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Measurement of Ionization Cooling With the MICE Experiment

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The international Muon Ionization Cooling Experiment (MICE) will demonstrate the ionization cooling of muons; the only known technique that can provide high brightness muon beams suitable for applications such as a Neutrino Factory or Muon Collider. MICE is underway at the Rutherford Appleton Laboratory and has recently taken the data necessary to characterise the physical processes that underlie the ionization-cooling effect. Measurements of the underlying physics processes will be presented. Measurements of the change in normalised transverse emittance will be presented in a number of configurations. The measurements of the ionization-cooling effect will be discussed. The engineering demonstration of ionization cooling will be carried out by upgrading the present configuration with two 201 MHZ RF cavities and additional focusing elements. The status of the reconfiguration of the experiment will be presented together with a detailed evaluation of the performance of the cooling demonstration itself.

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