

# MPP meeting 21 January 2011

---

## Original agenda:

- First results of FLUKA simulations for wire-scans (A. Lechner)
- Beta\* reach in 2011 (R. Bruce)
- Attempt to measure UFO speeds (J. Wenninger)
- News from the BLM system (E.B. Holzer)
- New beam presence flag system (A. Jalal)
- AOB:
  - Change in MPP organization
  - TCTVs for ions run 2011
  - Injection tolerances

## Present:

Matteo Solfaroli, Verena Kain, Laurette Ponce, Barbara Holzer, Francesco Cerutti, Roderik Bruce, Mariusz Sapinski, Marco Calviani, Annika Nordt, Markus Brugger, Markus Zerlauth, Massimiliano Ferro-Luzzi, Anton Lechner, Mario Deile (Totem), Marek Gasior, Ben Todd, Ralph Assmann, Siegfried Wenig (Atlas), Agnieszka Priebe, Eduardo Nebot, Christoph Kurfuerst, Antonello Di Mauro (Alice), Bernd Dehning, Ruediger Schmidt, Sigrid Wagner, Moritz Guthoff, Juan Blanco, David Stickland (CMS), Mirko Pojer, Jan Uythoven, Richard Jacobsson (LHCb), Jorg Wenninger, Mike Koratzinos.

## Minutes:

## News (Jorg):

Jorg informed us of some imminent organizational changes: due to other duties, he will step down from chairman of MPP and rMPP. New structure will be discussed in Chamonix and will be presented in the near future.

## Beam presence flag: report on status (A.Jalal)

Adam explained that the current system was designed with operational efficiency in mind, not safety. New system has been designed to answer safety issues. Four new flags are generated (coming from beam pick ups at pt 4), adding to the two flags of the old system. Then use majority of four out of six (this means that if 3 flags say no beam, the BPF is set to no beam). The system has been tested successfully. Since the beam pick ups have some dependency on the position of the beam, two opposite channels are added together, and are then split to two. (So 4 independent signals have become two double signals.)

Some observations: when below threshold, sometimes spikes can be seen due to off center beam. Noise is also seen, when close to threshold. Longest delay between two flags changing state: 4 minutes! This happens close to threshold.

Fail unsafe situation: defined as the case when the BPF says there is no beam, but there is.

Jorg: What should the threshold for beam be?  $1-3e9$  – not too low. The threshold can only be changed from down the tunnel. It has currently been set to approximately  $1e9$ . We will know the exact threshold when we get beam in the machine. We will then decide if we should change it. Ruediger remarked that we should be careful with the following: in case of unbunched beam, even at high intensity, BPF will show no beam.

## FLUKA simulations (Anton Lechner)

Anton reported on the quench test with the wire scanner that took place 1 November. A dipole quenched during that test. The idea is to benchmark fluka for a known, controlled event. Then compare relative BML pattern and absolute dose. The simulation used real field maps (impact on calculations was small) and a static wire situation was simulated. In reality, the BLM signal looks as if there are wire oscillations. So, an oscillation was introduced (50Hz) – oscillations have only a small effect overall ( a few %). Wire thickness: it was measured to be  $17\mu\text{m}$  (from  $30\mu\text{m}$  nominal) and it was round, not oval. The theory is that the wire heats up and surface evaporates. BLM active volume had to be increased by 12%.

Results: relative comparison looks good. Absolute uncertainty is also very good (within 20%, apart from the second BML where equipment in front is not simulated). 30% of the signal comes from the tunnel (not straight through particles). Quench level 15-20mJoule. Next step: work together with Arjan. Subject will be revisited this year.

## Beta\* reach in 2011 (R. Bruce)

Analysis considers only aperture limits. Uses nominal separation of .7mm, and 2mm orbit uncertainty. If we keep the present settings,  $\beta^*=2.7\text{m}$  (2.3 with aperture scaling). Orbit movements: It turns out that in the triplets, 99% of the time we are at less than 1.6 sigma (for IR1,IR5,IR8). And what happens during the 1% of the time that we are outside the limits? If we assume 1 asynchronous dump per year, then the risk is small. (1 in 30000 years damage in the triplets).

Proposed margins and settings for 2011: similar to 2m run last year; Biggest difference TCT-TCSG IR6 (where we were too conservative in 2010). (The plan is not to squeeze IR2 ) What can we reach in  $\beta^*$ ? N1 results: 4TeV: 1.8m (3.5TeV 2m) scaling method: 4TeV: 1.5m. Proposal: start this year at  $\beta^*$  of 1.5m (4TeV) or 1.5m-1.6m (3.5TeV). Recommendation to measure the local triplet aperture. Crossing angle 150urad.