

The ICMuS2 Project: Production of a Multi-GeV Muon Beam using Laser Wakefield Acceleration

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Current artificial muon beam sources require conventional radiofrequency (RF) accelerators that can be 100s-1000s of meters in size. Laser wakefield acceleration, instead, can achieve acceleration gradients up to 100 GeV/m, 1000 times greater than RF accelerators. Therefore, by using a meter-scale long plasma and combining it with next-generation laser driver technology the system could be potentially shrunk down to portable sizes. The Intense and Compact Muon Sources for Science and Security (ICMuS2) project aims at the production of a high-intensity high-energy (100 GeV) muon beam using a 10 PW-class laser to accelerate electrons. Muons will be then generated in a high-Z target via Bethe-Heitler process.

The ICMuS2 project and its latest results are presented including the design and development of a 10-100 GeV electron laser-driven accelerator and the production, detection, and characterization of muons within the background electromagnetic cascade.

Alternate track

1. Detectors for Future Facilities, R&D, Novel Techniques

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Session Classification: Accelerators: Physics, Performance, and R&D for future facilities

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