



VZERO Status Report

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for the VZERO group**

Offline Week - March 2009

Outline

- Geometry
- Simulation
- Calibration
- QA and Data Quality Monitoring
- Trigger simulation

Geometry

A change has been done in the geometry of V0A by Lizardo namely vertices have been redefined clockwise in class `AliVZEROv7`.

Changes did not affect the cell numbering.

The current situation is satisfactory.

Simulation

Time information is in Hits and Digits as time-of-flight values only.
No time width is estimated, is it needed ?

Implementation of track references in the step manager has been done and committed.

Are still to be done:

- Propagation of labels from kinematics tree for Hits, Sdigits, Digits
- Verification of merging procedure

Calibration

Calibration is achieved through Detector Algorithm VZEROda.

VZEROda is launched on the MON machine in PHYSICS Run Type.

Preprocessor retrieves pedestals computed by VZEROda and High Voltages values from DCS archive.

Both pedestal and High Voltage values are stored in OCDB and used in simulation and reconstruction.

Filling of the calibration file VZERO/Calib/Data in the OCDB needs to be checked now that the electronics has been reinstalled at P2.

QA and Data Quality Monitoring

In order to avoid code duplication we:

- put QA and DQM code in class `AliVZEROQADataMakerRec`
- used the QA “Expert” flag for the DQM histograms
- used the QA → *amore* interface developed and provided to us by Filimon and now Barthélémy
- developed the corresponding DQM GUI in the *amore* framework

Code has been committed and successfully checked replaying September 2008 data.

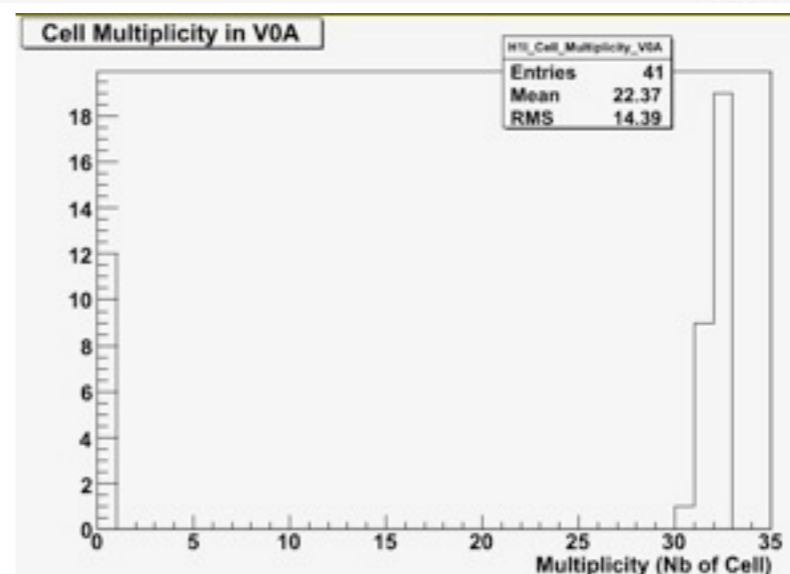
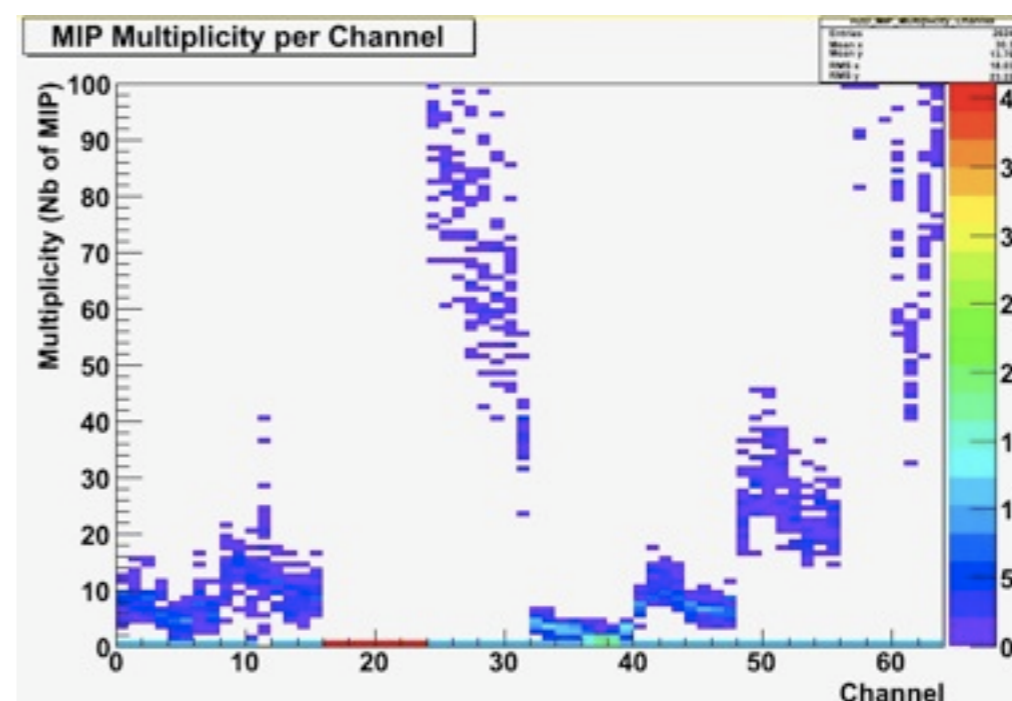
It has also been deployed at P2.

Reference data still need to be produced and stored.

VZERO QA - ESD

Monitored objects have been defined as:

- Cell Multiplicity in V0A and V0C
- MIP multiplicity in V0A and V0C
- MIP Multiplicity versus channel
- BB and BG flag counters
- Charge versus channel
- Time versus channel
- Mean time in V0A and V0C (in ns)
- Time difference V0A-V0C (in ns)

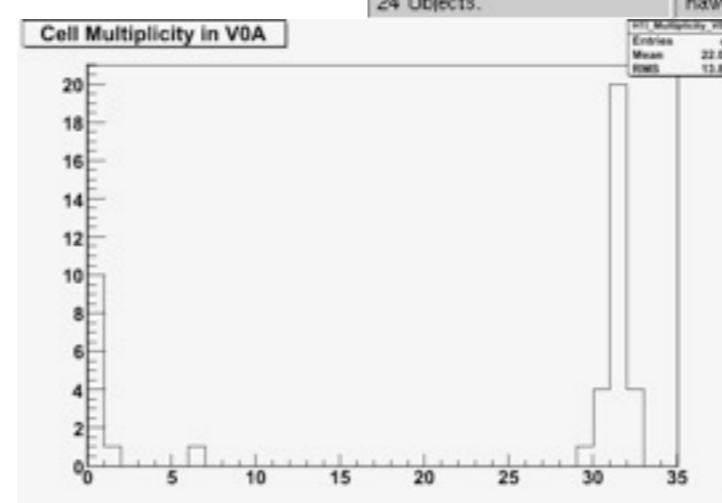
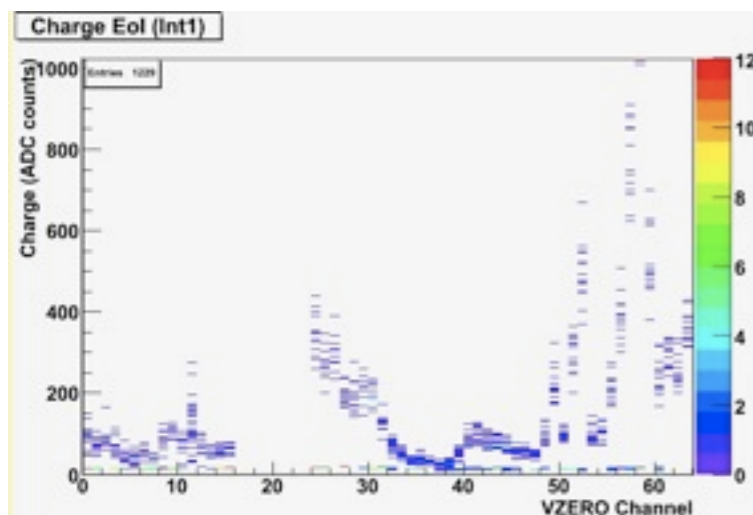
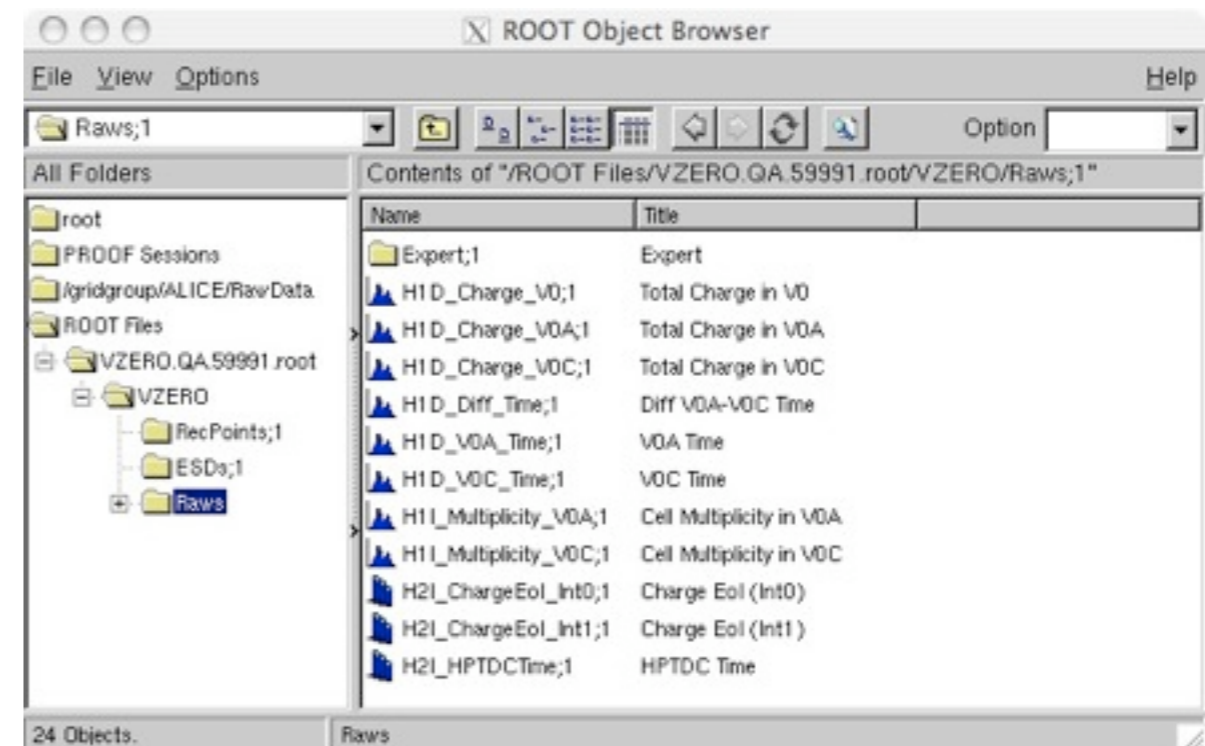


VZERO QA - RAW

Monitored objects have been defined and implemented.

Global variables defined for **correlation** are:

- Cell Multiplicity in V0A and V0C
- Total charges in V0A, V0C, and V0
- Total MIP multiplicity in V0A, V0C, and V0
- V0A and V0C times
- Time difference V0A - V0C



VZERO QA / DQM

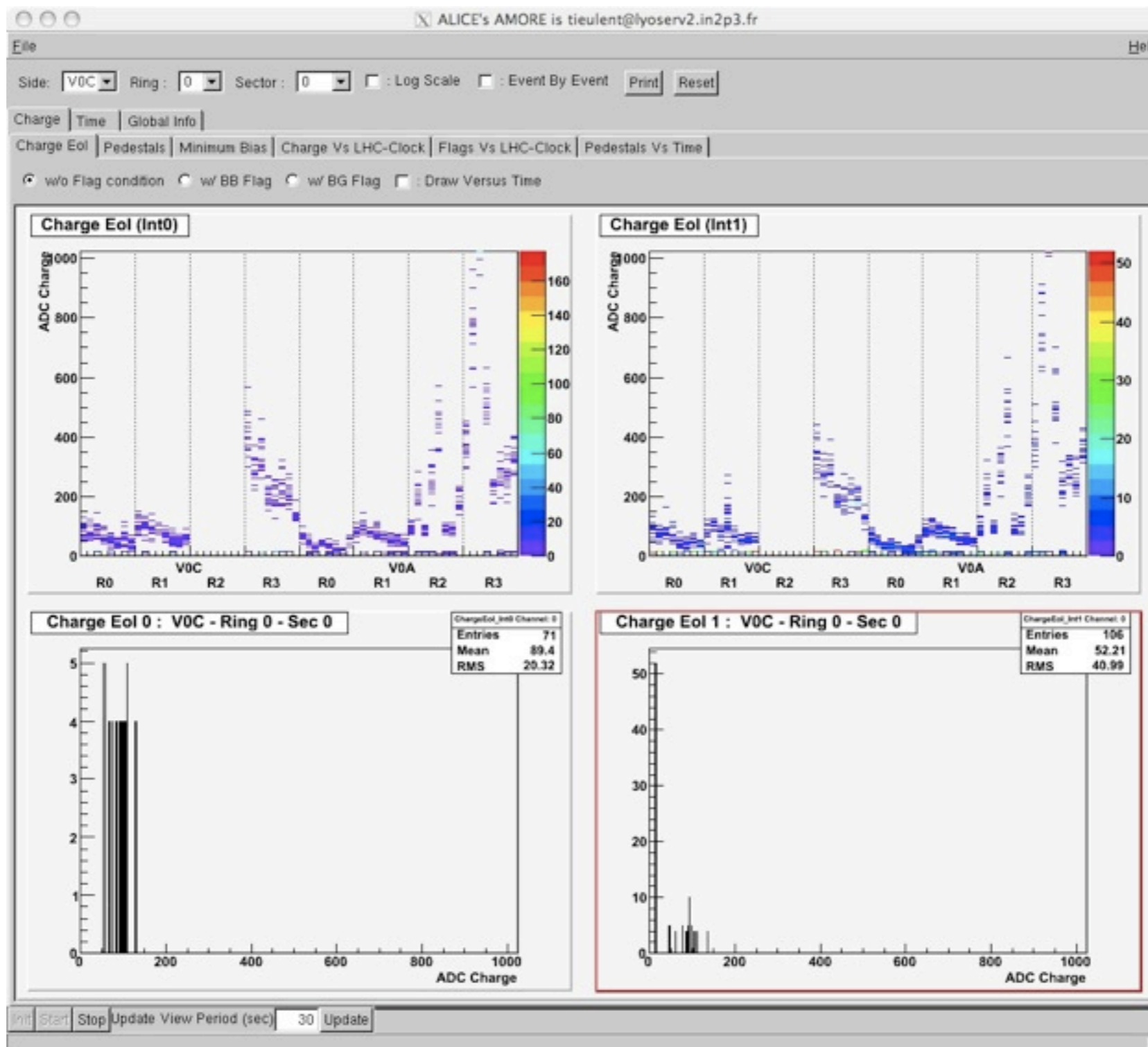
VZERO Data Quality Monitoring uses the **amore** framework and the **AIiVZEROQADataMaker** class to produce the monitored objects (37 objects are monitored).

All QA RAW histograms are monitored, including all QA "non-expert" histograms plus:

- Pedestal % channel (+ time trend)
- ADC Charge % channel % LHC Clock (+ time trend)
- Flags % channel % LHC Clock
- Time % channel (with and without flag condition)
- Charge of Event-of-Interest % channel (with and without flag condition)

VZERO DQM

subscribes to all RAW objects defined in QA code

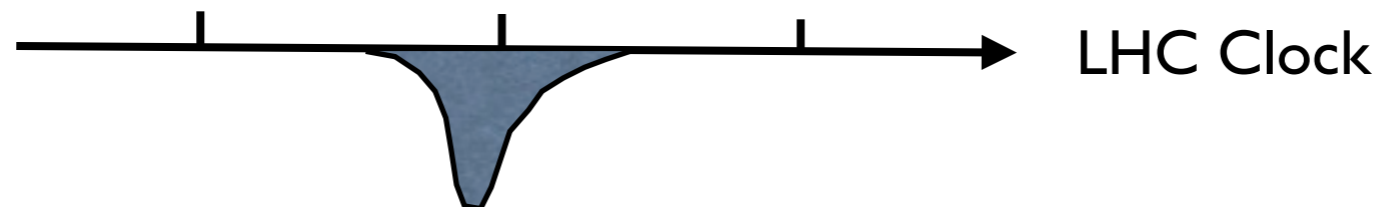


VZERO DQM - Cosmics

A new **amore agent** has been added, to be used in cosmics run:

as pulses are not synchronized with the LHC clock in cosmics data, we sum charges over 2 consecutive clocks in order to get the total charge.

Both *amore* agents have been put under version control in the *amore* svn repository
(thanks to Barthélémy)



Trigger Simulation

Implementation of the trigger simulation is in progress, not completed yet.

(done by Raphaël)

Trigger information

VZERO FEE can provide 16 different triggers to CTP:

- (1) BBA and BBC
- (2) BBA or BBC
- (3) BGA and BBC
- (4) BGA
- (5) BGC and BBA
- (6) BGC
- (7) BBA
- (8) BBC
- (9) BGA or BGC
- (10) (BGA and BBC) or (BGC and BBA)

Use discriminator **threshold** and **timing** consideration channel by channel

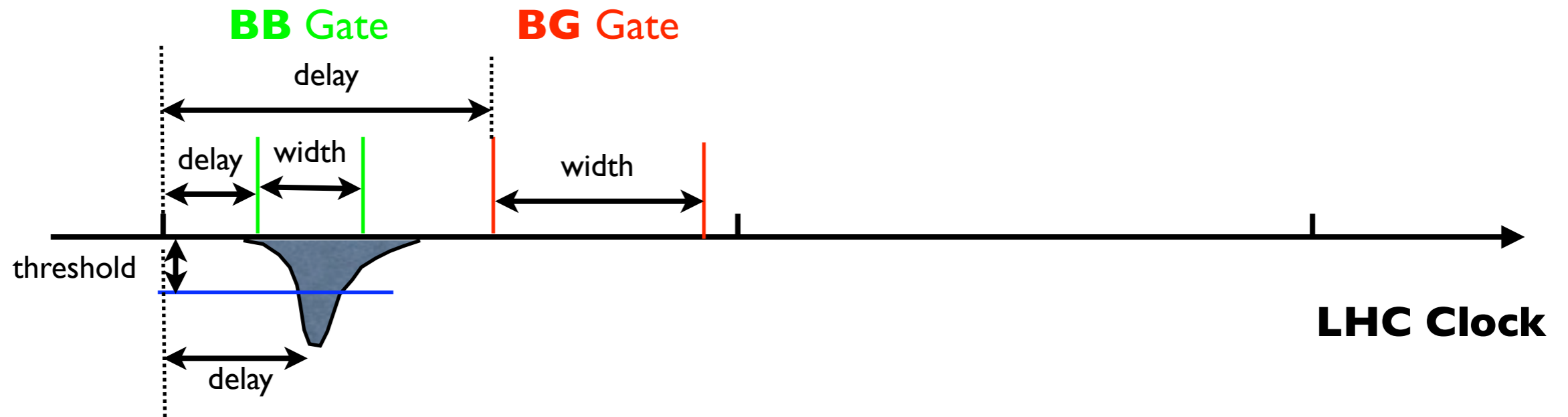
- (11) CTAI and CTCI
- (12) CTAI or CTCI
- (13) CTA2 and CTC2
- (14) CTA2 or CTC2

Use **charge** consideration per disk

- (15) MTA or MTC
- (16) MTA and MTC

Use cell **multiplicity** consideration per disk

Trigger information



For each channel, the BB and BG flags are generated according to the amplitude and the timing of the pulse.

For each side, BB and BG flags are generated if the number of individual channel flags is above a given threshold.

FEE parameters related to online trigger generation

CIU manual control

CIU0 Manual Control

	Mean even	Mean Odd	Cut even	Cut Odd	Delay hit	T reshold	Q	T
S7	11	12	15	16	500	2250	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
S6	12	12	16	17	500	2200	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
S5	11	10	16	15	500	2450	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
S4	12	10	17	15	500	2400	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
S3	11	14	13	16	500	2900	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
S2	13	13	16	16	500	2200	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
S1	12	10	15	13	500	2600	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
S0	10	13	14	16	500	2350	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Profil Clk1 win1 Profil Clk1 win2 Profil Clk2 win1 Profil Clk2 win2
 Profil Rst win1 Profil Rst win2 Profil Latch win1 Profil Latch win2

Delay Clk1 win1 Delay Clk1 win2 Delay Clk2 win1 Delay Clk2 win2

Delay win1: 6 Delay win2: 6

Autotest Odd/Even Autotest Mode Autotest Calibration Charge Filter

Test window Pedestal Suppr. SelA FPGA1 SelB FPGA1 SelA FPGA2 SelB FPGA2

Profil Reset Q

CTP and CCIU manual access

Trigger

MB VQA channel threshold	1	Centrality trigger VQA threshold 1	100
MB VOC channel threshold	1	Centrality trigger VQA threshold 2	504
Beam gas VQA threshold	1	Centrality trigger VOC threshold 1	100
Beam gas VOC threshold	1	Centrality trigger VOC threshold 2	500
BBA for beam gas trigger th	3	Multiplicity trigger VQA thr high	2
BBC for beam gas trigger th	3	Multiplicity trigger VQA thr low	2
Trigger delay	0	Multiplicity trigger VOC thr high	2
		Multiplicity trigger VOC thr low	2

Random trigger rate: 2147483638

Option code T1: 0
 Option code T2: 0
 Option code T3: 0
 Option code T4: 0
 Option code T5: 0

Trigger Output 1: BBA or BBC
 Trigger Output 2: BGA
 Trigger Output 3: BBA
 Trigger Output 4: BGA or BGC
 Trigger Output 5: BBA and BBC

Filters

- BBA and BBC
- BBA or BBC
- BGA and BBC
- BGA
- BGC and BBA
- BGC
- CTA1 and CTC1
- CTA1 or CTC1
- CTA2 and CTC2
- CTA2 or CTC2
- MTA and MTC
- MTA or MTC
- BBA
- BBC
- BGA or BGC
- All True BG

All these parameters, around 355 short integers, could be retrieved from DCS archive (and exported to the OCDB) to be used for generating **offline triggers**.

Trigger simulation - under discussion, work in progress -

- Retrieve from DCS or from OCDB the FEE parameters for a given run in order to define the "observation windows" (time windows) and retrieve the current charge thresholds and multiplicity thresholds
- Read reconstructed RAW data (pedestals subtracted, multiplicities estimated) in ESD Tree
- Generate the offline triggers:

BBA, BBC, BGA, BGC, and logically derived triggers (10 triggers)
by checking the HPTDC value with respect to the corresponding observation windows

CTAx, CTCx, and logically derived triggers (4 triggers)
by checking the total charge in each disk with respect to the charge thresholds

MTA, MTC, and logically derived triggers (2 triggers)
by checking multiplicities in each disk with respect to the multiplicity thresholds