V0 Offline Status

Outline

- Geometry
- Alignment
- Calibration
- Triggers

Geometry (1)

Two arrays of BC404 scintillators around beam pipe, each made of 4 rings, 8 sectors, 32 ADC channels

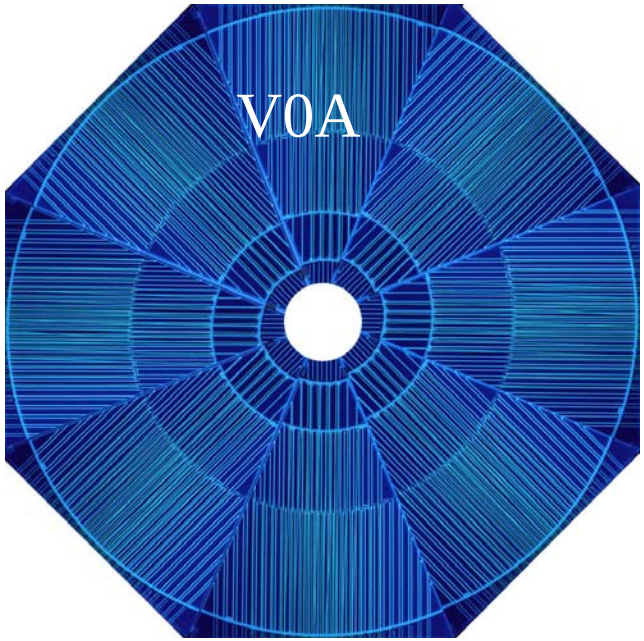
- V0C (Lyon)
  48 cells of scintillator 2 cm thick, 32 PMs
  - 90 cm away from interaction point in front of dimuon absorber

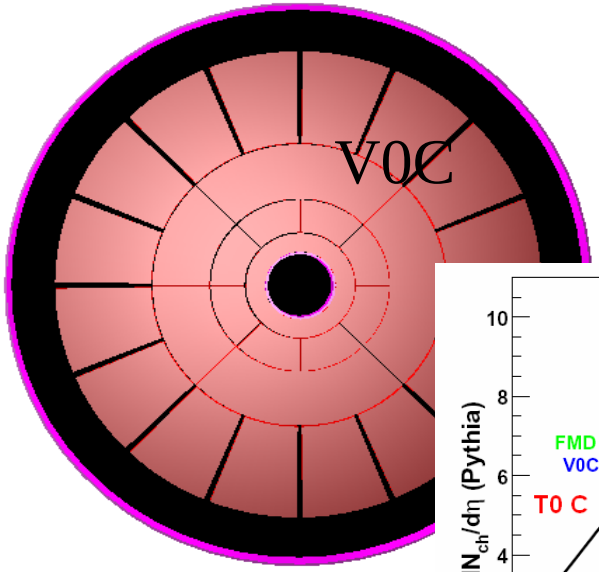
- V0A (Mexico)
  32 cells of scintillator 2.5 cm thick, 32 PMs
  + 340 cm away from interaction point on the other side

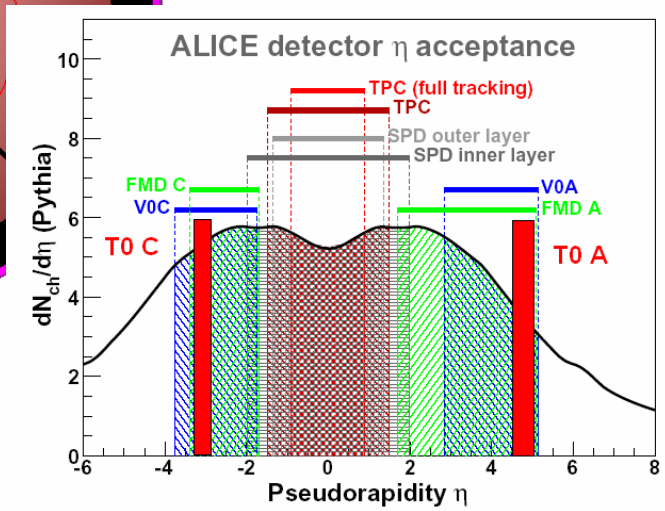
Geometry (2)

Geometry written as TGeometry in AliVZEROv7

AliVZEROv7 has been checked and bugproofed this summer







Alignment (1)

Surveyed and alignable volumes :

- Surveyed volumes : Volume Assembly “V0RI” and Volume Assembly “V0LE” which are the boxes containing V0C and V0A respectively
- Survey precision : mm
- Survey update frequency : once a year before starting beam period
- Source of survey data : optical survey of 12 fiducial positions
- Format of survey data not decided yet and therefore conversion into alignment objects not done

Alignment (2)

Simulation of misalignment effect on V0 efficiency :

using AliRoot HEAD of July 2006, ROOT 5.12/00 and

GEANT3 v1-5 packages

and Pythia 6.214 pp collisions minimum bias for event generation

- No significant loss of efficiency for longitudinal displacement (up to 10 cm)
- No significant loss or gain of efficiency for 1 cm transverse displacements

Calibration

Calibration CDB file has been created and CDB reading implemented.

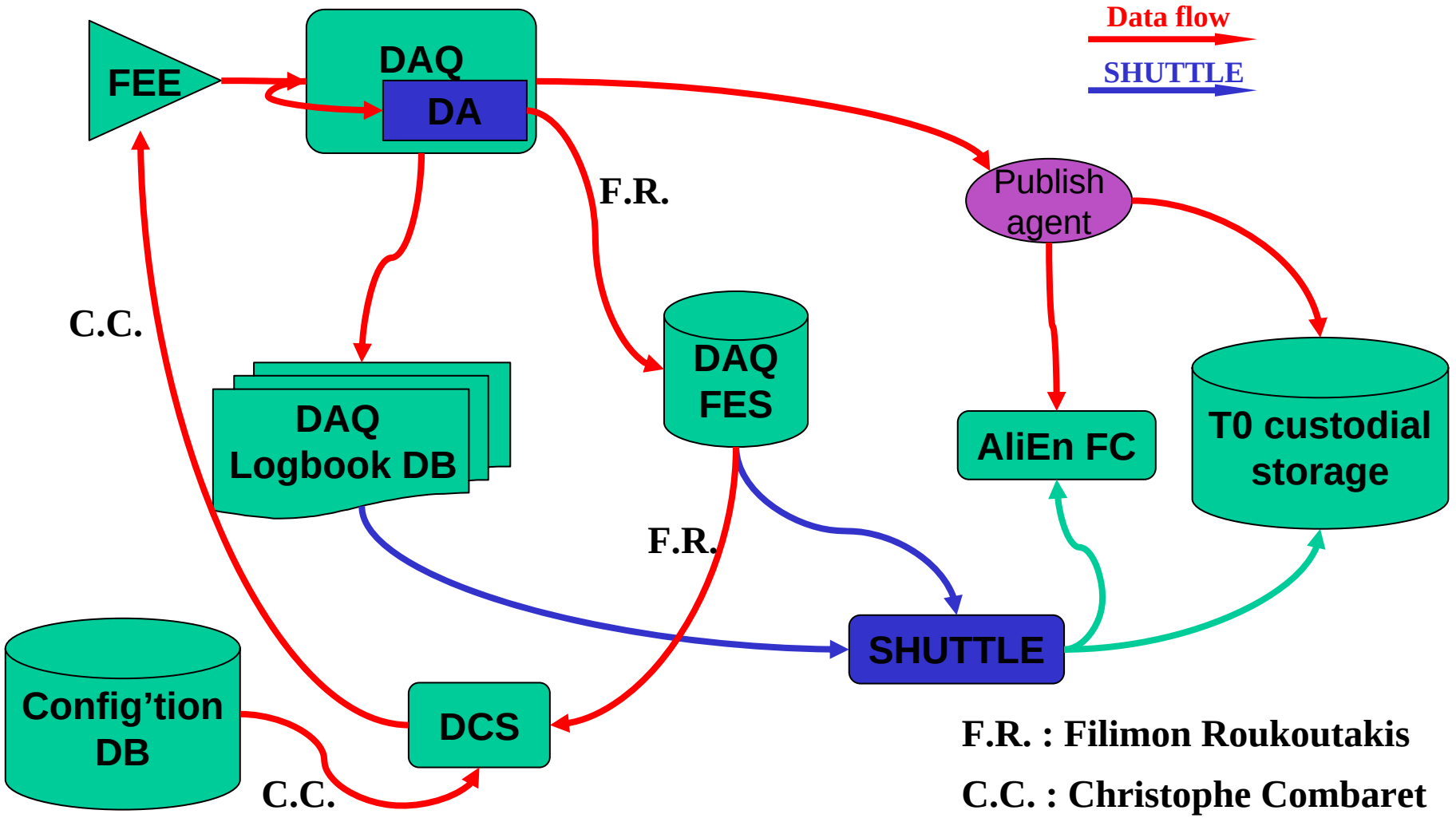
Calibration parameters stored into CDB are :

- 128 gains, 128 pedestal means, 128 pedestal sigmas (2 QDC per channel)
- 64 time gains and 64 time offsets

i.e. 512 floats, 4 kB

All these parameters are accessible through class AliVZEROCalibData

Use case 6


Data flow
SHUTTLE
FEE
DAQ
DA
F.R.
Publish agent
C.C.
DAQ Logbook DB
DAQ FES
AliEn FC
T0 custodial storage
F.R.
SHUTTLE
Config'tion DB
DCS
C.C.
F.R. : Filimon Roukoutakis
C.C. : Christophe Combaret

Calibration procedure

- Calibration parameters are computed online in the DAQ LDC from sampling dedicated data

- Results are made available as ROOT files in the DAQ FES

- DCS accesses the Root file in the DAQ FES, compares the parameter values to reference values stored in the DCS Configuration DB and updates the FEE values if needed.

Trigger (1)

Hardware triggers (Yannick Zoccarato) possibly sent to CTP will be :

- Minimum Bias Trigger
- Beam-Gas from RB24 Trigger
- Beam-Gas from RB26 Trigger
- Central Trigger based on charge selection
- Semi-Central Trigger based on charge selection
- Central Trigger based on time window selection (for p-p collisions only)

Trigger (2)

Software triggers (Claus Jorgensen)

```
void AliVZEROTrigger::CreateInputs()
{
if( fInputs.GetEntriesFast() > 0 ) return;

  fInputs.AddLast( new AliTriggerInput( "VZERO_LEFT", "At least one hit in the left VZERO", 0x01 ) );
  fInputs.AddLast( new AliTriggerInput( "VZERO_RIGHT","At least one hit in the right VZERO", 0x02 ) );
  fInputs.AddLast( new AliTriggerInput( "VZERO_AND",  "At least one hit in the each (left and right) VZERO",
0x04 ) );
  fInputs.AddLast( new AliTriggerInput( "VZERO_OR",   "At least one hit in the one (left one right) VZERO",
0x08 ) );

  fInputs.AddLast( new AliTriggerInput( "VZERO_BEAMGAS", "Beam gas VZERO trigger ", 0x010 ) );
}
```

- VZERO_LEFT, VZERO_RIGHT, VZERO_AND, VZERO_OR are based on charge selection
- VZERO_BEAMGAS is set from the time difference between V0A and V0C

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Online output data for DAQ and monitoring :

An event as seen by the V0 Front End Electronics will be:
- Charges (64).
- Arrival times (64) and time response widths (64).
- Beam-Beam (BB) and Beam-Gas (BG) flags (64).
- States of the 5 triggers sent to the CTP (MinBias, BB, BG, Central,SemiCentral).

For each event triggered by a L2 signal coming from the CTP (called Event-Of-Interest), the following information will be sent to the DAQ:

1. The event of interest itself with **all** the parameters listed above, for physics analysis
2. The events between EoI-10 to EoI+10 (charges and BB/BG flags), for monitoring pedestals, pile-up…
3. The 10 last V0 Minimum Bias events (charges and BB/BG flags), for monitoring gains

Summary of calibration procedure

Gains and pedestals will be computed by Online Monitoring using dedicated data (minimum bias and +/- 10 around the event of interest mini-events respectively) stored in the FEE and sent to the DAQ with the events of interest.

Note that this procedure is achieved by the FEE independently of the Central Trigger Processor.

These values will be written in the Calibration Data Base for later use by offliners and updated at each run change.
Validity period will be run interval unless a hardware failure occurs.
Writing access should be given to authorized people only and as frequently as needed for special updating.