

ZDC Status Report

ALICE Offline week April 2008

- **GEOMETRY**

We added the second ZDC set on the A side (RB24 side, opposite to the dimuon arm). Now we have 4 alignable objects (ZN and ZP on sideA and on side C).

The implemented classes for the geometry are:

AliZDCv3 that initializes both the ZDC arms (default in Config files)

AliZDCv2 initializes only the ZDC set on C (RB26) side

- **DIGITS**

Digits for reference signals used to monitor the stability of the PMT gains added to the stored digits. We have 1 stability check system per side therefore 2 more digits have been added.

- **RECONSTRUCTION**

Our ADCs (CAEN v965) convert each channel in parallel with 2 different gain stage (one with a gain x1, the other with a gain x8) providing thus 2 simultaneous ranges:

① 0÷900 pC (200 fC per ADC channel) ➡ used for **nuclear interactions** where each hadronic detector has a dynamic going from ~3 TeV to ~150 TeV

② 0÷100 pC (25 fC per ADC channel) ➡ used for **electromagnetic dissociation events** where we are interested in the peaks due to 1 and 2 neutron in the neutron ZDC spectrum.

The reconstruction for the second gain chain has been implemented in AliZDCReconstructor.

The reconstruction algorithm has been changed and will be further on refined, to improve the centrality variables (impact parameter and number of participants) determination.

I would like to stress that **WE CAN'T TEST OUR RECONSTRUCTION ALGORITHM ON COSMIC DATA** since it is designed for AA collisions!!!

- **CALIBRATION**

The calibration class has been splitted in 3 different classes, according to the different tasks and sources of the calibration procedures designed for the ZDC (I will give more details in the Shuttle session):

① **AliZDCPedestals** providing the parameters for pedestal subtraction

② **AliZDCCalib** manages the energy calibration of the hadronic ZDCs

③ **AliZDCRecParam** handles the parameters needed to reconstruct the number of participants and the impact parameter from the measured zero degree energy

- **ZDC ESD**

The ESD for the ZDC have been updated with respect to the last offline week.

Now in the ESD you can find:

➡ **energy detected in ZNA, ZPA, ZNC, ZPC** (the concerning getters are GetZDCN1Energy(), GetZDCP1Energy(), GetZDCN2Energy(), Get ZDCP2Energy(), where 1 and 2 refers respectively to the C and A sides. 1 and 2 are for backward compatibility!)

➡ **energy detected in ZEM1 and ZEM2** (the signal of the EM zero degree calorimeter has been splitted in two since there are two different ZEM and therefore it is more correct, besides than safer, to have the 2 signal splitted also if we typically use their sum)

➡ **the number of participants**

➡ **the energy calibrated signal for each PMT of the hadronic ZDCs** (5 signal x 4 detectors x 2 gain chains of the ADC = 40 values). The signal of the neutron ZDC is used to reconstruct event by event the centroid of the spectator neutrons over the detector front face in order to provide a first order estimate of the reaction plane.

- **AliZDCRawStreamer**

The class for raw streaming has been tuned and succesfully used to read back commissioning and cosmic run data.

We probably will need to store some reference data in order to manage some information that we don't use for calibration purposes but that we could need to access for analysis. Following Federico suggestion, we will contact very soon Latchezar to discuss this item.

- **PRODUCTION**

We will need a production of spectators on both sides relative to IP since the acceptance for proton calorimeters strongly depends on the LHC optics and on the elements of the beam pipe and the beam line are different on the 2 sides.

➡ **TO BE DONE**

Implementation of QA for digits and ESD ➡ the task will be completed by the end of April