T0 offline status

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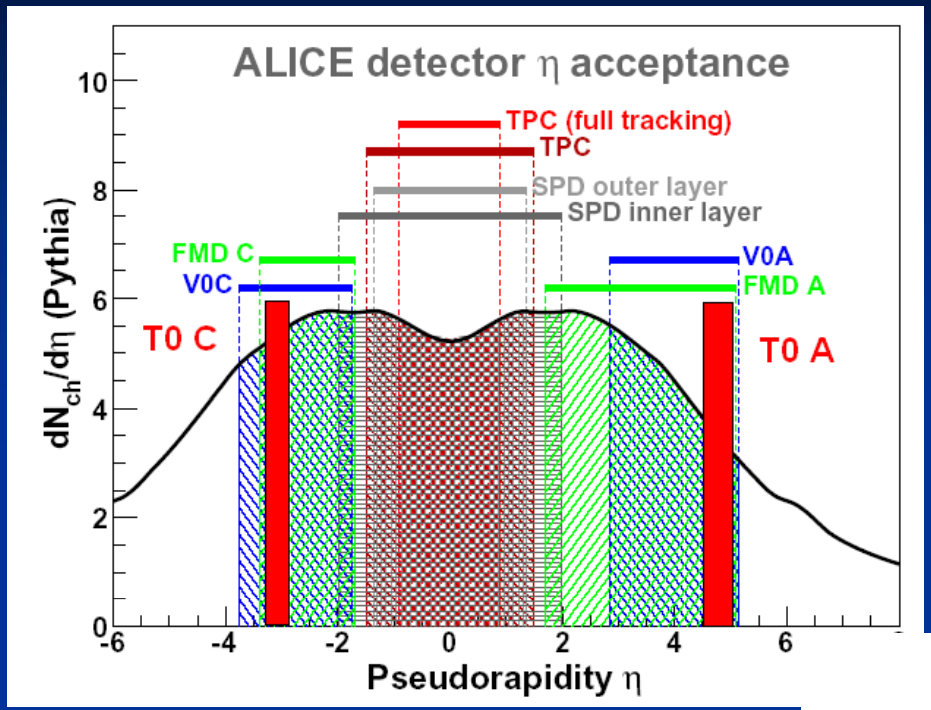
8 April 2008

ALICE offline week

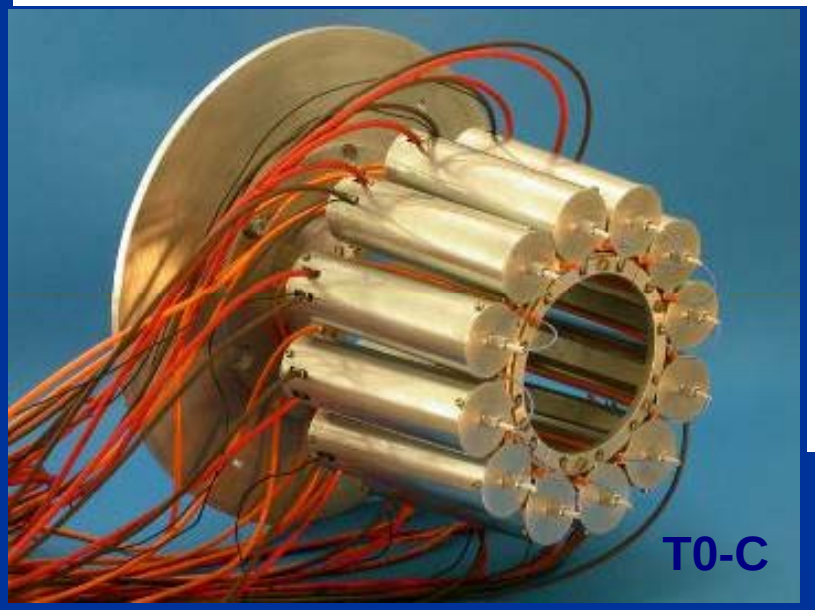
Outline

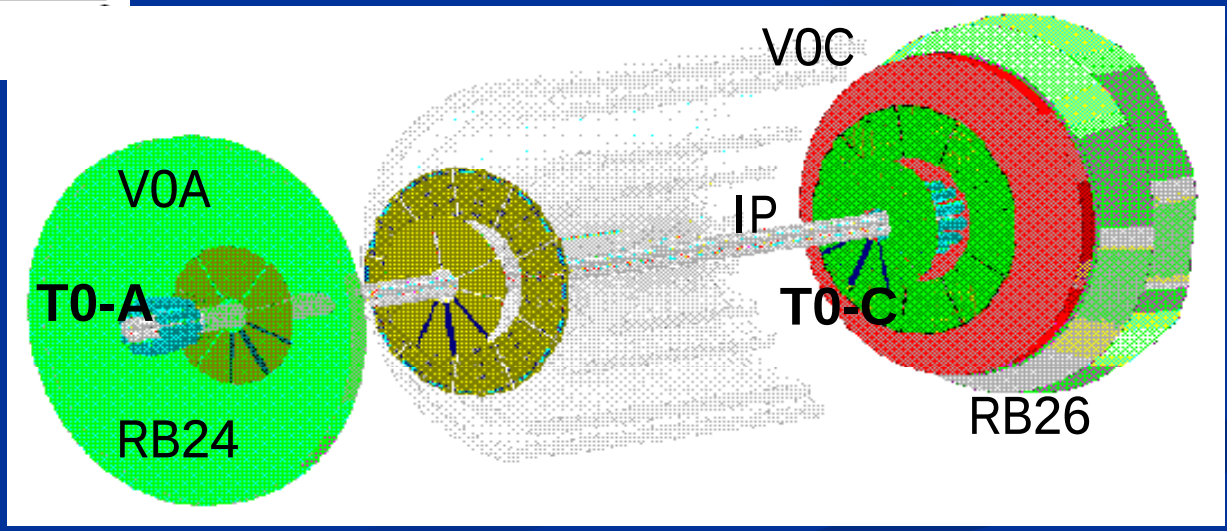
- **T0 commissioning status**
- **test February/March 2008**
- **calibration & reconstruction of runs collected during test**
- **QA**
- **Plans**

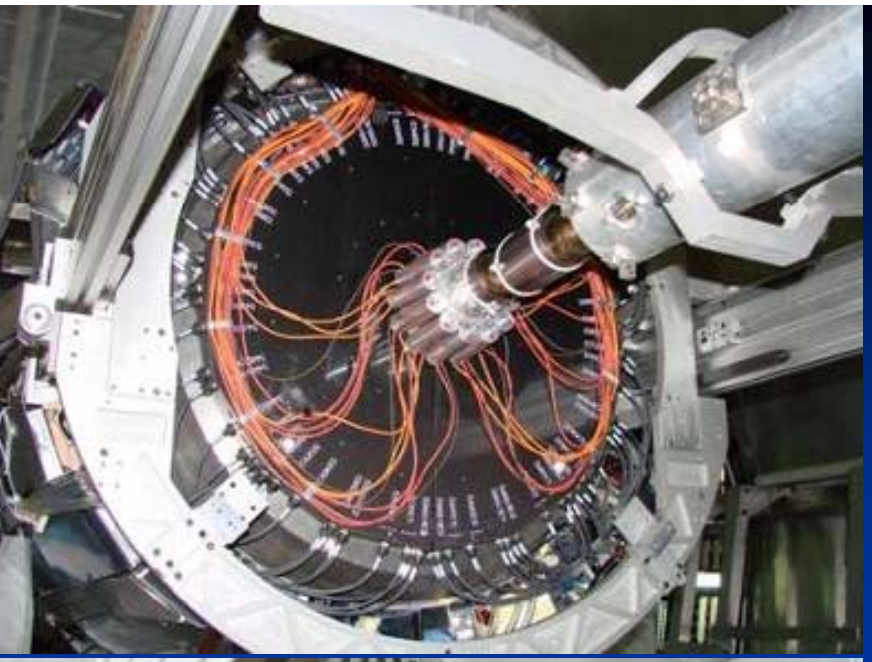
T0 detector



	T0	
	T0-A	T0-C
z-position(cm)	-350	+70
h - coverage	4.5 to 5.0	-2.9 to -3.3
# of channels	12	12
Active area(cm^2)	84.78	84.78
Time resolution	37ps	37ps







T0-C

- ← <u>Installed (April 2007)</u>
- Tested with laser without magnetic field (December 2007)
- Tested with L3 powered on 0.5 T (February 2008)
- All hardware Installed (November 2007)

T0-A

- **Installed (February 2008)**
- **Tested with laser with and without magnetic field (February 2008)**
- **All hardware Installed (January 2008)**

Configuration of Hardware during the February 2008 Run

- T0-C & T0-A detector (24 modules)
  - Fast electronics (final version, apart from G&P generator module)
  - Readout electronics (final version)
  - Trigger electronics (final version)
  - HV / LV (final version)
  - LV (for readout crate)
  - Laser system (final version)

DCS/ECS/Trigger

- **T0 detector integrated in ALICE DCS/ECS/Trigger**
- **Global and standalone modes were used**
- **All trigger modes *(toggle, signature, normal, random)* were tested at P2 with CTP**
- **During global run not used as trigger detector (from laser)**

Test Februrary/March 08

No data in GLOBAL runs

A lot of STANDALONE laser runs
Calibration data was collected by DA and written in OCBD by Preprocessor.
RAW and OCDB data registered in Alien

MOOD monitoring

DA, Preprocessor

- Two DAs:

T0Physda.cxx – equalizing channels

T0Laserda.cxx – walk correction

- Both set and configured on the monitoring machine
- Takes an input parameters file from DAQDB (going to be changed before next cosmic run)
- Sends an output file to the FXS with the corresponding file id.

DA, Preprocessor

- AliT0PreprocessorCosmic
- Has been set up and was working together with DAs.
- Modified to work only with Laser Calibration System (also in global run)
- Processes data from DAs and stores results in OCDB.
- DCS part still missing, to be done before next cosmic run.

see more in Michal presentation on Friday

Calibration : equalizing channels

T0Physda.cxx during Data Taking (Global Run).

DA collected histograms with CFDtime1 – CFD time on each side

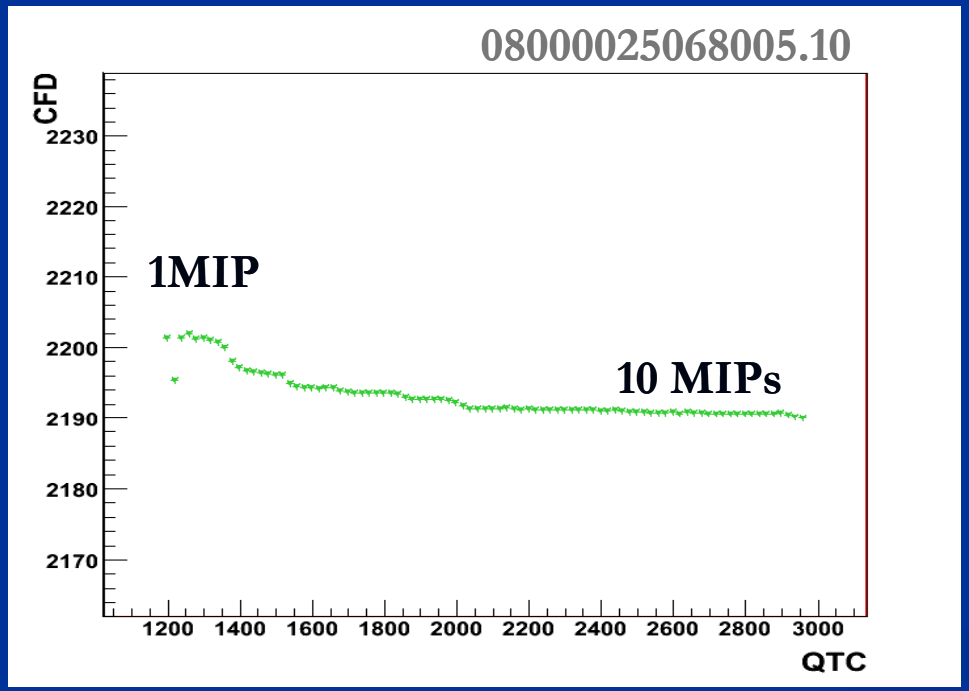
Currently, the preprocessor gets the mean of these histograms and writes it into OCDB to be used in reconstruction as the value of shift between channels for equalizing.

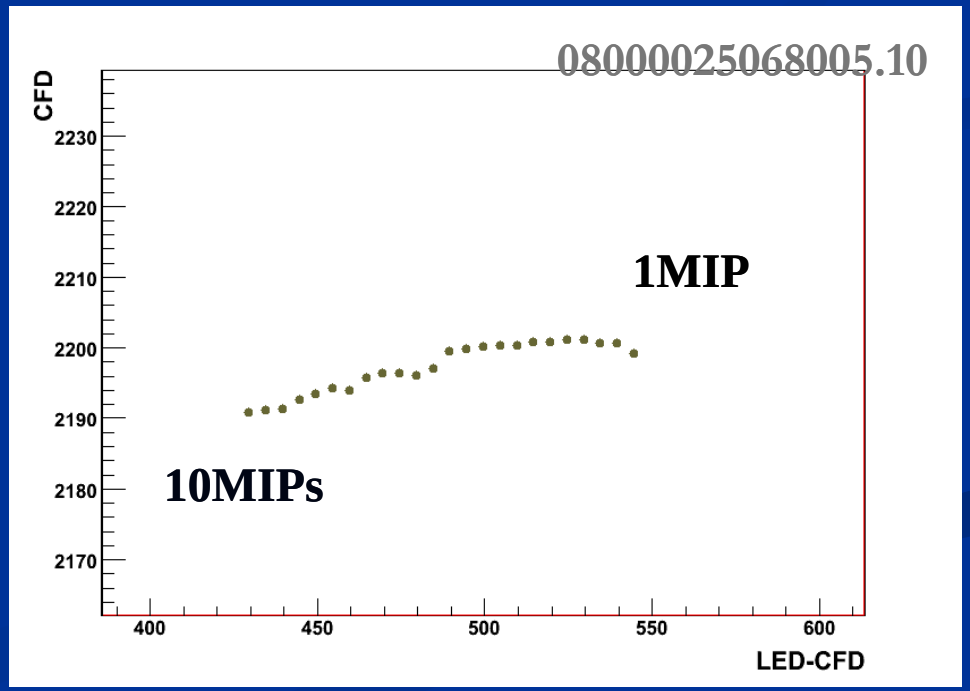
The preprocessor should fit histograms and write in the OCDB the mean, sigma and number of entries. But, because of not fully tuned electronics, the fitting method used previously (with TSpectrum) was not fully functional. Some of these problems are already solved, others (we hope) will be solved before the Cosmic Run May08.

Calibration: amplitude-time correction

T0Laserda.cxx during Laser Calibration Runs.

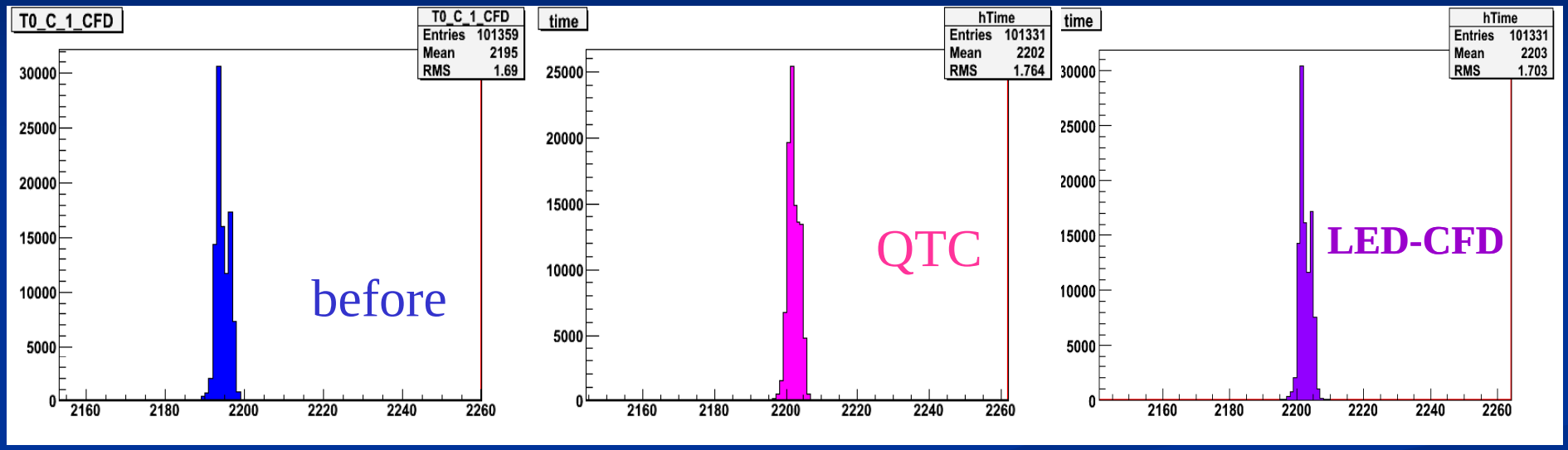
We can measure the amplitude in 2 ways:
QTC (charge-time converter) and as the difference of time measurements by Constant Fraction Discriminator and Leading Edge Discriminator (LED-CFD)

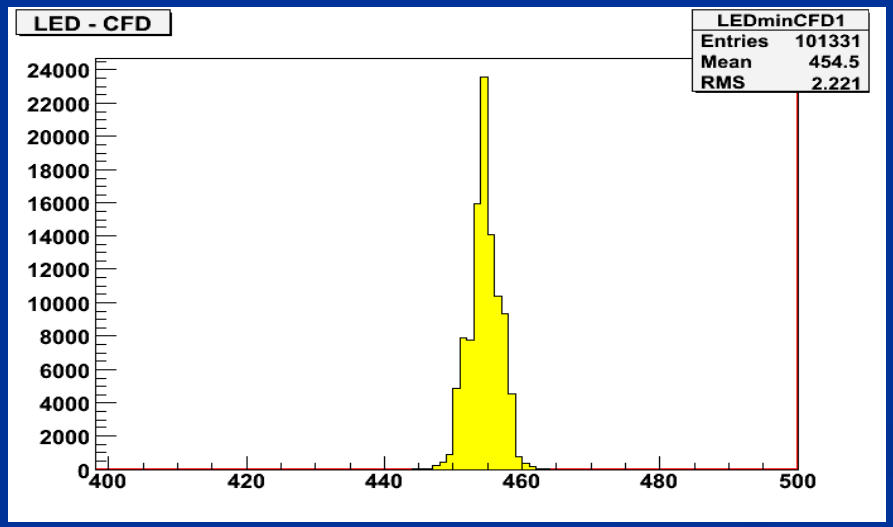


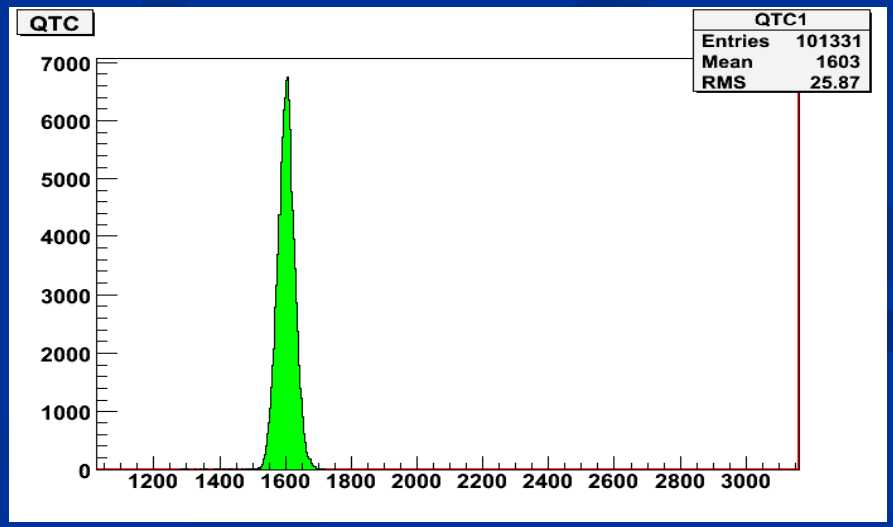


Calibration: results for mono-MIP(3mips) run

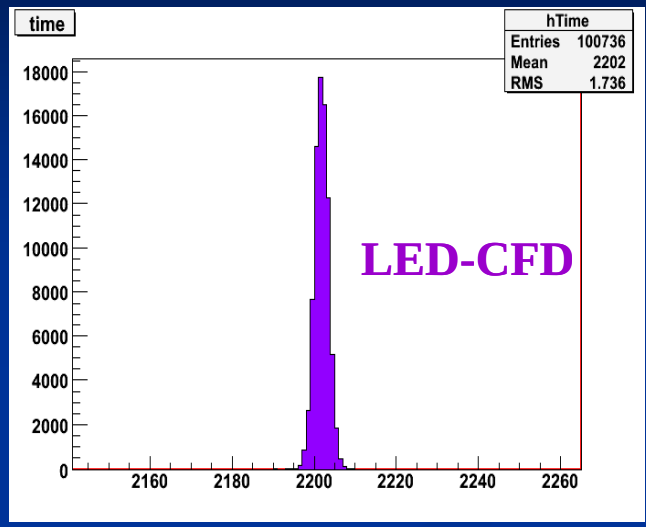
08000025081005.10







Calibration results for multi-MIPs (1-10 MIPs) run



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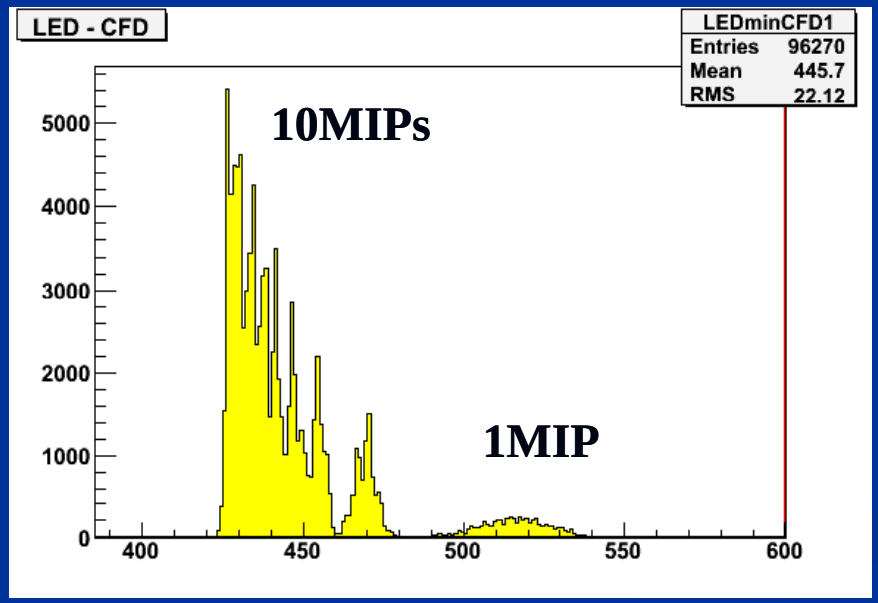
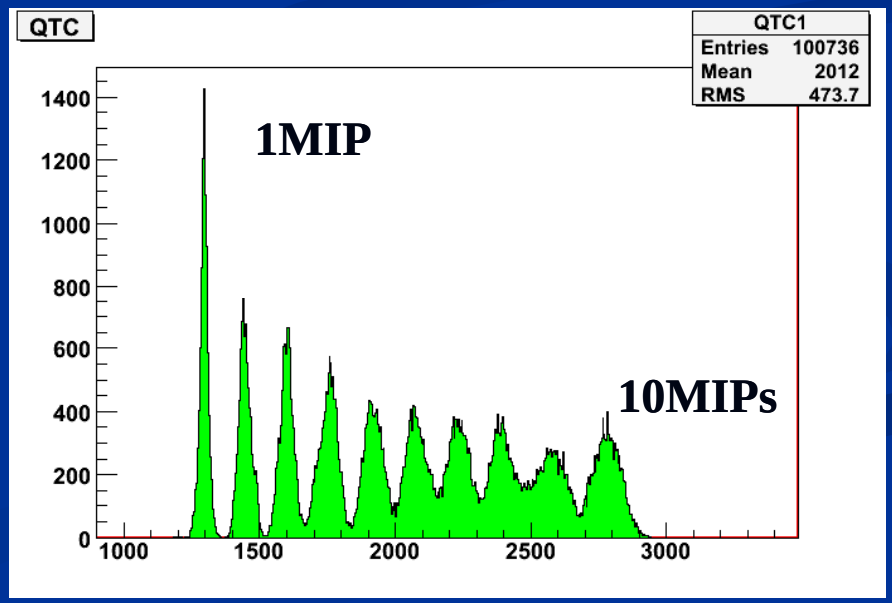




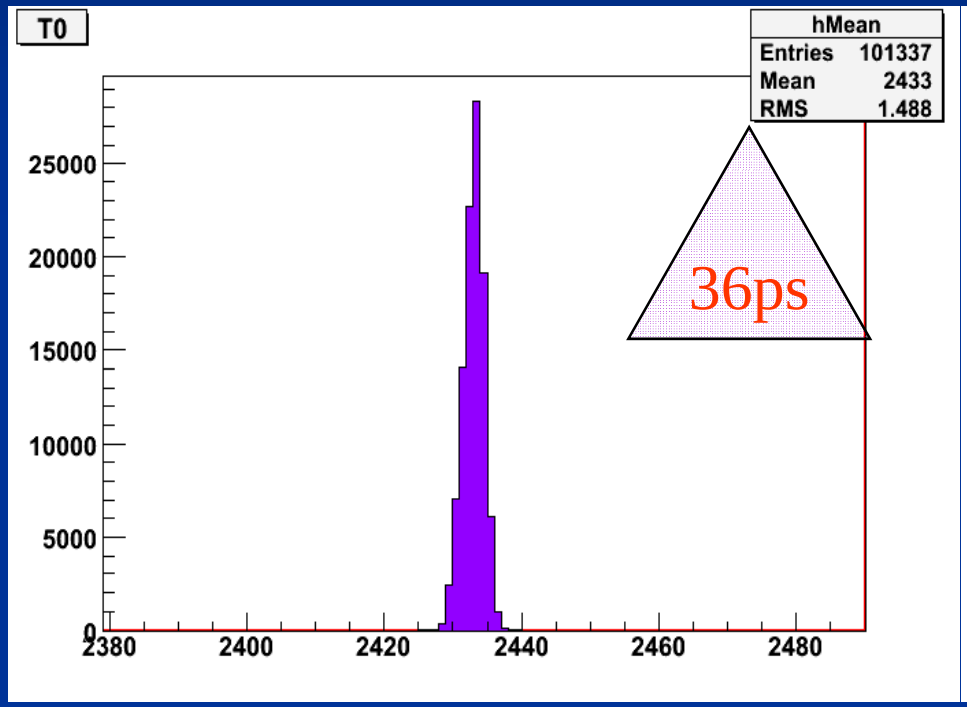
Reconstruction

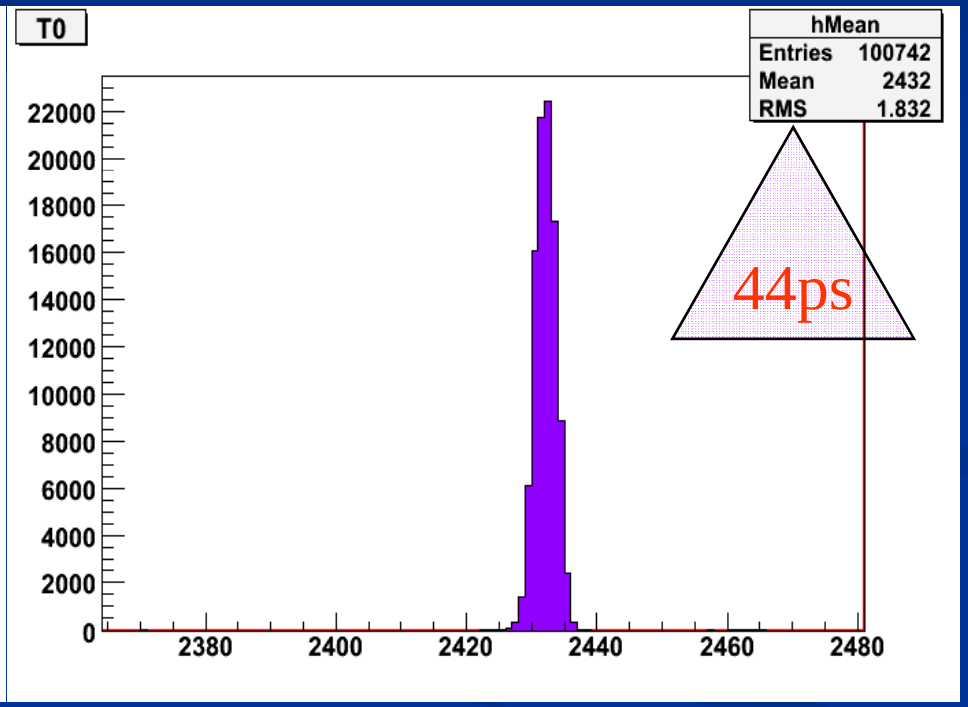
Choose 1st on the A and C side
Calculate T0 = (TA+TC)/2
vertex = (TA-TC)/2+(fdZonA-fdZonA)
AliT0Reconstructor & AliT0Calibrator have 2 options : pdc and cosmic

ESD

- **24 Time (UInt)**
- **24 Amplitude (Float) will be in "MIPs" unit**
- **T0 (UInt)**
- **Vertex (Float)**

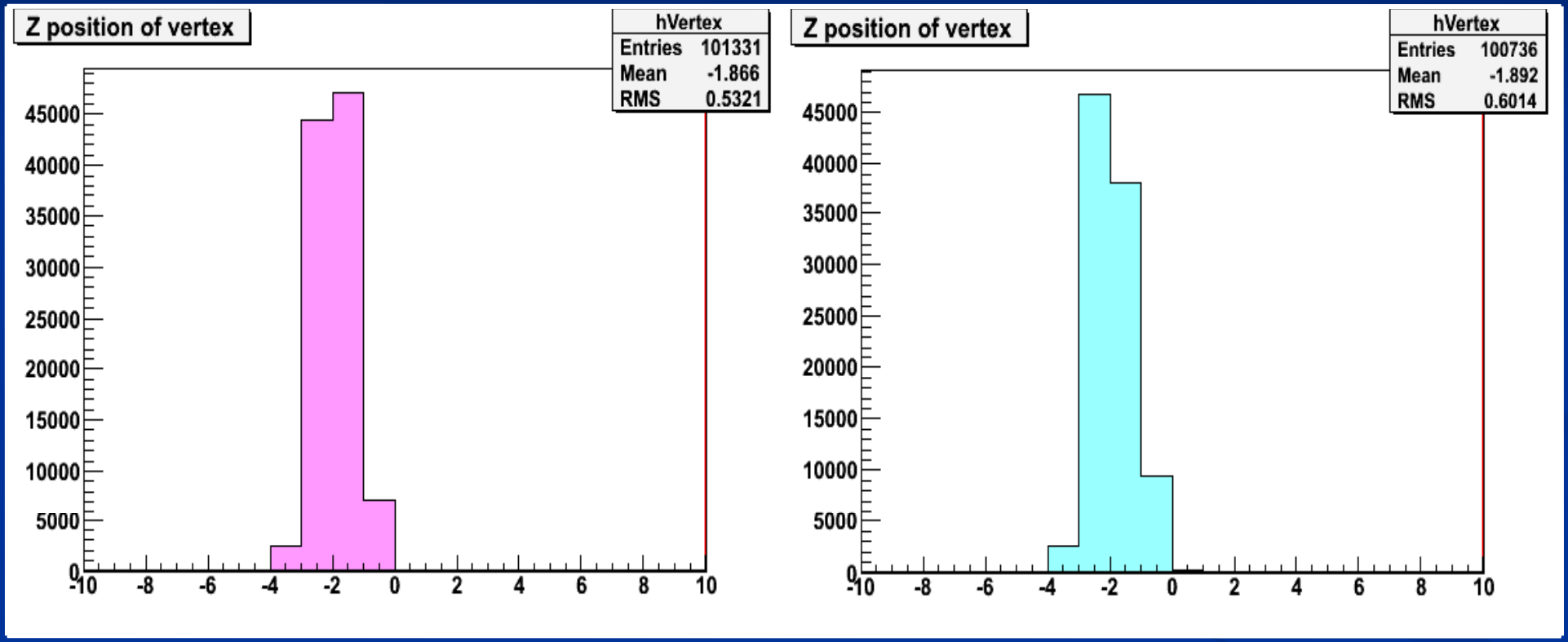
Reconstruction: mean time(T0)





mono-MIP **multi-MIPs**

Reconstruction vertex



mono-MIP

multi-MIPs

T0 Alignment

Survey data into alignment object

- **Alignment class (AliT0Align):**
  - **T0-C alignment based on survey data**
    - **Read data from survey (GRID)**
    - **Calculate x,y,z for T0**
    - **Create AliAlignObj**
    - **Store AliAlignObj to OCDB**
  - **T0-A to be surveyed at the end of April 2008**
    - **storing fake survey data**
    - **storing real survey data as soon as available**

T0 Alignment cont.

Clearance around alignable volumes

- **Removing all T0 overlaps (precision 0.01 [cm])**
- **Correcting macro MakeT0FullMisAlignment to properly store misaligned objects**
- **Shifts in T0 geometry**
  - **max shift in cm w.r.t. Global RS:**
    - **sigmatr = 0.05**
  - **max rot in degrees w.r.t. Global RS:**
    - **sigmarot = 0.3**
- **For T0 alignable volumes (24 PMTs, 12 on A- and 12 on C-side) with no overlaps in the ideal geometry, there are no newly created overlaps by misaligning the volumes**

QA RAW

QA RAW based on AMORE under construction:
AliT0QArec full set of needed histograms

During physics run we can take data with calibration trigger with laser data tuned on fixed amplitude.
Time, amplitude and T0 peaks position should be the same as in reference data.
Efficiency of each detector module should be stable.

1st prototype will be ready before Friday

QA RecPoint

- Comparison between online and offline mean and vertex
- Comparison between Time and Amplitude spectra and reference spectra

QA ESD

- Comparison between amplitude measured by 2 methods

To be done - I:

- **Remove overlaps** *before 11 April*
- **Online Amore/QA** *next week*
- **Update list of QA objects for what we really need**
- **Real QA with reference data**

Do be done - II

- **In time-amplitude correction procedure, improve conversion of "time vs amplitude" histogram to calibration TGraph** ***next week***
- **Add to the list of OCDB data table : position of peak for 1,2, 3… MIPs in amplitude spectra (DA & preprocessor type "Laser")** ***next week***

See Michal's presentaion on Friday

- **Write in ESD amplitude in "MIPs " units** ***next week***