



**Canadian Centre canadien
Light de rayonnement
Source synchrotron**

Reference Specifications

Machine parameter	Operational Year(s)		
	2003	2004 - 2005	> 2008
Energy (GeV)	2.9	2.9	< 2.9
Current (mA)	100	200	500
x-y Coupling (minimum)	< 10%	< 1%	< 0.2 %
Horizontal Emittance (nm-rad)	< 30	< 20	<18
Time Structure	multi bunch	multi bunch	multi or single
Lifetime (hr)	> 4	> 6	> 10 (or top-up)
Maximum Uncorrected closed orbit distortion in x or y (mm)	10	10	3
rms Uncorrected closed orbit distortion in x or y (mm)	5	5	1
Maximum Corrected closed orbit distortion in x or y (μm)	100	100	30
rms Corrected closed orbit distortion in x or y (μm)	30	30	10
Long Term rms ($>10^2\text{s}$) Horizontal Stability (μm)	30	30	10
Short Term rms ($10^{-2}-10^2\text{s}$) Horizontal Stability (μm)	3	3	1
Long Term rms ($>10^2\text{s}$) Vertical Stability (μm)	5	3	1
Short Term rms ($10^{-2}-10^2\text{s}$) Horizontal Stability (μm)	2	1	0.2

CLS Source Point Sizes					
		Horizontal		Vertical	
Device	Year	σ_{rms} (μm)	divergence rms (μrad)	σ_{rms} (μm)	divergence rms (μrad)
BM1	2003	190	237	278	54
	2005	159	194	72	14
	2008	152	182	30	6
BM2	2003	198	276	284	39
	2005	178	243	73	10
	2008	173	235	31	4
ID (Undulator)	2003	559	56	86	35
	2005	465	45	22	9
	2008	441	43	9	4

These source point sizes are rms values, not Full Width Half Maximum (FWHM). To obtain FWHM values, multiply by 2.35



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CLS machine parameters at 2.9 GeV

Circumference		170 m
Periodicity		12
Available Straights		10
Length of Straights		5.2 m
Optics:	ν_x (tune)	10.22
	ν_y	3.26
	χ_x (natural chromaticity)	-13.9
	χ_y	-17.7
	Momentum Compaction	0.0038
	β_x	8.8 m
	β_y	4.6 m
	η_x	0.15 m
RF Cavity	Frequency	500 MHz
	Voltage	2.4 MV
Damping Times	τ_x	2.4 ms
	τ_y	3.8 ms
	τ_E	2.7 ms
Radius of Bend Magnet		7.143 m
Dipole Fields		1.354 T
Energy Loss/Turn		0.876 MeV
Dipole Critical Energy		7.57 KeV
ϵ_x (emittance)		18.1 nm-rad
δ (energy spread)		0.111 %
Bunch Length (full)		54 ps
Interbunch Gap (100% fill)		2.03 ns
No of buckets (at 90% fill)		240