The Road to mCBM 2024

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CBM Online Meeting, 17 May 2023

mCBM Timeline

- October 2023: Dry runs / cosmis runs
- November 2023: Technical runs with beam
- March 2024: Commissioning with beam
- May 2024: Physics data taking (Ni+Ni)

Computing goal

Online data inspection and reduction

- Minimal version (fallback solution): unpacking + digi trigger + event builder (reduction factor ~10)
- Full version: Physics trigger on Lambda decay (reduction factor > 100)

Data challenges

Well-defined breakpoints / milestones where the available software is tested under run-like conditions.

- Structured and planned development
- Benchmark the available software
- See where we are; learn about deficits and open issues
- Allow to re-steer if needed
- Get experience for data taking

We do not necessarily connect to the detector for testing; synthetic runs with re-play of recorded data at adjustable rate is possible.

Development timeline (proposal)

Date	Data Challenge
End of June 2023	Synthetic runs (replay from disk)
End of September 2023	Dry run (just DAQ, no detectors)
End of October 2023	Cosmic runs (no beam, detectors on)
Mid November 2023	Technical runs
March 2024	Commissioning
May 2024	Data taking campaign

To be defined

For each milestone:

- Which online process do we aim for?
- On which farm do we want to run? (entry nodes or Virgo)
- How do we distribute and manage the online processes?
- Which data do we use as input (for synthetic runs)?
- How do we monitor the online process and QA the output data?
- Where do we get the needed parameters from and how do we distribute them?
- How do we record data?

Proposal for DC June 2023 (Synthetic run)

- Which online process do we aim for?
  - Minimal version: All unpackers, digi trigger (time cluster), event building
  - Testing / comparing GPU vs CPU?
- On which farm do we want to run? (entry nodes or Virgo)
  - Is Virgo possible?
- How do we distribute and manage the online processes?
  - One process per node / timeslice
  - Use flesnet tool to start the processes along with the flesnet processes
  - Controls?
- Which data do we use as input (for synthetic runs)?
- How do we monitor the online process and QA the output data?
- Where do we get the needed parameters from and how do we distribute them?
- How do we record data?
  - Stay with ROOT data model (DigiEvent)

Online data processing

- Minimal version: unpacking, digi trigger, event building: June/July 2023

- Physics trigger: Lambda. Minimal requirements:
  - Unpacking of all detectors in the data taking
  - Local reconstruction STS and TOF
  - Tracking with STS and TOF
  - Trigger: Coincidence of two off-target tracks
  - Event building
  - Optional / if available:
    - Local reconstruction of other detectors; inclusion in tracking (TRD)
    - Secondary vertex trigger (KFParticle?)
  - Should be available for commissioning in March 2024
  - Would be good to have for cosmic runs in October 2023

Work distribution for DC 1

Issue	Who
Unpackers: production-ripe	DS
Digi trigger: parameters	SR
Event builder: parameters	PAL
Online process implementation	FW, VF
Process management	JdC
Monitoring	PAL?
Entry nodes	JdC / DE
Computing nodes	?