Updates on MICE

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MICE setup

- Spectrometer solenoid 1
- Matching coils 1.1+1.2
- Focus coils 1
- Focus coils 2
- Focus coils 3
- Matching coils 2.1+2.2
- Spectrometer solenoid 2
- Coupling Coils 1+2
- RF cavities 1
- RF cavities 2
- Liquid Hydrogen absorbers 1,2,3
- Trackers 1 & 2
  measurement of emittance in and out
- Diffusers 1&2
- Beam PID
  TOF 0
  Cherenkov
  TOF 1
- Downstream particle ID:
  TOF 2
  Cherenkov Calorimeter
- Incoming muon beam
MICE Step

- Check systematics of components step-by-step

Step I: Spring 2007

Step II

Step III

Step IV

Step V

Step VI: Aim 2009
Topics

- SciFi tracker prototype test
  - KEK test beam
  - Oct. 2005
  - Improved prototype
  - Newly-designed cryostat with cryocooler
- Design and Safety Review of the MICE Cryogenic Hydrogen System
  - RAL
  - Nov. 2005
- Test cryostat with MICE LH absorber
  - MTA in FNAL
- Plan to test MICE target in ISIS
  - Preparation work for June 2006
  - building target
- Test plan for detectors
- Procurement
  - scintillating / clear fiber
  - 2slot VLPC cryostat
  - superconductor
- Go for construction
Solenoid arrived on 21st Dec. 2005
MICE Target

- Target moved by linear actuator scrapes halo of ISIS beam
  - On demand
  - 1 – 3 Hz operation
- Testing the target is planned
  - June 2006
  - background measurement
  - building target
Test cryostat for MICE absorber

- Test cryostat with cryocooler for MICE LH2 absorber
- Test at MTA in FNAL
Spectrometer solenoid

Conceptual design and draft of build-to-spec completed
- field uniformity +/-3%
- 3 cryocoolers
SciFi tracker

- Prototype for cosmic-ray test (Oct. 2003)
  - enough high light yield ~ 10 p.e.
  - few dead channels ~ 0.5%
- Prototype with 4 stations
  - new connector design
  - almost final design of waveguide
Tracker front-end electronics

- 2-slot Cryostat with Sumitomo cryocooler
  - developed for MICE
- Two VLPC cassettes and prototype AFE II boards borrowed from DØ
- Experience in operation
  - moisture on lid due to high humidity in Japan
  - Pumps were brought far from magnet
  - good long term stability for more than 1 month
Tracker prototype test in KEK KEK-PS T585

- MICE SciFi tracker group planned testing prototype to check basic performance in 1 Tesla solenoid magnet.
- KEK-PS T585 was performed in Sept. – Oct. 2005 by world-wide collaboration.
- Participants: more than 20 people joined.
  - M. Yoshida, K. Yoshimura, H. Sakamoto, A. Horikoshi, K. Sakai, Yoshi Kuno, A. Sato and several students
  - Aron. Fish, Roger. Hare, K. Long, M. Ellis
  - Amit Klier, Kwame. Bowie, Xiofeng Yang, Alan Bross, P. Rubinov
  - J.S. Graulich

KEK-PS π2 beamline

Aerogel Cherenkov Counter

TOF counters

Tracker prototype in Superconducting solenoid magnet
Tracker installation
Particle identification by TOF & ACC

- Good PID performance for $e/\mu/\pi$
- TOF resolution $\sim 60$ ps
- Light yield in ACC $\sim 30$ p.e.
Tracker performance

- Succeeded to observe particle track in 1Tesla magnetic field
- Light yield in old stations are stable.
- Detail analysis on going to drive the performance

First reconstructed track in magnetic field

240 MeV/c \( \pi \) by TOF
Summary

- MICE phase-I has been approved, and preparing for Phase-II
  - MICE will start in spring next year (2007)
- Tracker test successfully performed
- Hydrogen absorber cooled by cryocooler is tested
- Target in ISIS will be tested
- Moving on construction phase
  - fiber procurement
  - superconducting solenoid
  - etc...