Contribution ID: **2331** Contribution code: **SUPS073** Type: **Student Poster Presentation**

Design of FFA magnet for the laser-hybrid accelerator for radiobiological applications (LhARA)

Sunday 1 June 2025 14:00 (2 hours)

LhARA, which stands for "Laser-hybrid Accelerator for Radiobiological Applications", is a novel and flexible facility dedicated to research in radiobiology. A proton beam of energy up to 15 MeV can be produced by a laser driven source, the beam then enters a Fixed Field Alternating (FFA) gradient accelerator for acceleration to produce a variable extraction energy between 15-127 MeV. To avoid uncontrolled beam loss, the operational tune was picked carefully to avoid resonances. The magnetic field must be adjusted to ensure that the tune stays at the same working point for different energy ranges. The FFA ring uses combined-function spiral magnets, which create a radial magnetic gradient through distributed conductors wrapped around the pole, each carrying a different current. A three-dimensional study was carried out in OPERA 3D and the parameters of the magnet were optimized. The results showed that resonances up to fourth order were avoided for the entire range of acceleration for different operational energies.

Footnotes

Paper preparation format

LaTeX

Region represented

Europe

Funding Agency

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Session Classification: Student Poster

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T09 Normal Conducting Magnets