Low Energy Muon Ionization Cooling Channel Fermilab

Reviews of Accelerator Science and Technology
Beyond the Desert 2003
Physics Potential and Development of [mu]+ [mu]− Colliders, Second Workshop
The Proceedings of the International Symposium on Nuclear Electro-Weak Spectroscopy for Symmetries in Electro-Weak Nuclear-Processes
Beam Dynamics of Low Energy Muon Acceleration
Pion Contamination in the MICE Muon Beam
Reviews Of Accelerator Science And Technology - Volume 10: The Future Of Accelerators
Electromagnetic Design of RF Cavities for Accelerating Low-Energy Muons
News 99
Physics and Technology of Linear Accelerator Systems
The MICE Demonstration of Ionization Cooling
Tsukuba, Japan, 1-4 December 1999
Sausalito, CA, November 1994
Proceedings of the Conference Held in Sausalto, CA, 1994
Computational Accelerator Physics 2003
The MICE Collaboration
A Study of Muon Ionization Cooling at MICE.

Simulated Measurements of Cooling in Muon Ionization Cooling Experiment
Beyond the Desert 1999
High Field {u2013} Low Energy Muon Ionization Cooling Channel
Physicist's Desk Reference
Physics Potential and Development of U + U - Colliders
Challenges And Goals For Accelerators In The Xxi Century
Final 6D Muon Ionization Colling Using Strong Focusing Quadrupoles
Novel Linac Structures for Low-beta Ions and for Muons
Neutrino Factory and Muon Collider Fellow
Muon Muon Collider
Reviews of Accelerator Science and Technology
Introductory Muon Science
Proceedings of the Fourth Tegernsee International Conference on Particle Physics Beyond the Standard BEYOND 2003, Castle Ringberg, Tegernsee, Germany, 9–14 June 2003
Hydrogen-filled RF Cavities for Muon Beam Cooling
Handbook Of Accelerator Physics And Engineering (2nd Edition)
Muon Collider Final Cooling in 30-50 T Solenoids
Proceedings of the Seventh International Conference on Computational Accelerator Physics, Michigan, USA, 15-18 October 2003
Proceedings of the 2002 Joint USPAS-CAS-Japan-Russian Accelerator School, Long Beach,

California 6-14 November 2002
Lampf Users Group Inc. (Lugi) Symposium: 20 Years Of Meson Factory Physics: Accomplishments And Prosp
Physics Beyond the Standard Models of Particles, Cosmology and Astrophysics
High Field - Low Energy Muon Ionization Cooling Channel
Particle Physics: Perspectives And Opportunities - Report Of The Dpf Committee On Long-term Planning

LUCIANA LAUREL

Reviews of Accelerator Science and Technology World Scientific
Muon beams are generated with large transverse and longitudinal emittances. In order to achieve the low emittances required by a muon collider, within the short lifetime of the muons, ionization cooling is required. Cooling schemes have been developed to reduce the muon beam 6D emittances to ≈ 300 ?m–rad in transverse and ≈ 1–1.5 mm in longitudinal dimensions. The transverse emittance has to be further reduced to ≈ 50–25 ?m–rad with an upper limit on the longitudinal emittance of ≈ 76 mm in order to meet the high-energy muon collider luminosity

requirements. Earlier studies of the transverse cooling of low energy muon beams in high field magnets showed a promising performance, but did not include transverse or longitudinal matching between the stages. In this study we present the first complete design of the high field-low energy ionization cooling channel with transverse and longitudinal matching. The channel design was based on strong focusing solenoids with fields of 25–30 T and low momentum muon beam starting at 135 MeV/c and gradually decreasing. The cooling channel design presented here is the first to reach ≈ 50 micron scale emittance beam. As a result, we present the channel's optimized design parameters including the focusing solenoid fields, absorber parameters and the transverse and longitudinal matching.

Beyond the Desert 2003 World Scientific Edited by internationally recognized authorities in the field, this expanded and updated new edition of the bestselling Handbook, containing more than 100 new articles, is aimed at the design and operation of modern particle accelerators. It is intended as a vade mecum for professional engineers and physicists engaged in these subjects. With a collection of more than 2000 equations, 300 illustrations and 500 graphs and tables, here one will find, in addition to the common formulae of previous compilations, hard-to-find, specialized formulae, recipes and material data pooled from the lifetime experience of many of the world's most able practitioners of the art and science of accelerators.The eight chapters include both theoretical and practical matters as well as an extensive glossary of accelerator types. Chapters on beam dynamics and electromagnetic and nuclear interactions deal with linear and nonlinear single particle and collective effects including spin motion, beam-environment, beam-beam, beam-electron, beam-ion and intrabeam interactions. The impedance concept and related calculations are dealt with at length as are the instabilities associated with the various interactions mentioned. A chapter on operational considerations includes discussions on the assessment and correction of orbit and optics errors, real-time feedbacks, generation of short photon pulses, bunch compression, tuning of normal and superconducting linacs, energy recovery linacs, free electron lasers, cooling, space-charge compensation, brightness of light sources, collider luminosity optimization and collision schemes. Chapters on mechanical and electrical considerations present material data and important aspects of component design including heat transfer and refrigeration. Hardware systems for particle sources, feedback systems, confinement and acceleration (both normal conducting and superconducting) receive detailed treatment in a subsystems chapter, beam measurement techniques and apparatus being treated therein as well. The closing chapter gives data and methods for radiation protection computations as well as much data on radiation damage to various materials and devices.A detailed name and subject index is provided together with reliable references to the literature where the most detailed information available on all subjects treated can be found.

Physics Potential and Development of [mu]+ [mu]− Colliders,

Second Workshop
World Scientific
Muon beams of low emittance provide the basis for the intense, well-characterised neutrino beams necessary to elucidate the physics of flavour at the Neutrino Factory and to provide lepton-antilepton collisions at energies of up to several TeV at the Muon Collider. The International Muon Ionization Cooling Experiment (MICE) will demonstrate ionization cooling, the technique by which it is proposed to reduce the phase-space volume occupied by the muon beam at such facilities. In an ionization cooling channel, the muon beam passes through a material (the absorber) in which it loses energy. The energy lost is then replaced using RF cavities. The combined effect of energy loss and re-acceleration is to reduce the transverse emittance of the beam (transverse cooling). A major revision of the scope of the project was carried out over the summer of 2014. The revised project plan, which has received the formal endorsement of the international MICE Project Board and the international MICE Funding Agency Committee, will deliver a demonstration of ionization cooling by

September 2017. In the revised configuration a central lithium-hydride absorber provides the cooling effect. The magnetic lattice is provided by the two superconducting focus coils and acceleration is provided by two 201 MHz single-cavity modules. The phase space of the muons entering and leaving the cooling cell will be measured by two solenoidal spectrometers. All the superconducting magnets for the ionization cooling demonstration are available at the Rutherford Appleton Laboratory and the first single-cavity prototype is under test in the MuCool Test Area at Fermilab. The design of the cooling demonstration experiment will be described together with a summary of the performance of each of its components. The cooling performance of the revised configuration will also be presented.

The Proceedings of the International Symposium on Nuclear Electro-Weak Spectroscopy for Symmetries in Electro-Weak Nuclear-Processes CRC Press Stanford University hosted the XIX International Symposium on Lepton and Photon Interactions at High Energies on August 9 – 14, 1999, at the Law School on the Stanford

University Campus, the site of the previous Symposia. This volume constitutes the proceedings of the Symposium. Contents:Reports from the B Factories:CESR and CLEO (K Honscheid)Status of KEKB Accelerator and Detector, BELLE (F Takasaki)Status of PEP-II and BaBar (J Dorfan)HERA-B Status (M Medinnis)Brief Report from the Tevatron (M Paulini)Heavy Flavor Physics and CP Violation:Heavy Quark Decays (R A Poling)Heavy Quark Lifetimes, Mixing, and CP Violation (G Blaylock)ε'/ε Results from KTeV (E Blucher)Results on Direct CP Violation from NA48 (G Barr)A Status Report of KLOE at DAΦNE (S Bertolucci)Quark Mixing Matrix Studies and Lepton Flavor Violation Searches Using Rare Decays of Kaons (W Molzon)Tau Physics (A Pich)B Decays, the Unitarity Triangle, and the Universe (A F Falk)Neutrino Physics:Solar Neutrinos (Y Suzuki)Atmospheric Neutrinos and the Oscillations Bonanza (W A Mann)Accelerator and Reactor Neutrino Experiments (L DiLella)Neutrino Mass and Oscillations (R G H Robertson)Electroweak Interactions and Beyond:Precision on Electroweak at the Z (M L Swartz)Electro weak Measurements from Hadron Machines (M Lancaster)Precise Electroweak Results from LEP2 (D G Charlton)R Values in Low Energy e+e- Annihilation (Z-G Zhao)Status of the Muon (g – 2) Experiment (B L Roberts)Ten Years of Precision Electroweak Physics (A Sirlin)New Particle Searches (V Ruhlmann-Kleider)Recent Developments in Physics Beyond the Standard Model (G F Giudice)Structure Within Particles:Structure Functions in Deep Inelastic Lepton-Nucleon Scattering (M Klein)Diffraction and the Pomeron (H Abramowicz)The Spin Structure of the Nucleon (G K Mallot)Structure of the Photon (J M Butterworth)Rare Φ Decays and Exotic Hadrons (S I Serednyakov) QCD Phenomena and Theory:Fragmentation and Hadronization (B R Webber)Test of Perturbative QCD and Jet Physics (J Womersley)Applications of QCD (M Beneke) Lattice Calculations and Hadron Physics (S Aoki)Cosmology and Astrophysics: Dark Matter Searches (B Sadoulet)Supernovae, Dark Energy, and the Accelerating Universe: The Status of the Cosmological Parameters (S Perlmutter)High Energy Particles from the Universe

(R A Ong)Cosmic Microwave Background: Past, Future, and Present (S Dodelson)Looking to the Future:Physics Needs for Future Accelerators (J D Lykken)R&D Progress Toward Future Linear Colliders (G-A Voss)Towards Very High Energy Accelerators (J S Wurtele)Gravity, Particle Physics and Their Unification (J M Maldacena)Assessment and Outlook (B Richter)

Readership: High-energy, astro-, nuclear, experimental and theoretical physicists. Keywords:Lepton;Photon;High Energy Physics;Astrophysics;Nuclear Physics

Beam Dynamics of Low Energy Muon Acceleration

World Scientific

A feasibility study is presented of a 2 + 2 TeV muon collider with a luminosity of L = 1035 cm−2s−1. The resulting design is not optimized for performance, and certainly not for cost; however, it does suffice - we believe - to allow us to make a credible case, that a muon collider is a serious possibility for particle physics and, therefore, worthy of R and D support so that the reality of, and interest in, a muon collider can be better assayed. The goal of this support would be to completely assess the physics potential and to evaluate the cost and development of the necessary technology. The muon collider complex consists of components which first produce copious pions, then capture the pions and the resulting muons from their decay; this is followed by an ionization cooling channel to reduce the longitudinal and transverse emittance of the muon beam. The next stage is to accelerate the muons and, finally, inject them into a collider ring wich has a small beta function at the colliding point. This is the first attempt at a point design and it will require further study and optimization. Experimental work will be needed to verify the validity of diverse crucial elements in the design. Muons because of their large mass compared to an electron, do not produce significant synchrotron radiation. As a result there is negligible beamstrahlun g and high energy collisions are not limited by this phenomena. In addition, muons can be accelerated in circular devices which will be considerably smaller than two full-energy linacs as required in an e - e− collider. A hadron collider would require a CM energy 5 to 10 times higher than 4 TeV to have an equivalent energy reach. Since the accelerator size is limited by the strength of bending magnets, the hadron collider for the same physics reach would have to be much larger than the muon collider. In addition, muon collisions should be cleaner than hadron collisions. There are many detailed particle reactions which are open to a muon collider and the physics of such reactions - what one learns and the necessary luminosity to see interesting events - are described in detail. Most of the physics accesible to an e+ - e− collider could be studied in a muon collider. In addition the production of Higgs bosons in the s-channel will allow the measurement of Higgs masses and total widths to high precision; likewise, t{bar t} and W+W− threshold studies would yield m{sub t} and m{sub w} to great accuracy. These reactions are at low center of mass energy (if the MSSM is correct) and the luminosity and?p/p of the beams required for these measurements is detailed in the Physics Chapter. On the other hand, at 2 + 2 TeV, a luminosity of L ≈ 1035 cm−2s−1 is desirable for studies such as, the scattering of longitudinal W bosons or the production of heavy scalar particles. Not explored in this work, but worth noting, are the opportunities for muon-proton and muon-heavy ion collisions as well as the enormous richness of such a facility for fixed target physics provided by the intense beams of neutrinos, muons, pions, kaons, antiprotons and spallation neutrons. To see all the interesting physics described herein requires a careful study of the operation of a detector in the very large background. Three sources of background have been identified. The first is from any halo accompanying the muon beams in the collider ring. Very carefully prepared beams will have to be injected and maintained. The second is due to the fact that on average 35% of the muon energy appears in its decay electron. The energy of the electron subsequently is converted into EM showers either from the synchrotron radiation they emit in the collider magnetic field or from direct collision with the surrounding material. The decays that occur as the beams traverse the low beta insert are of particular concern for detector backgrounds. A third source of background is e+ - e− pair creation from?+ -?−

interaction. Studies of how to shield t ...

Pion Contamination in the MICE Muon Beam

World Scientific

This volume presents the possibility of high intensity muon sources whose intensity would be at least 104 higher than that available now. Scientific opportunities anticipated with such sources are search for muon lepton flavor violation, measurements of the muon anomalous magnetic moment and the electric dipole moment, neutrino factories based on a muon storage ring, muon collider and muon applied science such as muon catalyzed fusion and biology. In addition to physics opportunities, the necessary technology for such sources is discussed.

Reviews Of Accelerator Science And Technology - Volume 10: The Future Of Accelerators

World Scientific

Particle accelerators are a major invention of the 20th century. In the last eight decades, they have evolved enormously and have fundamentally changed the way we live, think and work. Accelerators are the most powerful microscopes for viewing the tiniest inner structure of cells, genes, molecules, atoms and their constituents such as protons, neutrons, electrons, neutrinos and quarks. This opens up a whole new world for materials science, chemistry and molecular biology. Accelerators with megawatt beam power may ultimately solve a critical problem faced by our society, namely, the treatment of nuclear waste and the supply of an alternative type of energy. There are also tens of thousands of small accelerators all over the world. They are used every day for medical imaging, cancer therapy, radioisotope production, high-density chip-making, mass spectrometry, cargo x-ray/gamma-ray imaging, detection of explosives and illicit drugs, and weapons. This volume provides a comprehensive review of this driving and fascinating field *Electromagnetic Design of RF Cavities for Accelerating Low-Energy Muons* World Scientific

A Neutrino Factory based on a high-energy muon storage-ring is proposed to study neutrino oscillation with high precision. An emittance reduction of muon beam by ionization cooling, which has never been demonstrated in practice, is one of the critical issues for Neutrino Factory. The international Muon Ionisation

Cooling Experiment (MICE) is the first experiment to verify an effect of the ionization cooling with muons. MICE will measure a change in transverse emittance of approximately 10% with a precision of ±0.1%. In order to meet the requirements, muon trackers based on 350 [mu]m diameter scintillating fibers have been proposed. The construction of such trackers is a very challenging task and some innovative techniques are needed to realize, since there have been no trackers made with such a small diameter of scintillating fibers in the world. Upstream and downstream SciFi trackers have been successfully constructed with the international collaboration of UK, US and Japan by 2008. Both of the trackers have been tested with cosmic-rays at the RAL by 2009, at which high tracking efficiencies more than 90% are measured for both trackers. It is also confirmed that by collecting the misalignments found in both of the trackers, the requirements for the emittance measurement is met.

News 99

World Scientific

This book reviews the major physics results from the meson factories, surveys the status of the

relevant fields (including pion physics, hadron physics, and electroweak physics), and explores prospects for further progress.
Physics and Technology of Linear Accelerator Systems AIP Conference Proceedings (Nu
The scientific program of these important proceedings was arranged to cover most of the field of neutrino physics. In light of the rapid growth of interest stimulated by new interesting results from the field, more than half of the papers presented here are related to the neutrino mass and oscillations, including atmospheric and solar neutrino studies. Neutrino mass and oscillations could imply the existence of a mass scale many orders of magnitudes higher than presented in current physics and will probably guide scientists beyond the standard model of particle physics.

The MICE Demonstration of Ionization Cooling

Atlantica Séguier Frontières
Volume 10 in the series of the annual journal Reviews of Accelerator Science and Technology (RAST), will be its final volume. Its theme is 'The Future of Accelerators'. This volume, together with previous 9

volumes, gives readers a complete picture as well as detailed technical information about the accelerator field, and its many driving and fascinating aspects.This volume has 17 articles. The first 15 articles have a different approach from the previous volumes. They emphasize the more personal views, perspectives and advice from the frontier researchers rather than provide a review or survey of a specific subfield. This emphasis is more aligned with the theme of the current volume. The other two articles are dedicated respectively to Leon Lederman and Burton Richter, two prominent leaders of our community who left us last year. *Tsukuba, Japan, 1-4 December 1999* World Scientific This is a major revision of a classic, best selling reference book. Originally published by the American Institute of Physics under the title "Physics Vade Mecum" in 1981, and then the second edition in 1989 with the new title "A Physicist's Desk Reference", this third edition has been completely updated and modernized to reflect current modern physics. The book is a concise compilation of the most frequently used physics data and formulae with their derivations. This revision has six more chapters than the second edition, outdated chapters dropped, and new chapters added on atmospheric physics, electricity and magnetism, elementary particle physics, fluid dynamics, geophysics, nonlinear physics, particle accelerators, polymer physics, and quantum theory. There is a new last chapter on practical laboratory data. The references and bibliographies have been updated.This book is an indispensable tool for the researcher, professional and student in physics as well as other scientists who use physics data. The editors of this volume are Richard Cohen, author of the first two chapters of PDR and the "Physics Quick Reference Guide"; David Lide, one of the editors of the previous two editions and the editor of the "CRC Handbook of Physics and Chemistry"; and George Trigg, editor of the "Encyclopedia of Physics" and the "Encyclopedia of Applied Physics" (VCH). The market for this classic reference book includes the practicing scientist, including engineers, chemists, and biologists; and students. Sausalito, CA, November 1994 World

Scientific Abstract Low emittance muon beam lines and muon colliders are potentially a rich source of BSM physics for future experimenters. A muon beam normalized emittance of ax, y, z = (280, 280, 1570)æm has been achieved in simulation with short solenoids and a betatron function of 3 cm. Here we use ICOOL and MAD-X to explore using a 400 MeV/c muon beam and strong focusing quadrupoles to achieve a normalized transverse emittance of 100 æm and complete 6D cooling. The low beta regions, as low as 5 mm, produced by the quadrupoles are occupied by dense, low Z absorbers, such as lithium hydride or beryllium, that cool the beam transversely. Equilibrium transverse emittance is linearly proportional to the transverse betatron function. Reverse emittance exchange with septa and/or wedges is then used to decrease transverse emittance from 100 to 25 æm at the expense of longitudinal emittance for a high energy lepton collider. Cooling challenges include chromaticity correction, ssband overlap, quadrupole acceptance, and staying in phase with RF. **Proceedings of the Conference Held in Sausalto,**

CA, 1994
Taylor & Francis
The international Muon Ionization Cooling Experiment (MICE) will perform a systematic investigation of ionization cooling with muon beams of momentum between 140 and 240\, MeV/c at the Rutherford Appleton Laboratory ISIS facility. The measurement of ionization cooling in MICE relies on the selection of a pure sample of muons that traverse the experiment. To make this selection, the MICE Muon Beam is designed to deliver a beam of muons with less than $\sim$1\% contamination. To make the final muon selection, MICE employs a particle-identification (PID) system upstream and downstream of the cooling cell. The PID system includes time-of-flight hodoscopes, threshold-Cherenkov counters and calorimetry. The upper limit for the pion contamination measured in this paper is $f_\pi

Computational Accelerator Physics 2003
Cambridge University Press
This volume provides an overview of the state of the art in computational accelerator physics, based on papers presented at the seventh international conference at Michigan State University in October 2002. The major

topics covered in this volume include particle tracking and ray tracing, transfer map methods, field computation for time dependent Maxwell's equations and static magnetic problems, as well as space charge and beam-beam effects. The book also discusses modern computational environments, including parallel clusters, visualization, and new programming paradigms. It is ideal for scientists and engineers working in beam or accelerator physics and related areas of applied math and computer science.

The MICE Collaboration

Springer Science & Business Media

A conceptual design of a muon acceleration scheme based on recirculating superconducting linacs is proposed. In the presented scenario, acceleration starts after ionization cooling at 210 MeV/c and proceeds to 20 GeV, where the beam is injected into a neutrino factory storage ring. The key technical issues are addressed, such as the choice of acceleration technology (superconducting versus normal conducting) and the choice of RF frequency, and finally, implementation of the overall acceleration scheme: capture, acceleration, transport and preservation of large phase space of fast decaying species. Beam transport issues for large-momentum-spread beams are accommodated by appropriate lattice design choices. The proposed arc optics is further optimized with a sextupole correction to suppress chromatic effects contributing to emittance dilution. The presented proof-of-principle design of the arc optics with horizontal separation of multipass beams is extended for all passes.

A Study of Muon Ionization Cooling at MICE.

Springer Science & Business Media

Muon ionization cooling to the required normalized rms emittance of 25 microns transverse, and 72 mm longitudinal, can be achieved with liquid hydrogen in high field solenoids, provided that the momenta are low enough. At low momenta, the longitudinal emittance rises from the negative slope of energy loss versus energy. Assuming initial emittances that have been achieved in six dimensional cooling simulations, optimized designs are given using solenoid fields limited to 30, 40, and 50 T. The required final emittances are achieved for the two higher field cases. Preliminary simulations of transverse cooling in hydrogen, at low energies, suggests that muon collider emittance requirements can be met using solenoid fields of 40 T or more. It might also be acceptable with 30 T. But these simulations did not include hydrogen windows, matching or reacceleration , whose performance, with one exception, was based on numerical estimates. Full simulations of more stages are planned. The design and simulation of hydrogen windows must be included, and space charge effects, and absorber heating, calculated. Simulated Measurements of Cooling in Muon Ionization Cooling Experiment Elsevier Particle accelerators are a major invention of the 20th century. In the last eight decades, they have evolved enormously and have fundamentally changed the way we live, think and work.Accelerat ors are the most powerful microscopes for viewing the tiniest inner structure of cells, genes, molecules, atoms and their constituents such as protons, neutrons, electrons, neutrinos and quarks. This opens up a whole new world for materials science, chemistry and molecular biology. Accelerators with megawatt beam power may ultimately solve a critical problem faced by our society, namely, the treatment of nuclear waste and the supply of an alternative type of energy.There are also tens of thousands of small accelerators all over the world. They are used every day for medical imaging, cancer therapy, radioisotope production, high-density chip-making, mass spectrometry, cargo x-ray/gamma-ray imaging, detection of explosives and illicit drugs, and weapons. This volume provides a comprehensive review of this driving and fascinating field.The poster (also available in 1118 x 406 mm size) which illustrates the history and development of particle accelerators from 1919 to the future can be purchased separately *Beyond the Desert 1999* World Scientific Muons are fundamental particles like electrons but much more massive. Muon accelerators can provide physics opportunities similar to those of electron accelerators, but because of the larger mass muons lose less energy to radiation, allowing more compact facilities with lower operating costs. The way muon beams are produced makes them too large to fit into the vacuum chamber of a cost-effective accelerator, and the short muon lifetime means that the beams must be reduced in size rather quickly, without losing too many of the muons. This reduction in size is called "cooling." Ionization cooling is a new technique that can accomplish such cooling. Intense muon beams can then be accelerated and injected into a storage ring, where they can be used to produce neutrino beams through their decays or collided with muons of the opposite charge to produce a muon collider, similar to an electron-positron collider. We report on the research carried out at the University of California, Riverside, towards producing such muon accelerators, as part of the Muon Accelerator Program based at Fermilab. Since this research was carried out in a university environment, we were able to involve both undergraduate and graduate students.

High Field {u2013} Low Energy Muon Ionization Cooling Channel World Scientific

We propose a high-gradient linear accelerator for accelerating low-energy muons and pions in a strong solenoidal magnetic field. The acceleration starts immediately after collection of pions from a target by solenoidal magnets and brings muons to a kinetic energy of about 200 MeV over a distance of the order of 10 m. At this energy, both an ionization cooling of the muon beam and its further acceleration in a superconducting linac become feasible. The project presents unique challenges - a very large energy spread in a highly divergent beam, as well as pion and muon decays - requiring large longitudinal and transverse acceptances. One potential solution incorporates a normal-conducting linac consisting of independently fed O-mode RF cavities with wide apertures closed by thin metal windows or grids. The guiding magnetic field is provided by external superconducting solenoids. The cavity choice, overall linac design considerations, and simulation results of muon acceleration are presented. While the primary applications of such a linac are for homeland defense and industry, it can provide muon fluxes high enough to be of interest for physics experiments.

Related with Low Energy Muon Ionization Cooling Channel Fermilab: