August 25, 2017 – Beam parameters at injection of each accelerator

PSB (H^- injection from Linac4)

		N (10^{11} p)	$\epsilon_{x,y}$ (μm)	E (GeV)	ϵ_z (eVs)	B_l (ns)	$\delta p/p_0$ (10^{-3})	$\Delta Q_{x,y}$
Achieved	Standard	17.73	2.14	0.05	1.0	1100	2.4	(0.51, 0.59)
	BCMS	8.48	1.15	0.05	0.9	1000	2.2	(0.46, 0.56)
LIU target	Standard	34.21	1.72	0.16	1.4	650	1.8	(0.58, 0.69)
	BCMS	17.11	1.36	0.16	1.4	650	1.8	(0.35, 0.43)

PS (Standard: 4b+2b – BCMS: 2× 4b)

		N (10^{11} p/b)	$\epsilon_{x,y}$ (μm)	E (GeV)	ϵ_z (eVs/b)	B_l (ns)	$\delta p/p_0$ (10^{-3})	$\Delta Q_{x,y}$
Achieved	Standard	16.84	2.25	1.4	1.2	180	0.9	(0.25, 0.30)
	BCMS	8.05	1.20	1.4	0.9	150	0.8	(0.24, 0.31)
LIU target	Standard	32.50	1.80	2.0	3.00	205	1.5	(0.18, 0.30)
	BCMS	16.25	1.43	2.0	1.48	135	1.1	(0.20, 0.31)

SPS (Standard: 4 × 72b – BCMS: 5 × 48b)

		N (10^{11} p/b)	$\epsilon_{x,y}$ (μm)	p (GeV/c)	ϵ_z (eVs/b)	B_l (ns)	$\delta p/p_0$ (10^{-3})	$\Delta Q_{x,y}$
Achieved	Standard	1.33	2.36	26	0.35	4.0 (3.0)	0.9 (1.5)	(0.05, 0.07)
	BCMS	1.27	1.27	26	0.35	4.0 (3.0)	0.9 (1.5)	(0.07, 0.12)
LIU target	Standard	2.57	1.89	26	0.35	4.0 (3.0)	0.9 (1.5)	(0.10, 0.17)
	BCMS	2.57	1.50	26	0.35	4.0 (3.0)	0.9 (1.5)	(0.12, 0.21)

LHC (≈10 injections)

		N (10^{11} p/b)	$\epsilon_{x,y}$ (μm)	p (GeV/c)	ϵ_z (eVs/b)	B_l (ns)	bunches/train
Achieved	Standard	1.20	2.60	450	0.47 (0.48)	1.65 (1.21)	288
	BCMS	1.15	1.39	450	0.40 (0.41)	1.50 (1.13)	96
LIU target	Standard	2.32	2.08	450	0.56 (0.58)	1.65 (1.24)	288
	BCMS	2.32	1.65	450	0.56 (0.58)	1.65 (1.24)	240

PSB, PS → Longitudinal emittance and bunch length are values from tomoscope (matched area and foot tangent). Momentum spread is rms value
SPS, LHC → Longitudinal emittance ϵ_z (2σ), momentum spread $\delta p/p_0$ (1σ), bunch length B_l (4σ). Values are given at first turn and after filamentation (in parentheses). Present voltages are $V_{SPS,inj}$=4 MV, $V_{SPS,ext}$=7 MV, $V_{LHC,inj}$=6 MV. Future voltage values are $V_{SPS,inj}$=4 MV, $V_{SPS,ext}$=10 MV, $V_{LHC,inj}$=8 MV. 800 MHz voltage in SPS is assumed 1/10 of the 200 MHz voltage value. Longitudinal emittances at SPS injection and after filamentation are the same because they are measured with different conventions