

Progress in design of a muon source for muon to electron conversion based on an FFA ring - PRISM

Tuesday 22 August 2023 17:50 (20 minutes)

Future muon to electron conversion experiments require an improvement in sensitivity by a factor of 100 and novel accelerator concepts are necessary to achieve this goal.

A Fixed-Field Alternating gradient (FFA) ring has been proposed to create a Phase Rotated Intense Source of Muons (PRISM), which will allow for a significant purification of the muon beam and suppression of a typically large momentum spread by the use of RF phase rotation. This will provide a reduction of the backgrounds and increase the number of stopped muons in the target. The experimental system based on PRISM-like concept is of interest to be used at J-PARC or in proposed Advanced Muon Facility (AMF) at Fermilab. The challenge of PRISM lays in the necessity to efficiently transport the beam with very large emittance and momentum spread and the use of an FFA is essential to meet this requirement.

An example FFA ring design and its subsystems are presented and their accelerator physics performance is evaluated.

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Session Classification: parallel (room#101)

Track Classification: WG4: Muon Physics