



Contribution ID: 112

Type: **Oral contribution**

Current Status of the High-Repetition-Rate Electron-Driven Pulsed Muon Source at the SHINE Facility

Tuesday, September 1, 2026 3:15 PM (25 minutes)

Precision measurements of muon properties and rare decay processes are ideally performed at repetition rates around 50 kHz, yet existing muon facilities are tied to proton accelerators operating in continuous or low repetition rate pulsed modes, making them mismatched to this requirement. We propose an electron driven muon production scheme at the Shanghai High repetition rate XFEL and Extreme Light (SHINE) facility, exploiting its 8 GeV electron beam at 1 MHz repetition rate with 100 pC per bunch, to deliver the time structure and comparable intensities needed for next generation muon experiments. Simulation studies confirm the potential of this approach for both fundamental muon physics and applied research, while also highlighting key challenges including lower per bunch yield, elevated backgrounds, and the need for novel measurement methods. To validate the concept, we propose a muon yield measurement using a compact vacuum chamber with a stopping target and surrounding scintillator detectors to detect muon decay electrons. The current status of the end to end simulation and the hardware installation progress at SHINE are presented.

Primary author: Mr NG, Jun Kai (Shanghai Jiao Tong University)

Co-authors: Mr YAP, JIA CHENG; Prof. KHAW, Kim Siang (TDLI/SJTU)

Presenter: Mr NG, Jun Kai (Shanghai Jiao Tong University)

Session Classification: WG3+WG4 —Muon Sources & Beams

Track Classification: WG3: Accelerator Physics