



Synchrotron Detector R&D

Cornell Linear Collider Workshop
July 15th, 2003

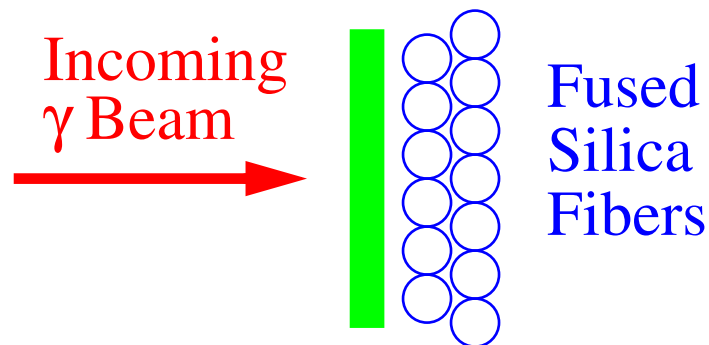
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Motivation

Can the Wisrd wire detector be improved/optimized for LC operation?

Čerenkov Fiber Detector



- Intrinsically fast, simplified readout (PMT)
- Čerenkov energy threshold $E_C > 0.7$ MeV
- Rad hard, large dynamic range
- Improved resolution?

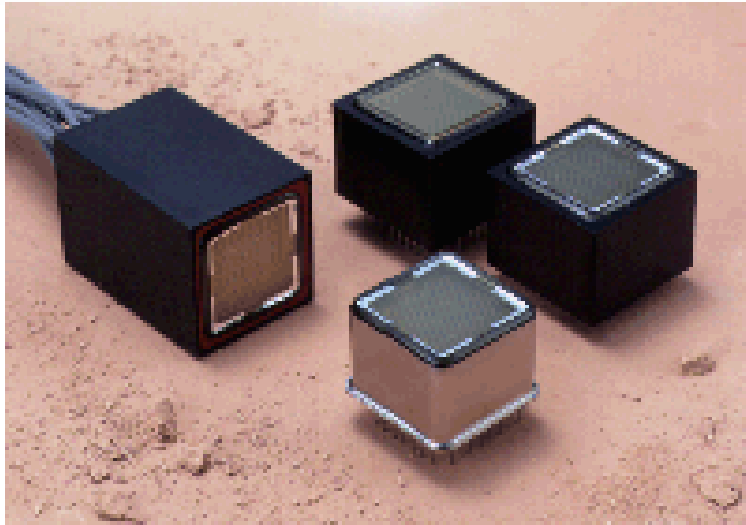
Oregon project

- Characterize multianode PMTs
- Play with mechanical fiber assembly
- Characterize efficiency/performance
- Build prototype for testbeam

Really should have started with simulation...

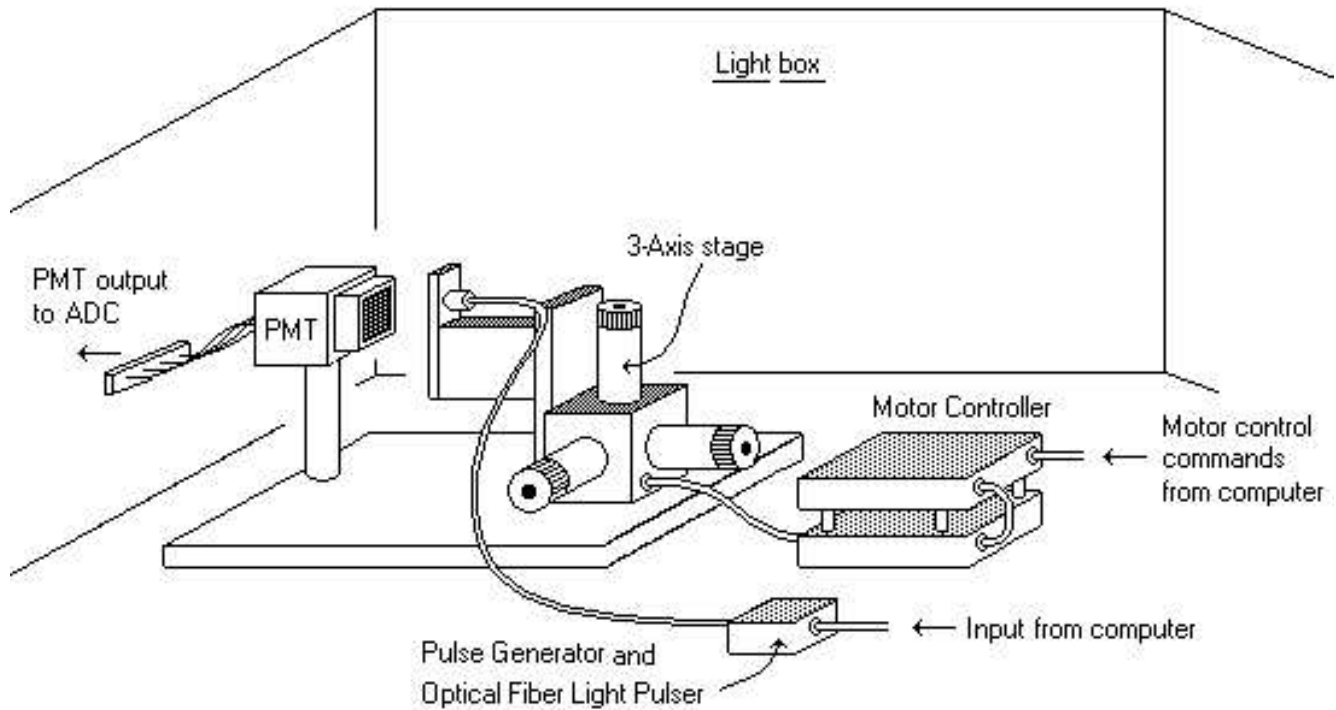


Phototube Tests



H6568 multi anode (4x4 channels)

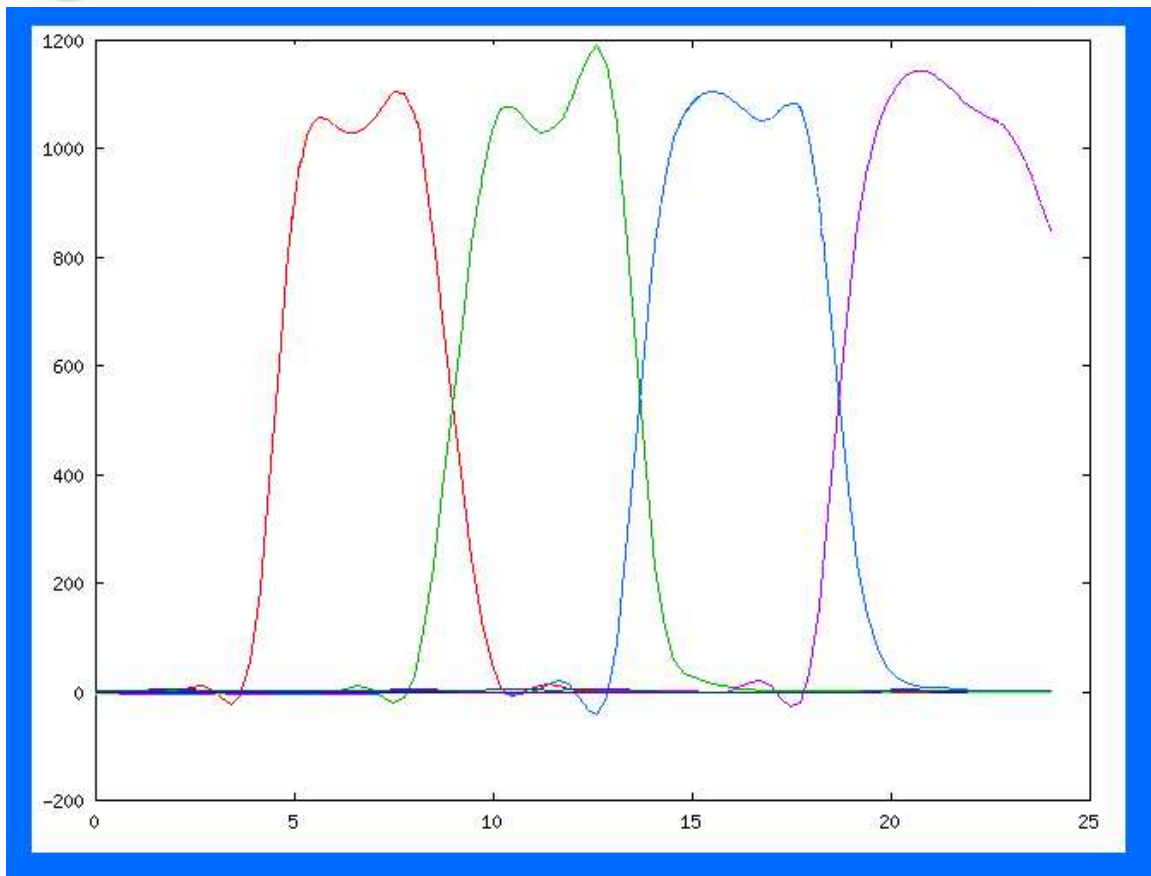
Response Mapping



PMT Response



Ch 0-3 output (ped subtracted)



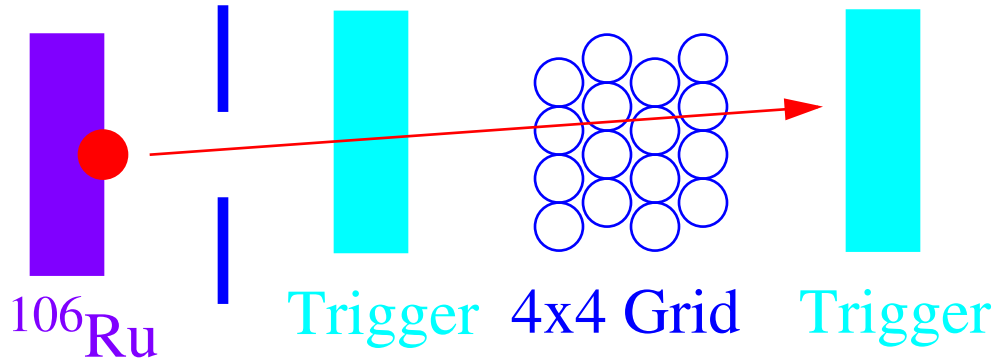
Fiber Position (mm)

- Bare fibers 1-4 mm from PMT face
- Area of good response $3 \times 3\text{mm}^2$
- Optimal distance 2 mm
- Crosstalk $\sim 1\text{-}2\%$

Other Checks

- Relative gain (factor 2)
- Stability with V or t (good)

Fiber Tests



- 600 μm fused silica fibers
- Trying to observe 3 MeV electrons (hard)
- Debugged setup using Bicorn sci-fibers

Tracks not (convincingly) found using Quartz

2003 Summer activities

- Improve single photon sensitivity
- Commission mini-cosmic telescope
(1x30 cm^2 planes using sci-fi)
- Build prototype detectors for testbeam

Future Plans

- Paul Csonka leaving for grad school
- Simulate response for Wisrd application
- Find some synchrotron radiation...