Miscellaneous

- VELO position limits : next week.
- SMP : next week.
- Squeeze factor (SMP++):
  - S. Redaelli identified quadrupole pairs (one pair/IR) that can be used to deduce b* from the ratio of the currents (b* 10 m to 0.5 m). To be checked for b* = 90 m, etc
- Power cut tests.
  - Review the status of power cut tests in near future.

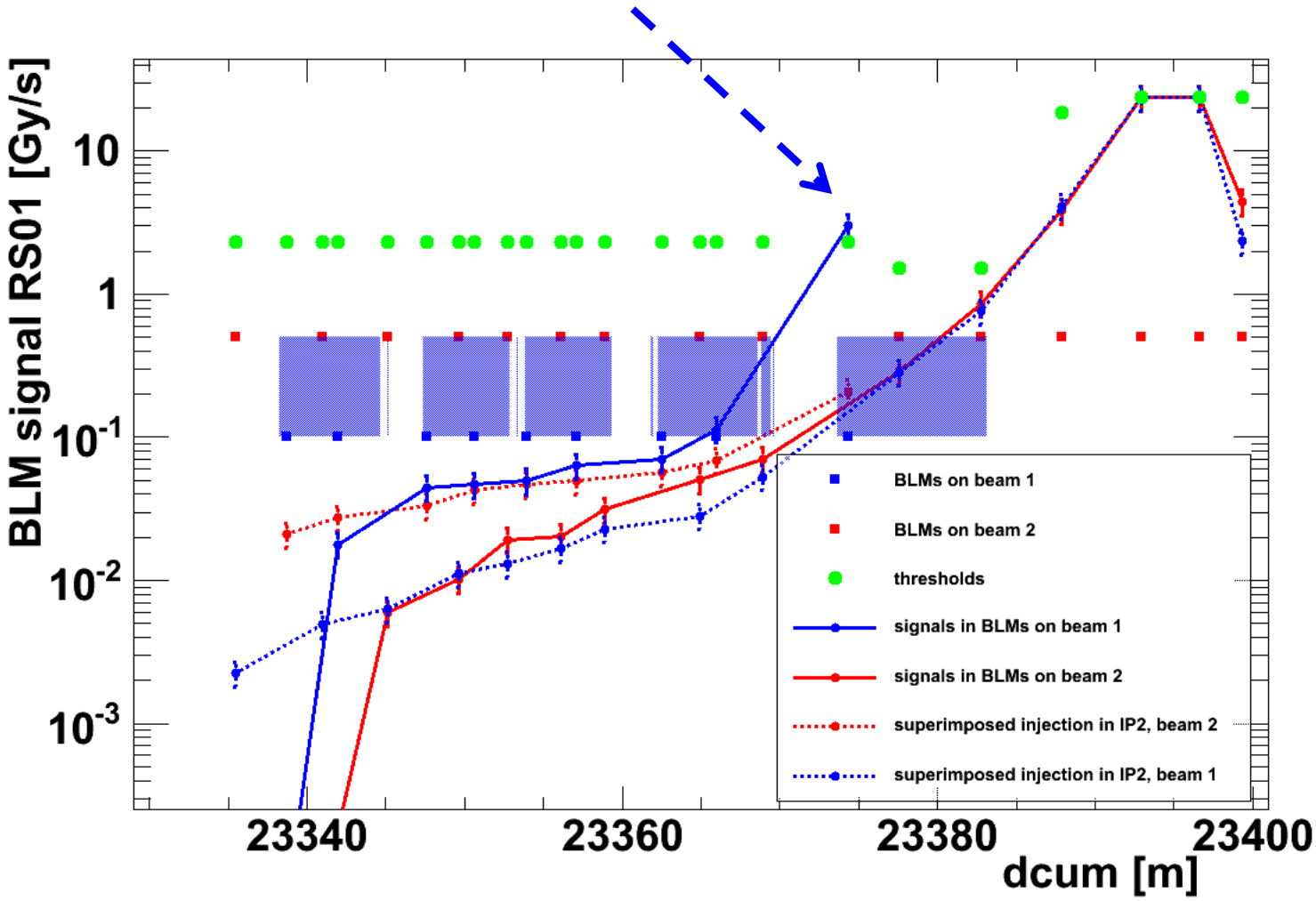
SIS

- New injection interlock on the QPS_OK signal.
  - Used as **startup** interlock in the PIC. In case of a quench heater problem, QPS_OK switches to FALSE but the PC is not stopped.
  - SIS will inhibit injection if there is any QPS_OK = FALSE (13 kA, IPQ, IPD, IT).
- New injection interlock on the RF TDCs.
  - Injection inhibit if the RF synchronization is not correct.
- IT girders motors interlock.
  - Beam dump if motors are switched on.

Over-injection – BLM team (1)

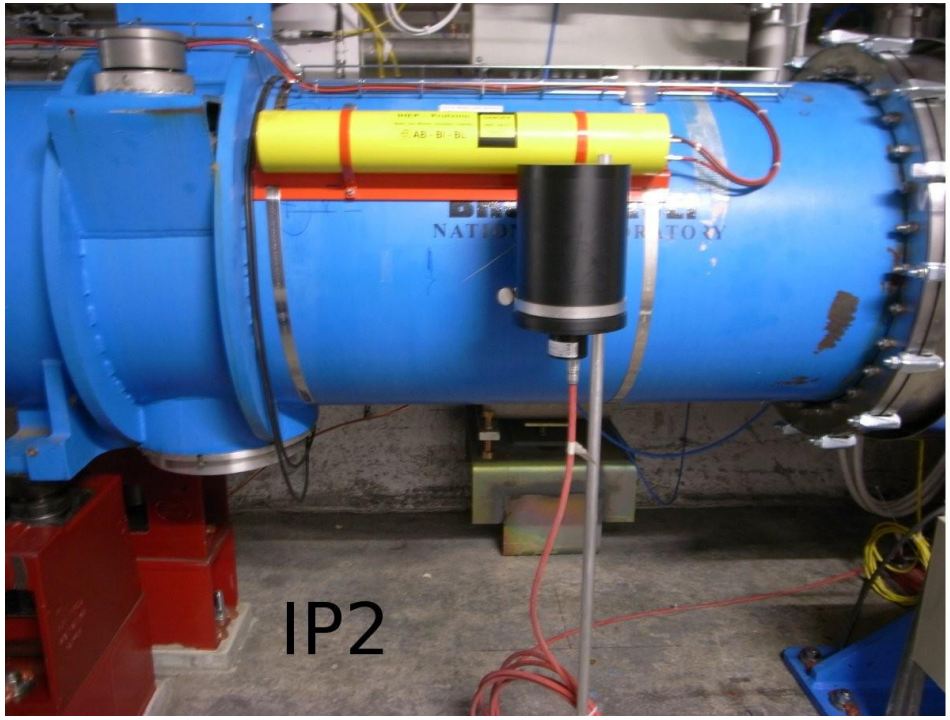
Summary of a presentation by M. Sapinski (added to today's presentations).

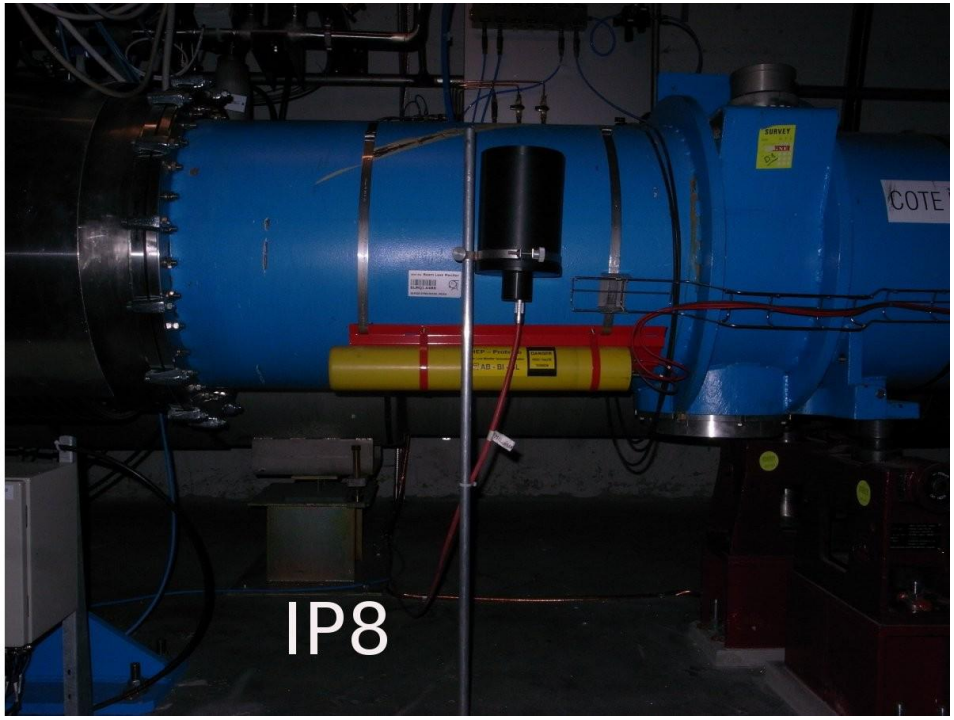
- 'Beam1' monitor for Q3/triplet protection installed on D1 systematically triggering when a pilot is send to the TDI.



Over-injection (2)

- Tests indicate that the losses come from the outside of the cryostat.
- Inspection of the BLM installation in the tunnel revealed that in LSS2 the BLM was installed ~20 cm above the beam line, while in LSS8 it was installed below the beam line (because of a RAMSES monitor).
  - LSS8 monitor moved to same position than LSS22 monitor.
  - There are also other local differences (walls, gates …).





Over-injection (3)

- A new threshold table will be prepared for the triplet BLM in case the problem is still present in 2010 (after moving the monitor).
- Saturation of the two TDI BLMs (IC):
  - The dynamic range of one monitor will be increased by a factor 100 (pulse stretching).
  - The other monitor will not be touched (for fast loss measurements).
- Large backgrounds in ALICE during over-injection?

Collimation BLMs

- The IC BLMs on the TCPs are likely candidates for saturation well below the damage level (factor … 1000!).
  - Ongoing discussions on increasing the dynamic with additional monitors, pulsing stretching of existing monitors etc. No yet converging.
  - This also has implication for protection of the collimators, as we always analyzed the failures by considering (fast) damage to the collimators. Probably covered by the TCS – but watch out!

LHCf

- SIS injection interlock from LHCf will become un-maskable (at restart with beam).
  - Issues in 2009 were related to the DIP⇔CMW servers.
  - Clear server restart instructions (to be done!) should largely improve the situation.
  - Would we fill the LHC if the DIP communication is down???

Wire scan limits

- From M. Sapinski (**CERN-AB-2008-030 BI** for damage limits):
  - Wire speed 1 m/s.
  - Q5 is the magnet that is most exposed for quench.
  - Damage limits are more “solid” than (older) Geant4 quench simulation.

E (GeV)	Quench limit	Damage limit
450	No limit	~25% of nominal
7000	~0.3-2.2% of nominal :1-7E12 p	~6% of nominal

- Performing wire scans at 3.5 TeV in the first phases (with a few pilots…) should be no problem at all (more margin wrt quench…factor 5 or more)
  - Observe BLMs during scans and check predictions.

Energy tracking (BETS) MKE/MKI

Proposal for changes (reduction of tolerances).

- SPS extraction :
  - adapt E to new LHC matching, tolerance < dp/p aperture TI2/8
  - SPS reference energy matched to LHC is 451.25 GeV.

Kicker	E limit 2009 (GeV)	E limit 2010 (GeV)	V limit 2009 (kv)	V limit 2010 (kv)
MKE4 (B2)	451 ± 1.5	**451.25 ± 1.2**	51.2 ± 2	51.2 ± **1?**
MKE6 (B1)	451 ± 1.5	**451.25 ± 1.2**	33.1 ± 2	33.1 ± **1?**
MKI2	450 ± 5	450 ± **1**	49.6 ± 1	49.6 ± 1
MKI8	450 ± 5	450 ± **1**	51.3 ± 3.5	51.3 ± **?**

- We could consider reducing the tolerance some of the kick voltages.
  - So far we never trimmed at extraction from the SPS… but the errors are acceptable (~ 30 μrad max).

Test documentation

- Very poor record of filling in the MPS te tracking pages.
- Only PIC, FMCM and SIS tests are sys
  - **Collimators not filled, but very nice** presentation @ Evian).
- Everyone should analyze what tests ne considered to be commissioned (from
  - Please reset the data on the MPS test
- In 2010 the test results must be filled f
- We should make a list of MPS tests to instead of programmed beam dump →
  - With good instructions they can be do

	A	B
1	Collimator	*MPP test resutls: EDMS Doc. No.*
2		
3	TCDIH-29012	https://edms.cern.ch/document/1052530/1
4	TCDIH-29050	https://edms.cern.ch/document/1052525/1
5	TCDIH-29205	https://edms.cern.ch/document/1052526/1
6	TCDIH-29465	https://edms.cern.ch/document/1052522/1
7	TCDIH-87441	https://edms.cern.ch/document/1052527/1
8	TCDIH-87904	https://edms.cern.ch/document/1052528/1
9	TCDIH-88121	https://edms.cern.ch/document/1052529/1
10	TCDIV-29012	https://edms.cern.ch/document/1052675/1
11	TCDIV-29234	https://edms.cern.ch/document/1052531/1
12	TCDIV-29509	https://edms.cern.ch/document/1052532/1
13	TCDIV-87645	https://edms.cern.ch/document/1052533/1
14	TCDIV-87804	https://edms.cern.ch/document/1052535/1
15	TCDIV-88123	https://edms.cern.ch/document/1052536/1
16	TCL-5L1-B2	https://edms.cern.ch/document/1052537/1
17	TCL-5L5-B2	https://edms.cern.ch/document/1052539/1
18	TCL-5R1-B1	https://edms.cern.ch/document/1052540/1
19	TCL-5R5-B1	https://edms.cern.ch/document/1052541/1
20	TCLA-6L3-B2	https://edms.cern.ch/document/1052542/1
21	TCLA-6R3-B1	https://edms.cern.ch/document/1052543/1
22	TCLA-7L3-B2	https://edms.cern.ch/document/1052544/1
23	TCLA-7R3-B1	https://edms.cern.ch/document/1052546/1
24	TCLA-A5L3-B2	https://edms.cern.ch/document/1052547/1
25	TCLA-A5R3-B1	https://edms.cern.ch/document/1052548/1
26	TCLA-A6L7-B2	https://edms.cern.ch/document/1052549/1
27	TCLA-A6R7-B1	https://edms.cern.ch/document/1052550/1
28	TCLA-A7L7-B2	https://edms.cern.ch/document/1052551/1
29	TCLA-A7R7-B1	https://edms.cern.ch/document/1052552/1
30	TCLA-B5L3-B2	https://edms.cern.ch/document/1052554/1
31	TCLA-B5R3-B1	https://edms.cern.ch/document/1052555/1
32	TCLA-B6L7-B2	https://edms.cern.ch/document/1052556/1
33	TCLA-B6R7-B1	https://edms.cern.ch/document/1052557/1
34	TCLA-C6L7-B2	https://edms.cern.ch/document/1052558/1
35	TCLA-C6R7-B1	https://edms.cern.ch/document/1052559/1
36	TCLA-D6L7-B2	https://edms.cern.ch/document/1052560/1
37	TCLA-D6R7-B1	https://edms.cern.ch/document/1052561/1
38	TCLIA-4L8	https://edms.cern.ch/document/1052562/1
39	TCLIA-4R2	https://edms.cern.ch/document/1052563/1
40	TCLIB-6L8-B2	https://edms.cern.ch/document/1052564/1

Increasing Intensity in 2010 (1)

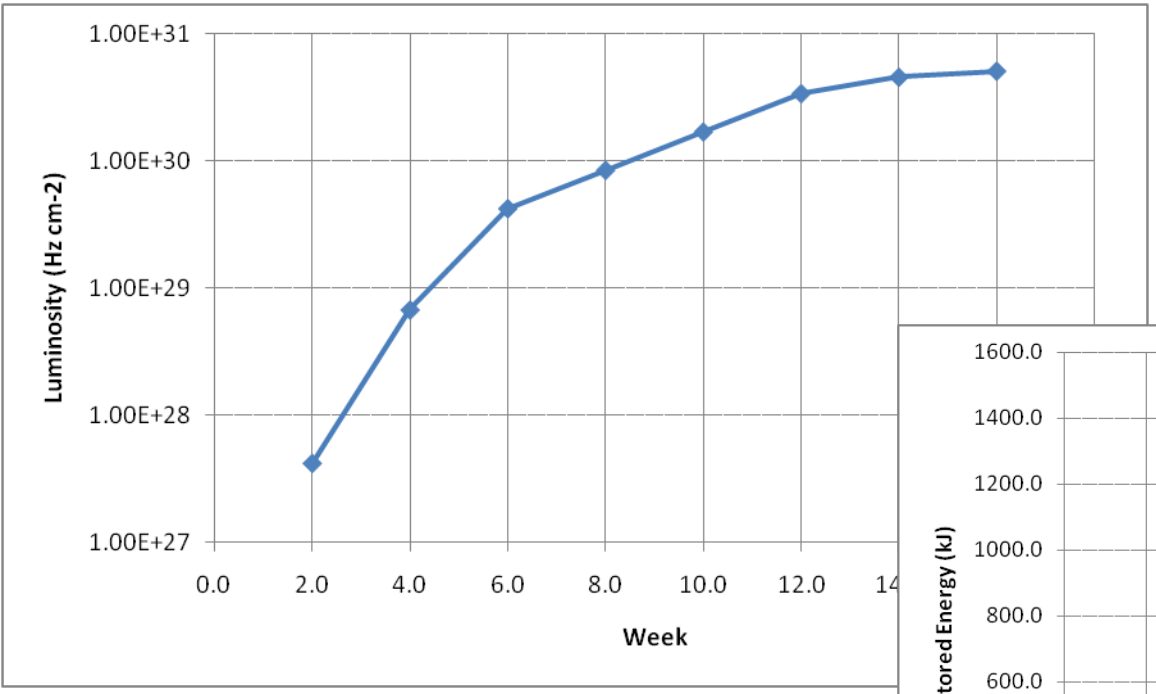
- Aim for intensity steps limited to factor ~2 (except vey beginning!).
  - Only up to ~40 bunches. Already a long way.
  - Arbitrary choice of max bunch intensity of 5E10.
- Use flexibility of train generation for 50 ns beams by groups of 6 bunches (1 PSB bunches → 6 SPS bunches).
  - CPS can a priori deliver batches of n×6 (6,12,18,24,30,36), n = 1-6.
  - Very nice for staging intensity (and inventing lot's of filling schemes !).
- Injection – based on progression.
  - Single bunch up to 5E10.
  - 4 bunches up to 5E10.
  - 6 bunches up to 5E10 (50 ns train). Injection of 3E11 still significantly below SBF limit at injection.
  - Then 12 bunches etc..
- Of course there are many alternate routes…

Increasing Intensity in 2010 (2)

Stage	Ib	Nb	Stored E (kJ)	Stored E step	Peak L (Hz cm-2)	Comment
Startup	5E+09	4	11.2	-	4.2E+27	
Single b inj, Stage 1	2E+10	4	44.8	4.0	6.8E+28	**≈ 3x SBF limit 3.5 TeV**
Single b inj, Stage 2	5E+10	4	112.0	2.5	4.2E+29	
Single b inj, Stage 3	5E+10	8	224.0	2.0	8.5E+29	
Four b inj, Stage 1	5E+10	16	448.0	2.0	1.7E+30	**SBF limit 450 GeV**
Four b inj, Stage 2	5E+10	32	896.0	2.0	3.4E+30	
Standard 43x43	5E+10	43	1204.0	1.3	4.6E+30	
Short trains	5E+10	48	1344.0	1.1	5.1E+30	8 trains of 6 **OR** 4 trains of 12

Increasing Intensity in 2010 (3)

- Just assume 2 (good) weeks per step (MDs not included)… arbitrary choice!



- If we reach that stage, we should run stably for a while (with trains or 43x43).