



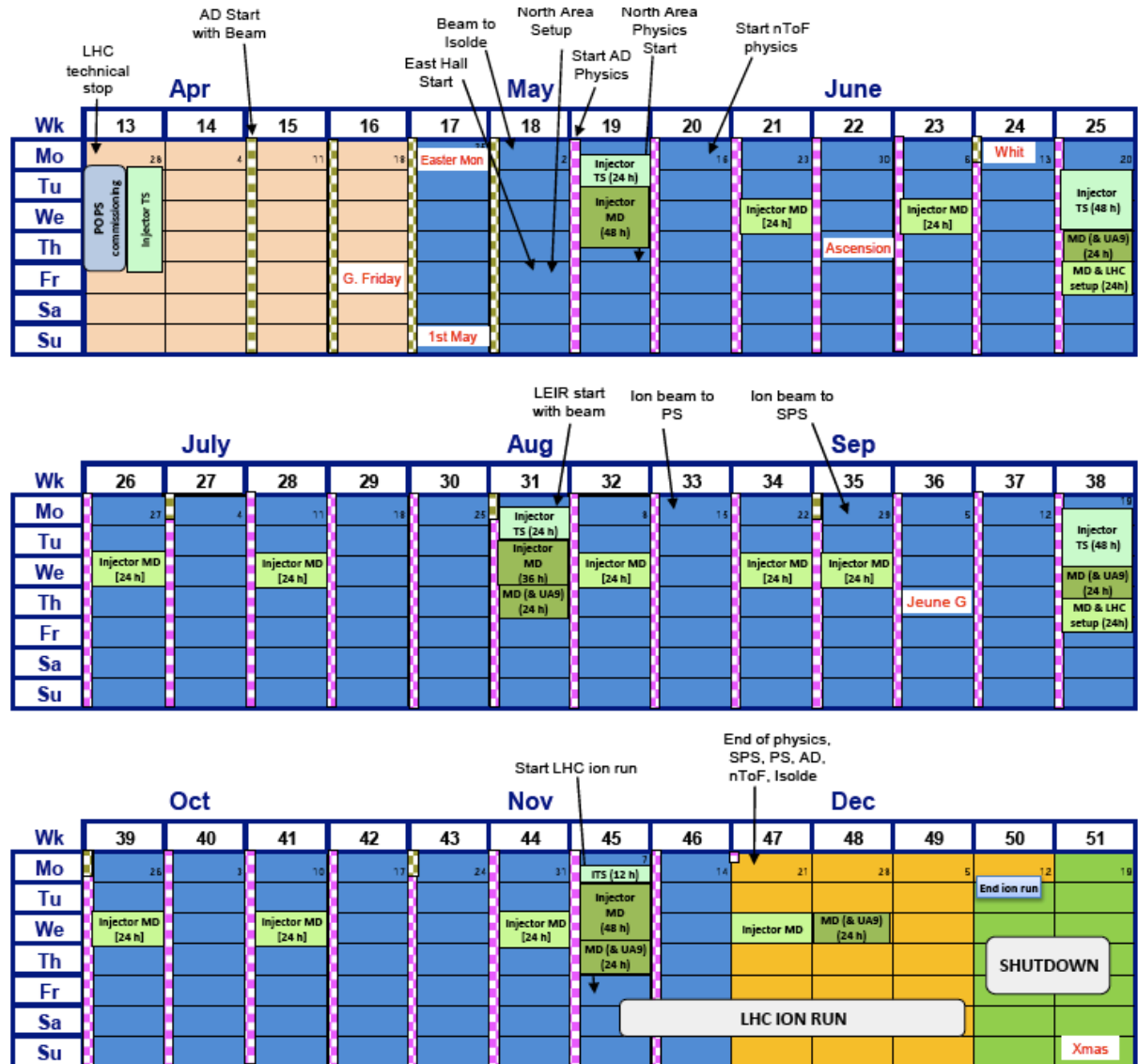
Injector MD planning 2011: preliminary considerations

G. Rumolo

- 2011 Injector Schedule
- SPS upgrade MD requests

Injector schedule 2011 v1.1

- MD requests are still being submitted, deadline Jan 31st 2011
- Already so far, quite large volume of requests for the optimization of the LHC beams and upgrade studies
- MD time is frequently also used to set up not only MD but also physics cycles (e.g. all the ion set up, NA61, UA9, etc.)



New MD web page (thanks to Sophie Dawson and B. Salvant)

Test MD Layout

https://ab-mgt-md-users.web.cern.ch/ab-mgt-md-users/2011/floatingmd.html

CERN Accou...anagement Euro-exchangeCHF OP Webtools LHC latest news Meteo-Chamonix.org CERN impedance webpage Old APC 2010 MD Planning emetral BTE Desktop PS optics files Controls

CERN Users' pages LSF Web - List of Members for Su... Test MD Layout Authorization and Resources Man...

2011 Machine Development Planning

- Home
- Submit MD Time Request
- Submit MD Results to MD Coordinator
- MD reports to MSWG
- Long MD Sessions
- Floating MD Sessions
- MD Sessions in Parallel with Physics
- SPS Physics and MD Cycles
- MD Requirements in terms of cycles

"Wednesday" Floating MD Sessions

The LHC has priority during these sessions: the MD might have to stop during the LHC re-fill

	Week No.				
Jan	1	2	3	4	
Feb	5	6	7	8	
Mar	9	10	11	12	13
Apr	14	15	16	17	
May	18	19	20	21	
Jun	22	23	24	25	26
Jul	27	28	29	30	
Aug	31	32	33	34	
Sep	35	36	37	38	39
Oct	40	41	42	43	
Nov	44	45	46	47	
Dec	48	49	50	51	

MD users are encouraged to submit their requests for 2011. The deadline is **January 31st, 2011**

Proposed MD studies/requests for 2011 (E. Shaposhnikova, SPSU meeting, Dec 2010)

- re-establish low-loss nominal 25 ns beam, reference measurements for e-cloud (scrubbing?)
 - 1st MD of 16 hours minimum (4h OP + 8h RF + 4h)
 - Note, 75 ns and 50 ns nominal beams will be operational before 1st MD ...
- limitations with “above nominal” intensity beams, increase of intensity in steps with time for optimisation
 - probably 50 ns first and then 25 ns beam
 - at least 2 MD blocks of 12 hours each
- transverse emittance preservation:
 - accurate and systematic measurements during each MD
 - minimisation of blow-up
 - study origin, if blow-up unavoidable
- impedance identification (transverse + HOM longitudinal)
 - transverse – parallel MDs (requested by B. Salvant)
 - longitudinal - with 75 ns, 50 ns and 25 ns beam of variable (low) intensity
- TMCI – single bunch - parallel MDs
 - threshold in a double RF system
 - multi-bunch stability
- double RF system (stability and emittance blow-up) – nominal LHC beam (dedicated time needed?)

Proposed MD studies/requests for 2011 (E. Shaposhnikova, SPSU meeting, Dec 2010)

- Low gamma transition - most urgent studies
 - optics studies - parallel MDs
 - acceleration of nominal LHC beams late - long dedicated MD session(s)
 - study minimum longitudinal emittance/bunch length at 450 GeV/c sufficient for beam stability
- Detailed proposal submitted later by H. Bartosik
 - optics studies (chromaticity correction, nonlinear optimization, working point, optics functions, ...): parallel MDs
 - matching of transfer line TT2/TT10: parallel MDs?
 - studies on instability thresholds (single bunch): parallel MDs
 - studies on the impedance model: parallel MDs
 - studies of collective effects and instabilities with nominal LHC beams (multi-bunch), finding minimum longitudinal emittance/bunch length needed for beam stability at 450GeV: dedicated MDs
 - if 6D beam parameters with Q20 are compatible with LHC -> inject into LHC: dedicated MDs
 - study possibility of injecting fixed target type of beams above transition: parallel MDs? (new user and MD cycle needed)

SPS upgrade requests – electron cloud (M. Taborelli)

1. MD few hours with the same beam (nominally) for the tests on the e-cloud monitors and pressure data each each time a new liner is put in. Even if we have a reference StSt sample, this is useful for more general comparison. Possibly these tests should be done with nominal intensity and 25ns. The same is true for Fritz's RF measurements
2. There were discussions to put a beam with a weaker bunch in front to sweep away the slow secondaries: if this is possible in the SPS, the ECM would certainly be a nice tool to qualify the efficiency of such a beam gymnastics.
3. If we insert more test devices (as pick ups between dipoles) it will not have a major influence on the type of beam needed for testing.
4. More after discussions in Chamonix ?

SPS upgrade requests – electron cloud (M. Jimenez)

1. We would like to measure or estimate the accumulation of surviving electrons using the SPS electron cloud diagnostics, which is enough to try this experiment.
 - Inject 6 or 7 batches (or the needed number) with 50 ns spacing and $1.1E+11$ ppb. The idea is to fill entirely the SPS in order to be as close as possible to the condition of LHC filling. Last year's measurements in the LHC have shown a coupling between batches when the spacing is smaller than $10\mu\text{s}$ so we should be able to reproduce something equivalent in the SPS.
 - The accumulation of surviving electrons is of major importance since, if it occur, it can compensate part of the benefit of the scrubbing.
- Even if the experiment is LHC driven, it can be of general interest to qualify the reflectivity properties (R) of the surfaces in the liners.

A rapid calculation of the requested MD hours for this list of studies (optimistic)

1. **24h** (25ns beam optimization, scrubbing)
+ **24h** (25ns beam to be used again for
liner/magnet exchanges)
2. **12h** (25ns ultimate) + **12h** (50ns
ultimate)
3. **12h + 12h** (longitudinal impedance
studies with 25, 50, 75ns beams)
4. **12h** (double rf-system)
5. **24h** (low γ_t multi-bunch beams)
6. **12h** (more e-cloud studies, e.g. single
cleaning bunch, Miguel's reflectivity
coefficient studies)



out of **434h** (floating +
dedicated), i.e. **33%**

Other users of SPS dedicated time (usually need SPS coasts)

- Collimator studies (request by R. Assmann already received): at least 6 x 12h
- Crab cavity studies (request by R. Calaga already received): at least 3 x 6 = 18h
- BBLR studies (no request yet received this year, but F. Zimmermann said he would certainly ask for MD time)
- NA61 set up (from MSWG on Jan 14th, however no official request yet)
- Set ups of the ion cycle needed later on during the year (no request yet)
- BI tests ?
- Probably 50% efficiency of the MD hours (based on the experience of last year)