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ID: 4356 Magnetic Field Measuring / Mapping Plan in MICE

Presenter Vittorio Carlo Palladino (INFN-Napoli, Napoli)

Authors Vittorio Carlo Palladino (INFN-Napoli, Napoli), Pierrick M. Hanlet (IIT, Chicago, Illinois)

Abstract The muon ionization cooling experiment, MICE, is a demonstration experiment of this novel cooling technique. It contains eighteen high field superconducting solenoids producing axial fields of several Tesla. It will be necessary to know the fields with sufficient precision to predict the final performance of the cooling section and ensure the precision of the momentum and phase-space measurements. The field measuring / mapping plan will be described.

Funding Agency

Type of Presentation Poster

Main Classification 03 Linear Colliders, Lepton Accelerators and New Acceleration Techniques

Sub Classification A09 Muon Accelerators and Neutrino Factories

ID: 4483 Muon Ionization Cooling Experiment: Controls and Monitoring

Presenter Pierrick M. Hanlet (IIT, Chicago, Illinois)

Authors Pierrick M. Hanlet (IIT, Chicago, Illinois)

Abstract The Muon Ionization Cooling Experiment (MICE) is a demonstration experiment to prove the viability of cooling a beam of muons for use in a Neutrino Factory and Muon Collider. The MICE cooling channel is a section of a modified Study II cooling channel which will provide a 10% reduction in beam emittance. In order to ensure a reliable measurement, we intend to measure the beam emittance before and after the cooling channel at the level of 1%, or an absolute measurement of 0.001. This renders MICE as a precision experiment which requires strict controls and monitoring of all experimental parameters in order to control systematic errors. The MICE Controls and Monitoring system is based on EPICS and integrates with the DAQ and Data monitoring systems. A description of this system, its implementation, and performance during recent muon beam data collection will be discussed.

Footnotes For the MICE collaboration.

Funding Agency NSF PHY0842798

Type of Presentation Poster

Main Classification 03 Linear Colliders, Lepton Accelerators and New Acceleration Techniques

Sub Classification A09 Muon Accelerators and Neutrino Factories

ID: 4433 Experimental Result of High Pressure RF Cavity with Intense Proton Beam at Fermilab

Presenter Katsuya Yonehara (Fermilab, Batavia)

Authors Katsuya Yonehara, Alan David Bross, Mukti Ranjan Jana (Fermilab, Batavia), Ben Freemire, Pierrick M. Hanlet, Yagmur Torun (IIT, Chicago, Illinois), Leo James Jenner, Ajit Kurup (Imperial College of Science and Technology, London), Maria Giulia Collura (Politecnico di Torino, Torino)

Abstract Muon is a very attractive species to study the elementally particle physics because of its unique characteristics. Recently, the Muon Acceleration Program (MAP) has been formed to establish the muon acceleration technology for neutrino factory and muon collider. One of most crucial elements in muon acceleration is a high gradient RF cavity operating in a strong magnetic field for muon beam cooling. Maximum field gradients in conventional vacuum RF cavity are limited by strength of external magnetic field due to focusing dark current in the cavity. This limitation disappears by filling dense hydrogen gas in the cavity. However, beam induced hydrogen plasma will be formed in the cavity and consume a large amount of RF power. We plan to measure the beam loading effect in the high pressure RF cavity by using a 400 MeV proton beam in the Mucool Test Area (MTA) at Fermilab. The beam loading effect will be measured by varying beam intensity, gas pressure, gas species, and RF amplitude. The experimental result will be reported in this presentation.

Funding Agency

Type of Presentation Poster

Main Classification 03 Linear Colliders, Lepton Accelerators and New Acceleration Techniques

Sub Classification A09 Muon Accelerators and Neutrino Factories

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