Progress Update

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WP6 Meeting

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Report Progress

- Baseline update recommendations
    - Collimator for stage 2 operation, removal of 1st octupole

- Beam discussion
    - Motivation for pursuing performance with SCAPA beam

- Baseline design performance with SCAPA beam
    - Highlight doubts over flexibility to deliver different spot sizes
    - Low beta requirement for FFA injection line

- 7 Gabor lens configuration
    - Plots/diagrams
    - Parameter tables
    - Discussion:
        - Nominal performance
        - Space charge impact
        - Optimisation
        - Collimation

- Done (locally)

- Ongoing

- To do

Report Questions

- Future plans
    - Details written in each subsubsection
    - Collate & move to Next Steps subsection?

- Review of current baseline
    - What to include?

New Optical Solution

- Updated Twiss beta values for new beam parameters

- New solution required for FFA injection conditions (β=50 m)

- Solution found in MADX
  - High solenoid equivalent field for GL6

- No GPT/BDSIM simulations yet
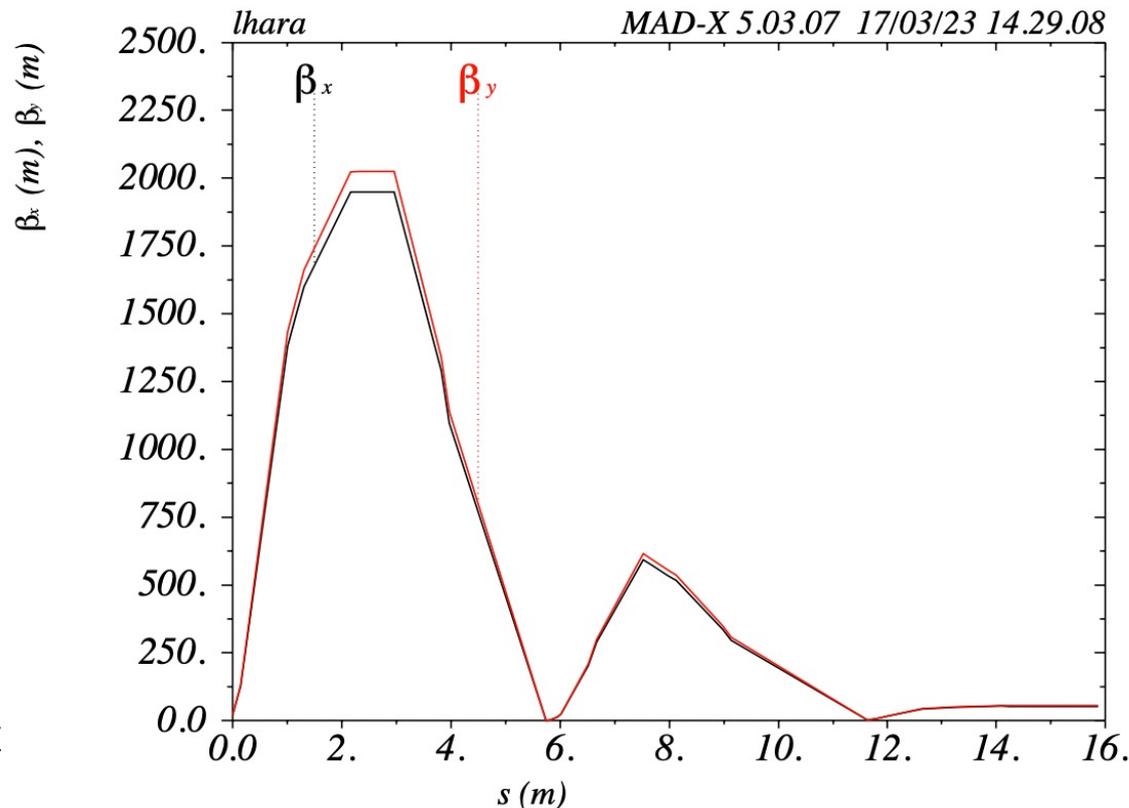
Beta Value (m)	Beam size at the end station (mm)	GL4	GL5	GL6	GL7
704.89	7.5	1.0051	0.9014	0.6994	0.6551
489.51	6.25	1.0051	0.8647	0.7377	0.7106
313.28	5.0	1.0051	0.8247	0.7947	0.7984
176.22	3.75	1.0051	0.7715	0.8040	0.9829
78.32	2.5	0.9060	0.8018	0.2661	1.2793
50.0	2.0	1.1875	0.5833	1.4000	0.3982

	Pre-CDR Beam	Smilei Sampled Beam	SCAPA Sampled Beam
Mean RMS Emittance [m]	$3.26e^{-7}$	$1.43e^{-8}$	$7.98e^{-8}$
Mean Beta [m]	4.89	141.34	21.62
Mean Alpha	-50.22	-1418.43	-222.23

- Include in report?

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Summary

- Done:
  - Found solution for β=50m with updated beam parameters

- Ongoing:
  - <u>Write-up for 6 month report</u>
  - Re-running of stage 1 beam transport simulations
  - Re-run optimisation routines with updated beam
  - Update models of alternative baseline design (v5.5)

- Todo:
  - <u>Talk for Design Review Meeting</u>
    - Send round Monday as early as possible.
  - Re-run collimation settings study
  - Determine nominal octupole settings
  - Quads only model (v6.0)
  - Develop OPAL model of FFA – need JP input.