

LHC running scheme for 2010 (from Giovannozzi's talk at Evian 2010)

Step	Bunches	p per bunch	Bx per s	L (cm ⁻² s ⁻¹)	L/Bx (cm ⁻²)	μ
2/3	2 x 2	2 x 10 ¹⁰	0.022 x 10 ⁶	3.6 x 10 ²⁸	1.64 x 10 ²⁴	0.1
3	43 x 43	3 x 10 ¹⁰	0.483 x 10 ⁶	0.17 x 10 ³¹	3.54 x 10 ²⁴	0.3
4	43 x 43	5 x 10 ¹⁰	0.483 x 10 ⁶	0.48 x 10 ³¹	9.94 x 10 ²⁴	0.8
5	156 x 156	5 x 10 ¹⁰	1.75 x 10 ⁶	1.7 x 10 ³¹	9.71 x 10 ²⁴	0.7
5/6	156 x 156	7 x 10 ¹⁰	1.75 x 10 ⁶	3.4 x 10 ³¹	19.4 x 10 ²⁴	1.5
7	144 x 144	7 x 10 ¹⁰	1.62 x 10 ⁶	2.5 x 10 ³¹	15.4 x 10 ²⁴	1.2
8	288 x 288	5 x 10 ¹⁰	3.24 x 10 ⁶	2.6 x 10 ³¹	8.02 x 10 ²⁴	0.6
8/9	432 x 432	7 x 10 ¹⁰	4.85 x 10 ⁶	7.5 x 10 ³¹	15.5 x 10 ²⁴	1.2
9	796 x 796	7 x 10 ¹⁰	8.93 x 10 ⁶	14 x 10 ³¹	15.7 x 10 ²⁴	1.2

50ns bunch trains

Proposed parameters evolution - I

Step	E [TeV]	Fill scheme	N	β^* [m] IP1 / 2 / 5 / 8	Run time (indicative)
1	0.45	2x2	5×10^{10}	11 / 10 / 11 / 10	Weeks
2	3.5	2x2	2 - 5×10^{10}	11 / 10 / 11 / 10	
3	3.5	2x2*	2 - 5×10^{10}	2 / 10 / 2 / 2	
4	3.5	43x43	5×10^{10}	2 / 10 / 2 / 2	Weeks/Months
5	3.5	156x156	5×10^{10}	2 / 10 / 2 / 2	
6	3.5	156x156	9×10^{10}	2 / 10 / 2 / 2	Months
7	3.5	50 ns - 144**	7×10^{10}	2.5 / 3 / 2.5 / 3	
8	3.5	50 ns - 288	7×10^{10}	2.5 / 3 / 2.5 / 3	
9	3.5	50 ns - 720	7×10^{10}	2.5 / 3 / 2.5 / 3	Months

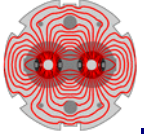
* Turn on crossing angle at IP1.

**Turn on crossing angle at all IPs.

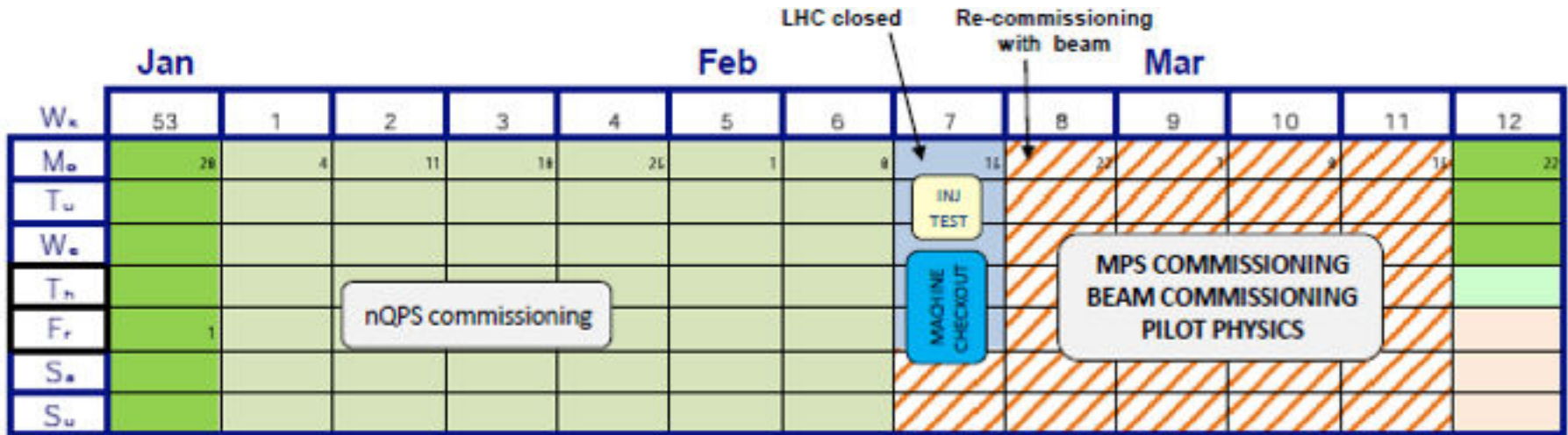
Proposed parameters evolution - II

Step	Phase	N	N_b^{\max}	$N_{\text{tot}}/N_{\text{tot}}^{\text{nom}}$ [%]	E_{beam} [MJ]	L [$\text{cm}^{-2}\text{s}^{-1}$]
2/3	Beam commissioning – respecting safe beam limit	2×10^{10}	2	0.01	0.02	3.6×10^{28}
3	Pilot physics – squeeze to target values	3×10^{10}	43	0.4	0.7	1.7×10^{30}
4		5×10^{10}	43	0.7	1.2	4.8×10^{30}
5		5×10^{10}	156	2.4	4.4	1.7×10^{31}
5/6		7×10^{10}	156	3.3	6.1	3.4×10^{31}
7	Bring on crossing angle – truncated 50 ns.	7×10^{10}	144	3.1	5.7	2.5×10^{31}
8		5×10^{10}	288	4.4	8.1	2.6×10^{31}
8/9		7×10^{10}	432	9.3	17	7.5×10^{31}
9		7×10^{10}	796	17.1	31.2	1.4×10^{32}

See also Mike's talk



LHC schedule 2010 – part II





2010 schedule – part II

	July				Aug				Sep				
W _k	26	27	28	29	30	31	32	33	34	35	36	37	38
M _o	28	5	12	19	26	2	9	16	23	30	6	13	20
T _u													
W _e													
T _h											Jeune G		
F _r													
S _a													
S _u													

Ion Beam to SPS

	Oct			Nov				Dec					
W _k	39	40	41	42	43	44	45	46	47	48	49	50	51
M _o	27	4	11	18	25	1	8	15	22	29	6	13	20
T _u													
W _e													
T _h													
F _r													Xmas Day
S _a													
S _u													

Ion Beam Setup

Start Ion Physics

IONS
(approx 4 weeks)



Timeline - guesstimate

Phase	Days	
Circulating beams	2	Essential checks
450 GeV re-commissioning	7	Injection, tune, Q', C-, orbit, collimators, LBDS, instrumentation
450 optics checks	3	Beating, energy matching optimization
450 two beams	1	bumps as standard set-up, adjust TDI etc
450 GeV collisions	1	experiments on at 450 GeV
Ramp to 3.5 TeV	5	commission essential machine protection, experiments' dipoles on in ramp, orbit and tune feedback
3.5 TeV	2	machine protection, optics
Pilot collisions un-squeezed	3	Safe beams at 3.5 TeV
Commission squeeze	4	orbit and tune feedback, collimation, aperture, bumps, machine protection checks, beam dumps etc.
Collisions squeezed – safe, stable beams	7	Stable beams up to safe beam limit