

Progress towards completion of the MICE demonstration of ionisation cooling of muons

The Muon Ionisation 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.

Extensions to the apparatus required to achieve STEP IV, including the first absorber cell, of either liquid hydrogen or lithium hydride, sandwiched between two particle tracking spectrometers shall be described. Two very large superconducting spectrometer solenoids (the first of which has just completed acceptance trials) and one focus coil solenoid (currently under test), manufactured in the US and UK respectively, will provide a magnetic field of $\sim 4\text{T}$ in the volume of the two trackers and the absorber cell. The development, testing and integration of these challenging components will be reported.

Progress towards STEPs V & VI including the 8 RF cavities to provide the required 8MV/m gradient in a strong magnetic field will be presented, including the RF drive system to deliver 2MW, 1ms pulses of 201MHz frequency at a PRF of 1Hz, the distribution network to deliver 1MW to each cavity with correct RF phasing, diagnostics to determine the gradient and transit phase of the muons and the development of the very large diameter magnets required for the linacs.

Primary author: Prof. PALLADINO, Vittorio (Univ & INFN Napoli, Italy)

Presenter: Prof. PALLADINO, Vittorio (Univ & INFN Napoli, Italy)