



Contribution ID: 119

Type: **not specified**

Project overview of ICMuS2: Developing plasma accelerator based active sources of GeV muons

Tuesday, 23 July 2024 16:20 (20 minutes)

Laser plasma accelerators are poised to reach electron energies of 10-100 GeV and this new regime will open novel applications such as the production of heavy particles including muons. Electrons with energies exceeding twice the rest mass of a muon ($211 \text{ MeV}/c^2$) can initiate muon generation through the Bethe-Heitler pair production process. This talk will present work on behalf of a multi-institution collaboration, Intense and Compact Muon Sources for Science and Security (ICMuS2), that aims to develop the capability to generate and detect muons using high energy and high charge electron beams, primarily at Colorado State University's ALEPH laser [1]. The electron acceleration method uses an optically formed plasma waveguide developed by University of Maryland [2,3]. Preliminary results from first of their kind experiments will be discussed along with plans for implementing the platform at the ELI-Beamlines Facility in the Czech Republic. We will also present progress on next-generation laser development research that will enable high average flux operations and system engineering to deploy such a design.

This work was supported by DARPA under the Muons for Science and Security (MuS2) Program and performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract DE-AC52-07NA27344.

LLNL-ABS-860513

Working group

WG6 : Radiation generation, medical and industrial applications

Primary author: WILLIAMS, Jackson (Lawrence Livermore National Laboratory)

Presenter: WILLIAMS, Jackson (Lawrence Livermore National Laboratory)

Session Classification: WG6