Session 2: MC & Trigger …

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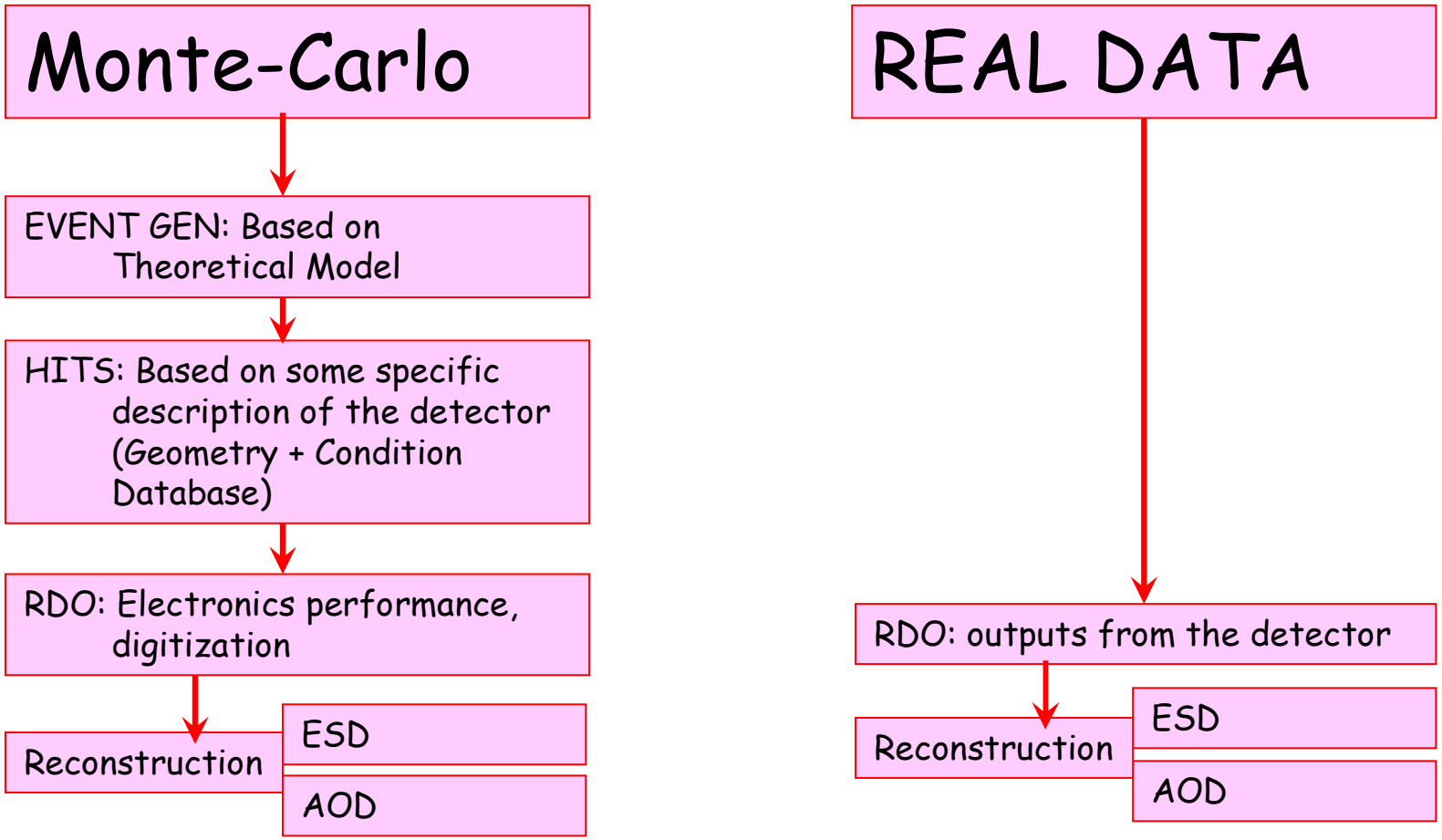
- Introduction to MC…
- Hands on Exercises
- Introduction to Trigger…
- Hands on Exercises…

Monte-Carlo: Do we claim we understand our Detector?

- Simple flow of MC generation process and comparison with the data process



What the difference?

Monte-Carlo

1. Does not produce at 100% the real data, specially at LHC where we are looking at an unknown region of parameter space…
2. Does not have the real detector description (as installed) together with the magnetic field map of the detector…
3. ….

REAL DATA

1. Does not have the truth information…
2. …

Your assignment (1) :

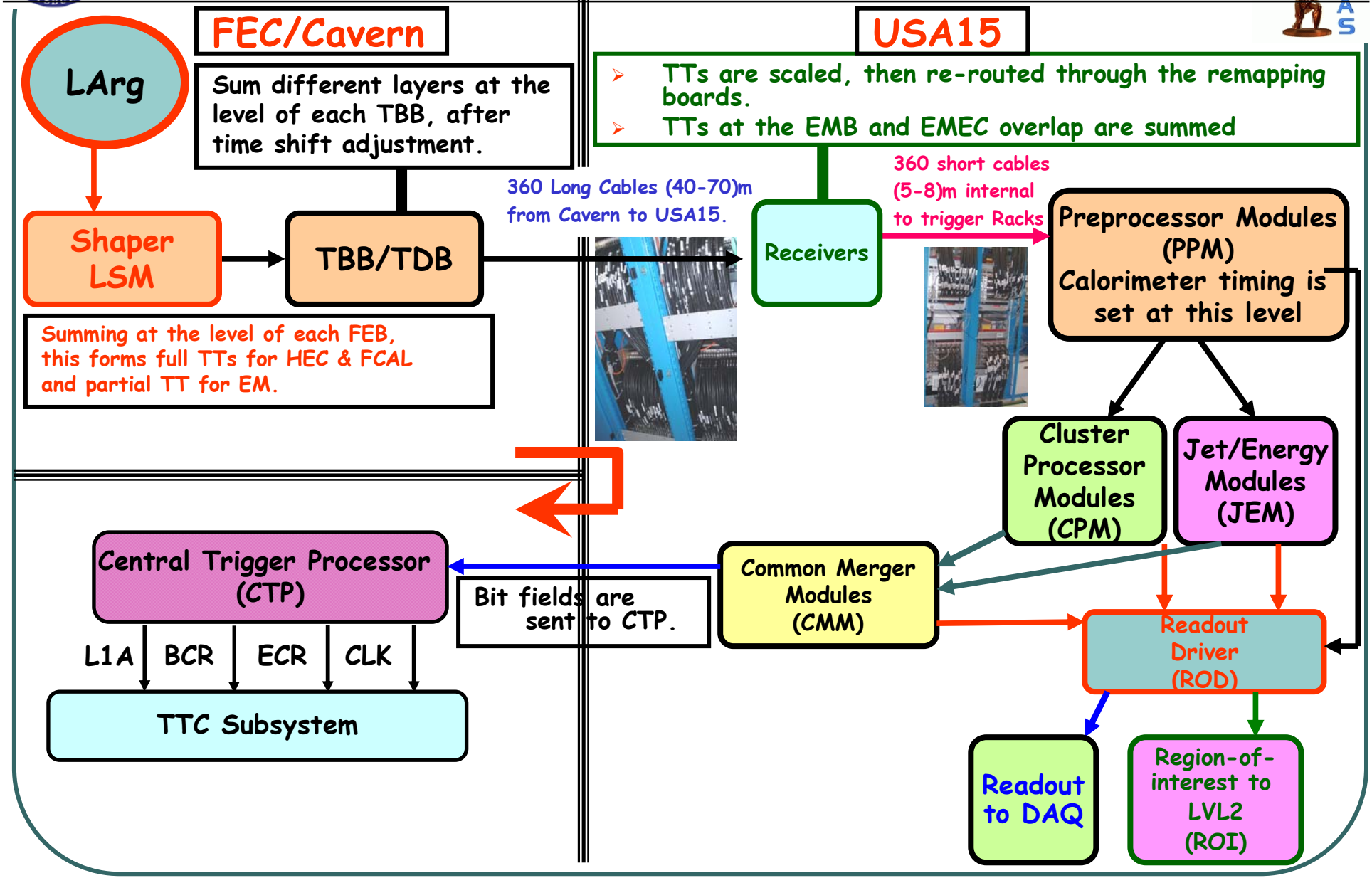
- Using the same code:

1. Include the MC truth information into the Code?
2. Try to identify the electrons from the truth and match it to one of the electron candidates from the Z peak?
3. Put in the same Ntuple all the necessary information.

Trigger…

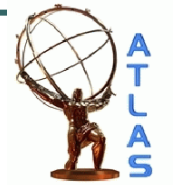
- Data taking is not an easy task… and cannot be taken for granted.
- Lot of work need to go into commissioning (See next slide for a flavor of the complication)

LArg signals are summed and mapped in a very complicated way:



Signatures: Your assignment (2)…

- There are three trigger decisions:
  1. L1
  2. L2
  3. EF
- Each trigger level has different signatures, your assignment is to identify all the signatures used in this particular release.
- To run please add the lines described in the wiki page.



That is it for today

Some Background Information before next assignment…

- The egamma PID builder makes various shower-shape and track-quality cuts and encodes the results of these cuts in isEM
- isEM is a word, whose bits represent various conditions (BitDef).

- Isolation cut → using (electron->parameter(ElectronParameters::etcone$X$))
- Etcone$X$ = Total ET in (X/100) cone around centroid - EM Cluster ET (i.e. 5x5 of EM layers only around centroid).
- Note, the etcone corresponds to R=0.45 and there are also etcone20, etcone30, etcone40 (for R=0.2, 0.3 and 0.4 respectively).

Your assignment (2) :

- Now, let's start the real study:

1. You need to know if the electron candidates you are selecting from the electron container are really good electrons, let's adopt the CSC definition of a good electron:
   1. ElecAuthor ==1 || ElecAuthor ==3 [AuthorEgamma]
   2. isEM&0x3FF == 0 (isEM medium: track matching, E/|p| and TRT requirements are not imposed)
   3. Eta cut |eta| <= 2.5 and also you can add a pT cut > 10GeV/c