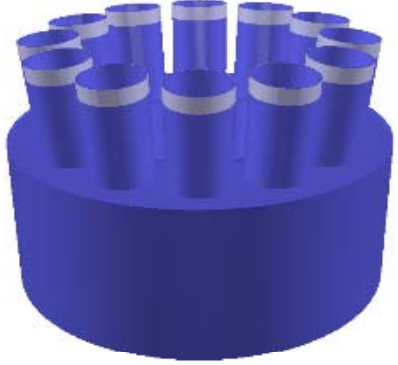
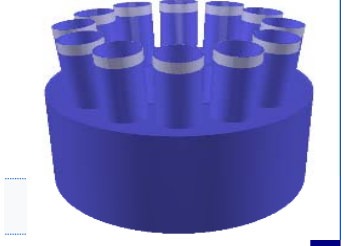


T0 offline status

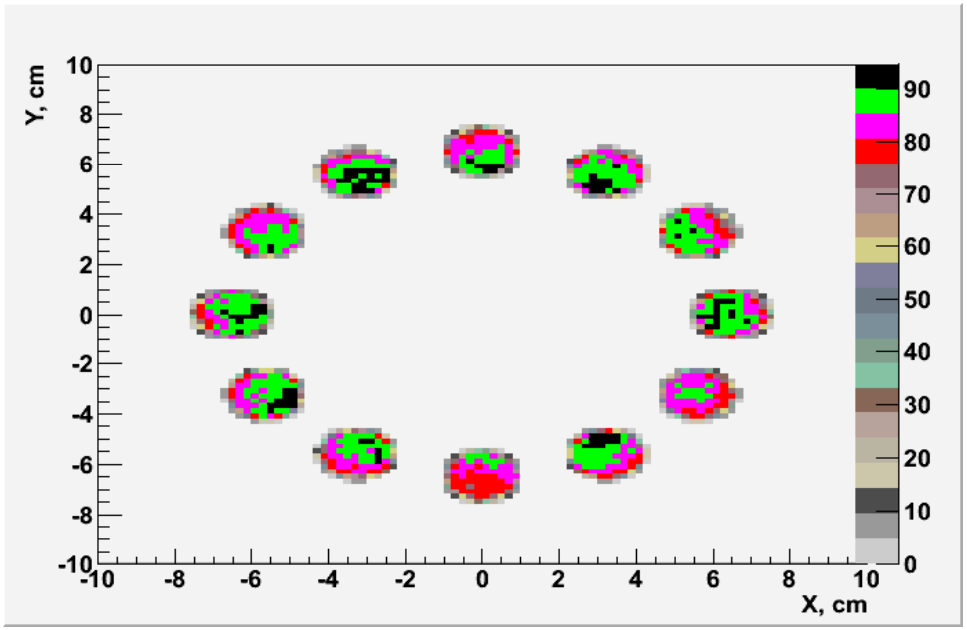
Alla Maevskaya
INR RAS Moscow

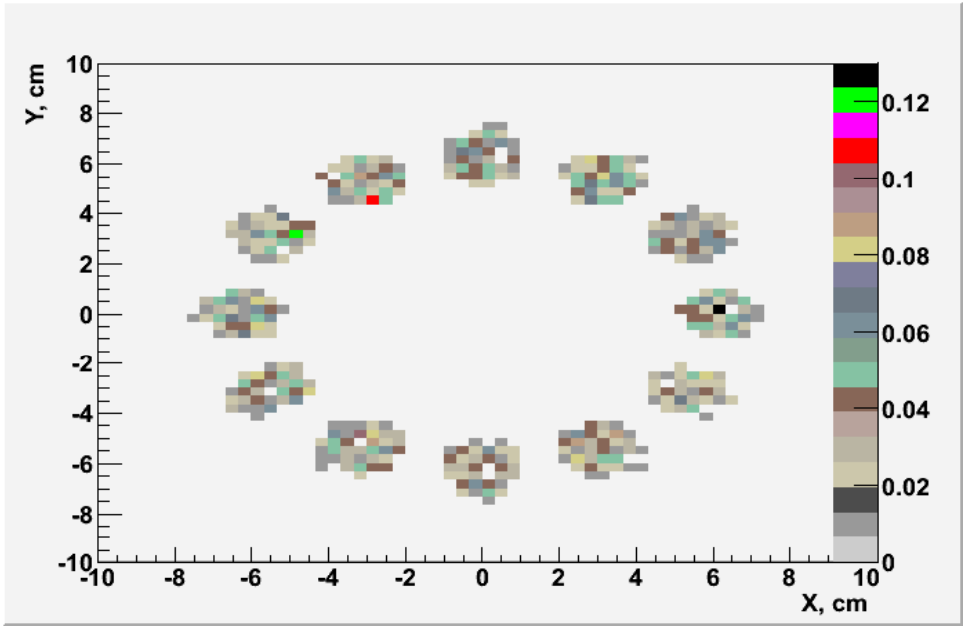
17 March 2009
ALICE offline week



Simulation

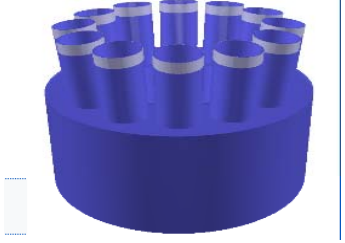
- Full survey alignment
- Cherenkov photons produced in radiator collected in photocathod and converted in photoelectrons, taking into account quantum efficiency.
- These photoelectrons were written into the Hits tree
- Charged particles hit radiator was collected in TrackReference tree





XY distribution for 1 HIJING mbias event

phooelectrons (Hits) charged particlles (TrackReference)



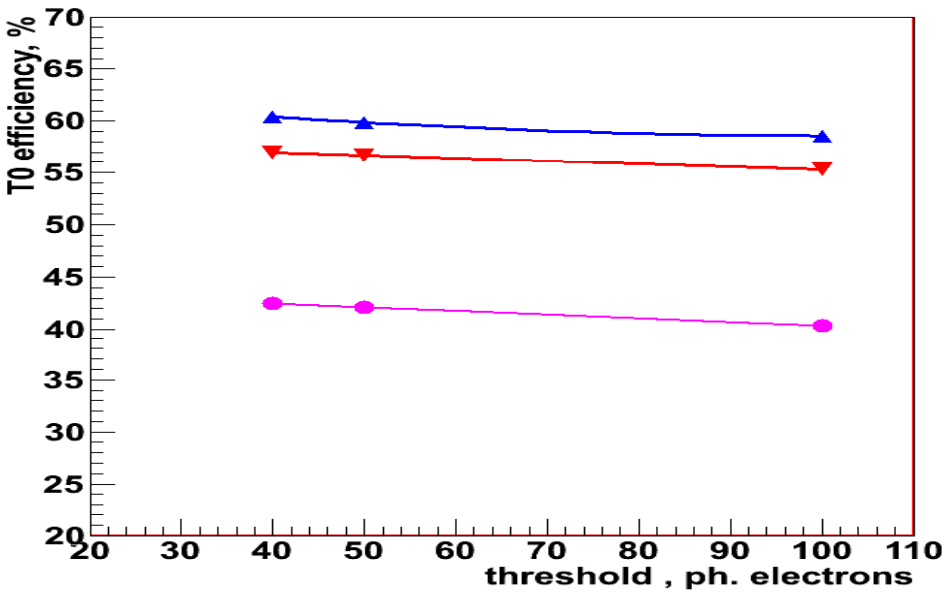
T0 efficiency with additional material before T0 @A-side

AliRoot v4-16-03
PYTHIA 14TeV

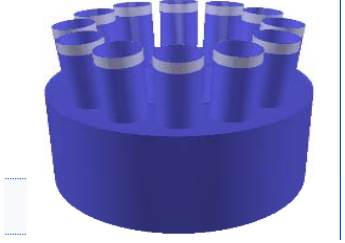
```
gener->SetOrigin(0, 0, 0);      // vertex position
gener->SetSigma(0, 0, 5.3);     // Sigma in (X,Y,Z) (cm) on IP position
```

OR-A	**56.7%**
OR-C	**59.8 %**
A&C	**42.08%**

For threshold 50 PhE



How T0 efficiency depend on threshold



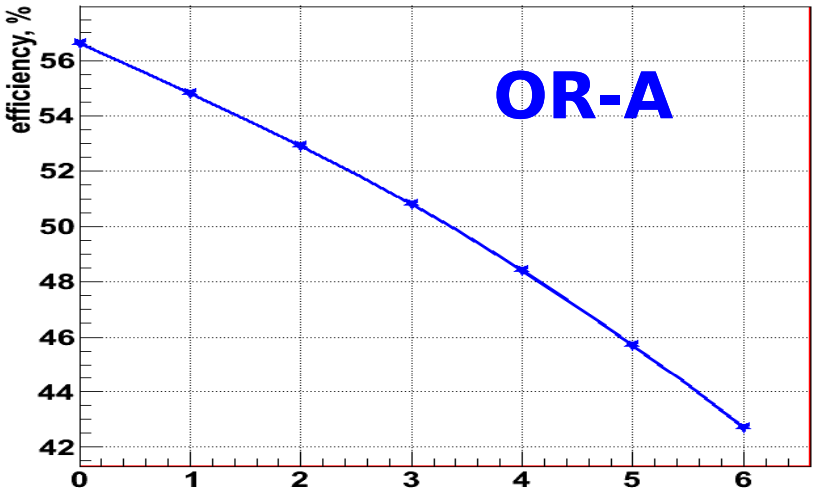
T0 efficiency with additional material before T0 @A-side with different vertex position

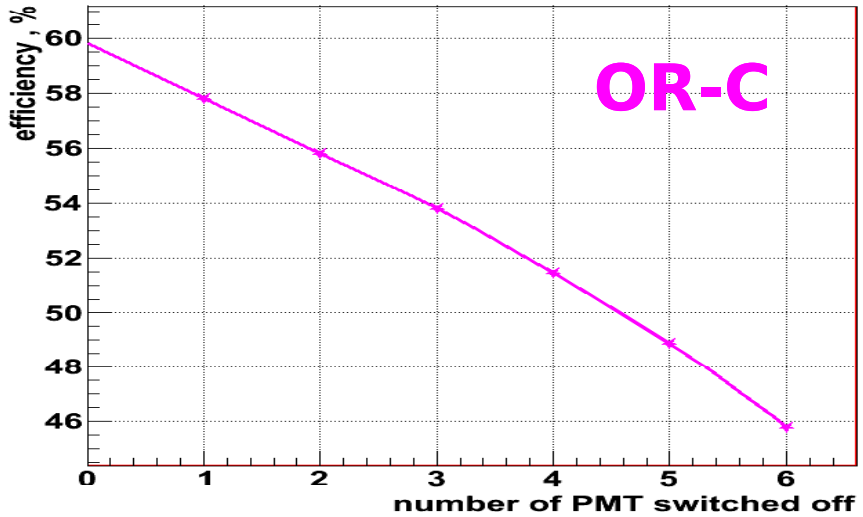
AliRoot v4-16-03
PYTHIA 14TeV

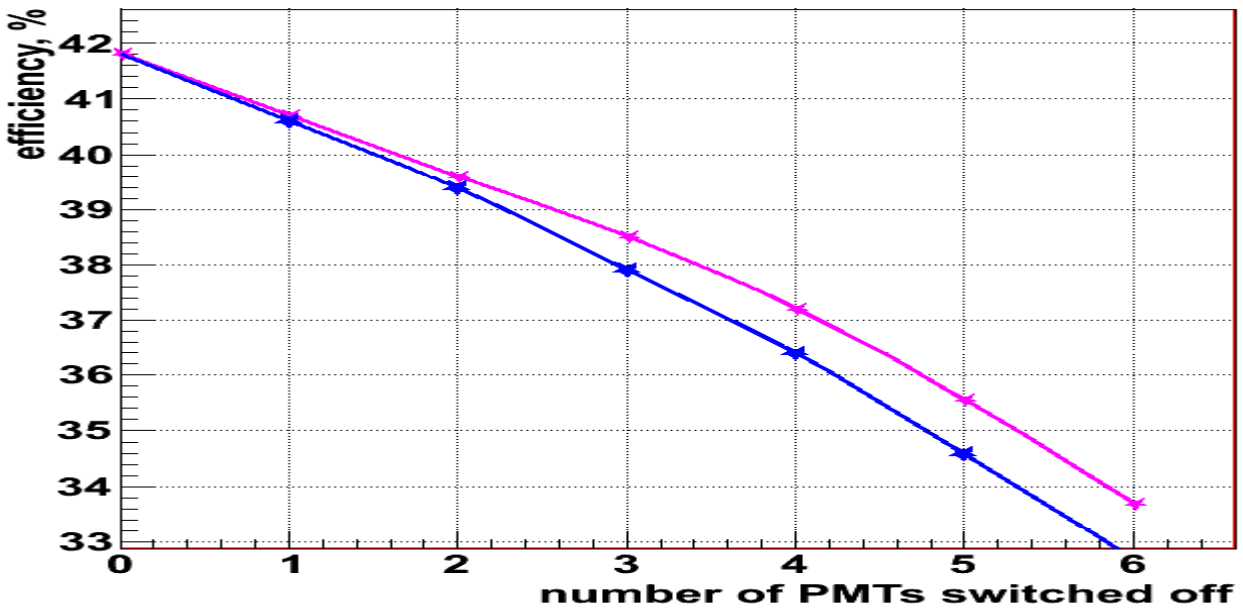
```
// vertex position
gener-> SetOrigin (0, 0, 0) || (0, 0, 10) || (0, 0, -10) || (0, 0, 20) || (0, 0, -20)
gener->SetSigma(0, 0, 0);   // Sigma in (X,Y,Z) (cm) on IP position
```

Vertex,cm	0	-10	10	-20	20
OR-A	55.9	55.92	55.97	57.2	54.5
OR-C	58.6	58.78	60.2	57.0	59.8
T0 A&C	41.5	41.63	41.36	40.01	40.23

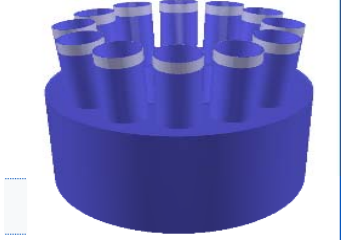
T0 efficiency dependence on number of “switched off” PMTs







A & C



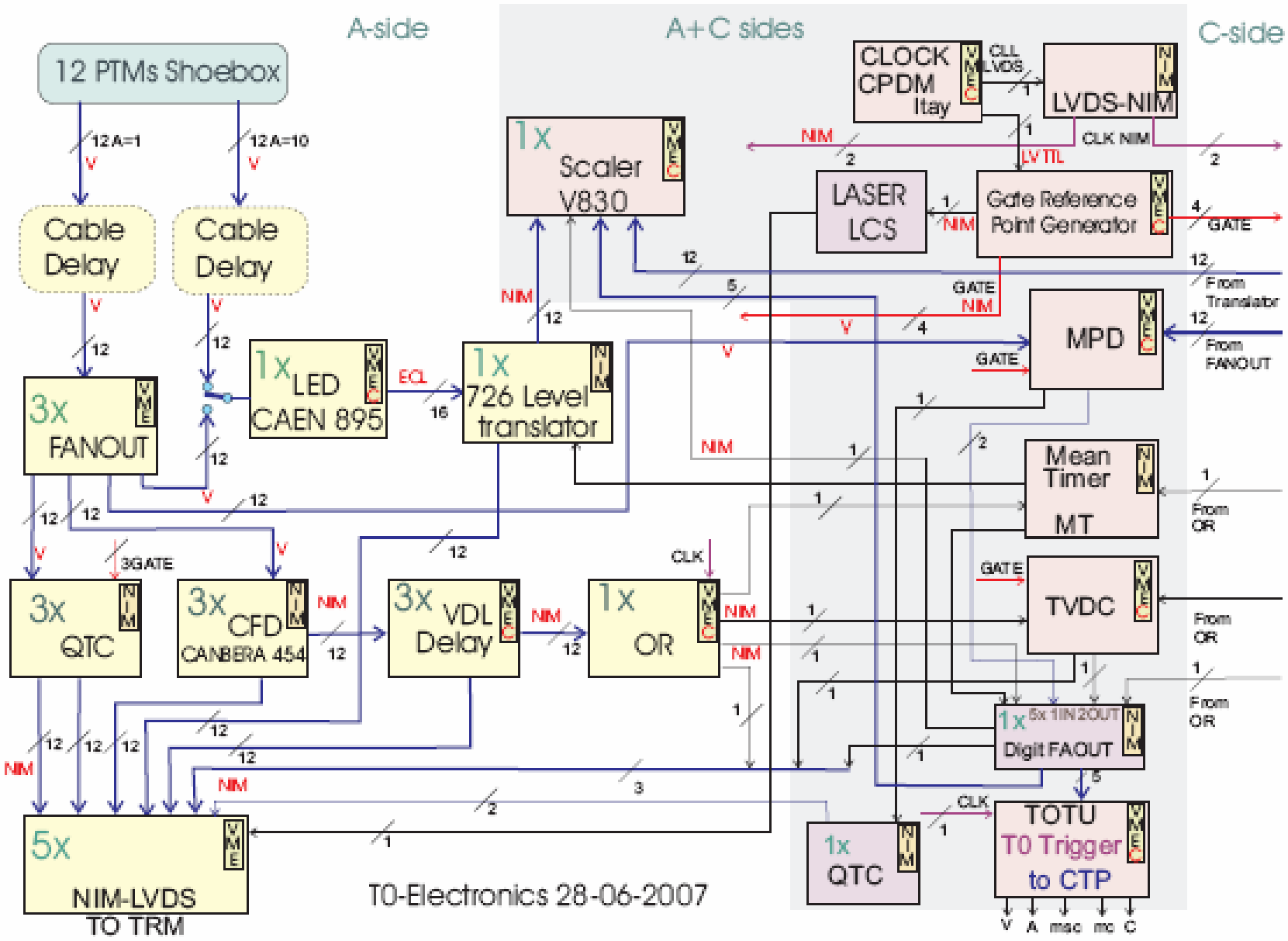
Trigger

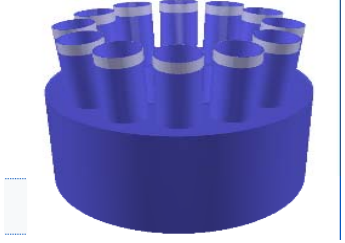
Trigger type	Parameters (from DCS)
OR-A	PMTs included in OR (24 0 or 1) Thresholds on each PMT 24 UInt
OR-C	
T0 vertex	Time window (cm)
T0 central	Amplitude thresholds for central and semi-central events
T0 semi-central	

This information is produced by special electronics blocks. Signals is sent to CTP as L0 input directly and also written to raw data :

can be simulated

T0-Electronics





Implementation

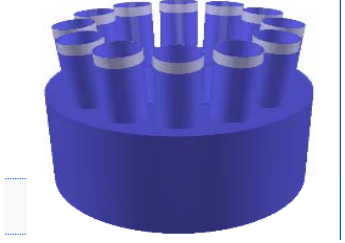
All 5 T0 trigger signals are written in raw data not as 0 or 1 but as a number.

In simulation:
according to Hits information detector Digits are produced with 5 trigger signals

Now class AliT0Trigger gets Digits from treeD and produces CTP input

We need 5 UInt to store value of trigger signals in AliESDs to be sure that online trigger works as it should

Class AliT0TriggerParameters implemented but not used yet



RAW QA

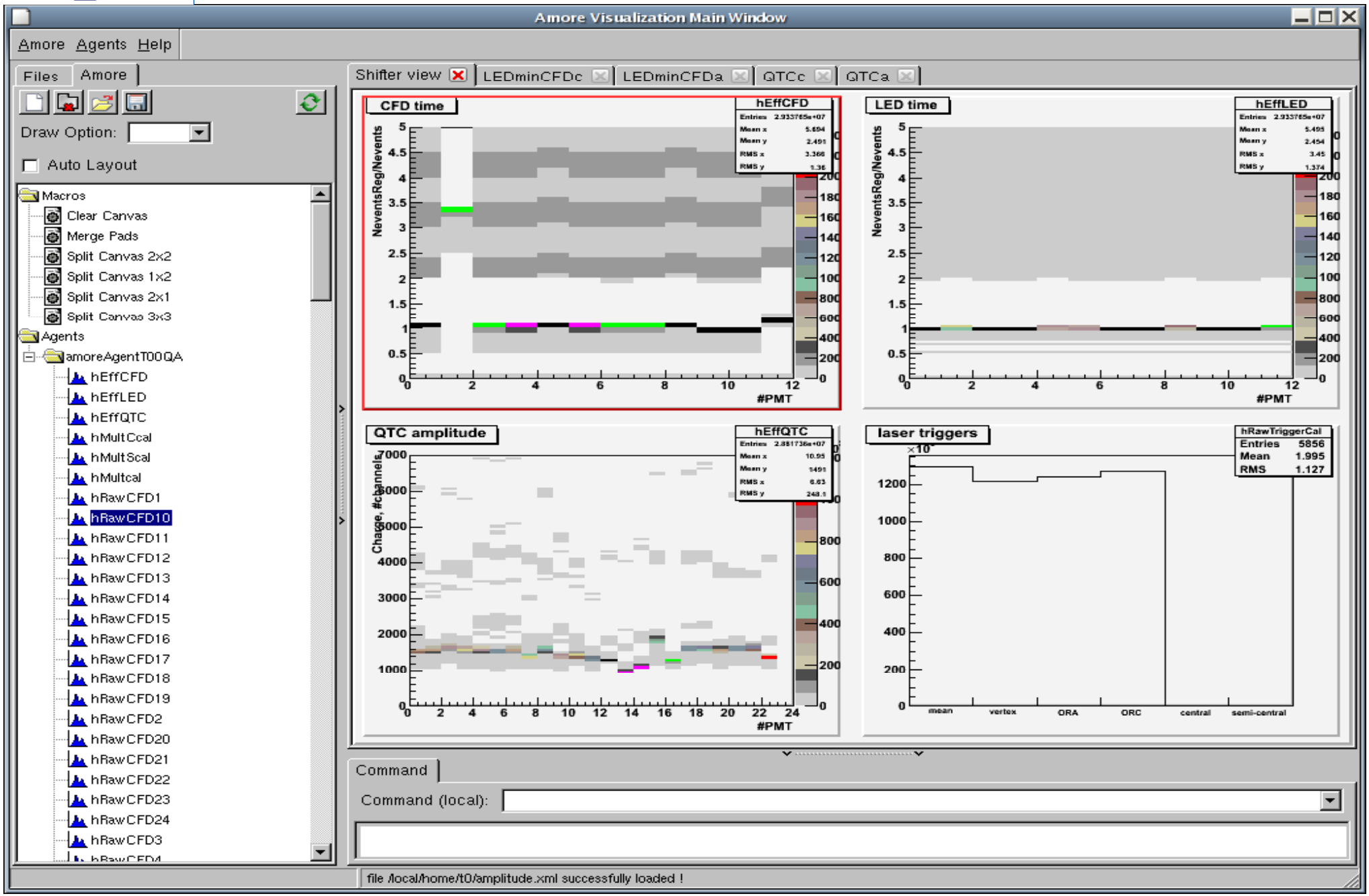
All monitoring during electronics tests done by AMORE : histograms described in AliT0QAMakerRec are shown.

During data taking laser calibration with given amplitude will take place in big gaps between bunches to check electronics condition
AliT0QAMakerRec::MakeRAW collects 2 sets of histograms:
for event type PHYSICS (only for monitoring)
for event type CALIBRATION (for QA)

Reference distribution :

Mean and RMS of reference histograms (their shape is not Gaussian) should be compared with the monitoring values. These histograms will be different for low multiplicity, high multiplicity and calibration.

AMORE - RAW QA


Amore Visualization Main Window
Amore Agents Help
Files Amore
Draw Option:
Auto Layout
Macros
Clear Canvas
Merge Pads
Split Canvas 2x2
Split Canvas 1x2
Split Canvas 2x1
Split Canvas 3x3
Agents
amoreAgentT00QA
hEffCFD
hEffLED
hEffQTC
hMultCcal
hMultScal
hMultcal
hRawCFD1
hRawCFD10
hRawCFD11
hRawCFD12
hRawCFD13
hRawCFD14
hRawCFD15
hRawCFD16
hRawCFD17
hRawCFD18
hRawCFD19
hRawCFD2
hRawCFD20
hRawCFD21
hRawCFD22
hRawCFD23
hRawCFD24
hRawCFD3
Shifter view
LEDminCFDc
LEDminCFDa
QTCc
QTCa
CFD time
hEffCFD
NeventsReg/Nevents
#PMT
LED time
hEffLED
NeventsReg/Nevents
#PMT
QTC amplitude
hEffQTC
Charge, #channels
#PMT
laser triggers
hRawTriggerCal
Entries 5856
Mean 1.995
RMS 1.127
mean
vertex
ORA
ORC
central
semi-central
Command
Command (local):
file /local/home/t0/amplitude.xml successfully loaded !

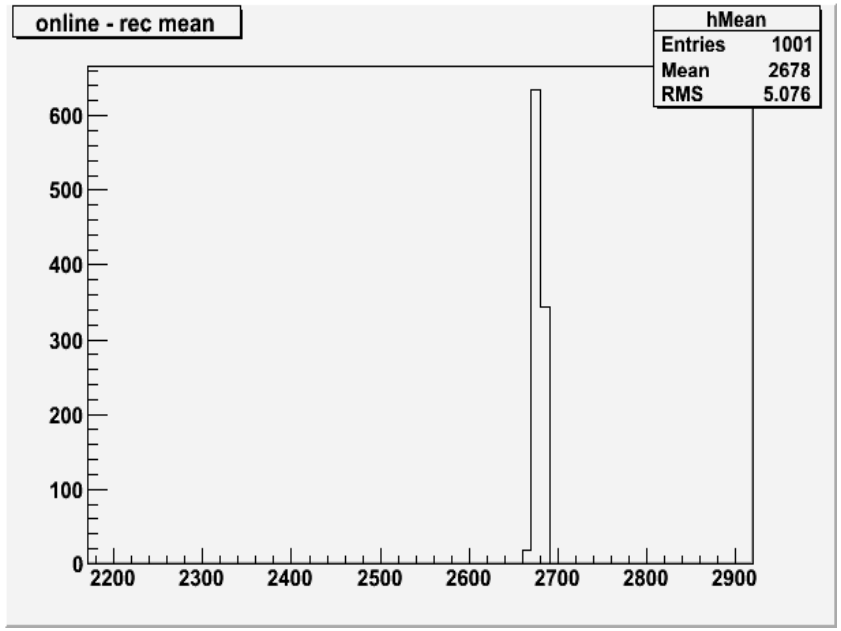
QA RecPoints

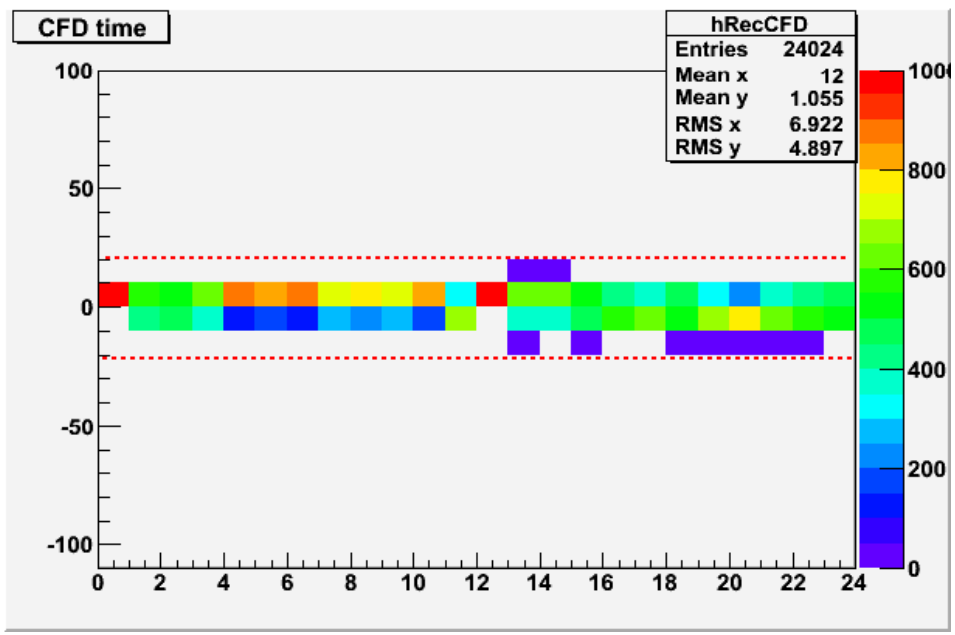
RecPoints QA checks (do not need reference distribution)

. **difference between online (apparatus) and offline mean time after calibration should be stable.**

. **difference between reconstructed time on the PMT1 and all others on each side : mean should be 0**

. **for low multiplicity only: check that amplitude measured by 2 methods (QTC and LED-CFD) has the same value**





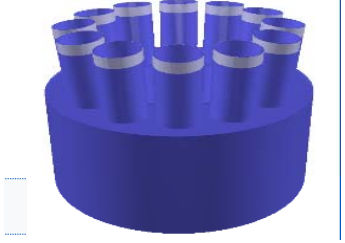
Shifter histograms

QA ESD

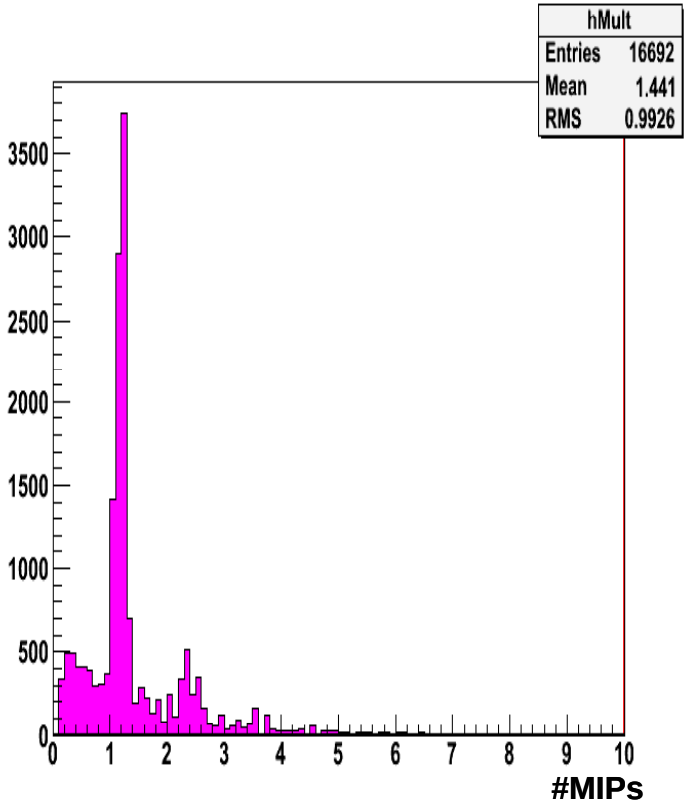
T0 QA checker for ESD

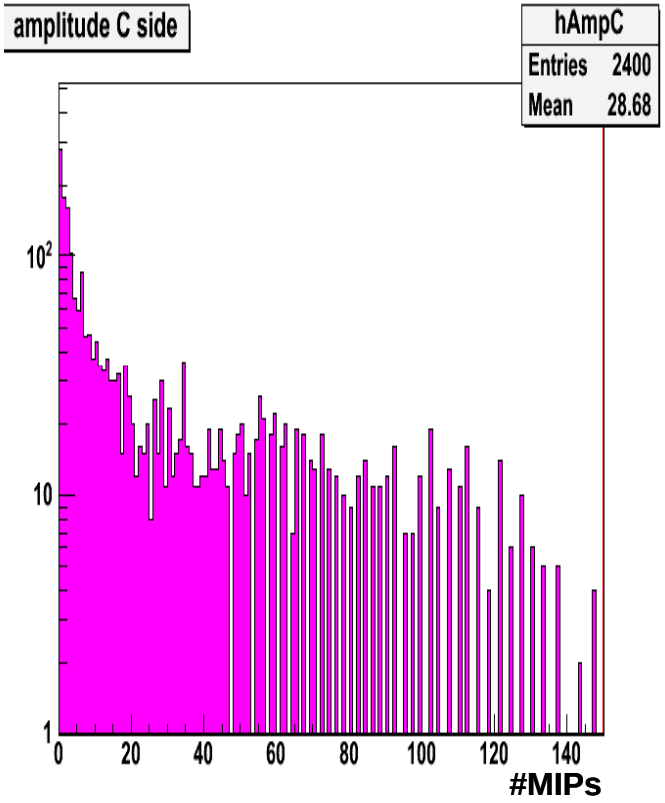
- **Difference between T0 and ITS vertex**
- **Width of mean and vertex histograms**

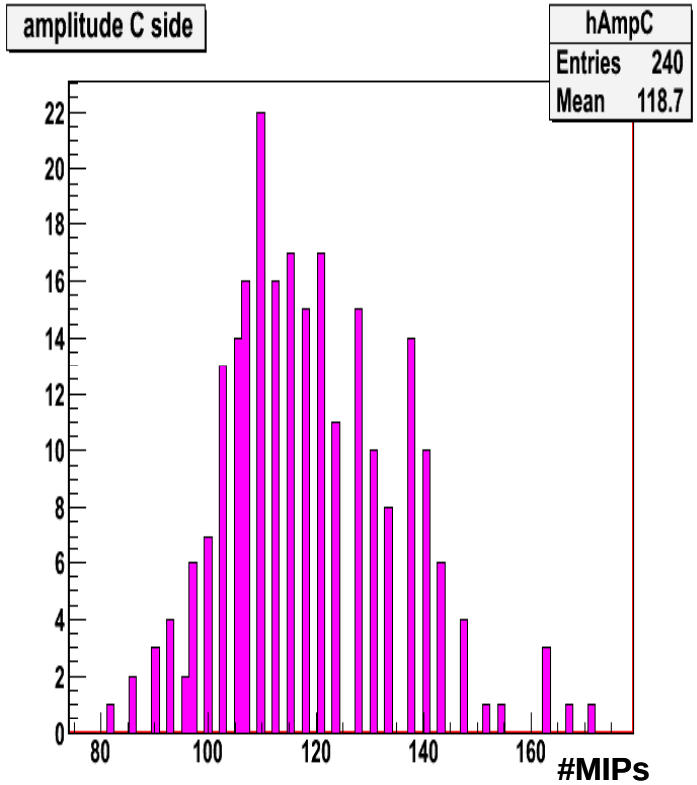
No reference used



T0 multiplicity







pp 14TeV

HIJING central (0-2 fm)

HIJING

mbias (0-15 fm)

RecoParam

T0 Reconstructor using calibration parameters written in OCDB:

- **Time shift between channels collected during data taking by DA;**
- **Time amplitude correction and amplitude units graphs produced before PHYSICs run (for sure when run conditions will be changed) during special LASER run**

What can be implement in RecoParam?

- **for calibration events – do not do reconstruction**
- **for High Multiplicity case only QTC amplitude used for time-amplitude correction**

Timeline

Trigger simulation with configurable parameters:
25 April

Reference distribution for RAW
after side A re-mount

RecoParam
10 April