PHOS and CPV O^2 status

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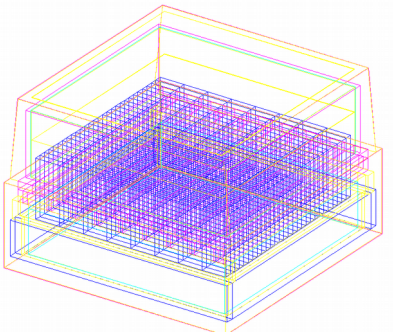
PHOS and CPV

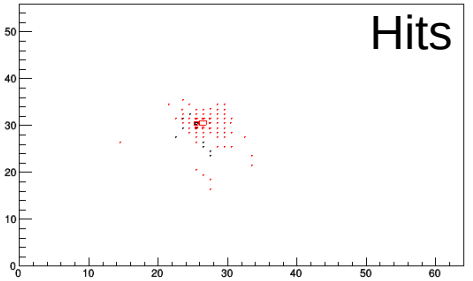
- So far, CPV reconstruction was always in shadow of PHOS: CPV was reconstructed only in runs where PHOS was present. CPV can be still useful in conjunction with tracking system and participate in global tracking.
- In Run3, readout hardware of CPV and PHOS will be different, raw data throughput will be different, data processing algorithms will also differ.
- In geometry description, alignment of CPV and PHOS modules should be decoupled as they are installed independently in ALICE.
- For all these reasons, it is more practical to split CPV and PHOS into two detectors in O^2

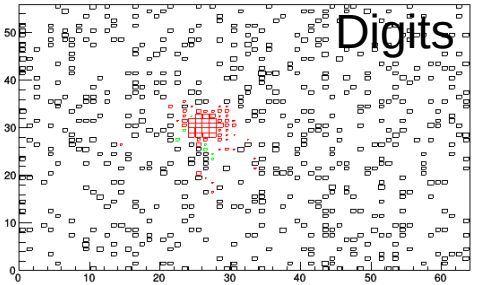
PHOS O^2 status



- Geometry description: ported in 2018
  - Caveat: mis-alignment implementation
- Hit creation: ported in 2018
- Digit creation: ported in 2018
  - Caveat: implement MC label handling with MC label container
  - Implement realistic time and pileup simulation
  - To be finalized before June 2019
- Digits->raw converter: to be ported
- Trigger simulation: to be ported

Single photon simulation





PHOS status: reconstruction

- Synchronous stage: to be implemented before Sept.2019
  - Sample decoding
  - Digits filtering to AOD caloCells, no clusters stored
    - Option 1:
      - Above some loose (~20 MeV) threshold
      - Not in noisy digits bad map
    - Option 2:
      - Belonging to clusters
- Asynchronous stage
  - Clusterization: ported in 2018
    - Create clusters with final calibration and bad map
    - Caveat: handle MC labels, accessing CCDB, unfolding
  - Track matching

FLP

- The goal of FLP:
  - Take raw data from 15 DDL links PHOS (35 kByte per Pb-Pb event) and from 1 CRU for CPV (5 kByte per Pb-Pb event)
    - Without data compression, raw data throughput from PHOS would be 1.7 Gbyte/s in Pb-Pb collisions → compression is inevitable.
  - Decode and compress data
    - Output of compressed data in PHOS would be cell ID, energy, time, HG/LG flag, quality flag
  - Create calibration objects for energy and time calibration, and bad channel map.
  - Create digits with significant information only and pass them to EPN
- Benchmarks of PHOS raw data decoding:
  - 13 μs/event/DDL in Pb-Pb 5.02 TeV 2018 @ CPU Intel Core i7 670 2.9 GHz
  - 6 μs/event/DDL in pp 13 TeV 2018
  - Assuming multi-core FLP CPU, all DDL links can be processed in parallel
- One FLP for PHOS and one FLP and CPV are installed, raw data processing to be developed and tested till September 2019.

CPV

- Simulation: being ported, to be finished before June 2019
  - Detector description
  - Hit production
  - Digit production
- Reconstruction: being ported, to be finished before Sept. 2019
  - Synchronous:
    - Signal decoding
    - Filter digits to AOD caloCells
  - Asynchronous stage
    - Clusterization
    - Track/PHOS cluster matching