

Progress Update

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WP6 Meeting

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ROYAL
HOLLOWAY
UNIVERSITY
OF LONDON



- Fixed 6-Month progress review report references
 - No 'missing' references?
- Rechecking SCAPA beam emittance
 - Documenting methodology – reproducibility.
- Updated CCAP-SIM repository
 - pygpt updates, SCAPA beam conversion scripts, etc.

- Planning IPAC paper
 - Confirmed attendance
 - Present progress on 7 Gabor lens configuration:
 - Design
 - Beam profile
 - Optics
 - Optimisation
 - Losses & energy deposition?

- Submitted abstract:

LhARA, the Laser-hybrid Accelerator for Radiobiological Applications, is a proposed novel facility capable of delivering high intensity beams of protons and ions that will enable radiobiological research to be carried out in completely new regimes. A two-stage facility, the first stage utilizes laser-target acceleration to produce proton bunches of energies up to 15 MeV. A series of Gabor plasma lenses will efficiently capture the beam which will be delivered to an in-vitro end station. The second stage will accelerate protons in a fixed-field alternating-gradient ring up to 127 MeV, and ions up to 33.4 MeV/nucleon. The beams will subsequently be deliverable to either an in-vivo end station or a second in-vitro end station. The technologies demonstrated in LhARA have the potential to underpin the future of hadron therapy accelerators and will be capable of delivering a wide variety of time structures and spatial configurations at instantaneous dose rates up to and significantly beyond the ultra-high dose rate FLASH regime. We present here recent progress and the current status of the LhARA accelerator as we work towards a full conceptual design.

- **Submission deadline: May 3rd**
 - Aim: draft version by 25th April

- Done:
 - 6 month progress review report write-up

- Ongoing:
 - IPAC paper planning
 - Rechecking target housing beam transport & emittance calculations
 - Re-running of stage 1 beam transport simulations
 - Re-run optimisation routines with updated beam

- Todo:
 - IPAC paper draft & poster
 - Update models of alternative baseline design (v5.5)
 - Re-run collimation settings study
 - Determine nominal octupole settings
 - Quads only model (v6.0)
 - Develop OPAL model of FFA – need JP input.