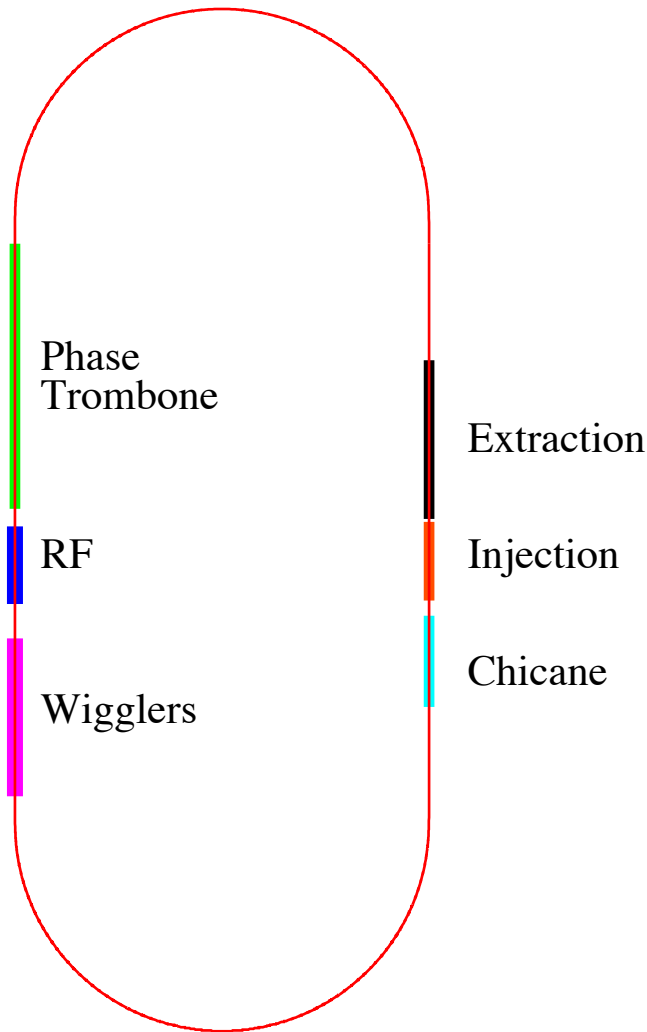


DR 3.238km DTC03 Lattice

31 January 2012

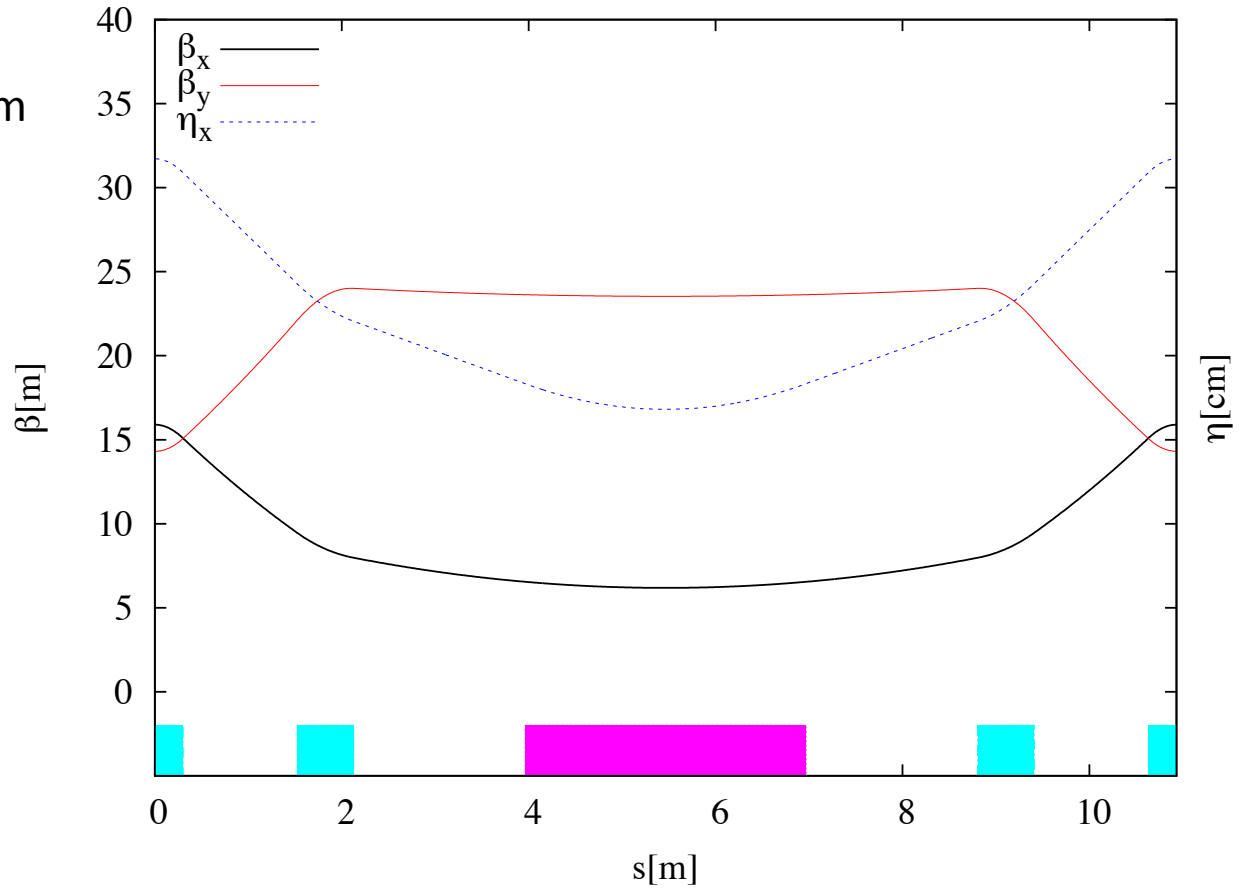
DTC03 layout



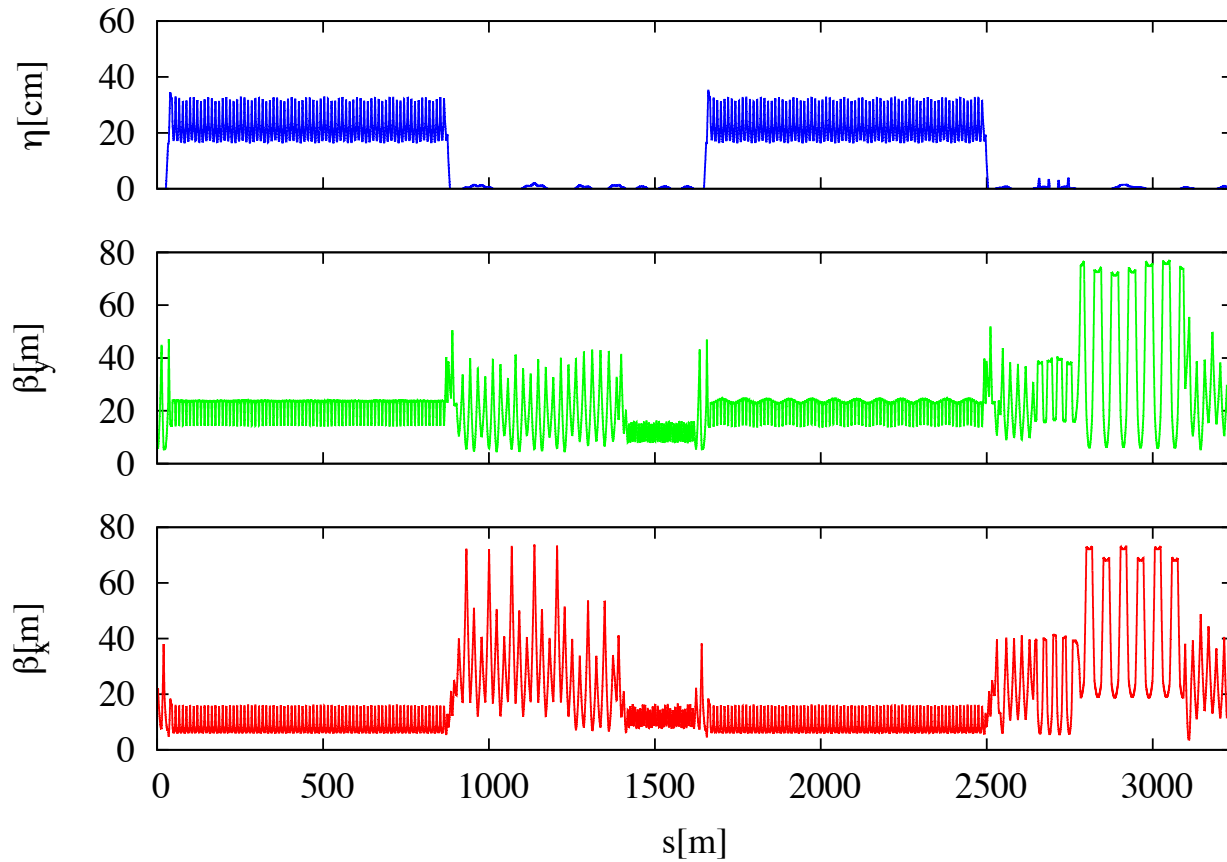
1. Circumference = 3238.68m, 710.22m straights
2. ~ 6 phase trombone cells
3. 54 – 2.2 m long wigglers
wiggler period = 30cm
14-poles
 $B_{\max} = 2.16 \text{ T}$
4. Space for 16 RF cavities
Cryostats for upper and lower positron rings
are interleaved

Arc cell - FDBDF

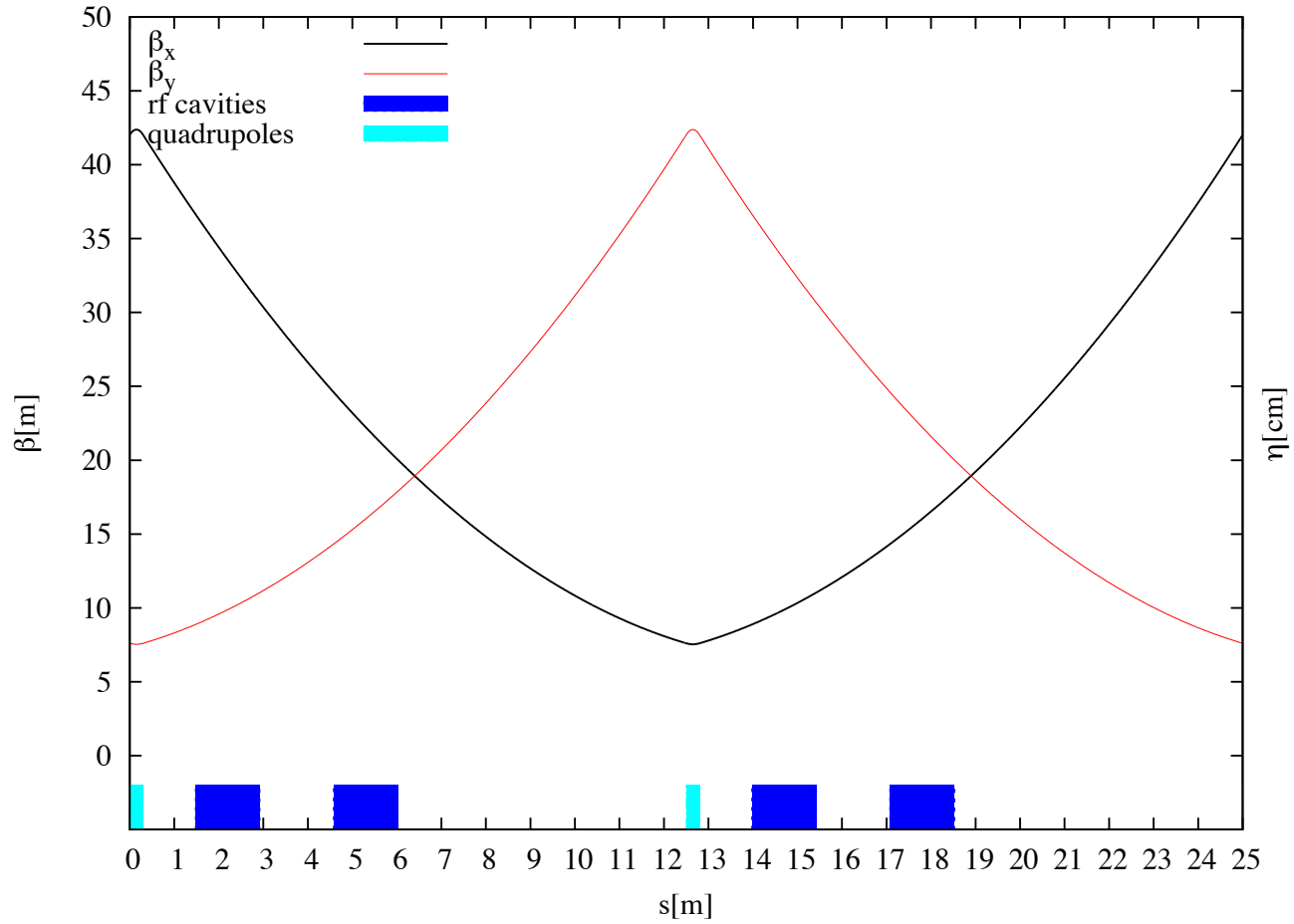
Cell length = 10.93m
Bend length = 3.0m
75 cells/arc



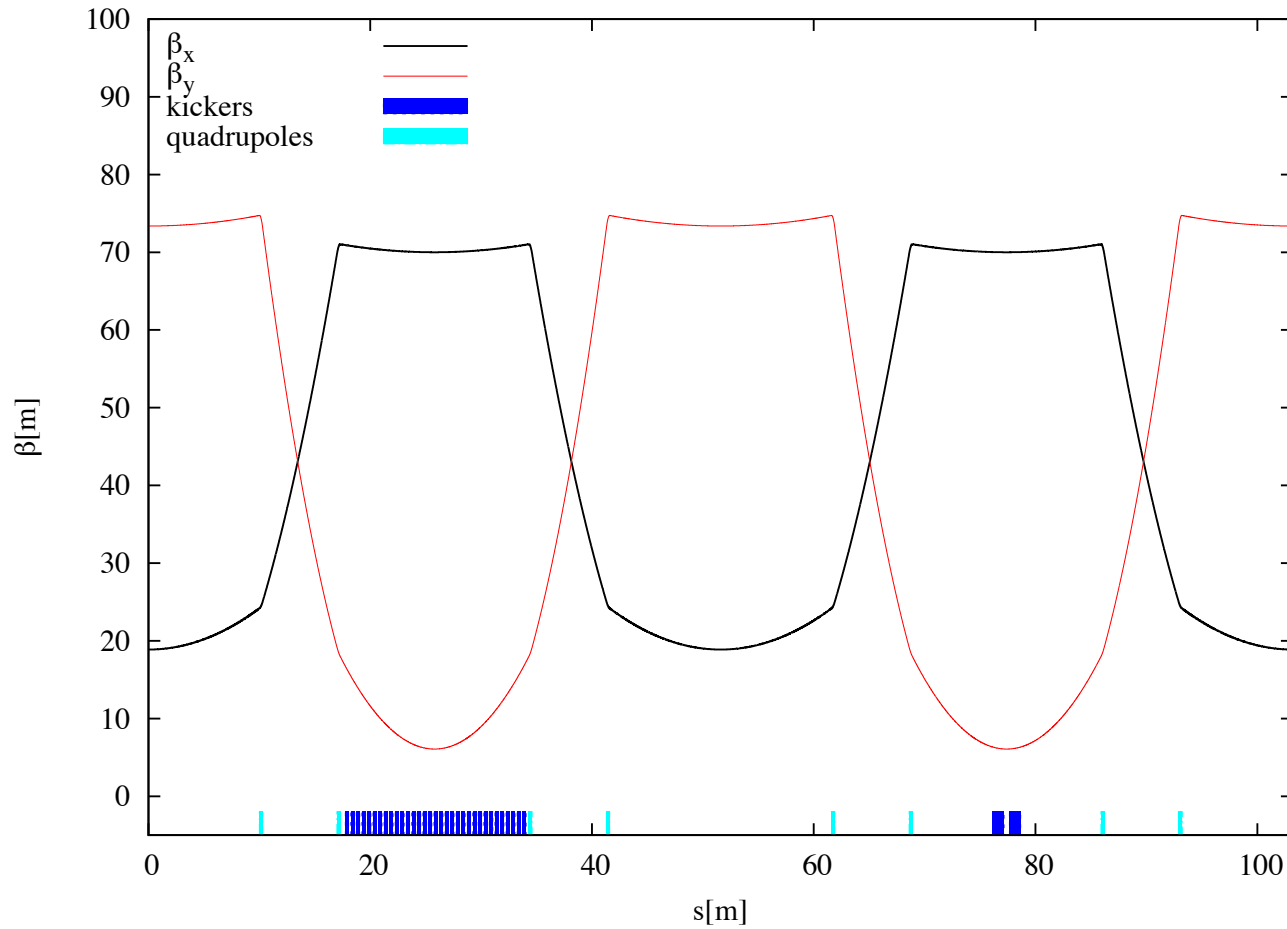
DTC01 lattice functions



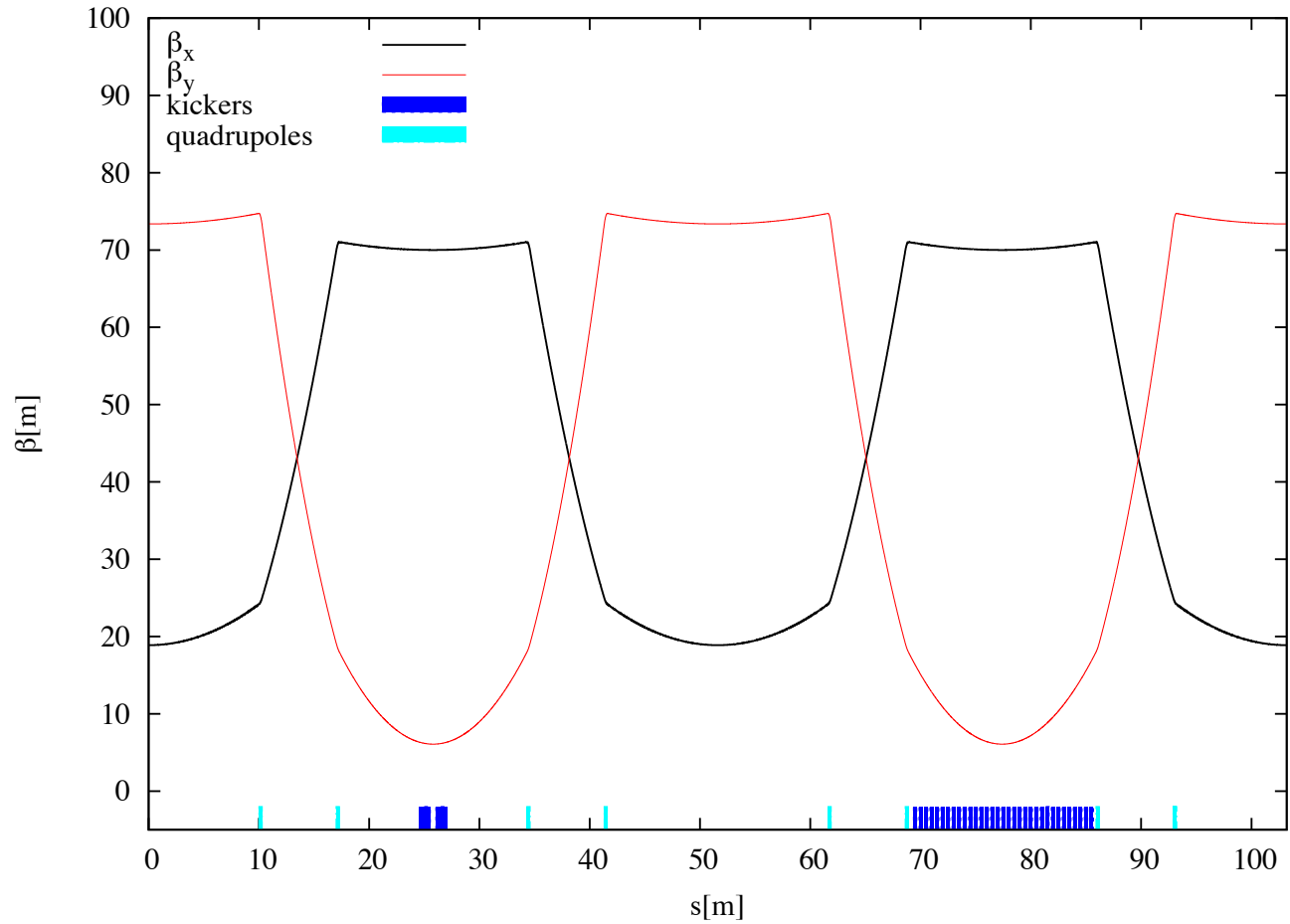
RF cells



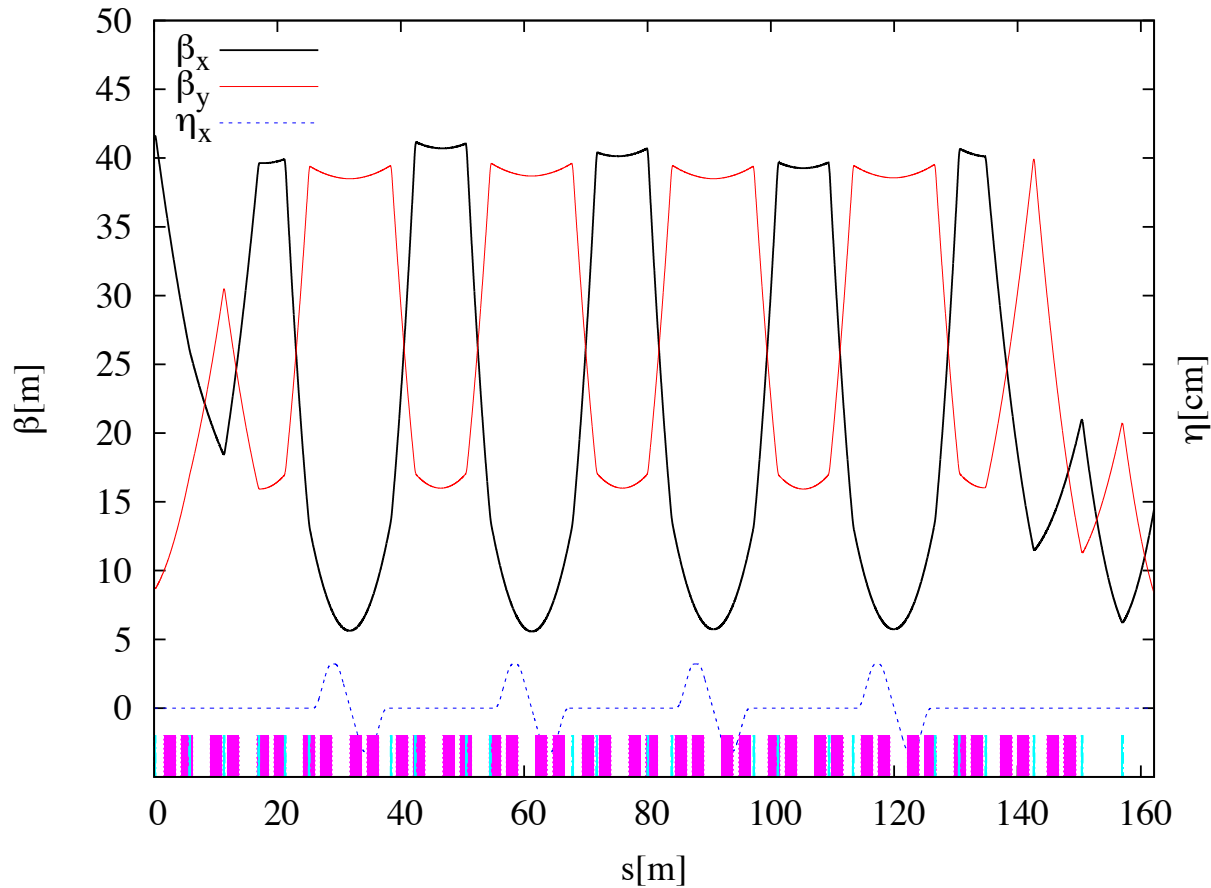
Extraction straight



Injection straight



Circumference changing chicane



wiggler

30cm wiggler params

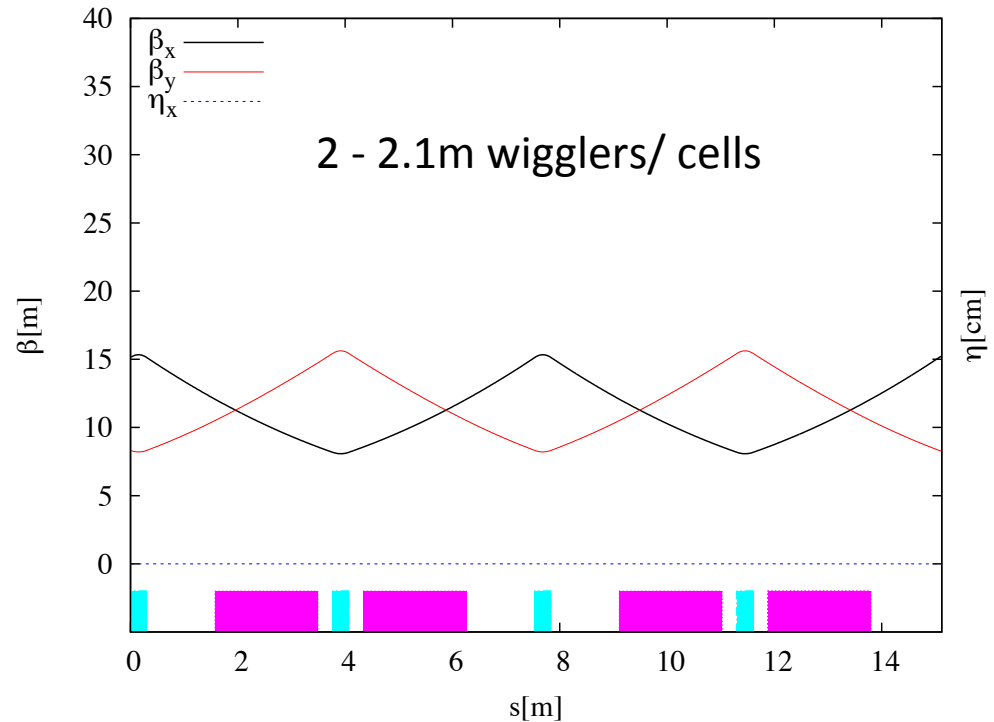
14 poles

30cm period

Wiggler length = 2.1 m

Cell length = 7.56 m

Space for 30 wiggler cells



DTC03

Parameter	10 Hz(Low)	5 Hz (Low)	5 Hz (High)
Circumference	3.238 km	3.238 km	3.238 km
RF frequency	650 MHz	650MHz	650 MHz
τ_x/τ_y [ms]	12.86	23.95	23.95
T_z [ms]	6.4	12.0	12.0
σ_s [mm]	6.02	6.02	6.02
σ_δ	0.137%	0.11%	0.11%
α_p	3.3×10^{-4}	3.3×10^{-4}	3.3×10^{-4}
$\gamma\epsilon_x$ [μm]	6.3	5.8	5.8
RF [MV] (12 cavities) Total/Per cav	20.4/1.7	13.2 /1.1	13.2/1.1
ξ_x/ξ_y	-50.9/-44.1	-51.3/-43.3	-51.3/-43.3
Wigglers- $N_{\text{cells}}@B[\text{T}]$	27@2.16	27@1.51	27@1.51
Energy loss/turn [MeV]	8.4	4.5	4.5
sextupoles	3.34/-4.34	3.34/-4.23	3.34/-4.23
Power/RF coupler @400mA [kW]**	280	150	300

Radiation parameters (damping times, emittance, energy spread, etc. based on map-type wiggler

** $(400\text{mA} \times 8.4 \text{ MeV/turn})/12$

RF

The lattice can accommodate 16 RF cavities

If we assume 12 then

Voltage/ cavity in 10Hz mode is 1.7

Power/coupler in 5Hz, high power mode is 300kW

Magnet count

Element	Length[m]	Strength	Number
Arc Dipoles	3	2.28 kG	150
Circumference changing chicane dipoles	1	2.68 kG	28
Other dipoles	2	< 2.28 kG	4
Arc Quadrupoles	0.6	< 0.6 m ⁻²	450
Quadrupoles in dispersion suppressor and straights	0.3	< 0.55 m ⁻²	211
Sextupoles	0.3	< 4.34 m ⁻³	600
RF cavities	3	< 1.64MV	12
Wigglers	2.1	2.16T	54