

ZDC offline code in Pb-Pb data taking

SUMMARY

- DA and Shuttle
- OCDB
- RECONSTRUCTION
- SIMULATION
- ANALYSIS

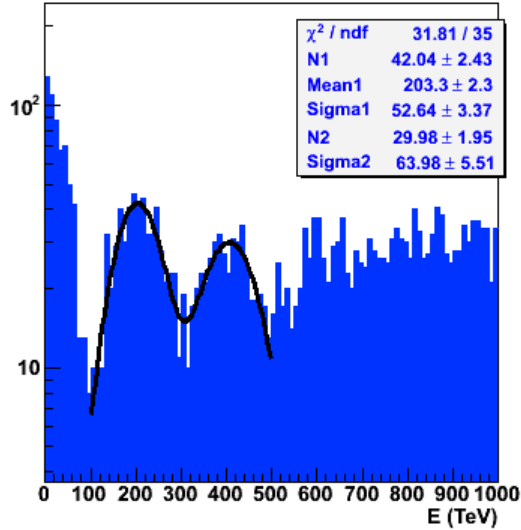
- DA running at P2 for STANDALONE_PEDESTAL, STANDALONE_LASER, CALIBRATION_BC and PHYSICS run types
- validated, installed at P2 but waiting for test session with DAQ people for CALIBRATION_EMD run type

CALIBRATION_EMD runs

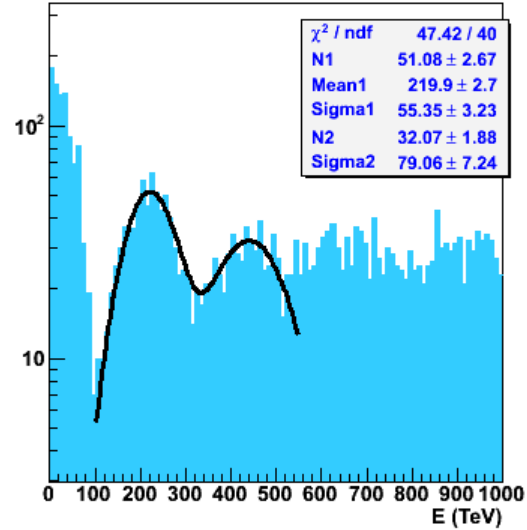
- ➔ standalone runs with L0 trigger given by ZDC (~12 bunch cross late) to trigger EM dissociation events
 - ➔ interest not only for ZDC energy calibration but also for physics of ultra-relativistic interactions (i.e., 1n emission x-section...)
 - ➔ first data taken with Pb circulating beams the past week
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- Shuttle failed for CALIBRATION_EMD runs since the DA is not properly producing output files retrieved by the Shuttle
 - waiting for DAQ people (we didn't run CALIBRATION_EMD runs but at the very beginning of the Pb run even before STABLE BEAM declared by LHC)

Single EMD event selection in physics runs (ZNA or ZNC) && !(ZEM1 or ZEM2)
 1n and 2n peaks in low gain chain ADC (dual range)

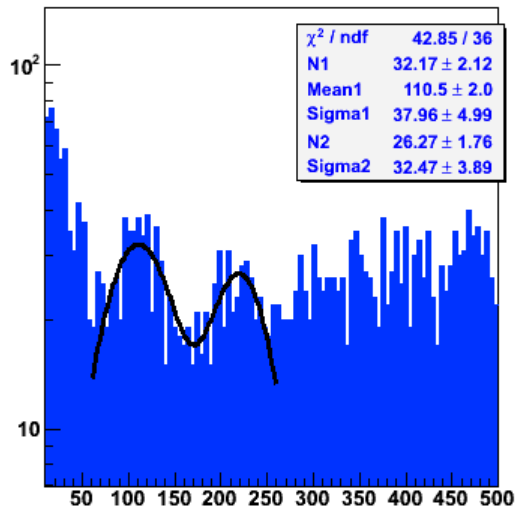
ZNC



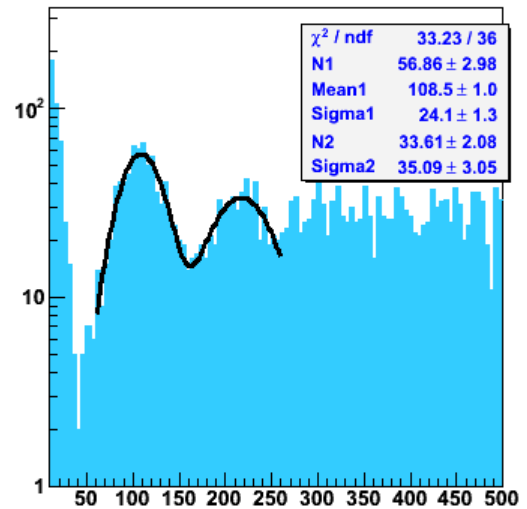
ZNA



ZNC PMC



ZNA PMC



ZDC OCDB entry that could be soon updated

ZDC/Calib/EnergyCalib

- ➔ energy calibration coefficient calculated in CALIBRATION_EMD runs
- ➔ all coefficients are currently set =1 as in pp
- ➔ calculating offline energy calibration for neutron ZDCs

ZDC/Calib/MBCalib

- ➔ MB distributions used to select centrality event by event during Pb-Pb data reconstruction
- ➔ contains the output of the most recent simulations
- ➔ need to be updated with correlations taken from data

MC

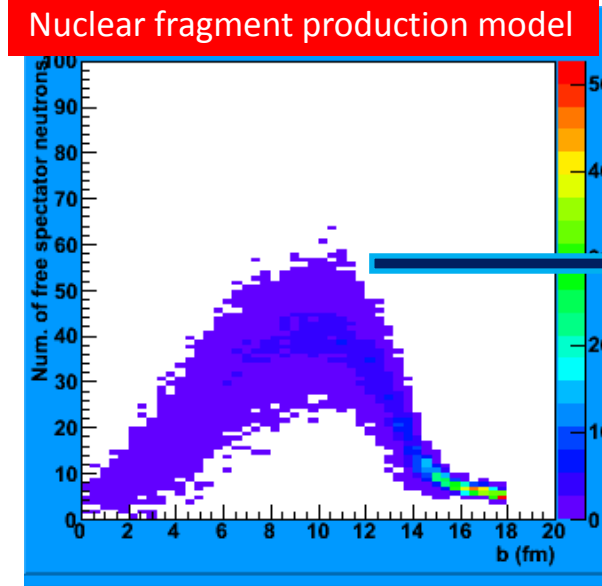
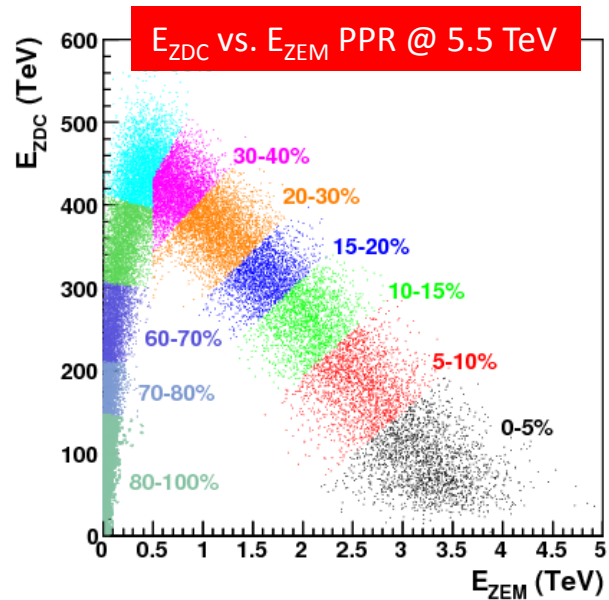
- ➔ reconstruction correctly provides centrality estimations (N_{part} and b)

DATA

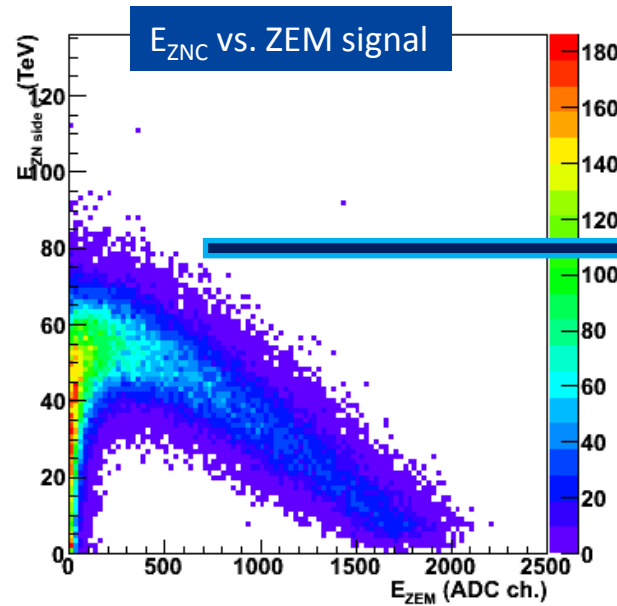
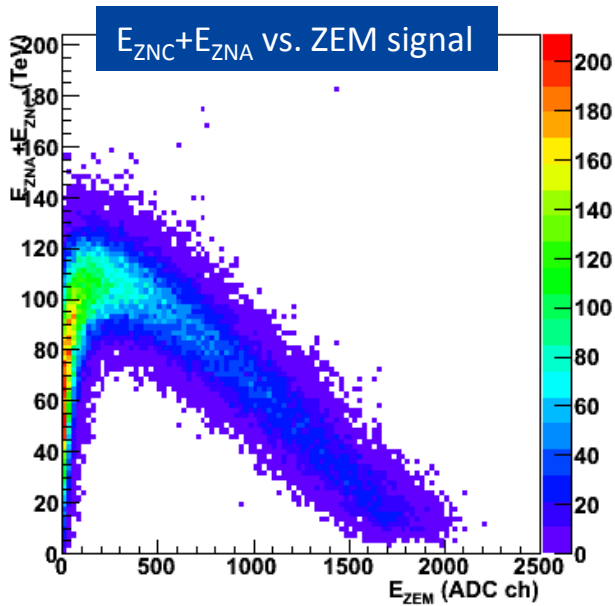
- ➔ currently centrality variables provided by reconstruction are NOT reliable at all!
- ➔ need to establish offline the centrality determination “golden rule” (i.e., use only of ZN or also of ZP signals...)

PROBLEM ➔ calibration events in PHYSICS run makes use of default AliZDCRecoParam object which is the object for pp but the reconstruction is initialized for Pb-Pb! Therefore when the reconstructor tries to access data that are not even defined in pp reco param object it crashes...Peter kindly offered to help me in finding a solution

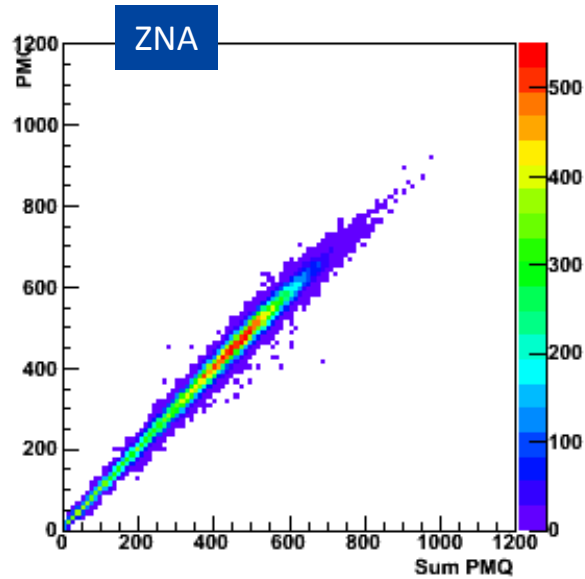
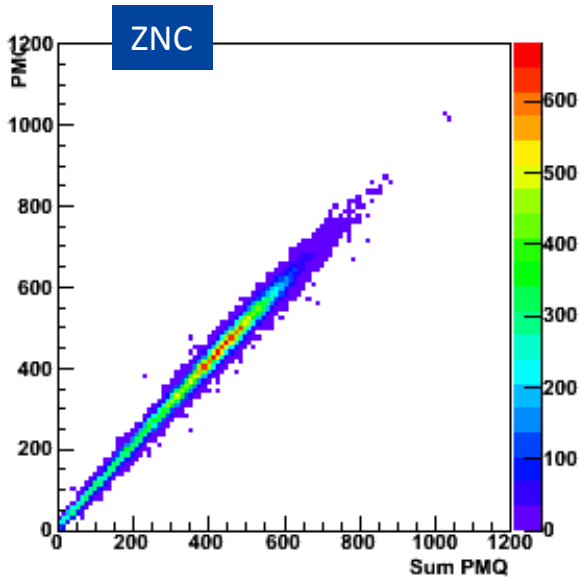
- $N_{\text{spectator}}$ is taken from the generator
 - fragmentation algorithm is applied to extract the number of FREE (not bound in fragments) spectators
 - to consistently reduce the simulation speed it was long ago decided to store the signal given by a sample of 10^4 spectators in 2 files (1 for spectator n, 1 for spectator p) and then to add this event by event to the signal generated by participants
 - The signal is stored in different folders according to the CMS energy of the colliding system: 2760 or 5500
- ➡ This made the AliZDCDigitizer crash when the energy value retrieved by the GRP object was 3500...
- ➡ Solved with the help of Andreas and Peter...



Expected maximum number of free neutrons ~ 60

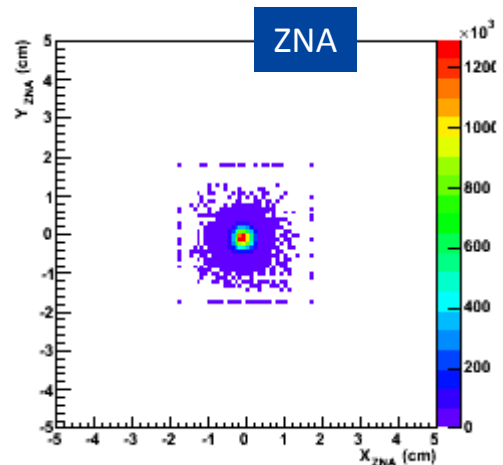
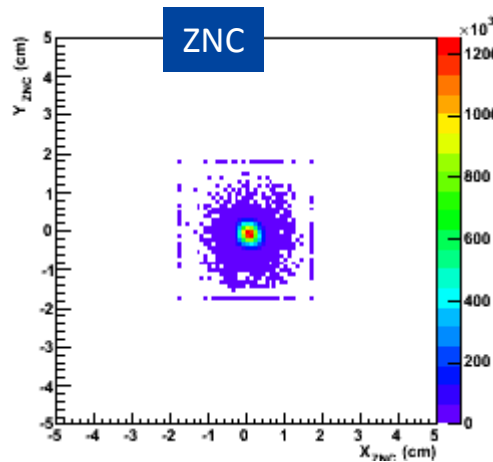


Maximum number of detected neutrons = $80/1380 \sim 57$!!!



➔ Very narrow correlations between common PMT and tower PMTs, without events outside correlations as observed during pp run! 😊

➔ No collimator shadowing, uniform particle distribution over ZN front face! 😊



BACKUP SLIDES

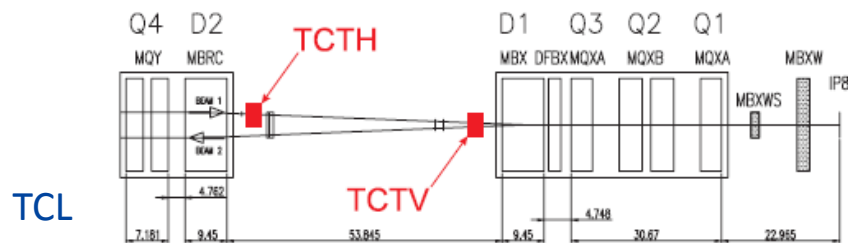
Luminosity and collimator aperture values measured by machine luminometers (BRAN) can be very useful. (G. De Cataldo contacted.)

Already defined DP (to be archived):

- dip/acc/LHC/Beam/LuminosityAverage/BRANB.4L2
- dip/acc/LHC/Beam/LuminosityAverage/BRANB.4R2
- dip/acc/LHC/Beam/LuminosityPerBunch/BRANB.4L2
- dip/acc/LHC/Beam/LuminosityPerBunch/BRANB.4R2
- dip/acc/Machine/CollimatorPosition/TCDD.4L2
- dip/acc/Machine/CollimatorPosition/TDI.4L2
- dip/acc/Machine/CollimatorPosition/TCTH.4L2.B1
- dip/acc/Machine/CollimatorPosition/TCTH.4L2.B2

DP to be defined and stored in archive:

TCTV.4L2 TCTV.4R2 TCTVB



Run types for which these DP should be retrieved by Shuttle preprocessor:

PHYSICS CALIBRATION_EMD
 CALIBRATION_MB CALIBRATION_CENTRAL CALIBRATION_SEMICENTRAL

Still I don't see any of them in the GRP preprocessor ?

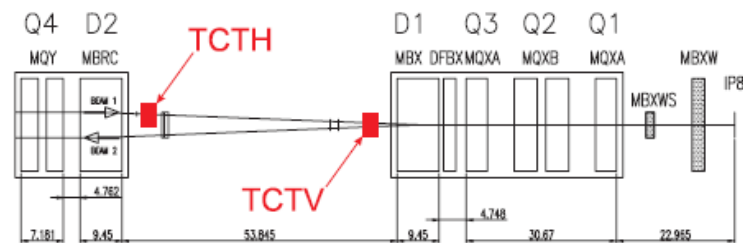
<http://alisoft.cern.ch/viewvc/trunk/STEER/AliGRPPreprocessor.cxx?root=AliRoot&view=markup>

Info in GRP

Luminosity and collimator apertures values measured by machine luminometers (BRAN) can be very useful. G. De Cataldo contacted.

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- dip/acc/LHC/Beam/LuminosityAverage/BRANB.4R2
- dip/acc/LHC/Beam/LuminosityPerBunch/BRANB.4L2
- dip/acc/LHC/Beam/LuminosityPerBunch/BRANB.4R2
- dip/acc/Machine/CollimatorPosition/TCDD.4L2
- dip/acc/Machine/CollimatorPosition/TDI.4L2
- dip/acc/Machine/CollimatorPosition/TCTH.4L2.B1
- dip/acc/Machine/CollimatorPosition/TCTH.4L2.B2



DP to be defined and stored in archive:

TCTV.4L2

TCTV.4R2

TCTVB

TCLIA

Run types for which these DP should be retrieved by Shuttle preprocessor:

PHYSICS

STANDALONE_EMD