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CERN Prototype Run Plan: comments on data volume and data taking strategy

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Overview and basic assumptions

- Issue at hand: potentially prohibitively large total data volume to be recorded if the nominal plan created on 4/22/2015 is to be followed.
- A bit of history: initial discussions involved MC-based estimates of event sizes, such as 4MB per a 2GeV EM shower (electron) and 5 to 10MB for a muon track O(1GeV), after zero-suppression.
- Then we realized there is the CR muon flux of approx. 160 per m^2 of flat surface (~1.36 correction can be applied to account for the sides of a rectangular box resulting in ~200).
- This translates into approx 10,000 μ coming into the detector volume each second.
- 2ms drift time translates into 20 μ superimposed onto most any event we will be trying to record.
- The “before” and “after” windows are highly desirable in order to characterize backgrounds (mostly CR muons) and allow to properly tune tracking and other pattern recognition machinery.
- Even without the “before” and “after” readout we have 20x10MB=200MB per readout.
- Current run plan contains multimillion samples. One million corresponds to 0.2×10^{15}B, i.e. 0.6PB with oversampling. Not sustainable!

Some questions and comments

- Not sure what is meant by “spill” in the run plan.
- Dividing the stated statistics by time gives ~10Hz rate. What was the 200Hz mentioned before? Probably has to do with “spill” definition.
- Very large samples of π+ are due to (I assume) taking all positives including protons. Do we need or do we want to trigger on species?
- We probably won’t need specialized μ runs.
- Need to do reprioritization.