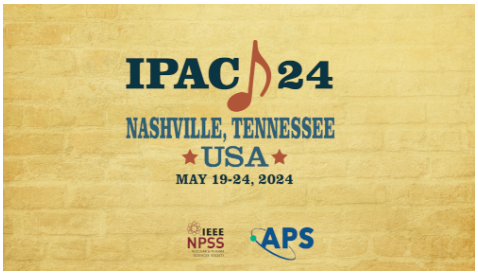

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The Laser-hybrid Accelerator for Radiobiological Applications (LhARA): an update towards the conceptual design

Thursday, 23 May 2024 16:00 (2 hours)

LhARA, the Laser-hybrid Accelerator for Radiobiological Applications, is a proposed facility designed to advance radiobiological research by delivering high-intensity beams of protons and ions in unprecedented ways. Designed to serve the Ion Therapy Research Facility (ITRF), LhARA will be a two-stage facility that will employ laser-target acceleration in the first stage, generating proton bunches with energies around 15 MeV via the TNSA mechanism. A series of Gabor plasma lenses will efficiently capture the beam, directing it to an in-vitro end station. In the second stage, protons will be accelerated in a fixed-field alternating gradient ring, reaching up to 127 MeV, while ions can achieve up to 33.4 MeV/u. The resulting beams will be directed to either an in-vivo end station or a second in-vitro end station. The demonstrated technologies have the potential to shape the future of hadron therapy accelerators, offering versatility in time structures and spatial configurations, with instantaneous dose rates surpassing the ultra-high dose rates required for studies into the FLASH effect. Here, we present a status update of the LhARA accelerator as we approach a full conceptual design.

Footnotes

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Primary author: SHIELDS, William (Royal Holloway, University of London)

Presenter: SHIELDS, William (Royal Holloway, University of London)

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