

Potential baseline alternatives

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Beam parameters at the exit of the nozzle (based on SCAPA 3D simulations)

- RMS physical emittance $1.26 \cdot 10^{-7}$ m
- Beta 12.82 m
- Alpha -129.79
- Round beam

Flexible GL baseline

Capture rematching, equivalent solenoidal fields

- GL1 – 1.4T
- GL2 – 0.5724T
- GL3 – 0.8139T

Energy collimator

- Only one energy collimator for both Stage 1 and Stage 2 at 5.752m from the exit of the nozzle ($z=5.852\text{m}$ from the target).

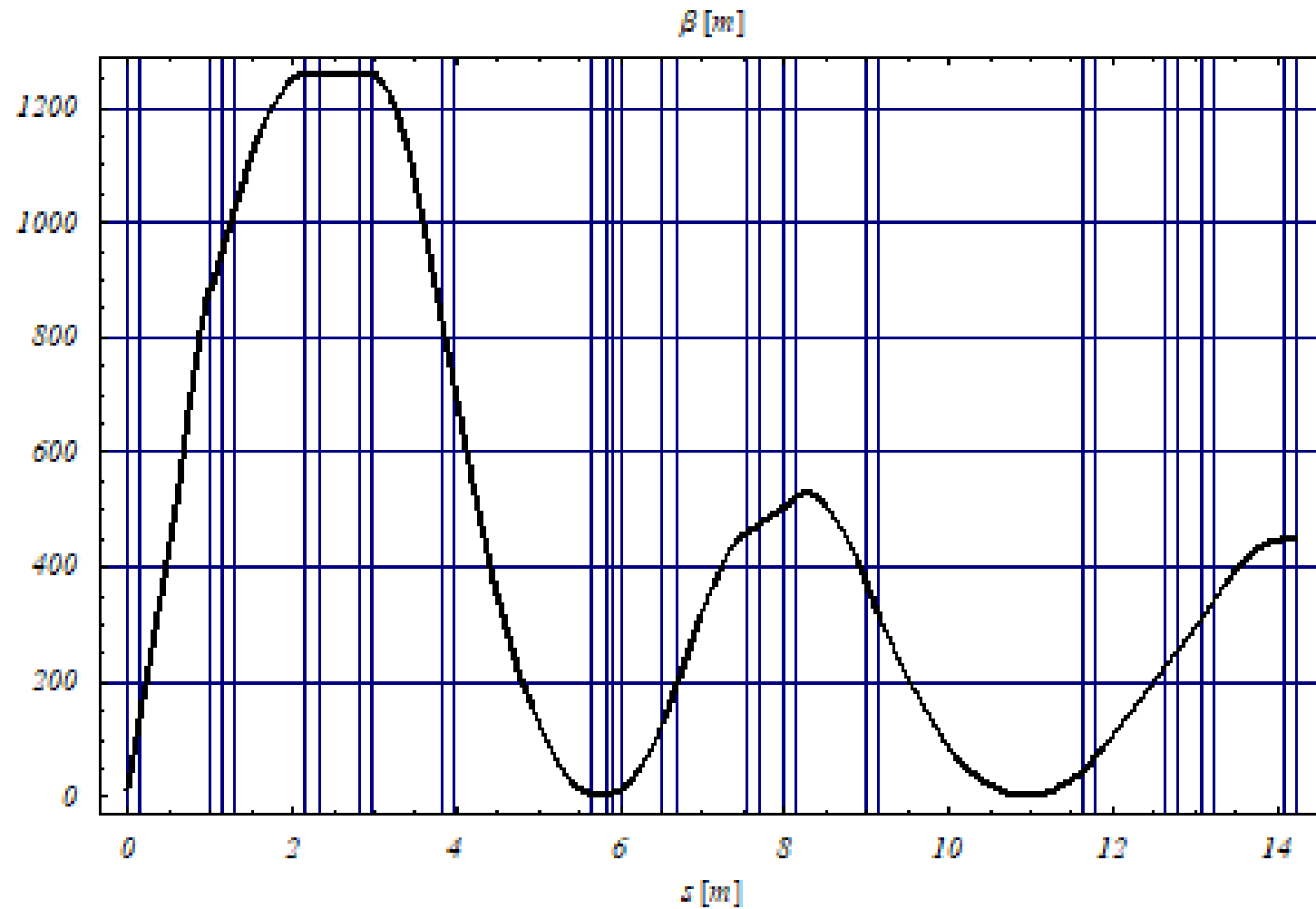
Geometry modifications

- Drift length between GL4 and GL5 increased from 0.1m to 0.3m
- Downstream of GL5 extra drift of 2.5m is added
- GL6 and GL7 are added in the same configuration as GL4 and GL5 (with 0.3 m distance between)

Matching solutions, equivalent solenoidal fields [T]

Beta value [m]	Size in the end station (2 sigma) [cm]	GL4	GL5	GL6	GL7
446.43	3	1.0051	0.9014	0.6994	0.6551
310.02	2.5	1.0051	0.8647	0.7377	0.7106
198.41	2	1.0051	0.8242	0.7947	0.7984
111.61	1.5	1.0051	0.7715	0.8040	0.9829
50.00	~1.0 (also for Stage 2)	0.9060	0.8018	0.2261	1.2793

Optics, highest beta



Quads downstream
(alternative)

Geometry + quad strengths for beta=446.43

- Capture + energy collimator all the same then from the “RF cavity” drift:

drift, l=0.5; %%RF cavity%%

Q1, quadrupole, l=0.1, k=24.3236;

Onew1, drift, l=0.1;

Q2, quadrupole, l=0.1, k=-23.5053;

Onew2, drift, l=1.5;

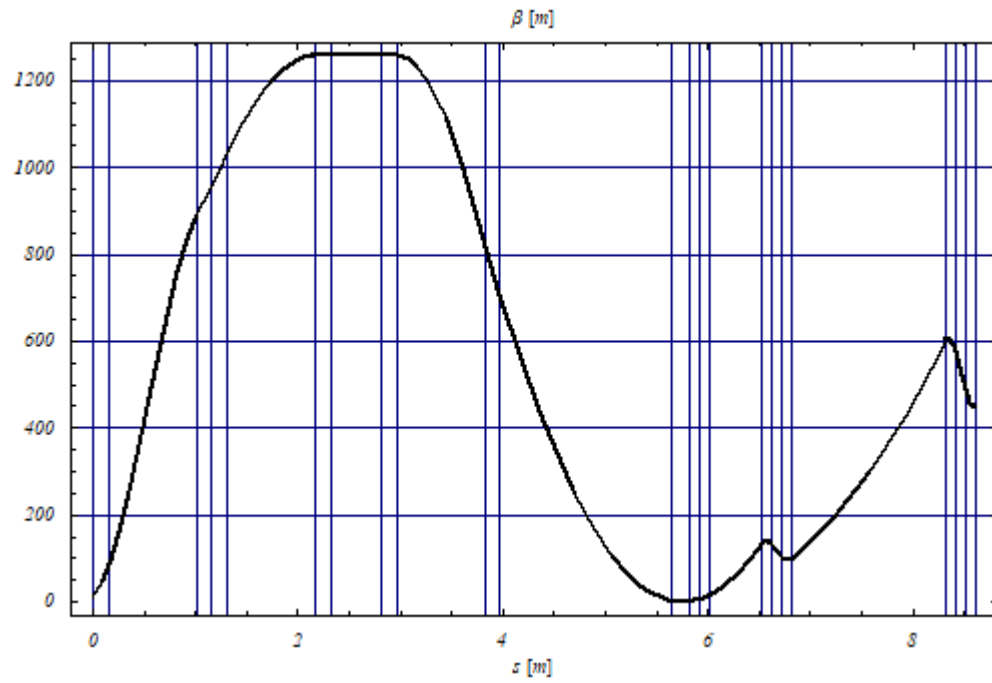
Q3, quadrupole, l=0.1, k=11.731;

Onew3, drift, l=0.1;

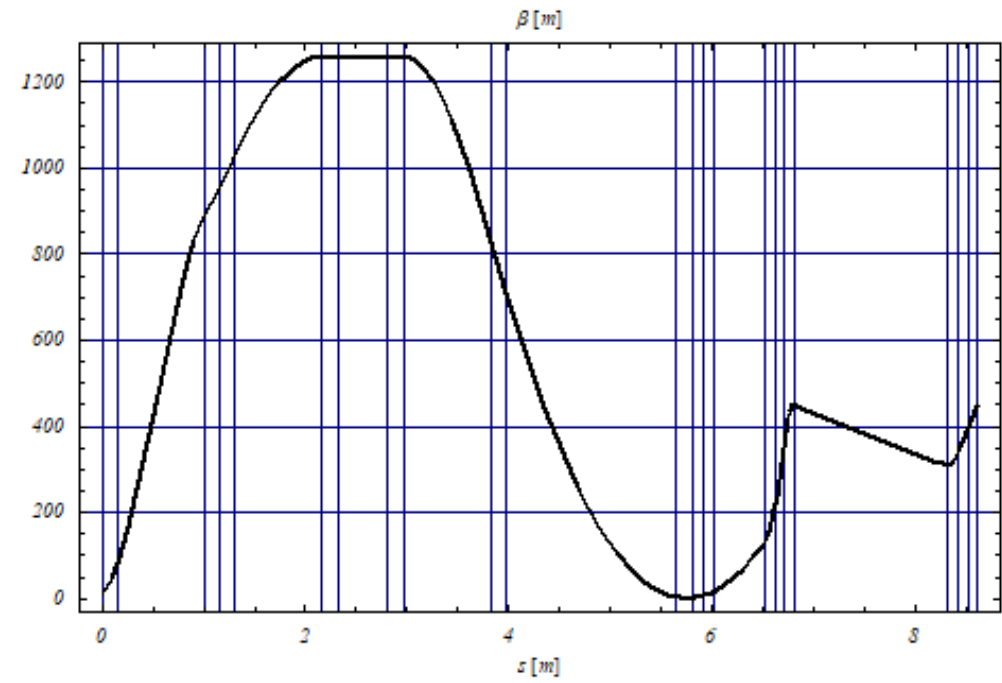
Q4, quadrupole, l=0.1, k=-8.86824;

Solutions for other
betas also created.

Optics, highest beta



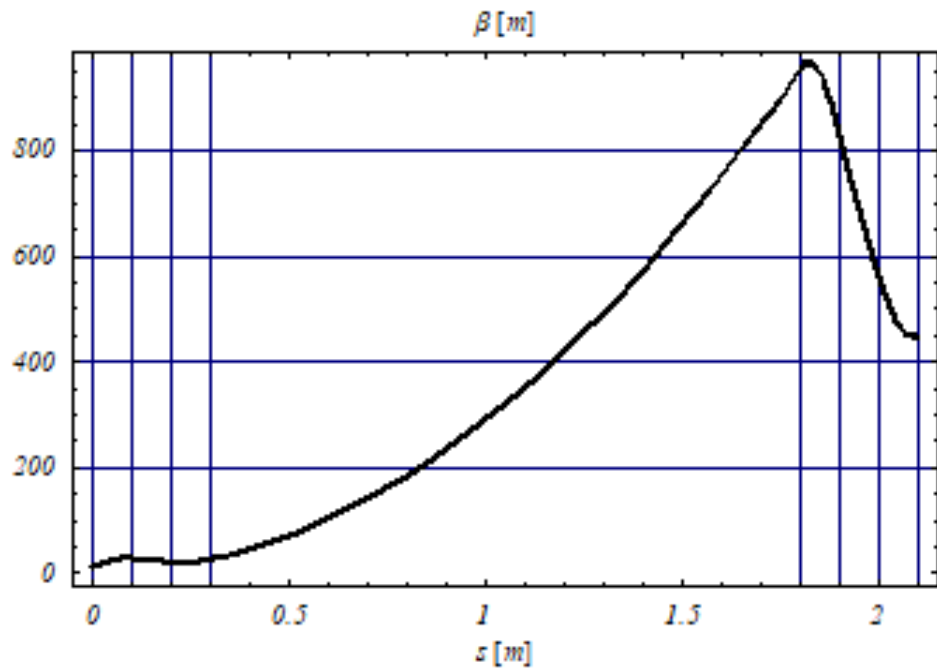
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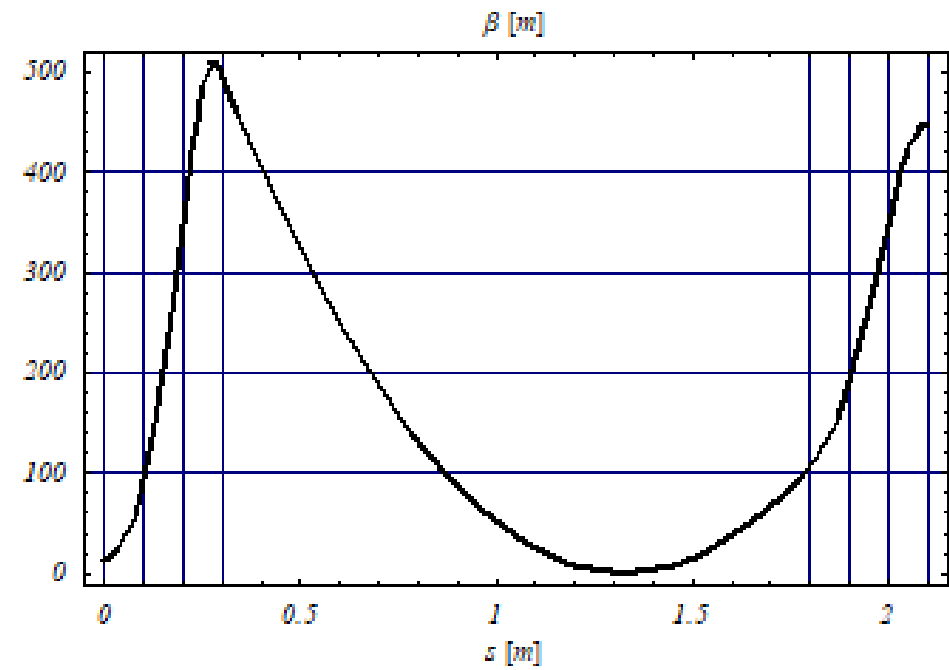
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Quads ONLY (alternative)

Optics, highest beta, 4 room temperature quads



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