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ID: 4465 MICE Muon Beamline Particle Rate and Related Beam Loss in the ISIS Synchrotron

Presenter Linda Coney (UCR, Riverside, California)

Authors Linda Coney (UCR, Riverside, California), Adam James Dobbs (Imperial College of Science and Technology, London)

Abstract The international Muon Ionization Cooling Experiment (MICE) will provide a proof of principle of ionization cooling, reduction of muon beam phase space, which will be needed at a future Neutrino Factory and Muon Collider. The MICE muon beam is generated by the decay of pions produced by dipping a cylindrical titanium target into the proton beam of the 800 MeV ISIS synchrotron at the Rutherford Appleton Laboratory, U.K. Studies of the particle rate in the MICE beamline and correlations with induced beam loss in ISIS are described, including the most recent data taken in the summer of 2010, representing some of the highest loss and rate conditions achieved to date. Ideally, a high rate of muons in the MICE beamline is desired, in order to facilitate the cooling measurement. However, impact on the host accelerator equipment must also be minimized. The implications of the observed beam loss and particle rate levels for MICE and ISIS are discussed.

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