Contribution ID: **340** Type: **poster**

Nuclear activation of copper isotopes in a γ-ray beamline based on Texas Petawatt Laser-Plasma Accelerated Electrons

Wednesday, 18 September 2019 19:00 (1 hour)

The advent of laser wakefield acceleration of electrons to GeV energies and charges up to nanocoulombs offer a unique tool to generate high intensity bremsstrahlung with characteristics similar to conventional accelerators, but in a more compact setup. Future facilities like the ELI pillars will use laser-generated bremsstrahlung at high repetition rates to study nuclear physics phenomena. However, for this scheme to be successful, proper characterization of the generated beam and the acceleration process is required.
In this poster we show the application of such a beamline in an experiment conducted at the Texas Petawatt facility. Electrons accelerated to GeV energies generated high intensity MeV gamma rays by means of a bremsstrahlung radiator and by Thomson backscattering. The radiation was used to activate copper isotopes via (γ, n) and (γ, 2n) producing 64Cu, 62Cu and 61Cu whose decay times were measured via a coincidence detector. At the same time, the acceleration process was diagnosed with an electron spectrometer and the gamma-ray beam with a differential calorimeter. We will report measurements of gamma-ray photon number and spectrum based on this suite of detectors.

Primary authors: HANNASCH, Andrea (University of Texas at Austin); LASO GARCIA, Alejandro (Helmholtz Zentrum Dresden Rossendorf); WAGNER, Andreas (Helmholtz-Zentrum Dresden-Rossendorf); DOWNER, Michael (The University of Texas at Austin)

Co-authors: Mr LABERGE, Maxwell (University of Texas - Austin); CHENG, Xiantao (The University of Texas at Austin); BROOKS, Jason (The University of Texas at Austin); LISI, Luc (The University of Texas at Austin); BOWERS, Brant (The University of Texas at Austin); PAGANO, Isabella (The University of Texas at Austin); SPINKS, Michael (The University of Texas at Austin, Center for High Energy Density Science); QUEVEDO, Hernan (The University of Texas at Austin, Center for High Energy Density Science); DONOVAN, Mike (The University of Texas at Austin, Center for High Energy Density Science); BERNSTEIN, Aaron (The University of Texas at Austin); ZGADZAJ, Rafal (The University of Texas at Austin); DITMIRE, Todd (The University of Texas at Austin, Center for High Energy Density Science); COWAN, Thomas (Forschungszentrum Dresden-Rossendorf)

Presenter: HANNASCH, Andrea (University of Texas at Austin)

Session Classification: Cheese and Wine Poster Session 2

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