GLAST Calorimeter Development Status 9. Sept. 1998

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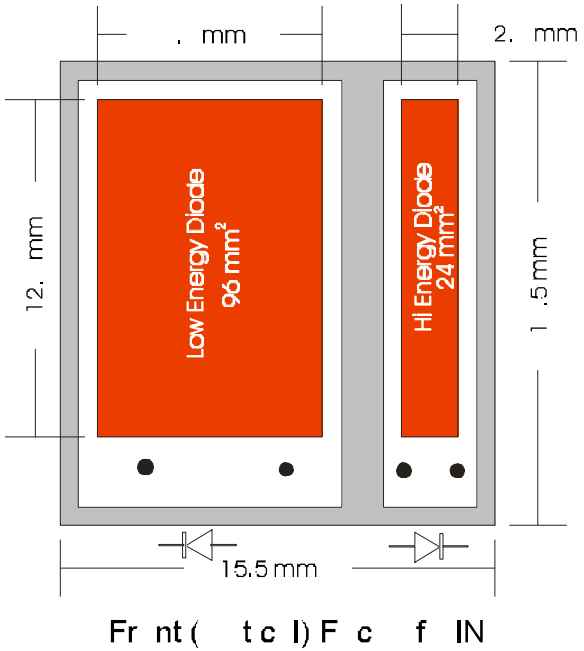
Crismatec CsI Detector Procurement

- Remainder of CsI for BeamTest ‘99 calorimeter will be procured by SLAC/Stanford using the BaBar contracts and expertise.
- Crismatec has created sample detectors of various sizes and measured uniformity. Measurements with polished crystals similar to results of NRL testing.
- Questions remain on surface treatment. Meeting with SLAC and Crismatec needed to finalize specifications.
- Procurement should be initiated by November 1st to meet schedule.

Custom PIN Photodiode

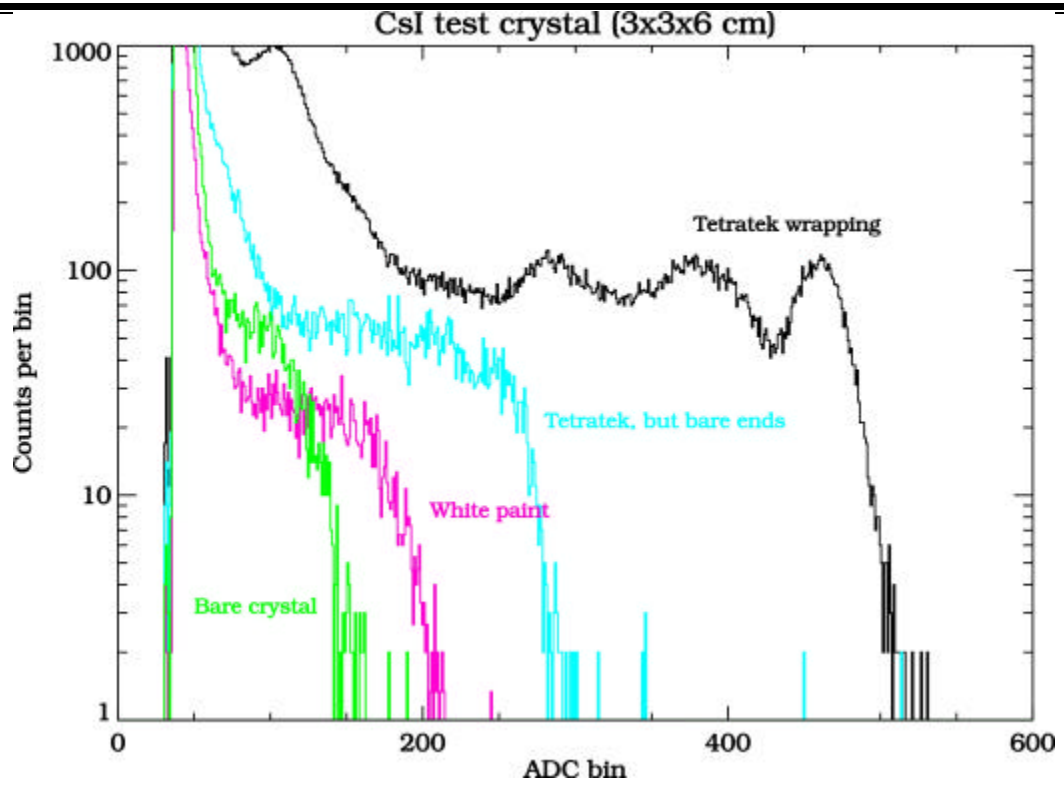
- The design for the dual PIN photodiode for GLAST has been completed with Hamamatsu.
  - Package is 15.5 mm x 16.5 mm ceramic carrier
  - Large diode area - 96 mm^2
  - Small diode area - 24 mm^2
- Ceramic carrier has been selected for lowest noise and cross-talk
- Non-recurrent engineering cost much larger than anticipated ($40k)
- Unit cost, in small quantities, was correctly estimated.
- Schedule: 3 months ARO; no order placed yet.



Detector Packaging / Light Collection Properties

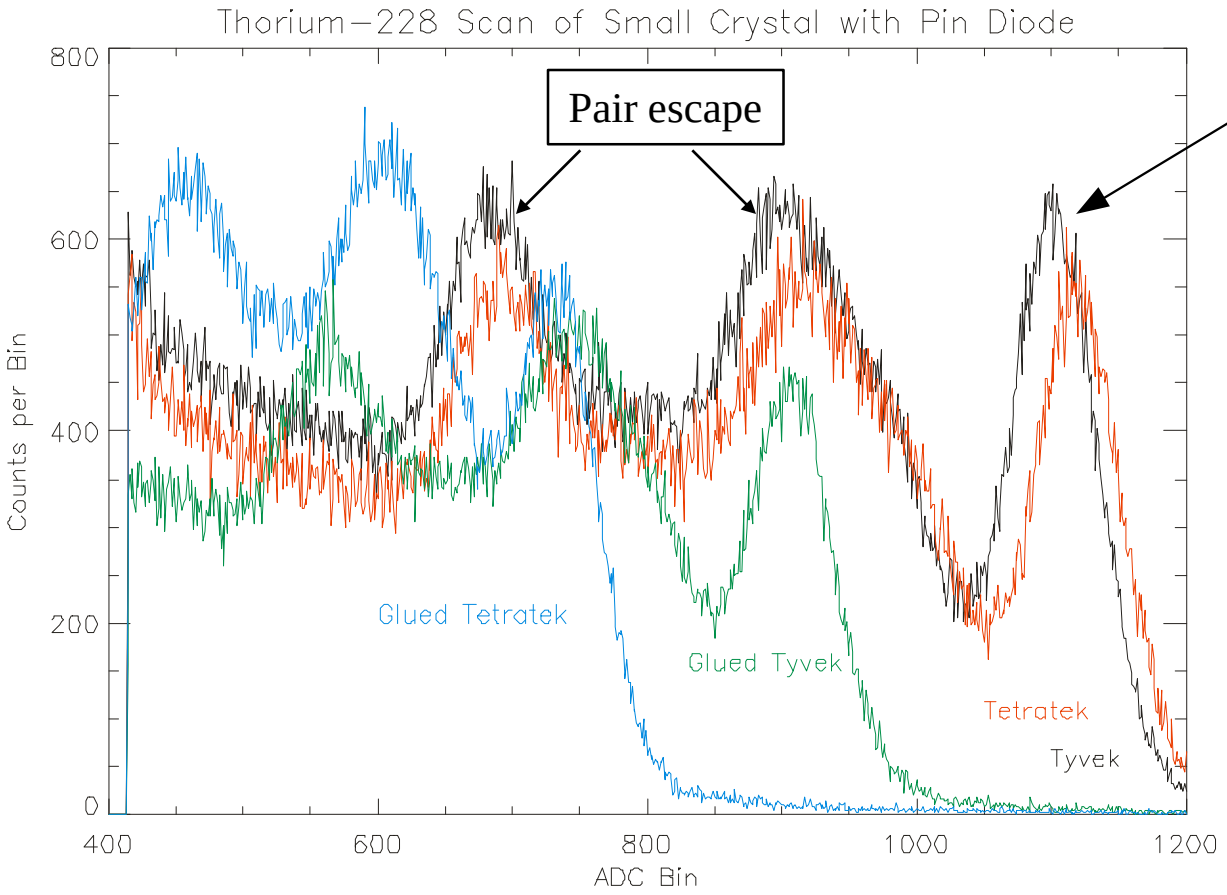
- Study of light collection impact of various crystal wrapping techniques:
  - treatment of CsI block ends vs light output
  - Tyvek, Tetratek, and paints
  - Tyvek & Tetratek laminated with Aluminized mylar
  - laminates attached to crystals with adhesives
  - * Paints are out, laminates show promise
- Study of compressive load impact on light collection for various wrapping techiques
  - * Short-term loss not significant, longer tests in progress

Paints/wraps



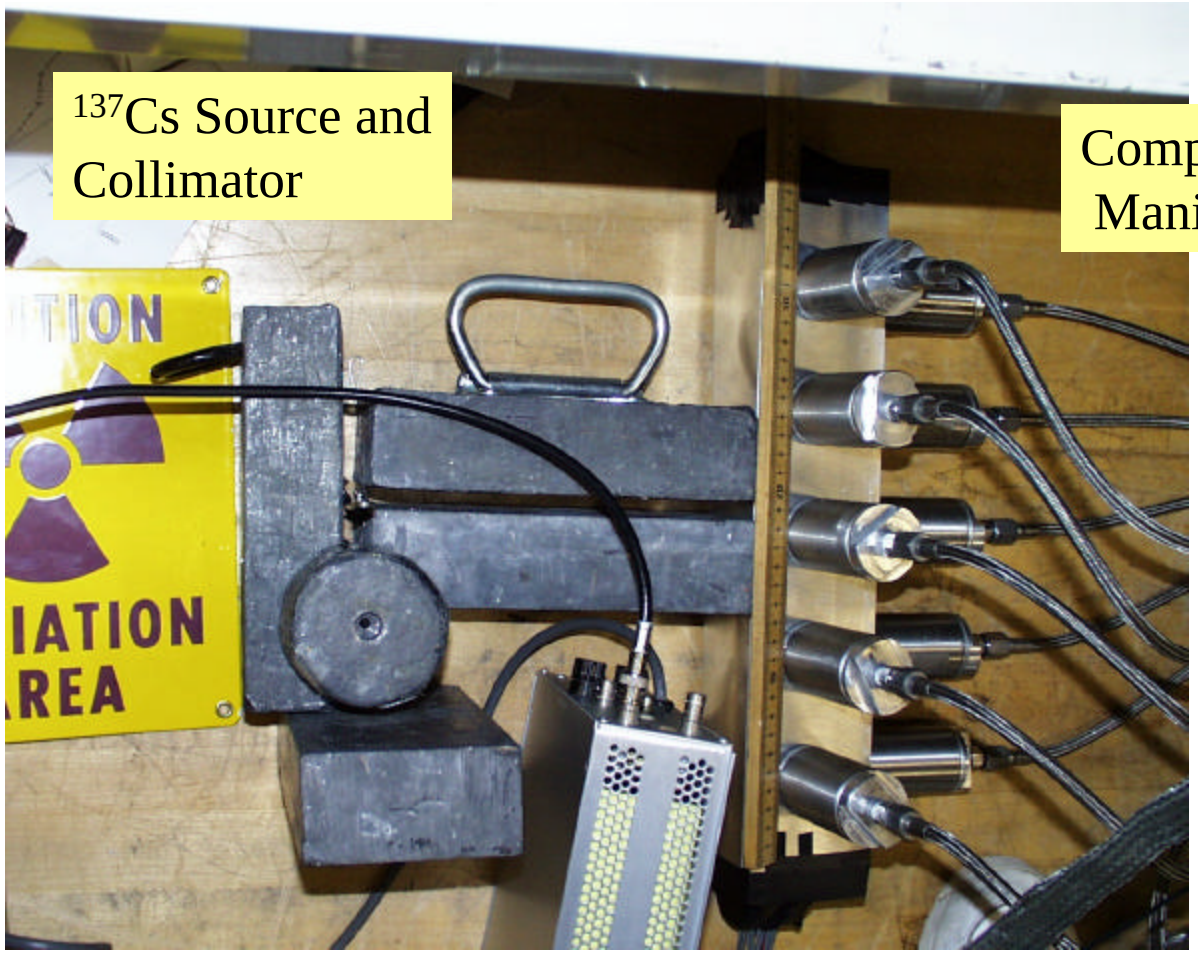
- Tests on 3x3x6 cm log with 1 cm2 PIN diode

CsI Light Collection vs. Wrapping Techniques



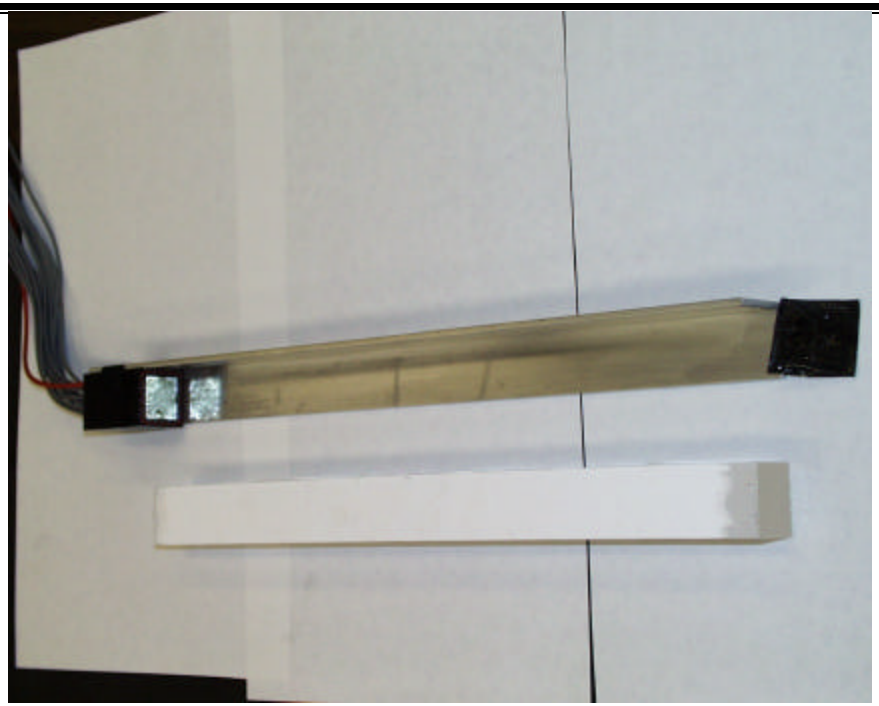
- 6-cm CsI Detector
- ^{228}Th source
- Two wrappings with and without adhesives

Detector Light Collection Test Unit



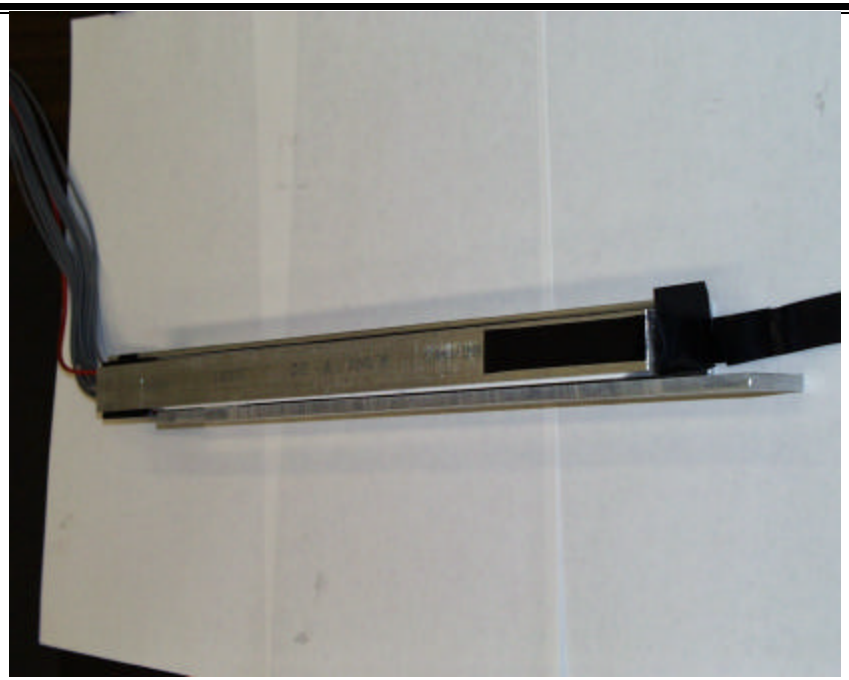
- 36 cm detector viewed by PMT
- Crystal scanned by ^{137}Cs source in Pb collimator
- Compression controlled by regulator and high pressure Nitrogen

Pressure Test Setup



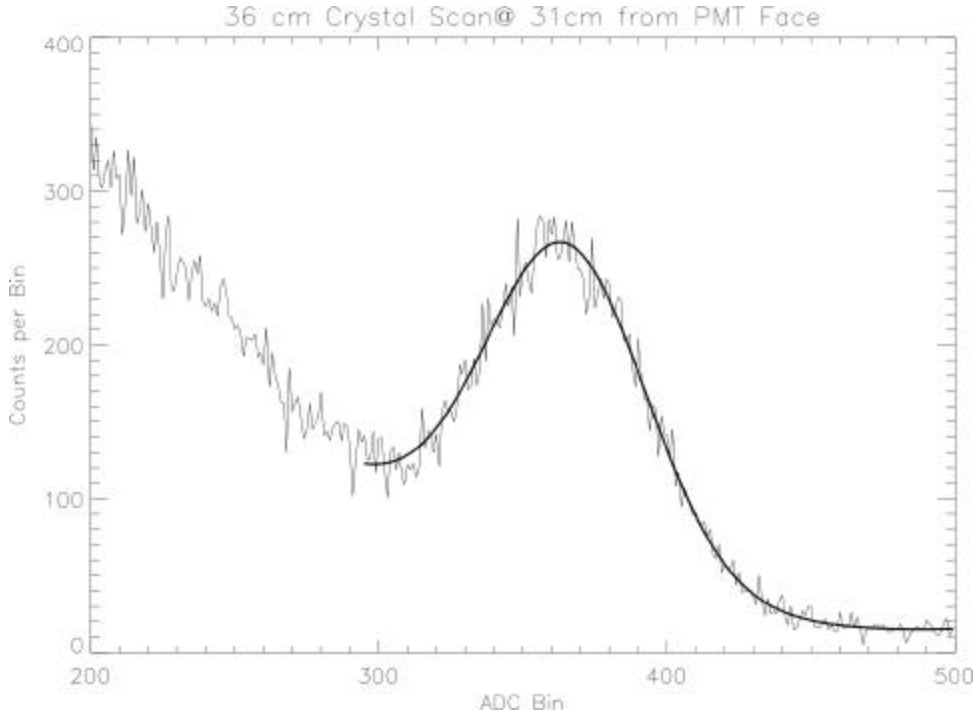
- Pressure test performed with RU5900 series PSPMT (all pixels merged)

Pressure Test Setup



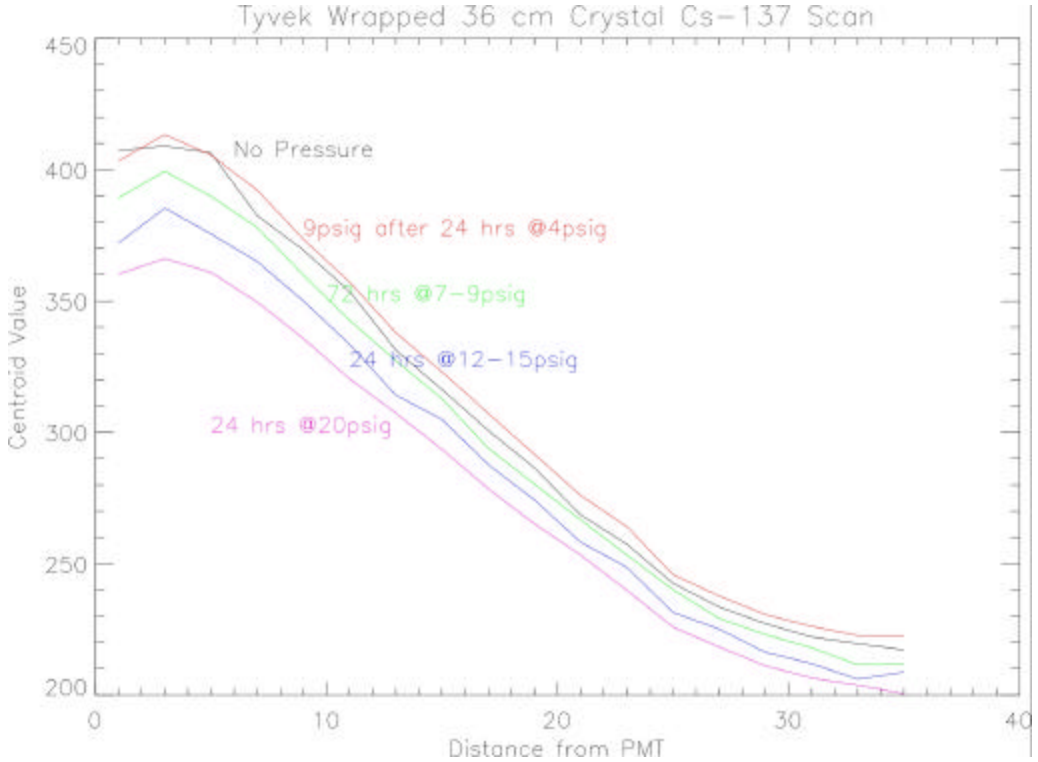
- 2 Plates of polished 1/4 inch Al to apply pressure from pistons

Pressure Test Data



- Fit peak at 662 keV and map centroid versus position along crystal

Pressure Test Results



- Losses due to pressure not very large
- Long term effect TBD

Summary

- Significant progress has been made in understanding the design issues
- Meeting the schedule for Beam Test '99 will be a challenge
  - critical path centered on the development cycle for the ASIC
  - mechanical design and testing of the compression cell is also a concern
  - must get PIN and CsI procurements initiated this month