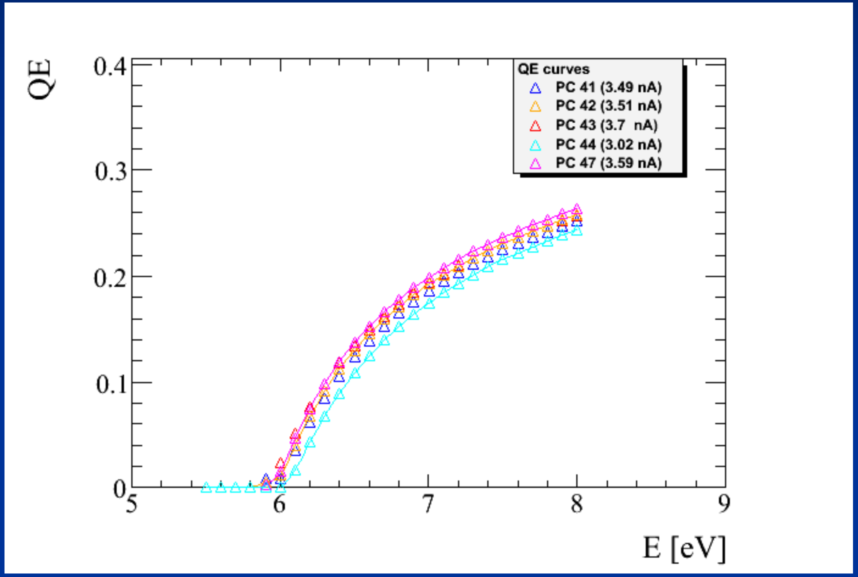
- CsI Quantum Efficiency for each from DCDB into OCDB.

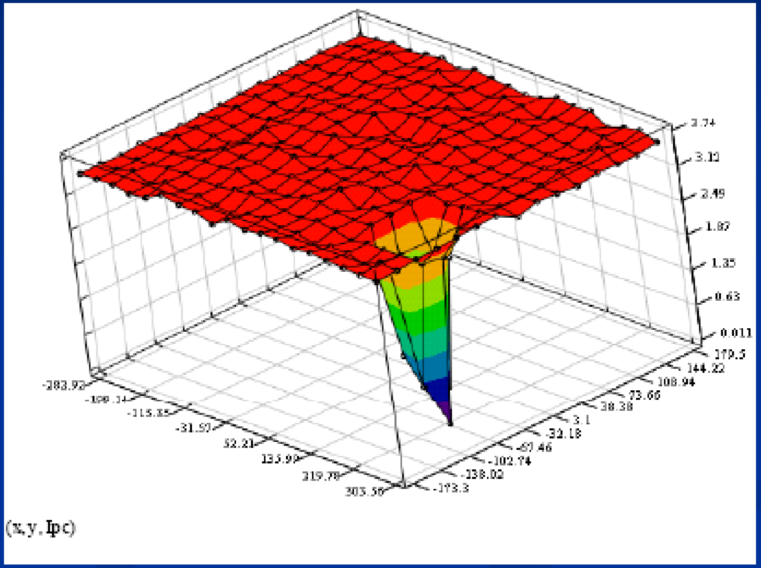
(See next slide)

- C_6F_{14} transmittance from DCS, still waiting for transparency DCS subsystem.
- SiO_2 transmittance hard-coded.

MWPC HV, CH_4 temperature, pressure and transparency will not be directly stored in the OCDB, just Qthre (after calculation).

Quantum Efficiency map(s)





- Quantum efficiency segmentation on the photo cathode level

- In case of connection problem, apply the relevant masking?

SHUTTLE Preprocessor

DONE

- Is under test in the SHUTTLE test setup.
- Analysis and storage of monitored DCS Data Points and of the pedestal files is executed correctly.

To be done

- Calculation of C_6F_{14} transparency. Still waiting for the final hardware setup.

Qthre and Nmean calculation

- Qthre depends on HV and CH_4 pressure, the dependence on the temperature is negligible.

- Qthre calculation has been implemented and now is in the CVS.

- Nmean depends on the radiator (C_6F_{14}) temperature and on mean photon energy.

- The radiator temperature is retrieved directly by DCS.

- Mean photon energy is related to the radiator transparency.

- The calculation of the transparency is done starting from the PMT currents, values of the transparency system integrated in the HMPID DCS.

- Nmean calculation will be implemented in the Preprocessor.

Detector Algorithm

- HMPID detector algorithm has to provide the mean and sigma values of the pedestals of electronics channels.
- It has to process the CALIBRATION_EVENT.
- DA for the HMPID has been already submitted to CVS.
- The number of LDCs for the HMPID are 2 in the final DAQ setup, not 4.
- The pedestal files provided by DA consist of 14 .txt file packed in two .tar files, one for each LDCs.

HmpidPedDdl01.txt …… …… HmpidPedDdl014.txt

HmpidPeds1.tar

HmpidPeds2.tar

Raw data handling and pedestal classes for HMPID

“Motivation”

Before:

- Raw data handling was implemented in AliHMPIDDigit.
- Only pad information was written to the simulated raw DDL files

Now:

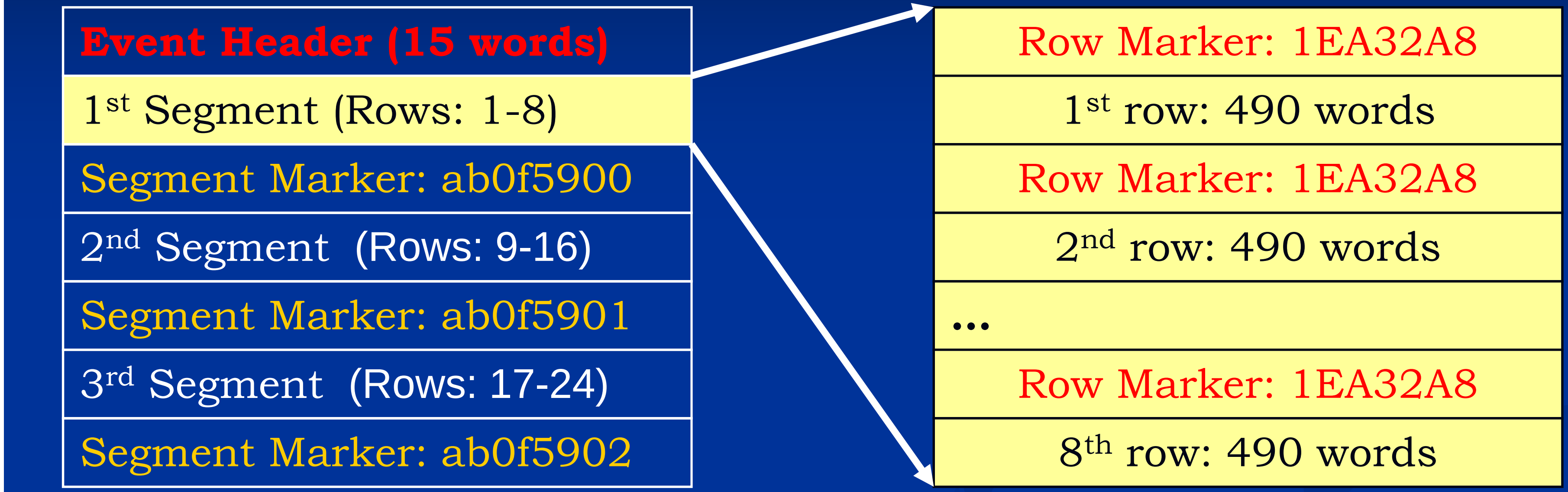
- AliHMPIDRawStream is implemented:

  reading, conversion of raw data, writing simulated raw data files.

Raw data structure

1 HMPID chamber → 2 DDL
For 1 DDL → 3 segments: 24 rows

1 segment = 8 rows



Event Header (15 words)

1st Segment (Rows: 1-8)

Segment Marker: ab0f5900

2nd Segment (Rows: 9-16)

Segment Marker: ab0f5901

3rd Segment (Rows: 17-24)

Segment Marker: ab0f5902

Row Marker: 1EA32A8

1st row: 490 words

Row Marker: 1EA32A8

2nd row: 490 words

…

Row Marker: 1EA32A8

8th row: 490 words

Segment marker:

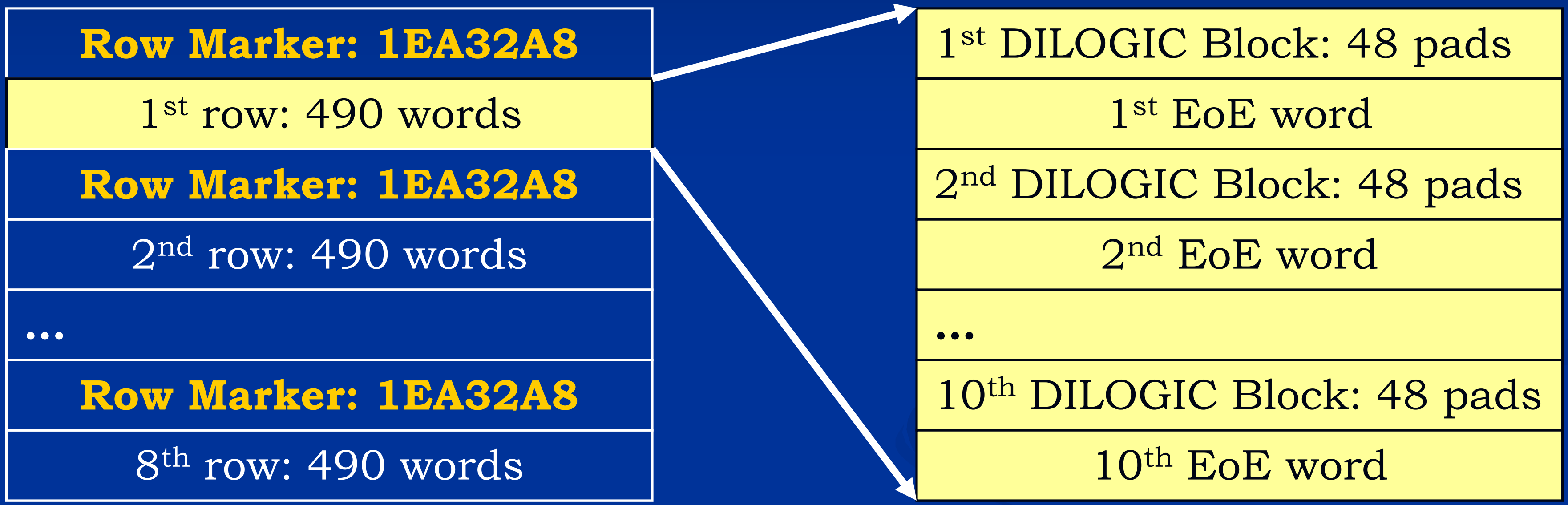
- ab0: marker word
- f59: # of words in seg.
- 0X, X=0,1,2 (seg.num.)

Row marker:

- 32A8: marker word
- 1EA: # of pads in a row

Numbers represent pedestal setup.

Raw data structure cont.



1 segment = 8 rows

Row Marker: 1EA32A8
1st row: 490 words
Row Marker: 1EA32A8
2nd row: 490 words
…
Row Marker: 1EA32A8
8th row: 490 words

1 row = 10 DILOGIC blocks

1st DILOGIC Block: 48 pads
1st EoE word
2nd DILOGIC Block: 48 pads
2nd EoE word
…
10th DILOGIC Block: 48 pads
10th EoE word

EoE word contains:

- # of words
- DILOGIC address
- Row address

Raw data checks

- Row marker:
  - Check for # of words
  - Within rows: check for DILOGIC parameters
  - Within DILOGIC block: check # of words in EoE
- Segment marker: check for # of words in the segment

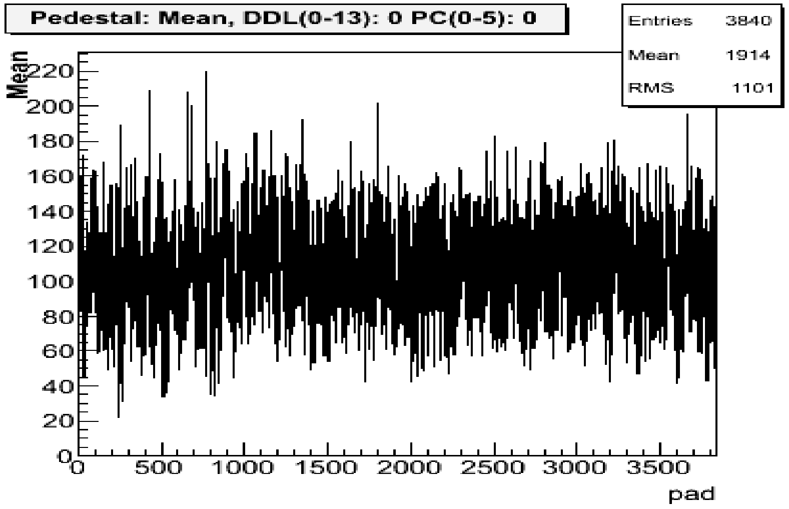
Simulated and real raw data

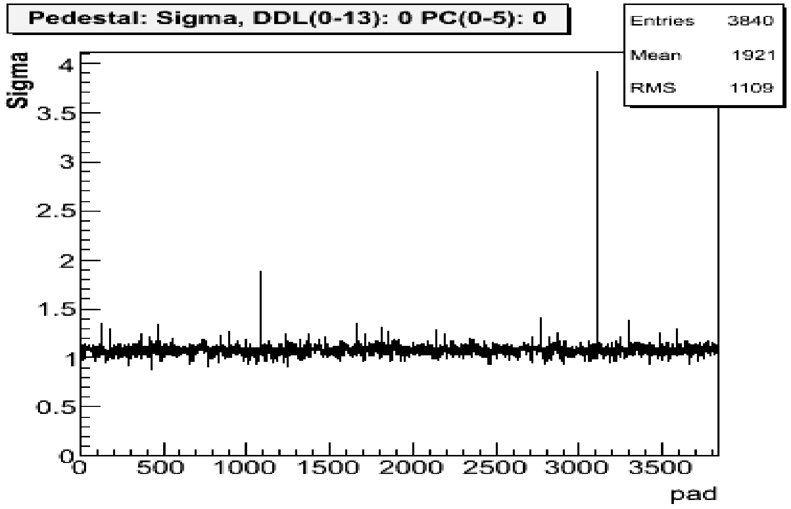
- Raw data structure introduced to sim.
  (only pad information before, no markers).

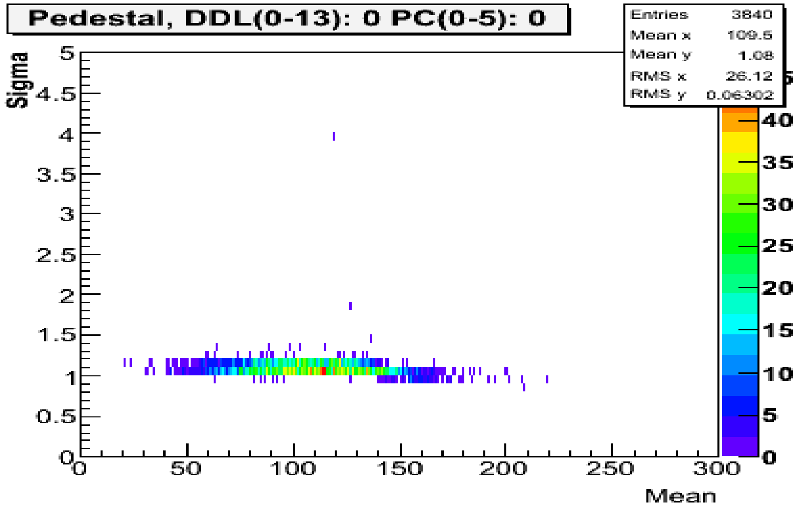
- Pedestal files are simulated to test DA, can be provided for DA validation.

- Actual pedestal calculation in AliHMPIDCalib

Results from real pedestal file





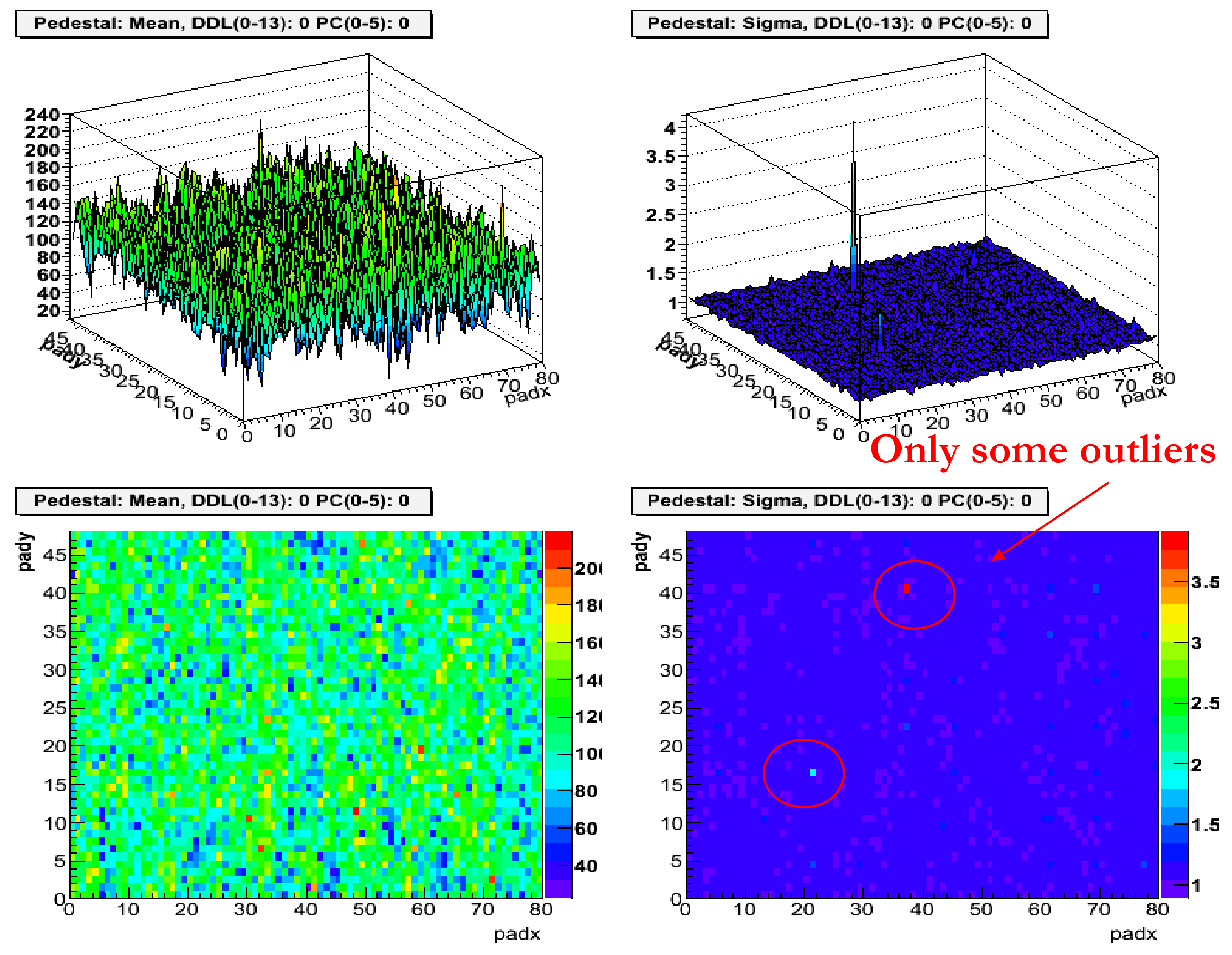


Pedestal taken @ P2:

Fri Sep 21 18:29:40 2007

Sigma: stable, only some outliers

Results from real pedestal file



Only some outliers

QA framework for the HMPID

QA framework

Implementation of

-AliHMPIDQualAssDataMaker →

- Which histograms to book
- Executing filling

- AliHMPIDQualAssChecker →

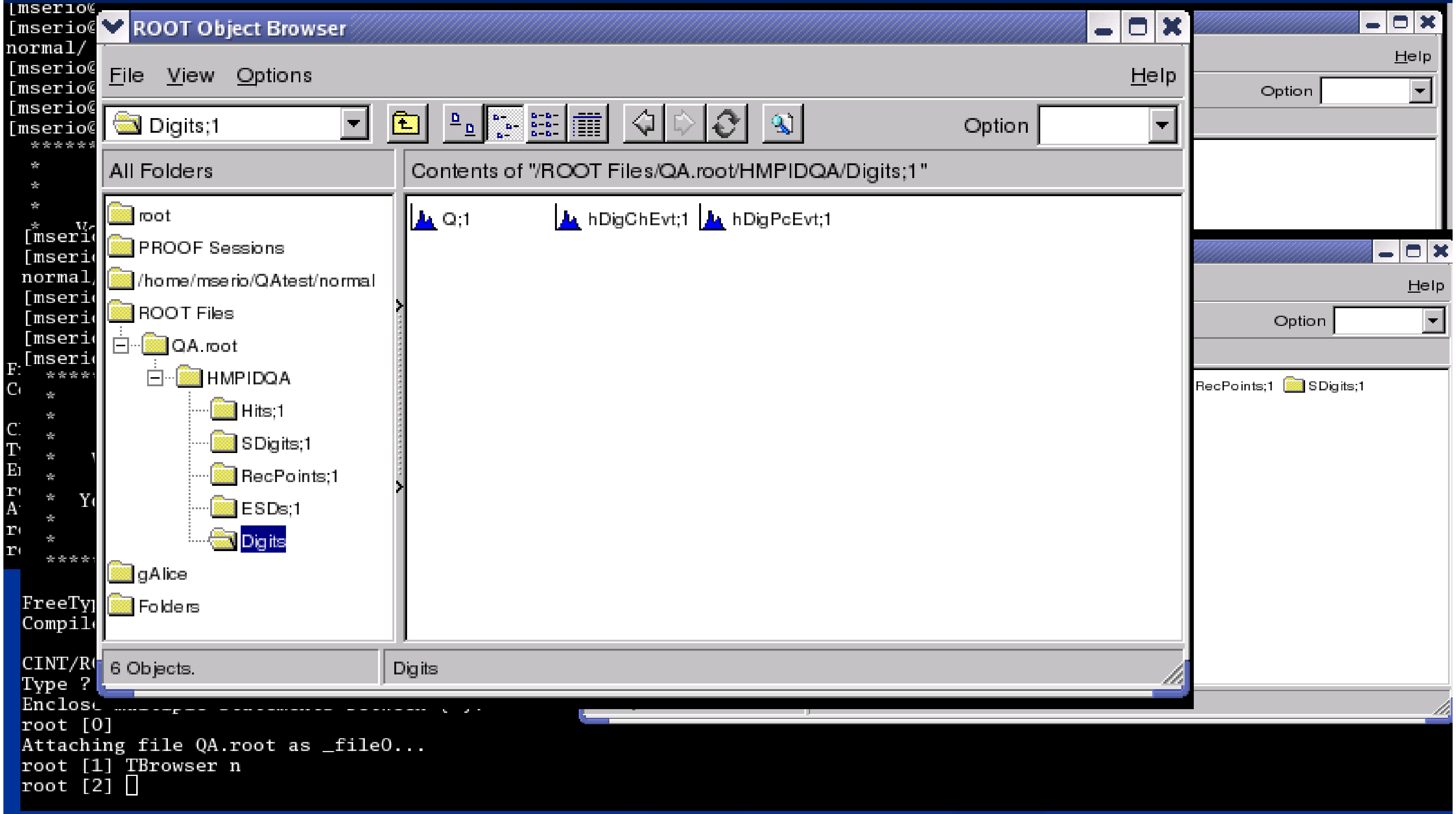
- Test the resulting histograms with reference histograms

External Inputs needed to init the QA and to write the histograms

…to be done according to the new developments

The simulation retrieves the QA framework output file : “QA.root”

AliHMPIDQualAssDataMaker



Contents of "/ROOT Files/QA.root/HMPIDQA/Digits;1"

6 Objects.

Digits

```
[mserio@
[mserio@
normal/
[mserio@
[mserio@
[mserio@
[mserio@
  ******
   *
   *
   *
  [mseri
  [mseri
  normal,
  [mseri
  [mseri
  [mseri
  [mseri
  FreeTy
  Compil

  CINT/R
  Type ?
  Enclos
  root [0]
  Attaching file QA.root as _file0...
  root [1] TBrowser n
  root [2]
```

Preliminary studies for the AliHMPIDQualAssChecker

What is needed:

- Reference histograms

- Compare thre reference histograms with the newly produced ones

-> Testing sensitivity

Simulation of the HMPID response in two different situations:

- Increased gain of the MWPC

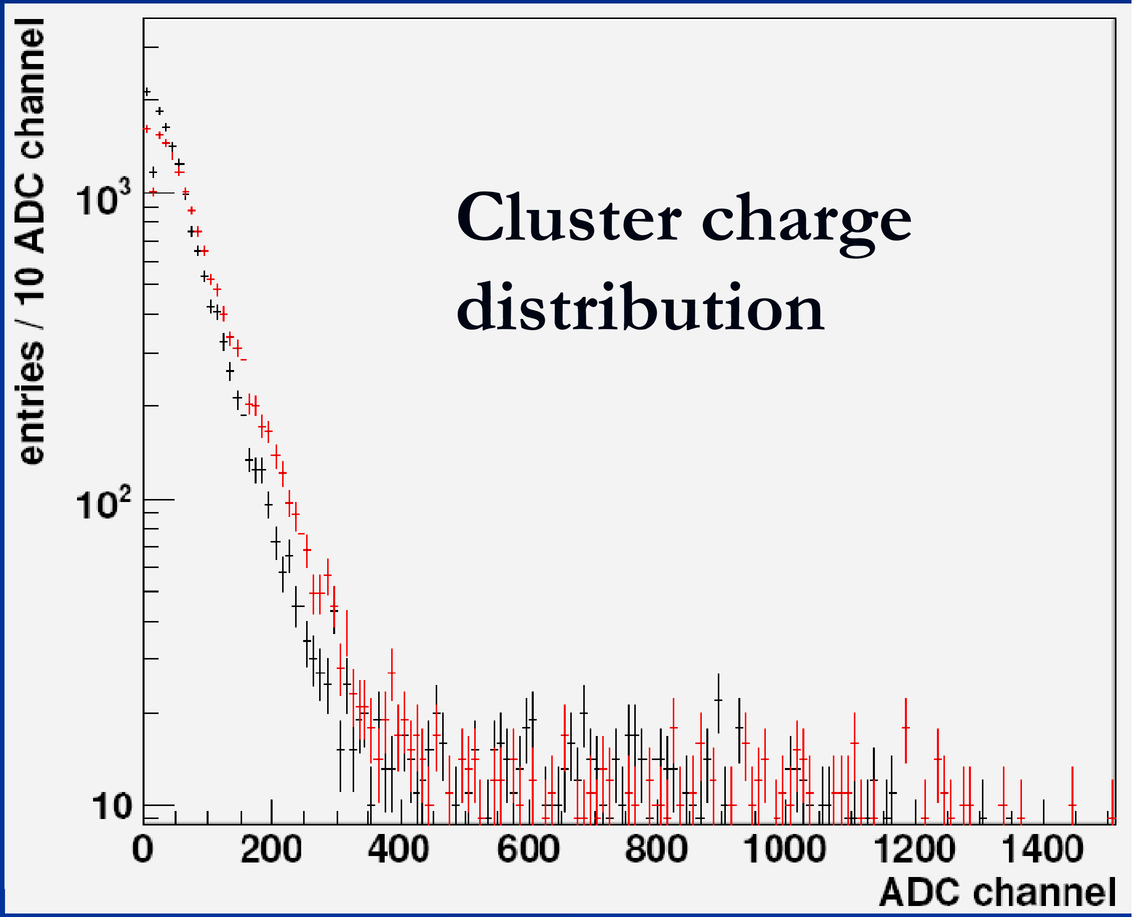
- Normal operation mode

Preliminary studies for the AliHMPIDQualAssChecker

--- Normal

--- Increased gain

Kolmogorov test : 0


Cluster charge distribution

HMPID QA framework status

- Version of the QA framework for the HMPID at the level of the data booking (AliHMPIDQualAssDataMaker) ready

- Studies on how to handle the checks have been done

- Clearer ideas on what to do in the AliHMPIDQualAssChecker

- More details needed about the reference histograms (where to keep them, when to update, etc.)

Remaining tasks

- Geometry as installed, -> new task : Services (in progress)

- Introdution of AliCluster3D, integration to EVE

- New DCS parameter: detector status word