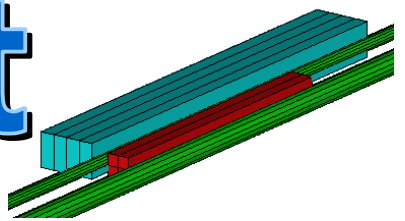
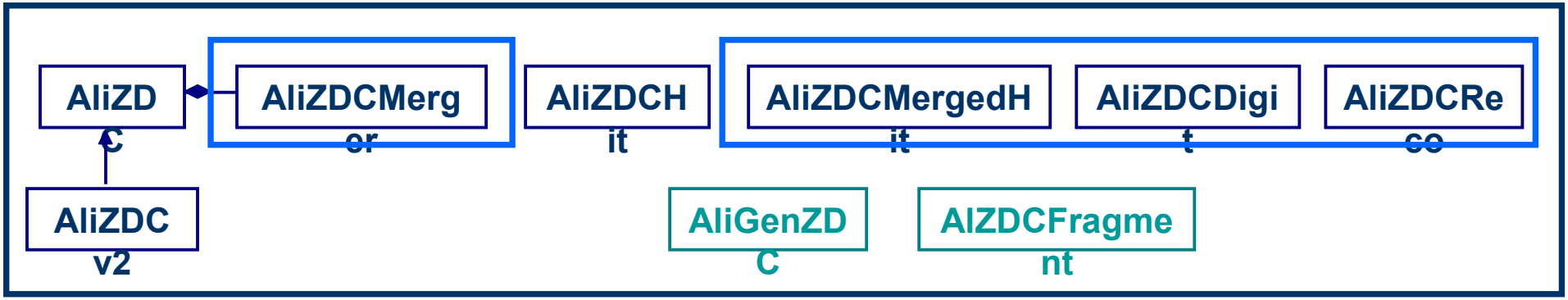
ZDC Status Report



18 March 2002 – ALICE Week
C. Oppedisano

Outline

- ZDC classes in AliRoot



- Event merging: motivation and “strategy”
- Reconstructed quantities
- Avalaible macros

Merging “strategy”

Procedure adopted to generate only once a sample of spectators (n and p)

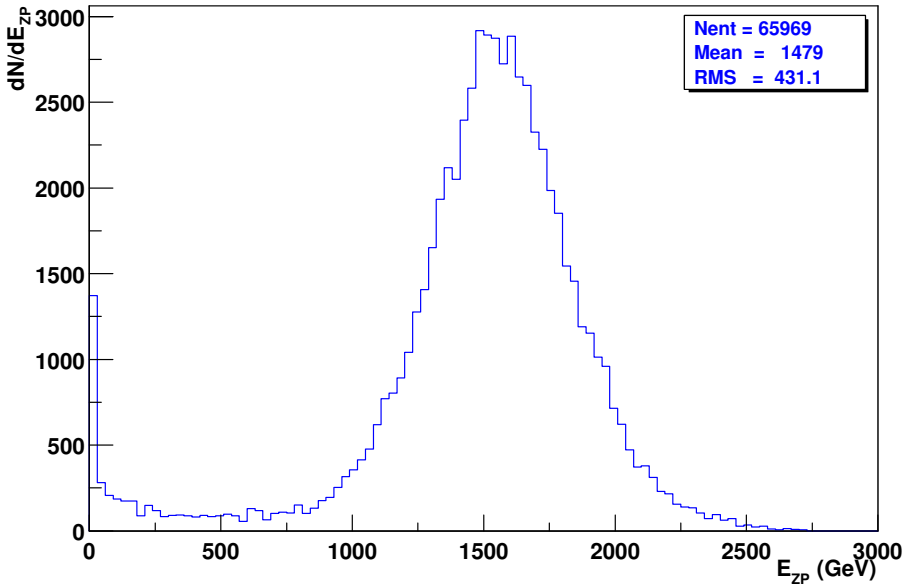
➡2 TNtuple containing hits for 10^4 neutrons and 10^4 protons:

ZNsignalntu.root and ZPsignalntu.root (~ 600 Kb each).

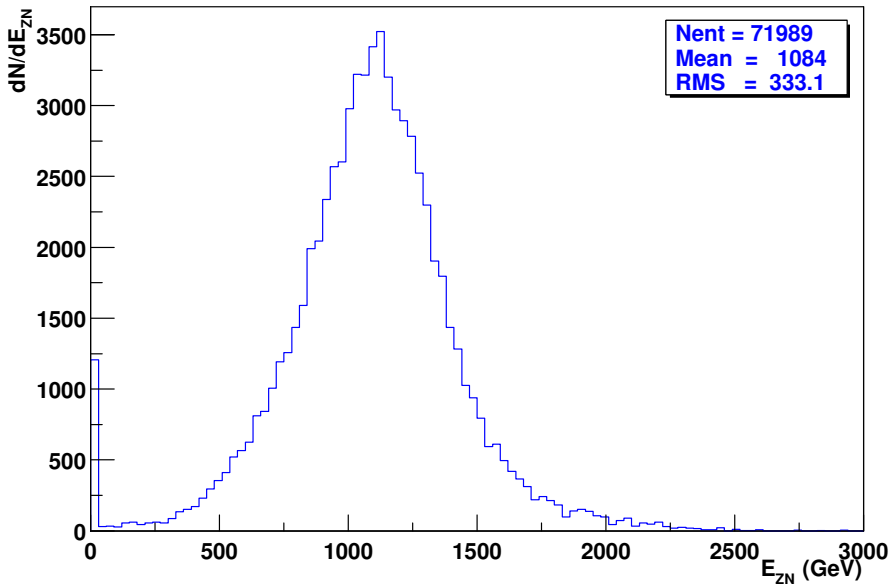
➡Time required for simulations is minimized;

➡Fast merging and digitization procedures.

Energy deposited in ZP by 10^4 p of 2.7 TeV



Energy deposited in ZN by 10^4 n



Class for event merging and digitization

AliZDCMerger

Only digitization (fMerge = kDigitize)

Merging and digitization (fMerge = kMerge) –> default

Background (full HIJING simulation) + Signal (spectators)

Event merging

Initialization

➡ **Background** opens background file and reads generated b, N_{spec} from event header;

➡ **Fragmentation** applies fragmentation alghoritm, providing N_{spec} "free".

Merging ➡ from background hits to "merged hits"

➡ **Mixing** adds signal to background hits, creating a TCA of AliZDCMergedHit;

➡ **ExtractSignal** used to extract signal from the stored spectator distributions.

Digitization

Digitize ➡ from "merged hits" to digits

➡ **Phe2ADCch** taking into account PMT gains and resolutions computes the light yield;

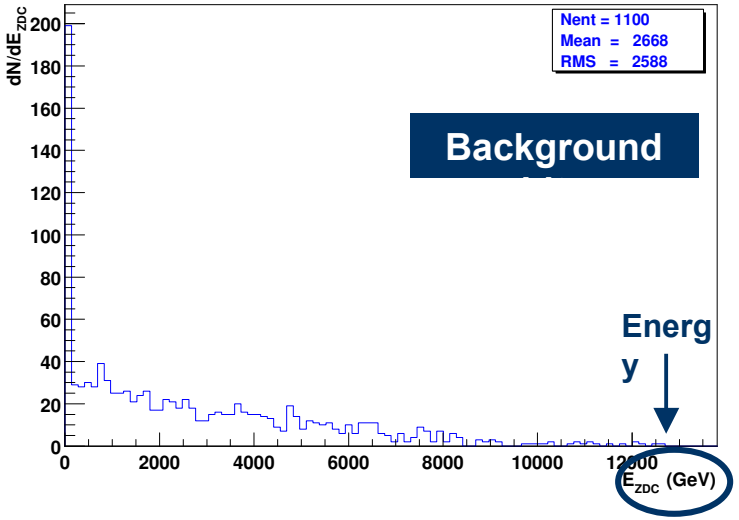
➡ **AddPedestal** add a bedestal to the ADC spectrum.

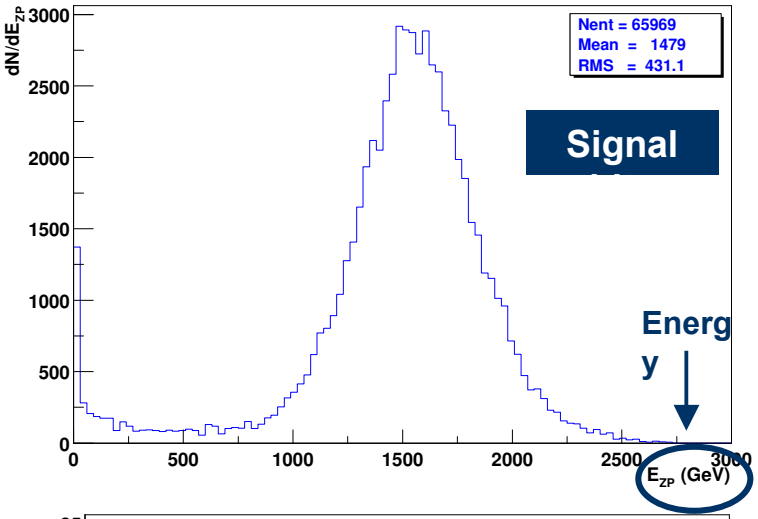
Structure of the ZDC branches

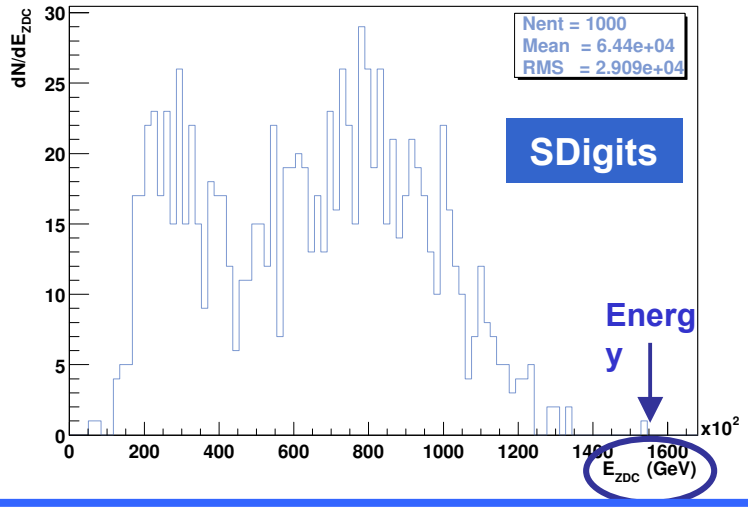
Hits ➡ hits generated by background (AliGenHijing without spectators);

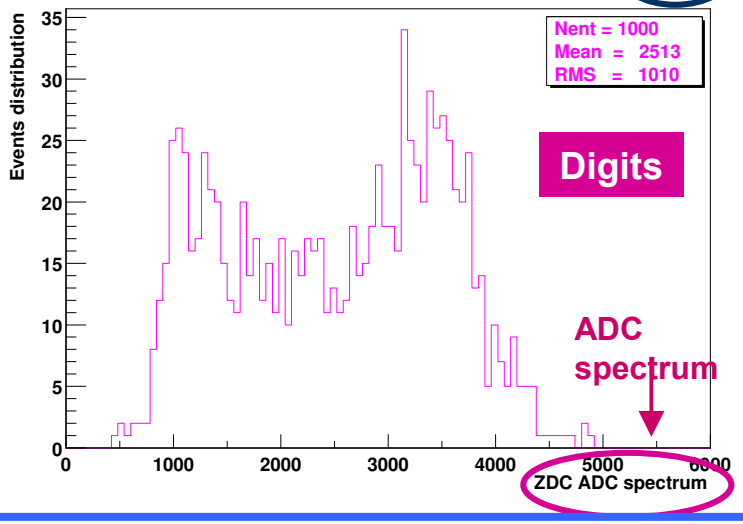
SDigits ➡ background + signal hits ➡ "merged hits";

Digits ➡ ADC spectra of the PMTs for the merged event;









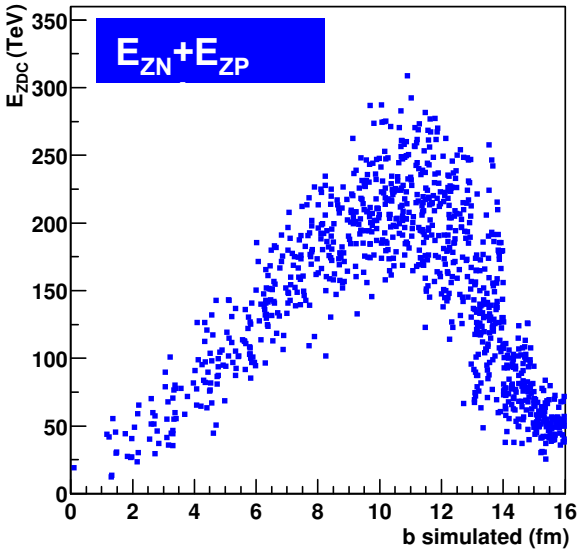
Class for reconstructed quantities

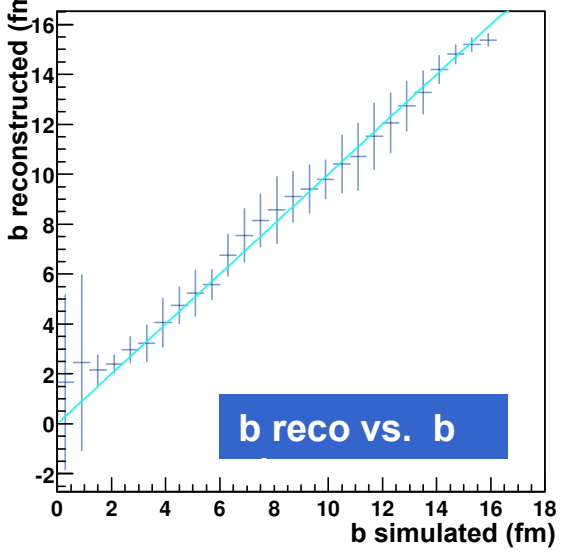
Reconstructed quantities provided by AliZDCReco:

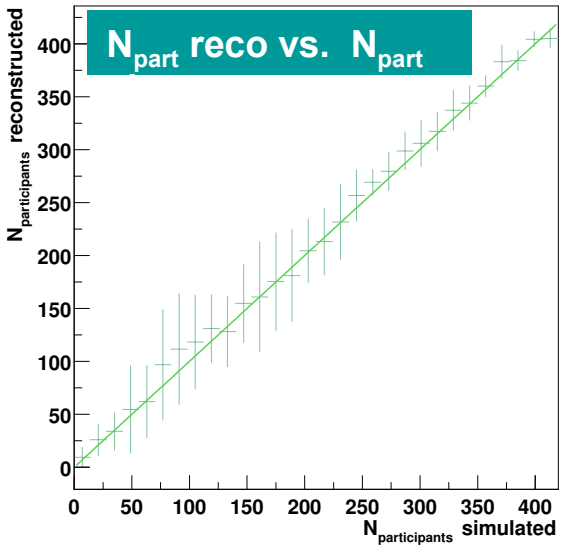
Calculated
- energy detected in ZN, ZP and ZEM;
- number of detected spectator protons and neutrons;

Estimated
- number of "true" spectator protons and neutrons;
- impact parameter and number of participants.

10^3 HIJING events merged with signal and reconstructed







Macros avalaible in CVS server

• Digitization ➡ ZDCHits2Digits.C (# events, merge mode)

Default (mode = 1) -> merging and digitization

• Reconstruction ➡ ZDCDigits2Reco.C (# events)

b, N_{part} are written in ZDC branch of TreeR

```
AliZDCMerger *merger = new AliZDCMerger();
merger->SetBackgroundFileName("file.root");
ZDC->SetMerger(merger);
merger->SetBackgroundEventNum(iev);
gAlice->Hits2SDigits("ZDC");
gAlice->SDigits2Digits("ZDC");
gAlice->Digits2reco("ZDC");
```

Loop over the events

Merging and digitization

Reconstruction