International Workshop on Muon Physics at the Intensity and Precision Frontiers (MIP2025)



Contribution ID: 65

Type: not specified

Current status of the SHINE muon source

A high-repetition-rate pulsed muon source operating at approximately 50 kHz could improve the sensitivity of various particle physics and material science experiments involving muons. We proposed using the high-repetition-rate pulsed electron beam at the SHINE facility to generate a surface muon beam. Our simulation studies show that an 8 GeV, 100 pC charge pulsed electron beam striking a copper target can produce up to 2 \times 10³ muons per pulse. Through beamline optimization, approximately 60 surface muons per electron bunch can be efficiently transported to the beamline's end. When operated at 50 kHz, the pulsed electron beam yields a surface muon rate of 3 \times 10⁶ μ^+/s —comparable to existing muon facilities.

In this talk, the current status and challenges of the SHINE muon source, as well as the preparation status for the upcoming beam test will be reported.

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