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The detector system of the Muon Ionization Cooling Experiment (MICE) experiment

Content :

The Muon Ionization Cooling Experiment (MICE) based at the Rutherford Appleton Laboratory aims to demonstrate 10% ionisation cooling of a beam of muons by its interaction with low Z absorber materials followed by restoration of longitudinal momentum in RF linacs.

A prototype cell of an ionization cooling channel will be preceded and followed by two detection systems each measuring to 0,1 % the emittance of the the muon beam. The reduction of its emittance will to measured to 1%.

Two identical scintillation fiber trackers in solenoidal magnetic field each equipped a 50-60 ps time of flight station are now almost complete and tested to perform these measurement.

Perticle identifiction will also be decisive to suppress

-pion contamination, with TOF and Cerenkov aereogel detectors, in the first tracker

-muon decay electrons, with TOF, KLOE-like preshower(KL) anf fully active electron muon ranger (EMR), after the second tracker

These two PID stations are also operational, with the last unit, the EMR, being commissioned now.

Performance of the integrated detector system in the precise measurements of emittances will be detailed.

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Comments :

Abstract submitted by the chair of the MICE speakers bureau. If accepted, a member of the collaboration will be selected for the mission