7th European Advanced Accelerator Conference

EAAC2025

Contribution ID: **490** Type: **Oral contribution**

Compact Beamline for Laser-Plasma-Based Radiotherapy

Tuesday 23 September 2025 18:00 (20 minutes)

There has been growing interest in using very high energy (100-300 MeV) electrons for radiotherapy, both using conventional and plasma-based sources. While not as precise as ions, ultra-relativistic electrons offer a more favorable dose deposition profile than X-rays, potentially reducing the irradiation of healthy tissue. Laser-plasma sources of ions and electrons could offer cheaper and more compact alternatives to conventional sources, and recent advances have brought them closer to a relevant parameter range for radiotherapy. However, their energy spread often exceeds the stringent requirements of clinical radiotherapy. While further source optimization could partially bridge the gap, the particle transport system from source to target can also be used to tailor the final beam properties. This work outlines the design concept for a compact particle transport beamline that filters the particle energies and reduces the outgoing spatial and angular jitter, offering a step towards clinical implementations of laser-plasma particle sources for radiotherapy.

Author: Dr BJÖRKLUND SVENSSON, Jonas (Lund University)

Co-authors: Dr CURBIS, Francesca (Lund University); LUNDH, Olle (Lund University); Prof. WERIN, Sverker (Lund University)

Presenter: Dr BJÖRKLUND SVENSSON, Jonas (Lund University)

Session Classification: PS5: Applications

Track Classification: PS5: Applications