

Physics potentials and accelerator challenges of Phase Rotated Intense Source of Muons (PRISM)

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Muon to electron conversion in a muonic atom is an excellent laboratory to search for charged lepton flavor violation (CLFV). Its discovery would be a clear signal of physics beyond the Standard Model (BSM). In order to further improve the experiments by an additional factor of 100 in sensitivity beyond the current generation ones and study potential signals, the use of a Fixed-Field Alternating gradient (FFA) ring has been proposed to create a Phase Rotated Intense Source of Muons (PRISM). PRISM will allow significant purification of the muon beam and suppression of a typically large momentum spread by the use of RF phase rotation in the ring, both reducing the backgrounds and increasing the number of stopped muons relative to other methods. PRISM requires a proton driver capable of producing short, intense proton bunches. New facilities, in particular PIP-II at Fermilab equipped with a dedicated accumulator ring, or upgrades of other accelerator facilities, such as J-PARC and ESS, offer promising opportunities for providing the required intensity and time structure of the proton beam. A new proposed complex at Fermilab, the Advanced Muon Facility, would use the PRISM concept to provide the world's most intense positive and negative muon beams by exploiting the full potential of PIP-II and the Booster upgrade. Progress in R&D studies on PRISM are discussed.

Attendance type

In-person presentation

Primary author: PASTERNAK, Jaroslaw (Imperial College/RAL-STFC)

Presenter: PASTERNAK, Jaroslaw (Imperial College/RAL-STFC)

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