



DAQ for BIG

BIG=joint Beam Instrumentation wG

- Common solutions as far as possible for SP and DP protoDUNEs
- Configuration of the beam instrumentation still evolving, should be fixed by September
- Mixed Hadron+electron beams
- Beam momenta from 1 to 7-10 GeV/c
- At low energies electrons dominate
- Crowded and relatively short beam line
- Need to reduce the data throughput selecting events with trigger
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 - Extremely sensitive to material budget
 - Difficult for Cerenkov
 - Difficult for ToF
- Will be a "variable configuration" beamline

Starting point

- Beam monitors + trigger + spectrometer+tracking
 - 5 stations equipped with one or two planes of scintillating fibres
 - Each plane 200 fibres (square, 1mm)
 - Readout by SiPM , one per fibre
 - Time stamped
- ToF for Particle Id at low energies
 - 1ns or better needed
 - Try to reuse the same devices as above.
 - New electronics to be tested for fast timing
- PID at "high" energies
 - One or two Cerenkovs, standard CERN readout
 - Time stamp
- Rejection of electrons
 - Probably a threshold cerenkov

Online - offline selections

- Trigger:
 - From beam monitors, select tracks with signal in at least N of them, where N is probably all
 - Electron discrimination from Cerenkov
 - Keep open the possibility to add Cerenkov if wish to enrich the proton sample
- Stored:
 - Signals from every fibre of all beam monitors
 - Fast time signal from fibres, at least first and last monitors
 - Signals from Cerenkov
 - All with CERN-compatible time stamp (whiteRabbit?)

Today, and next future

- Define participations
- Start thinking about requirements to be implemented in the electronics of the beam monitors
- Start thinking to the architecture of the trigger, needed hardware, software...
- How to merge in the DAQ
- We would like to test a prototype of the beam monitors+electronics
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