



Contribution ID: 235

Type: talk

A positron source for applications using the TARANIS laser

Thursday, 19 September 2019 16:40 (20 minutes)

The realization of compact positron source is of great importance for a wide range of applications such as positron annihilation spectroscopy for material science. Moreover, a number of applications could benefit from short pulse duration (sub-100 ps) positron beams.

The interaction of a high-intensity laser with high-Z solid targets can be used to produce a population of relativistic electrons which, in turn, initiate an electromagnetic cascade in the target emitting a positron beam together with electrons and X-rays. This technique can be used to produce high-current mildly relativistic to relativistic positron beams suitable for applications in a compact setup.

Preliminary experiments using the TARANIS laser facility at Queen's University providing intensities $\sim 10^{19} \text{ W/cm}^2$ on target and simulations using the Monte-Carlo scattering code FLUKA were performed to design a compact and high-quality positron source at the Queen's University of Belfast. Results of preliminary experiments, simulations and plans to optimize the positron source will be presented.

Primary authors: AUDET, Thomas (The Queen's University of Belfast); WARWICK, J (Queen's University Belfast); ALEJO, Aaron (Queen's University of Belfast); Mr MARRERO SAMARIN, Guillermo (Queen's University Belfast); Mr RAFFERTY, Cormac (The Queen's University of Belfast); Mr CUNNINGHAM, Mark (The Queen's University of Belfast); SARRI, Gianluca (Queen's University Belfast)

Presenter: AUDET, Thomas (The Queen's University of Belfast)

Session Classification: WG4

Track Classification: WG4 - Application of compact and high-gradient accelerators