MICE Tracker Update

Progress towards a tracker test at KEK
Overview

• Our plans are to test a 4 station tracker prototype in the KEK $\pi2$ beam line

• Ingredients
  ◆ 4 station tracker
  ◆ VLPC readout system
    ◆ 2 VLPC cassettes (2048 ch)
    ◆ Cryostat with cryo-cooler
    ◆ Readout electronics
    ◆ VME/Linux based DAQ
  ◆ TOF
  ◆ Cerenkov
  ◆ Beam Counters

• This is a close approximation to MICE Phase I
Emittance Measurement

Phase 2
w/ large emittance

* Study of emittance measurement

Degraded

Trigger

TOF
Status: Tracker

- The 4 Station prototype is complete*

*Still need to hook up external waveguides
The VLPC system is complete and operating to spec
- Can easily control to the 9K spec.
  - With heaters off
    - $T=5.3K$

Uses a Sumitomo SRDK-415D Cryocooler.
- This is the unit we plan to use throughout MICE
The system will use 4 AFE II boards from D0. These are now working.

512 ch
ADC
Discrim.
TDC in next version
The DAQ is a VME/Linux based system that has now been tested in the recently completely Phase 0 of the KEK test beam run (5/26-6/2).

The system is a reasonable model of what we might want for the full MICE experiment

VLPC system, TOF, and counter ADC information can all be readout through VME
Status: Phase 0 @ KEK

- All hardware except tracker Tested
  - Magnet
  - TOF hodoscope
  - Aerogel Cherenkov counter
  - Beam defining counters
- All worked well
  - Data are being analyzed now
KEK Test Beam – Phase 0

- For TOF calibration
  - Phase I setup (TOF is located upstream) w/ and w/o B field
  - Wide beam defocused and diffused with 5 cm Lead.
  - Sharp beam defined with the 5mm-finger counter
- For Aerogel performance
  - Momentum scan (0.2 GeV/c - 3 GeV/c both positive and negative polarity)
- Beam survey, study
  - Phase II setup (TOF is located down stream) with dummy scifi tracker (a pair of defining counters with 32-cm diameter)
  - Lead diffuser (0 ~ 4 X0) w/ and w/o magnetic field with p=-0.3 GeV/c and -0.4 GeV/c)
- VME DAQ evaluation
  - P=+1 GeV/c, -3 GeV/c to compare with CAMAC DAQ