

LHeC Linac lattice

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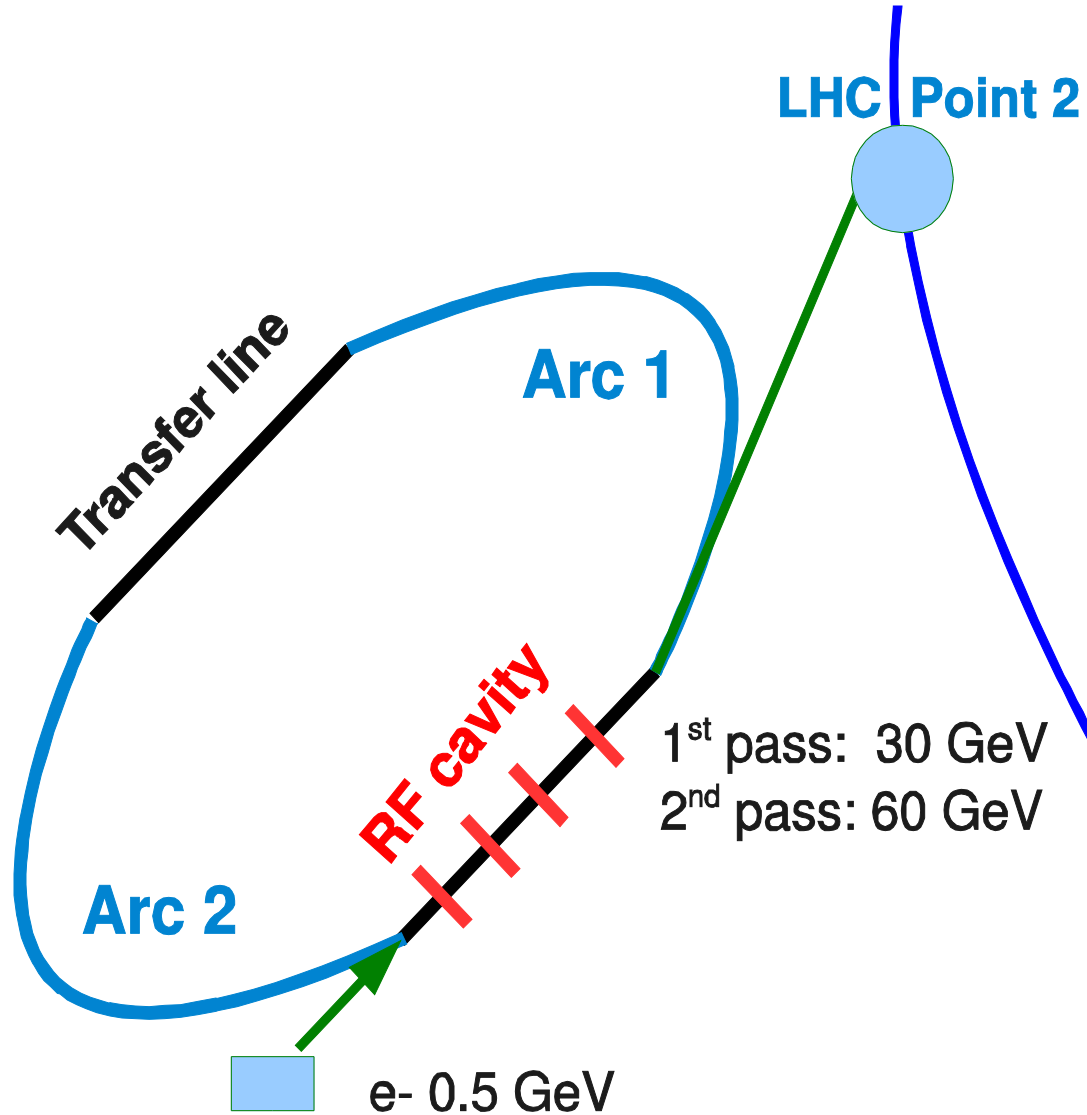


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Layout Racetrack (RL option)





Accelerating cell comparison

	XFEL	ILC	Anders
Half Cell Length [m]	12	12.652	12
# of cavities	8	8~9	8
Single cavity length [m]	1.038	1.038	1.05
Physical cavity filling factor	0.69	0.71	0.7

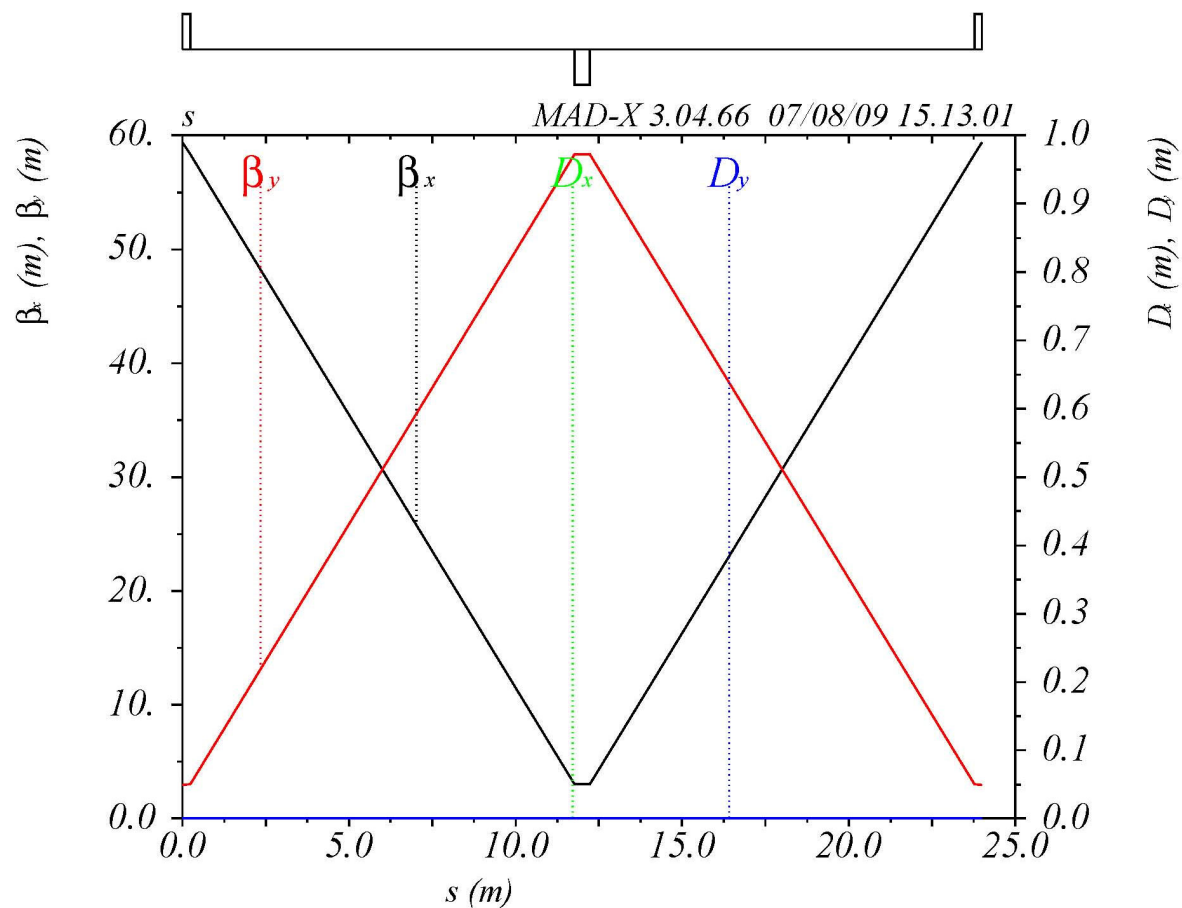


General parameters

	XFEL	ILC	Chris 60GeV	Chris 60GeV CW	Chris 140GeV	Anders 60GeV CW	Anders 100GeV	Anders 140GeV
Length [km]	1.392	10.9	1.5	3.9	3.9	3.336	2.928	3.192
Energy_i [GeV]	2	15	0.5	0.5	0.5	0.5	0.5	0.5
Energy_f [GeV]	20	250	30	30	70	30	50	70
Gradient [MV/m]	20.8	31.5	31.5	13	31.5	13	25	32
Filling factor	0.62	0.684	0.62	0.58	0.57	0.68	0.676	0.68

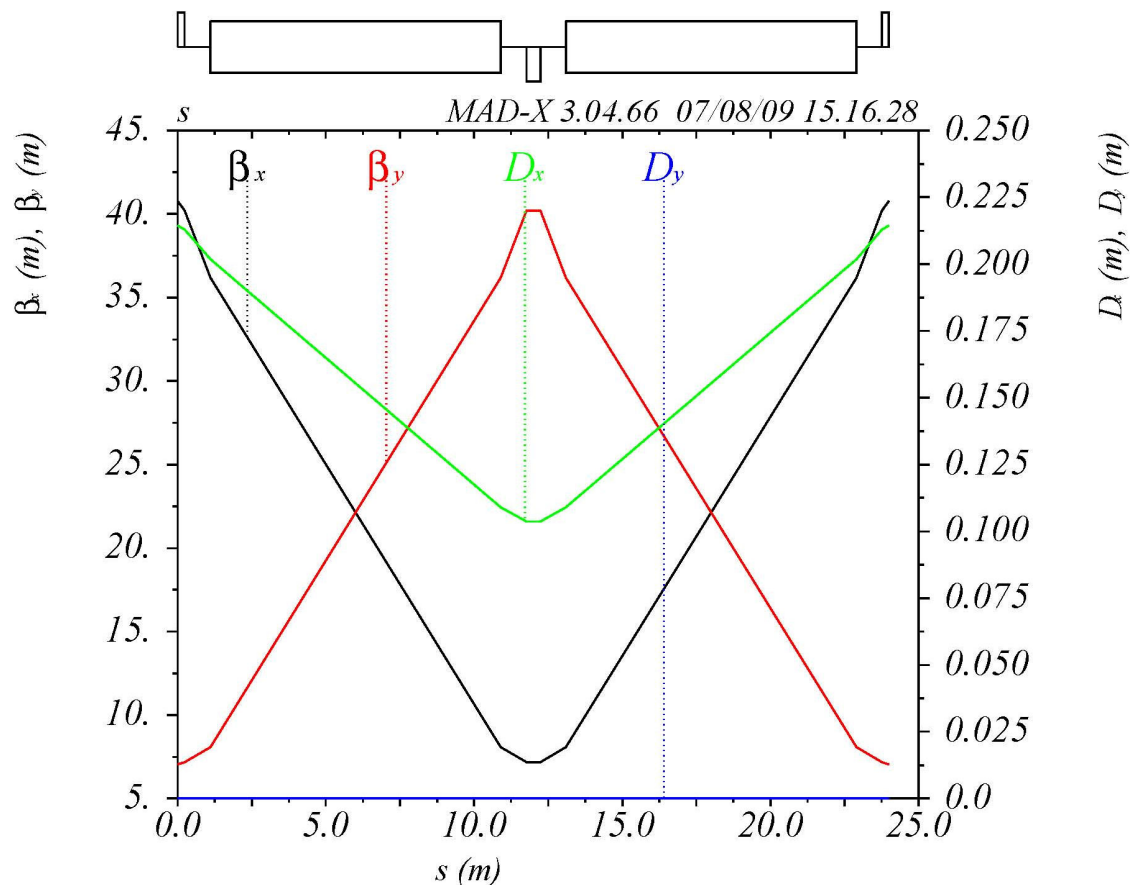
Linac cell

Cell length	24 m
# of cells	119
Length of quad	0.47 m
Length of cavity	8.4 m
Length of drift	1.565 m

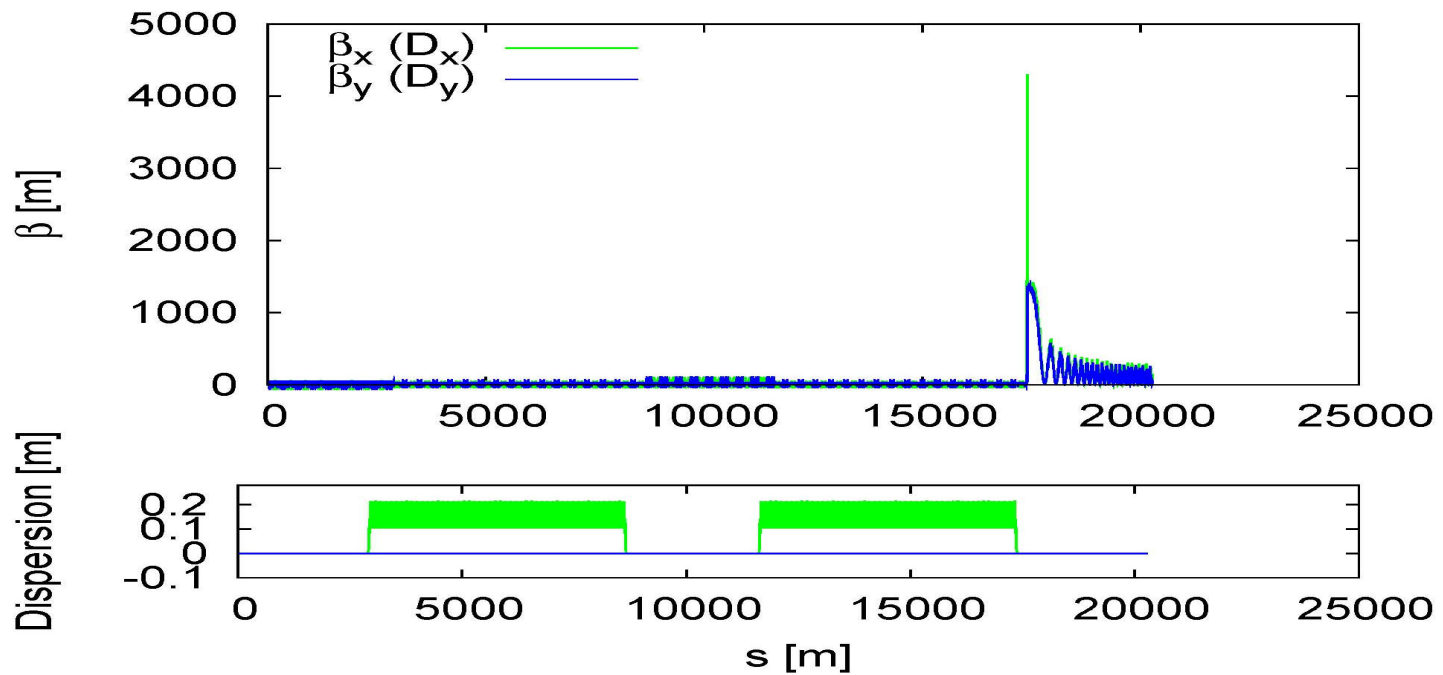
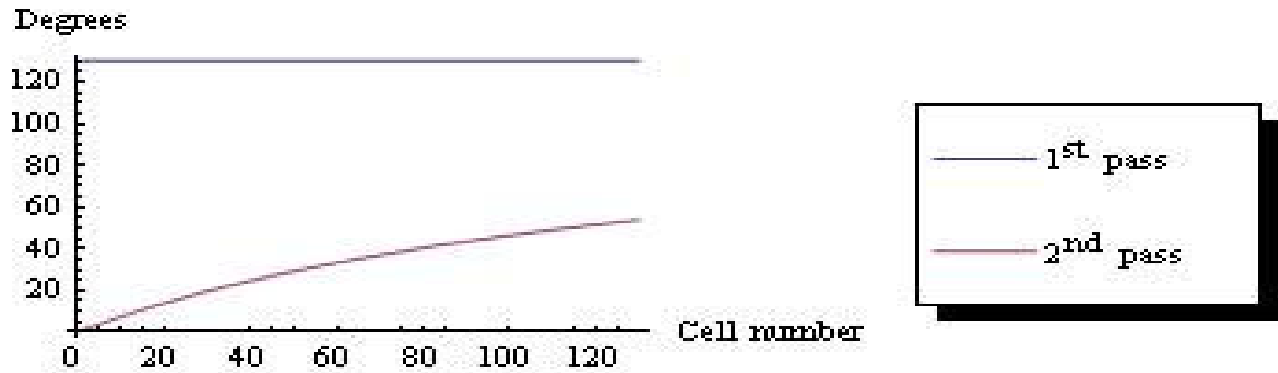


Arc cell

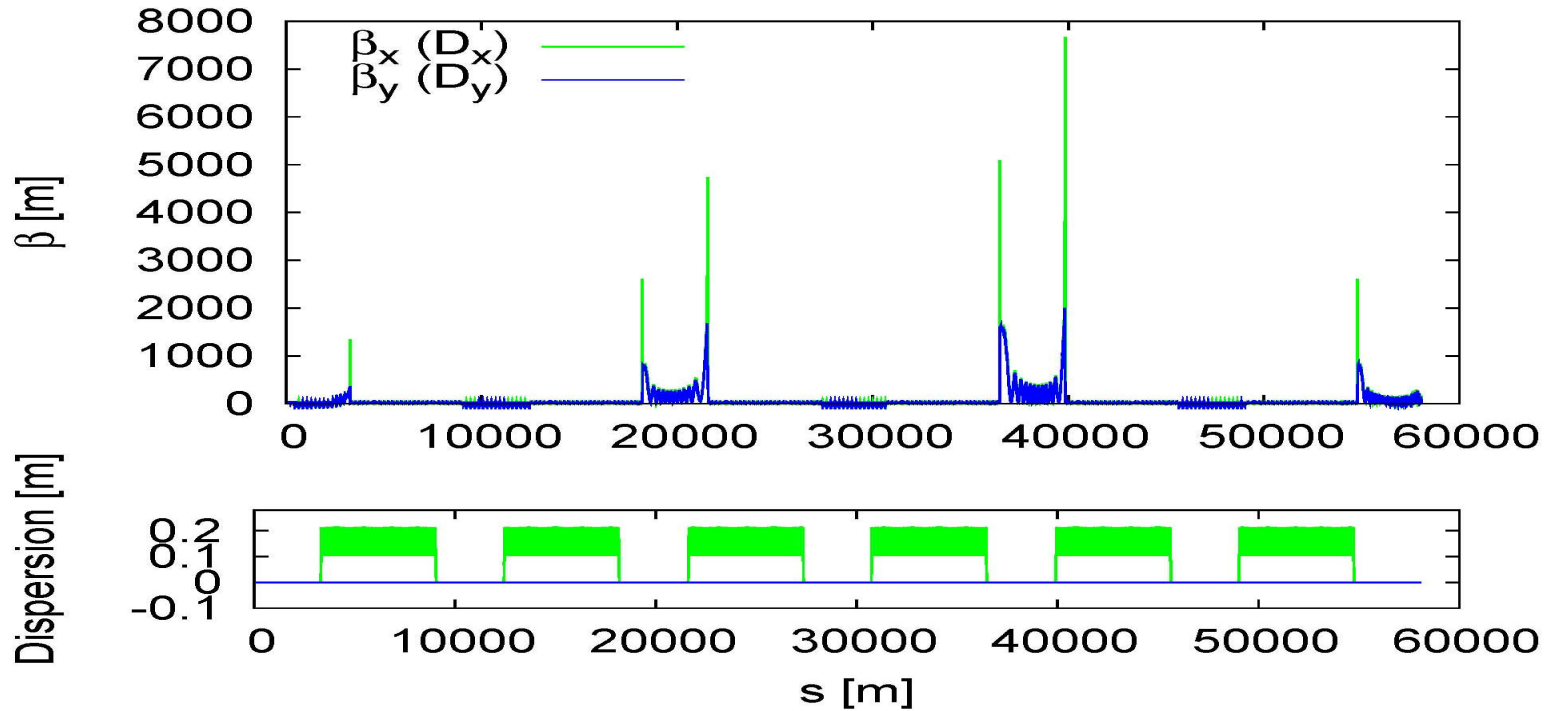
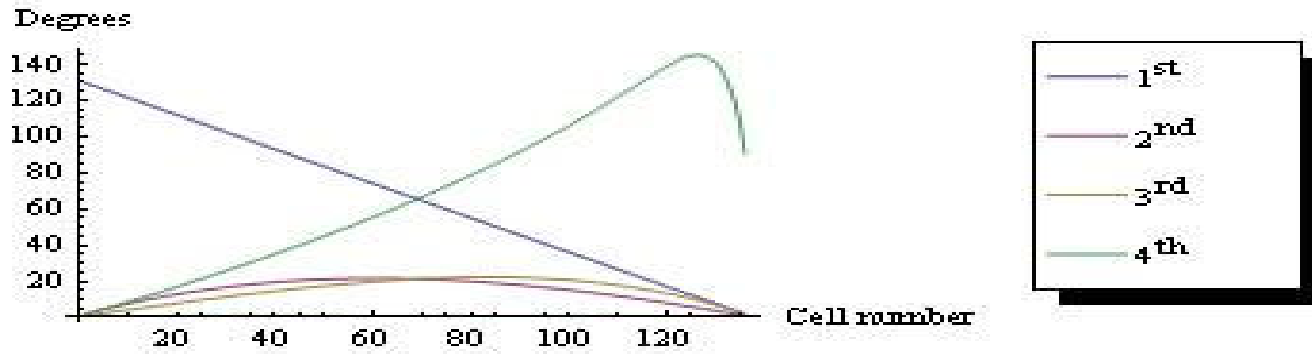
Cell length	24 m
# of cells	240
Length of quad	0.47 m
Length of dipole	9.8 m
Length of drift	0.865 m



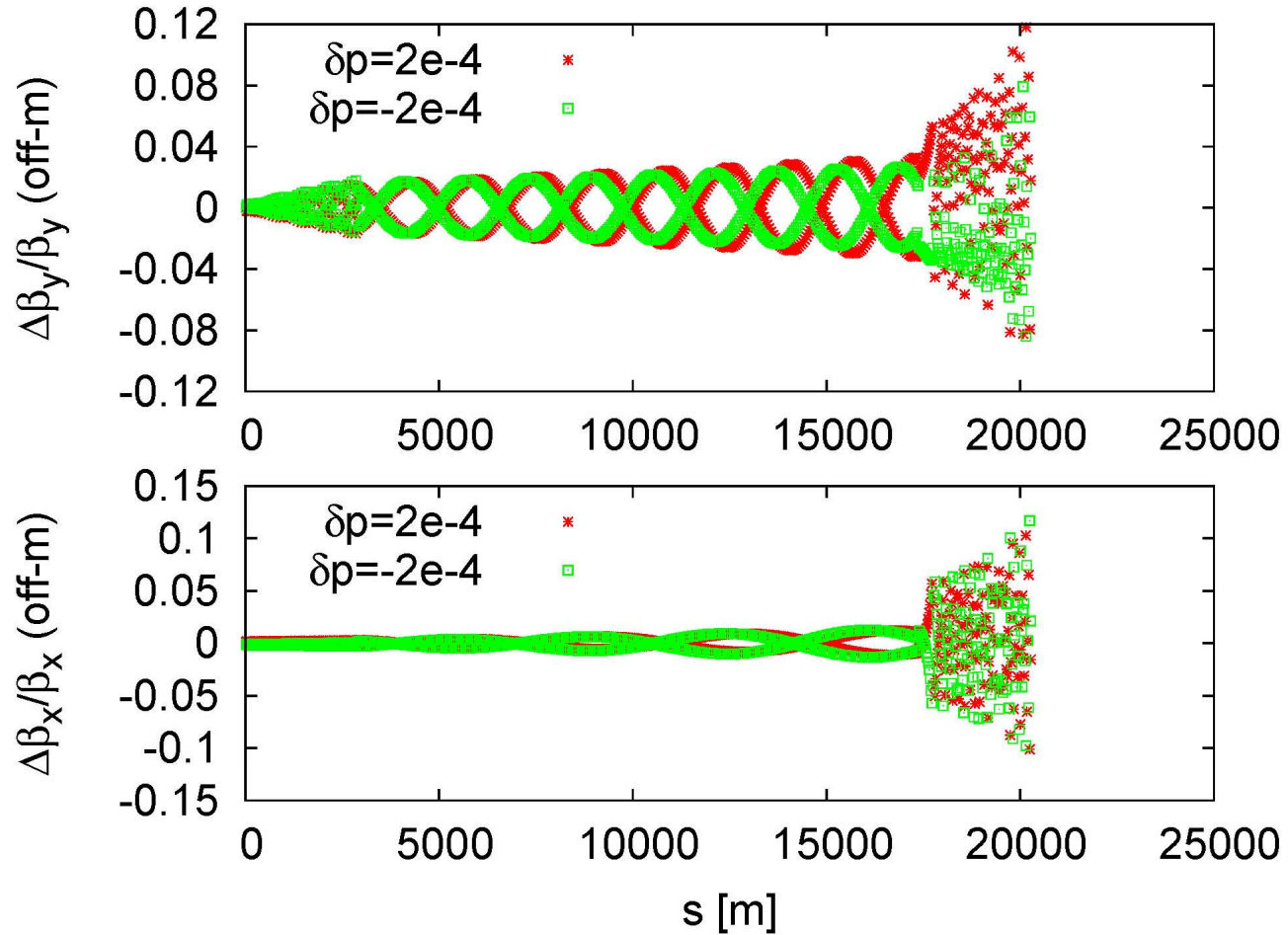
100 GeV pulsed



60 GeV ERL



Beta-beating





Lattice summary

	100 GeV pulsed	140 GeV pulsed	60 GeV ERL
Linac length [m]	2,928	3,192	3,336
Arc length [m]	5760	5760	5760
Max # of RF cavities	1,952	2,128	2,224
# of dipoles	960	960	960
# of quads	1,448	1,492	1,516
Bending radius [m]	1,485	1,485	1,485
Dipole strength [T]	0.118	0.163	0.073
Max quad gradient [T/m]	50	50	50



To do list

- 1. Adjust the linac length (shape)? Add spare cells.**
- 2. Document the linac lattice design part**