

The Muon Ionization Cooling Experiment

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The Muon Ionization Cooling Experiment (MICE) is a high-precision, accelerator experiment being performed at Rutherford Appleton Laboratory in the UK, using particle physics techniques. Its goal is the first demonstration, with 0.1% resolution, of the feasibility of reducing the transverse emittance (beam volume in 4D phase space) of a beam of muons by ionization cooling in low-Z absorbers. Ionization cooling will be a key technique used in creating beams of muons for high-intensity Neutrino Factory(ies) and Muon Collider(s) of the future.

MICE is being staged in the following steps: I. Creating and characterizing a beam of muons; II. Measuring their emittance; III. Systematic comparison of successive measurements; IV. Inserting absorber; V. Reaccelerating longitudinally; and VI. Complete “10%-cooling” test. Step I has recently been completed and preliminary results will be shown.

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