

MPP meeting 25 March 2011

Original agenda:

- Estimating UFO speed/size (J.Wenninger)
- Status report for ONLINE UFO search tool (T.Baer)
- MP issues of (too) high lumi rates in ALICE (A. Di Mauro)
- AOB

Present:

Bernd Dehning, Jorg Wenninger, Tobias Baer, Antonello Di Mauro (Alice), Barbara Holzer, Andrzej Siemko, Richard Jacobsson (LHCb), Ruediger Schmidt, Eduardo Nebot, Bruno Puccio, Mario Deile, Ben Todd, Sigrid Wagner, Annika Nordt, Arjan Verweij, Mariusz Sapinski, Juan Blanco, Markus Zerlauth, Mike Koratzinos.

Minutes:

On UFO duration and speed (Jorg and Tobias)

Jorg finally presented his analysis, pending since January. When we look at BLM data vs time, what we see is the convolution of UFO shape and beam shape. Jorg looked at all UFO data. All of the signals look surprisingly Gaussian. Jorg then assumes a constant vertical speed. Free fall velocity is 0.6m/s. (but ionization as it hits the beam might change that). There are two types of UFOs with respect to this analysis that triggered a dump: 1/ UFO signal rises and a dump is triggered before maximum losses 2/signal had already started falling before the dump came. There are 18 UFOs in this second category which are fitted to a Gaussian and then the speed is determined. Also some pre-cursors are included (full Gaussians). Assuming that emittance is 3.5um, in many cases the speed is higher than the .6m/s expected from free fall (from .4 to 4.5m/s). A. Nordt did the analysis of the one event where 5 precursors were seen. No clear correlation is seen between beam size and signal duration.

The next step is to check the UFOs seen below threshold (Tobias). There are 113 of them. The distribution of speeds has as most probable value 0.6m/s, as expected from free fall, with a tail at high values. A possible explanation is that UFOs below threshold are not expelled, whereas above they are.

Another possibility is that they get evaporated (postulated by Arjan). More statistics would be interesting.

UFO buster (Tobias)

Tobias then presented the new tool he is developing for catching UFOs below threshold. The idea is to have an online tool that triggers and stores data if a UFO pattern is seen. Status of the tool is as follows: trigger has been implemented; BLM buffer has been implemented (running sum 2 , 43000 points equivalent to 3.5sec); Data selector and extractor to be done.

The program found 26 UFOs in 3 fills (total run time 17 hours) with no false triggers (purity 100%). Mike: 100% purity means that we are able to loosen trigger requirements?) Most of UFOs are 1% of dump threshold. The spatial distribution of these UFOs was shown and already some UFOs were seen in the 'holes' of last year.

Trigger algorithm:

- RS4 of one BLM above threshold 1;
- two BLMs within 40 m above threshold 2;
- some BLMs are not taken into account. Both BLMs from same beam.
- $RS2/RS1 < 0.6$ and $RS3/RS2 < 0.4$

Ruediger: why have we seen no UFO dumps this year? Possible answer is the higher threshold used. There was some discussion of how to make this a permanent tool.

Luminosity jumps issues in Alice (Antonello)

Alice has been designed as a low luminosity experiment (limit typically 10^{30}). Major limitation comes from drift time inside the TPC (96usec). Antonello then showed an example of a luminosity jump: fill 1640 had a luminosity jump during optimization when the trigger rate reached 500kHz (target rate is 20kHz). This is a safety issue for Alice (gaseous subdetector safety). He then proposed a "luminosity jump protection system" with the goal of bringing Alice to a safe state on detection of high rates, but not dumping the beam. Such a protection will result in loss of data for Alice (as much as 2 hours). To prevent such a system triggering and the resulting loss of data, the lumi leveling application might be able to help. Ruediger noted that the machine cannot guarantee currently that at the time scale of a few seconds luminosity does not shoot to maximum. It was noted that there is no indication for the moment that a hardware interlock is necessary. Richard commented that LHCb has no such problems.

MDs and MPS (jorg)

Jorg made a first proposal for discussion of how we should handle MDs: He suggests a classification according to boundary conditions.

MPS class A: MDs with setup beams, probe bunch or setup beam – automatically approved

MD requests with unsafe beams:

MPS class B: unsafe beams at end-of-fill: to be approved on a case by case basis.

MPS class C: unsafe beams involving changes of orbit optics: setup time is a 1-2 days. For approval, a series of steps need to be followed

MPS class D: unsafe beams involving virgin machine territory.

Jorg insisted that we should always ask the question if a request cannot be downgraded to a lower category. For the first MD period (end of April) Jorg suggested to schedule only class A MDs. Markus: for class C and D some formalism should be enforced – perhaps with a written procedure?

Tracking and revalidation of changes (Markus)

Markus presented his proposal for tracking changes to MP systems: key is to provide and produce clear procedures. A good start is to start using the MPS website. Markus showed us the MPS site which he has populated with most changes (from memory). Proposed next steps: anybody can add to the tracking tool. Propose to produce a common EDMS document as it already happens for the magnet protection system.

Scriba: Mike