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ID: 4462 Particle Production in MICE

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Abstract The Muon Ionization Cooling Experiment (MICE) is designed to test transverse cooling of a muon beam. This will satisfy a crucial step along the path toward creating high intensity muon beams in a Muon Collider or Neutrino Factory. MICE is being built at Rutherford Appleton Laboratory (RAL) at the ISIS 800 MeV proton synchrotron. Pions created by a titanium target dipping into the ISIS beam are captured, momentum-selected, and pass through a superconducting solenoid where they decay to produce muons. Particles of varying type and momentum are selected with dipoles for propagation through the rest of the MICE beamline. Different beam configurations were tuned to produce the desired particle type, momentum, and spatial distribution. Within the last year, MICE took data for Step I, with the goal of commissioning the beam line and calibrating the particle identification detectors. In this paper, studies of the MICE beamline and target timing will be discussed, including the use of Time-of-Flight detectors to understand the content of the MICE beam, both negative and positive polarity, with momentum from 100 to 300 MeV/c.

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