

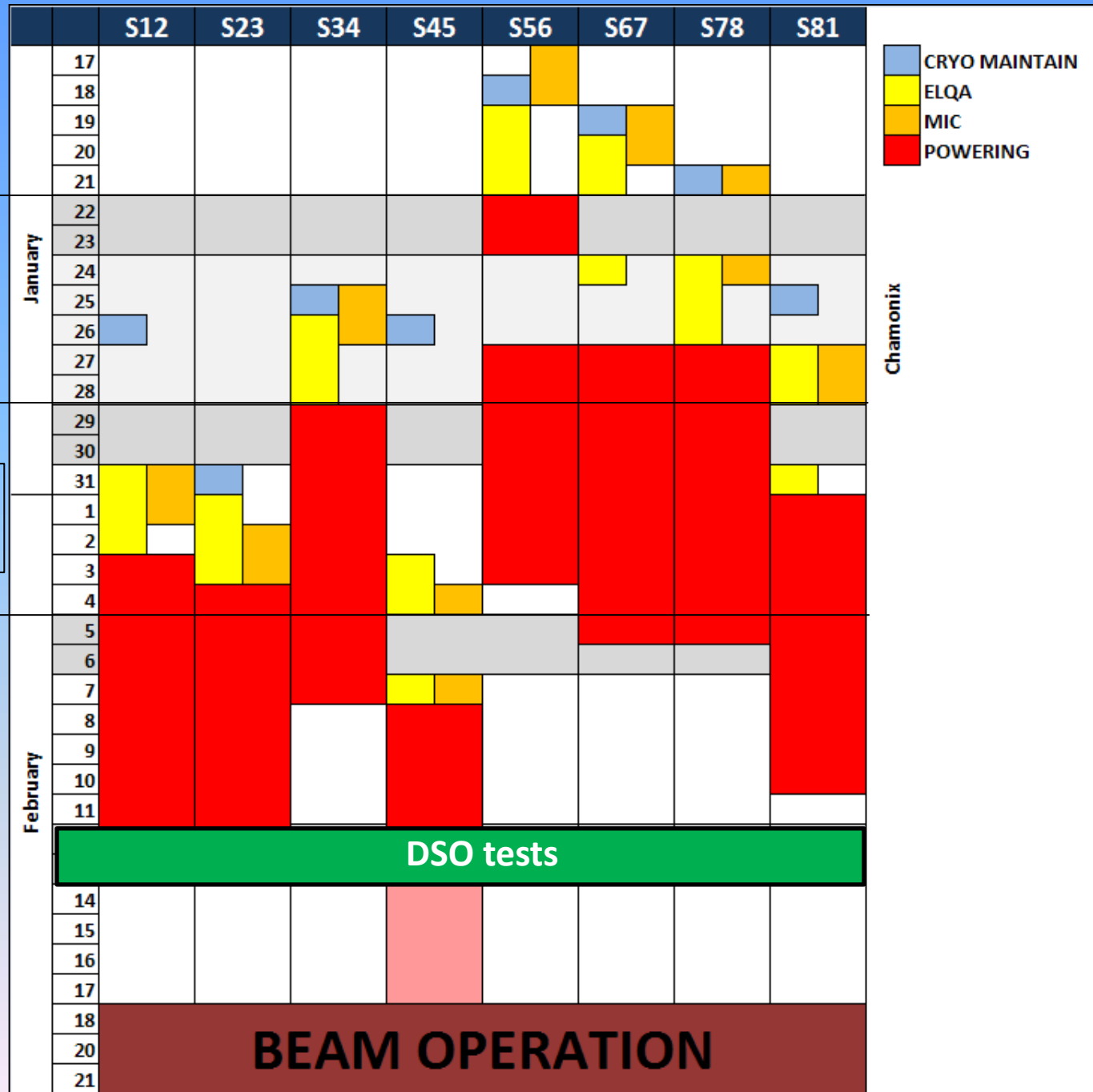
Injectors - proton physics

Special runs (TOTEM, Alice, etc.) to be scheduled

2011

- Beam back around 21st February
- 2-3 weeks re-commissioning with beam
- 4 day technical stop every 6 weeks (6 of them)
- Count 1 day to recover from TS (optimistic)
- 2 days machine development every 2 weeks (11 of them)
- 4 days ions set-up
- 4 weeks ion run
- End of run – 12th December

HWC



1

Chamonix:
1 shift
2pm - 10pm

2

2 shifts (A/N)
7/7 days

3

3 shifts
7/7 days

- CRYO MAINTAIN
- ELQA
- MIC
- POWERING

Chamonix

February

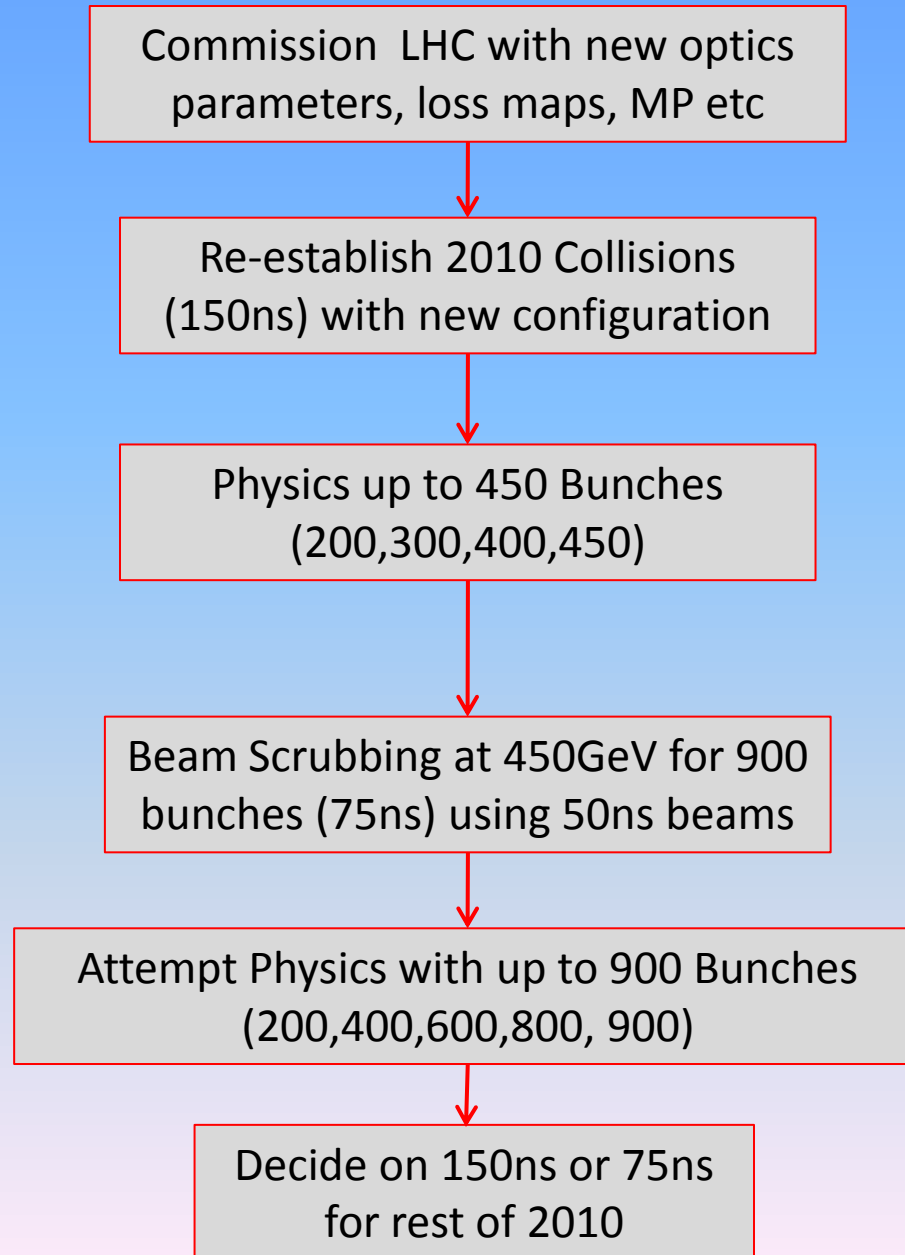
BEAM OPERATION

DSO tests

Suggestion at Evian for beam

Decide on beam and optics parameters, E , β^* , crossing angle, emittance, N_b

Chamonix



2011 schedule

First beam: 21st February

End proton run: 10th November

	Days
Re-commissioning	21
Machine development	22
Technical stops	30
Scrubbing run	7
Special physics runs	10
Ramp-up to peak luminosity	40
Peak luminosity	133
Total	263

2011: “reasonable” numbers

- 4 TeV (to be discussed at Chamonix)
- 936 bunches (75 ns)
- 3 micron emittance
- 1.2×10^{11} protons/bunch
- $\beta^* = 2.0$ m, nominal crossing angle

Peak luminosity	$\sim 7 \times 10^{32}$
Integrated per day	$\sim 15 \text{ pb}^{-1}$
130 days	$\sim 2 \text{ fb}^{-1}$
Stored energy	72 MJ

Usual warnings apply – see problems, problems above

Ultimate reach

- 4 TeV
- 1400 bunches (50 ns)
- 2.5 micron emittance
- 1.5×10^{11} protons/bunch
- $\beta^* = 2.0$ m, nominal crossing angle

Peak luminosity	$\sim 2 \times 10^{33}$
Integrated per day	$\sim 40 \text{ pb}^{-1}$
130 days	$\sim 5 \text{ fb}^{-1}$
Stored energy	134 MJ

Usual warnings particularly apply – see problems, problems above

Steve at Evian

Mode of Operation	TeV	OEF	β^*	Nb	lb	Normalized Emittance	Peak luminosity	Beam beam Shift	Pile up	pb-1 per day	Days	Integrated (fb-1)
2011	3.50	0.28	3.50	368	1.15E+11	1.6	2.13E+32	0.0217	3.1	5.2	194.0	1.00
HWC	4.00	0.00	1.50	0	0.00E+00	1.5		0.0000			28.0	0.00
recommissioning	4.00	0.00	1.50	0	0.00E+00	1.5		0.0000			14.0	0.00
redo 150ns, 450 b	4.00	0.20	1.50	200	1.20E+11	1.5	3.79E+32	0.0241	10.1	6.6	14.0	0.09
scrubbing	4.00	0.00	1.50	200	0.00E+00	1.5	0.00E+00	0.0000	0.0	0.0	7.0	0.00
up to 900 bunches	4.00	0.10	1.50	450	1.20E+11	1.5	8.53E+32	0.0241	10.1	7.4	14.0	0.10
Physics with 900 bunches	4.00	0.15	1.50	900	1.50E+11	1.5	2.67E+33	0.0301	15.8	34.5	159.0	5.49
Physics with 450 bunches	4.00	0.20	1.50	450	1.50E+11	1.5	1.33E+33	0.0301	15.8	23.0	159.0	3.66

Lot of variations possible
1fb-1 if we do not improve on 2010 performance
2-3 fb-1 looks reasonable
3-5 fb-1 is not excluded