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# MICE Tracker Update

Progress towards a tracker test at KEK

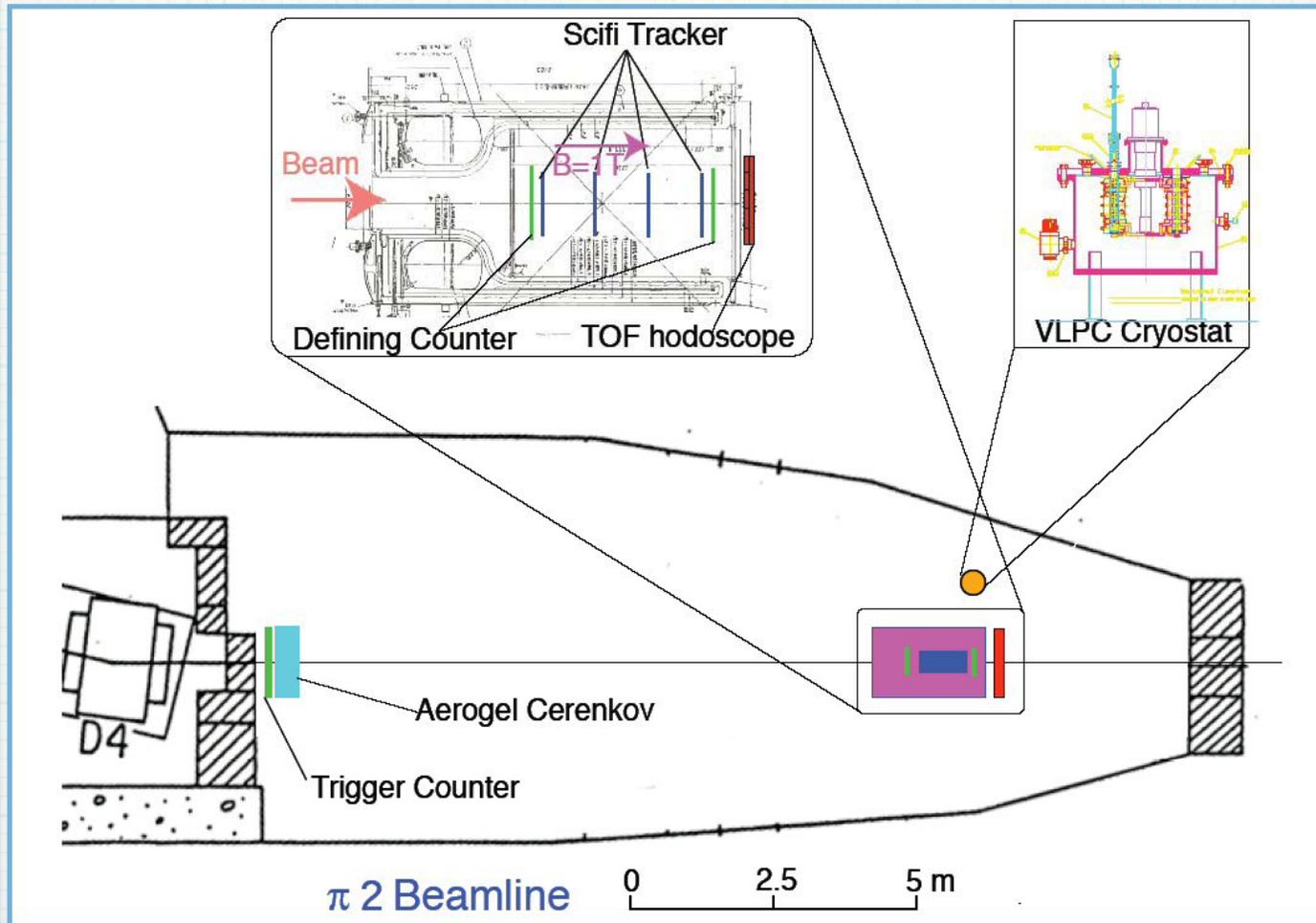


# Overview

- Our plans are to test a 4 station tracker prototype in the KEK  $\pi^2$  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

# KEK $\pi$ 2 Beam Line

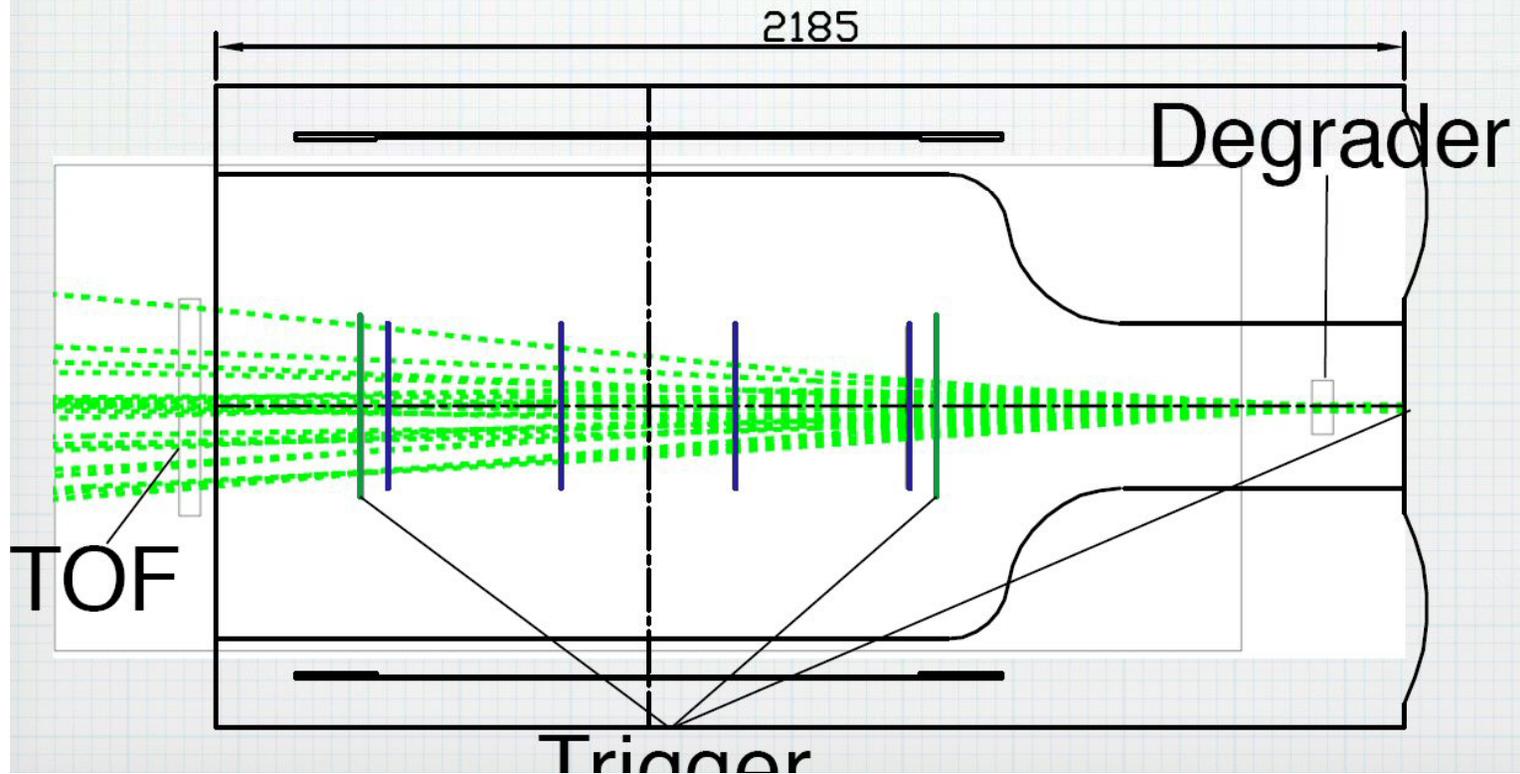
## KEK test



# Emittance Measurement

## Phase 2 w/ large emittance

\* Study of emittance measurement



# Status: Tracker

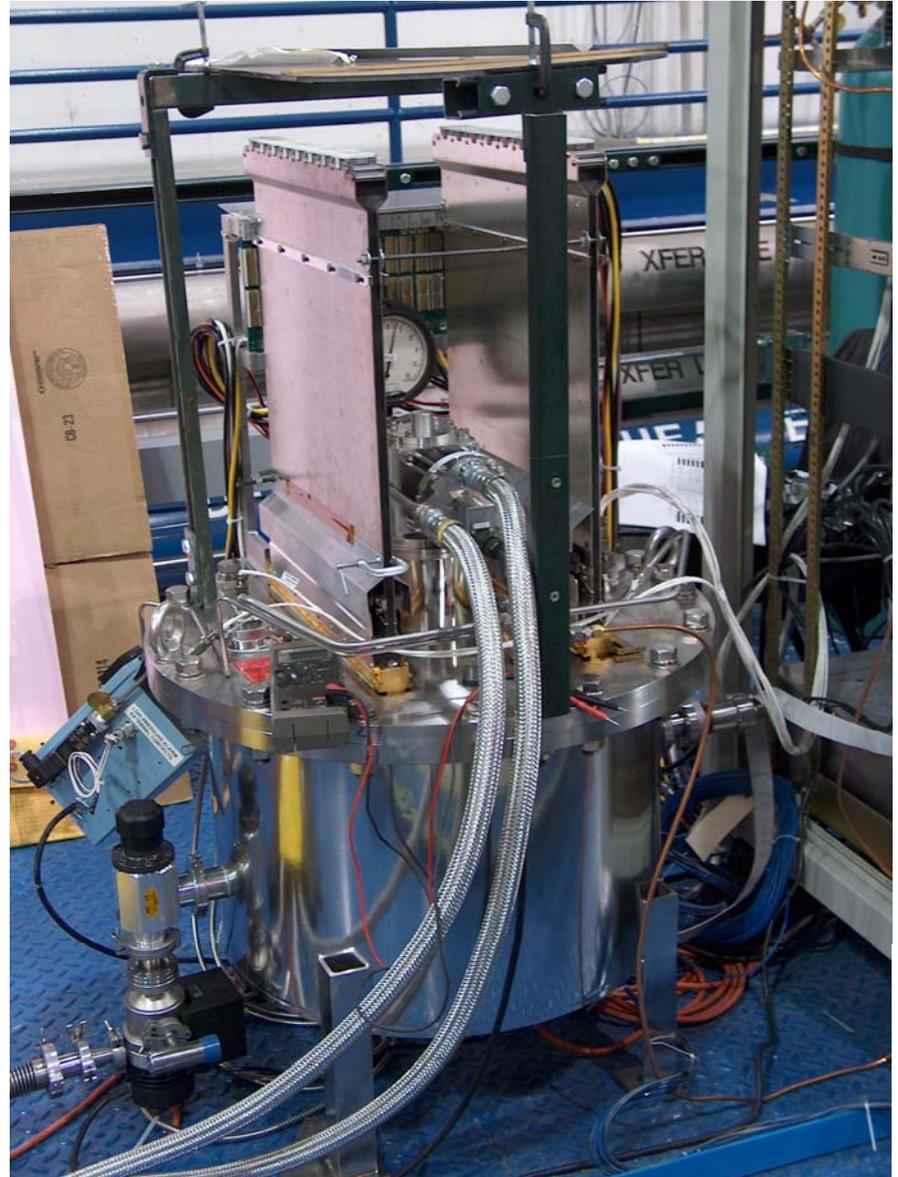
- The 4 Station prototype is complete\*



\*Still need to hook up external waveguides

# Status: VLPC System

- 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 Cryo-cooler.
  - ◆ This is the unit we plan to use throughout MICE



# Status: Electronics

- The system will use 4 AFE II boards from D0. These are now working

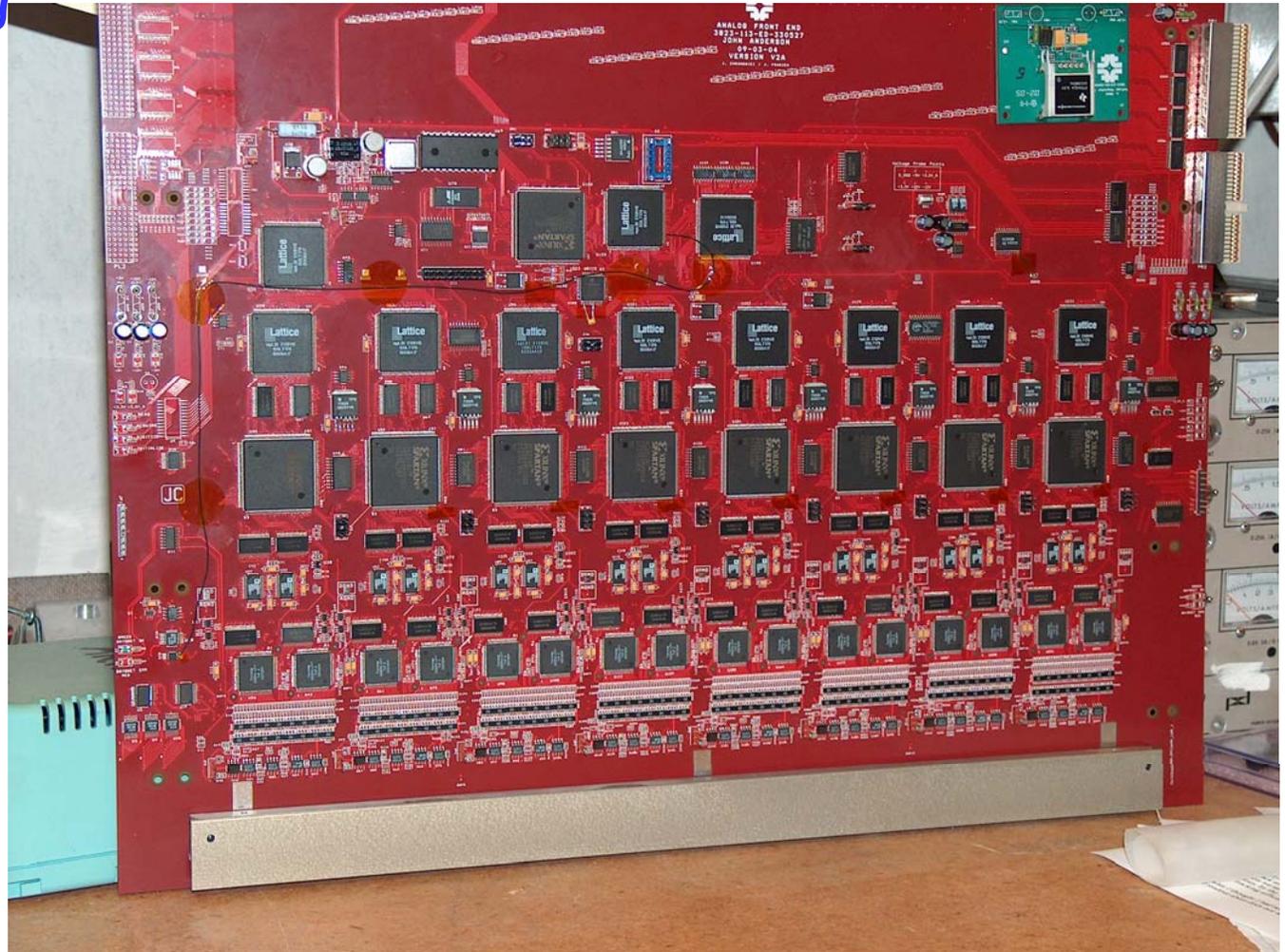
512 ch

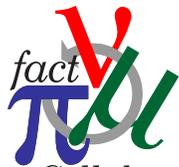
ADC

Discrim.

TDC in next

version





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## Status: DAQ

- The DAQ is a VME/Linux based system that has now been tested in the recently completed 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



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# 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 couter
- 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

