

MINERVA triangle test

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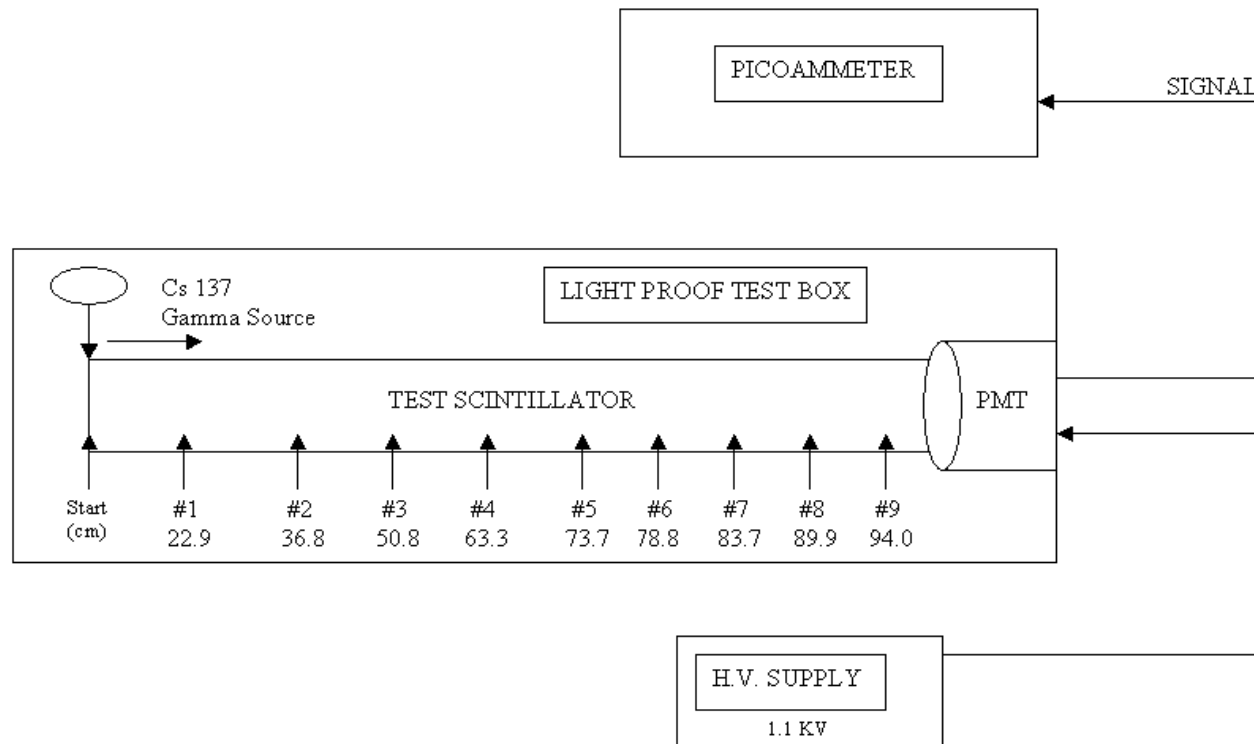
FNAL-NICADD

Outlines

- LY vs hole size.
- LY with glue or without glue.
- LY on cosmic rays.

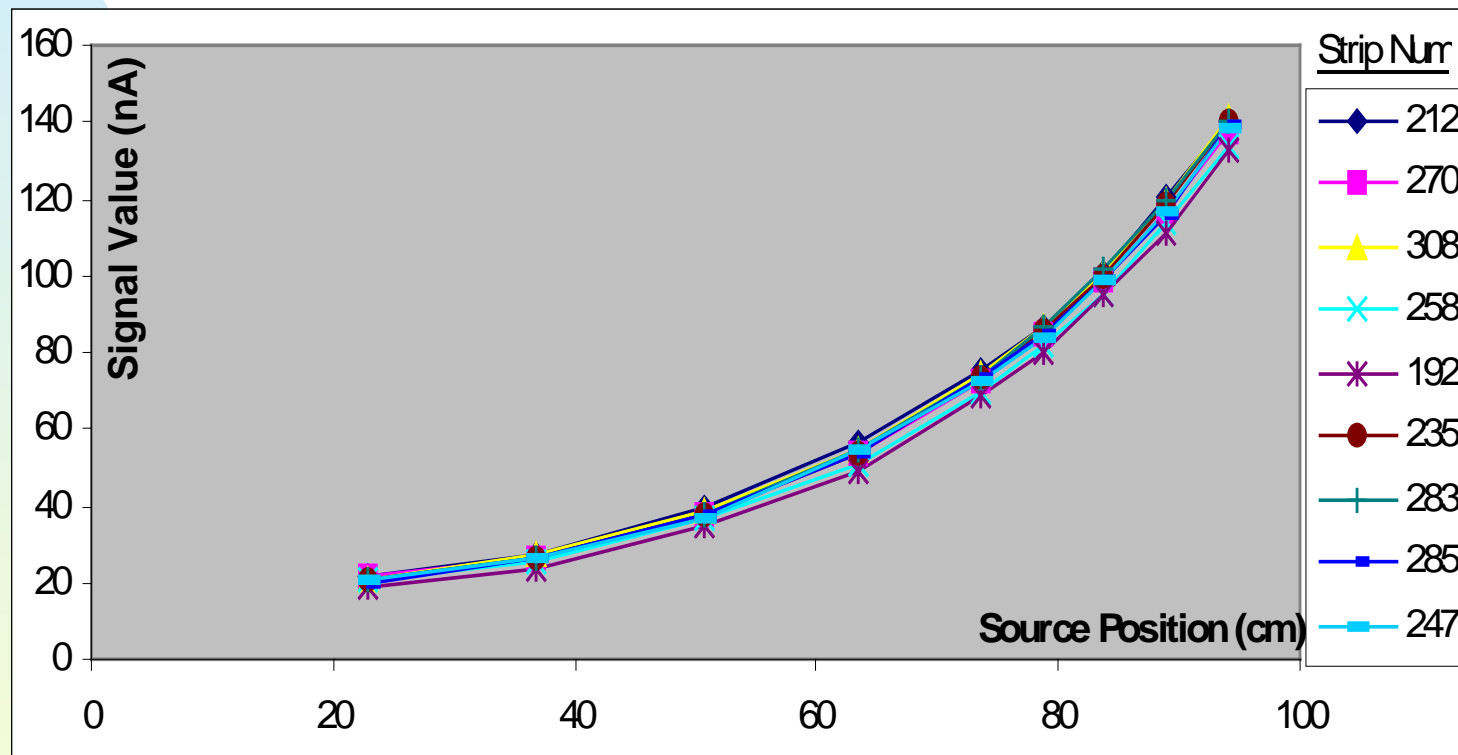
Setup we used

- Attenuation light measurements (scintillator no fiber)



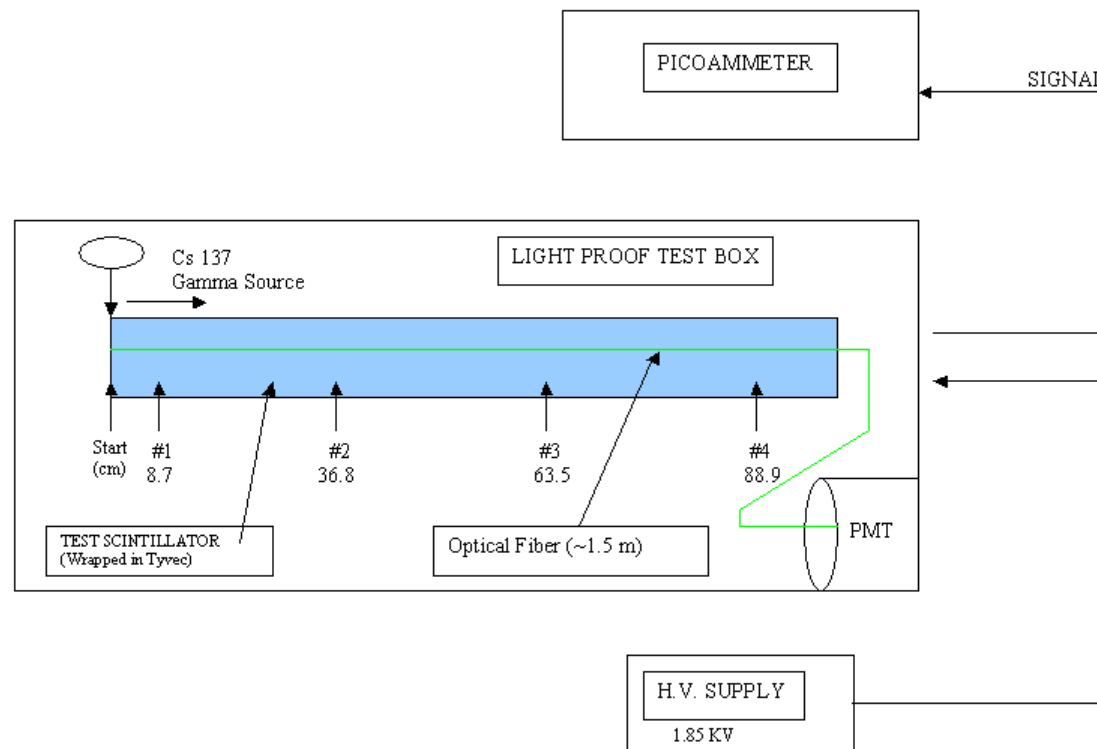
Attenuation length

<p>40 (20 of 1.2mm hole) (20 Of 1.5mm hole)</p>	<p>1.2mm hole: 30.52±0.74 cm 1.5mm hole: 30.33±0.77 cm</p>
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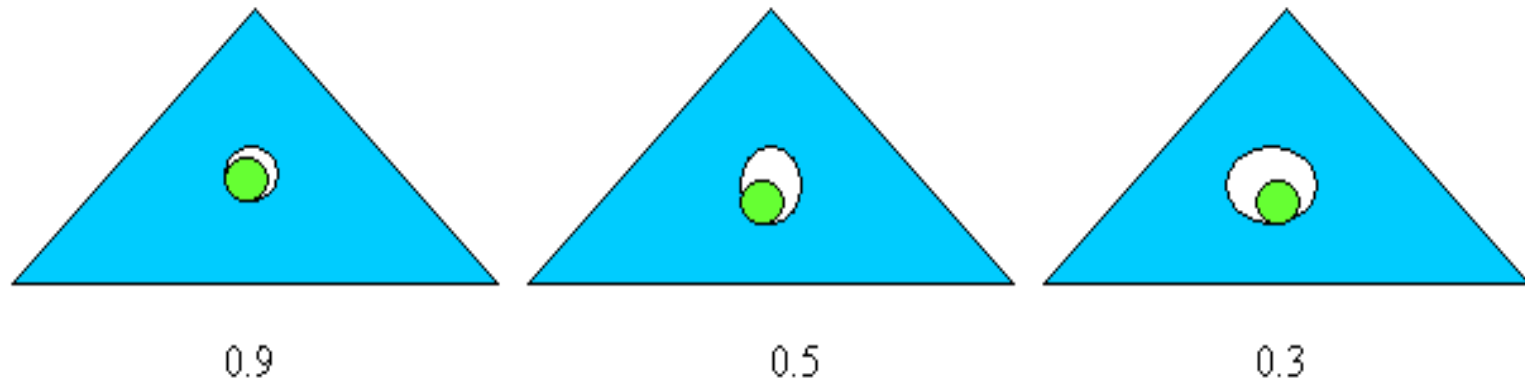


Setup we used

- Scintillator strip with embedded fiber

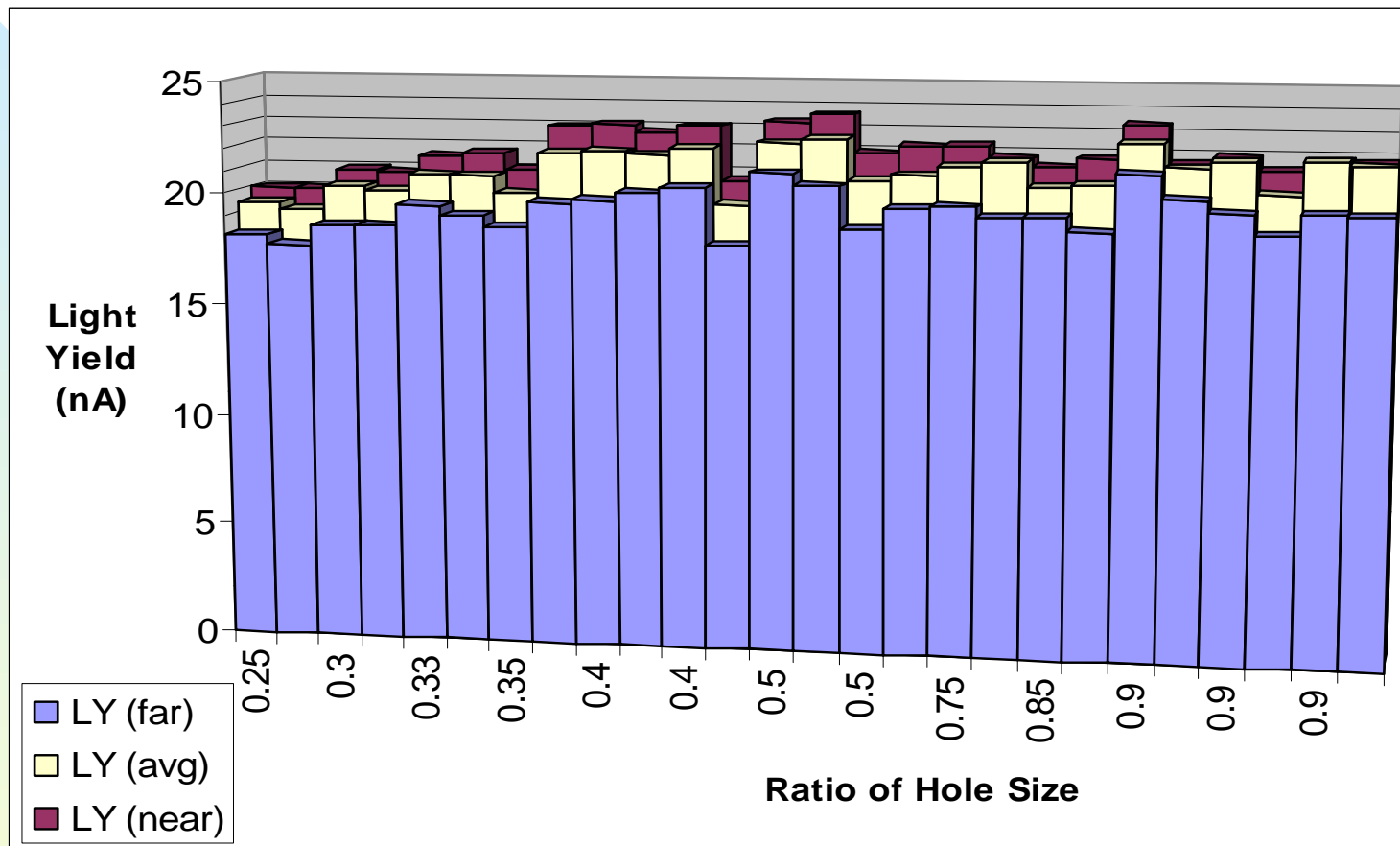


Test with fibers



Ratio of surfaces = $S_{\text{fiber}}/S_{\text{hole}}$

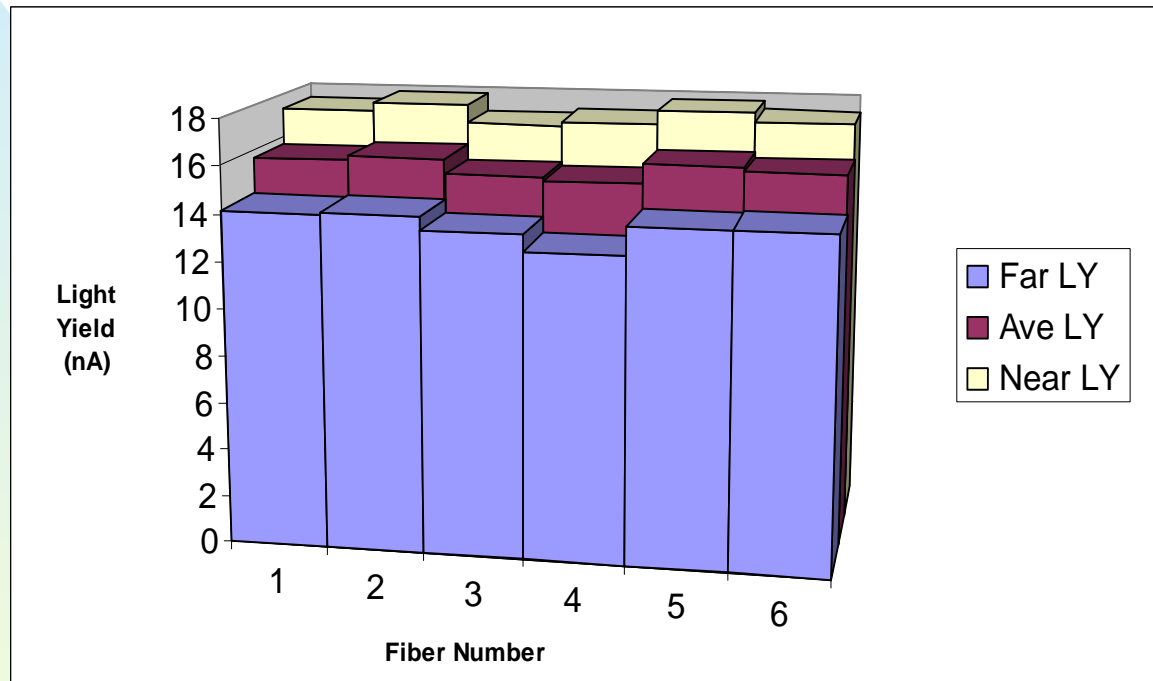
Results on the relative LY with fibers (no optical glue)



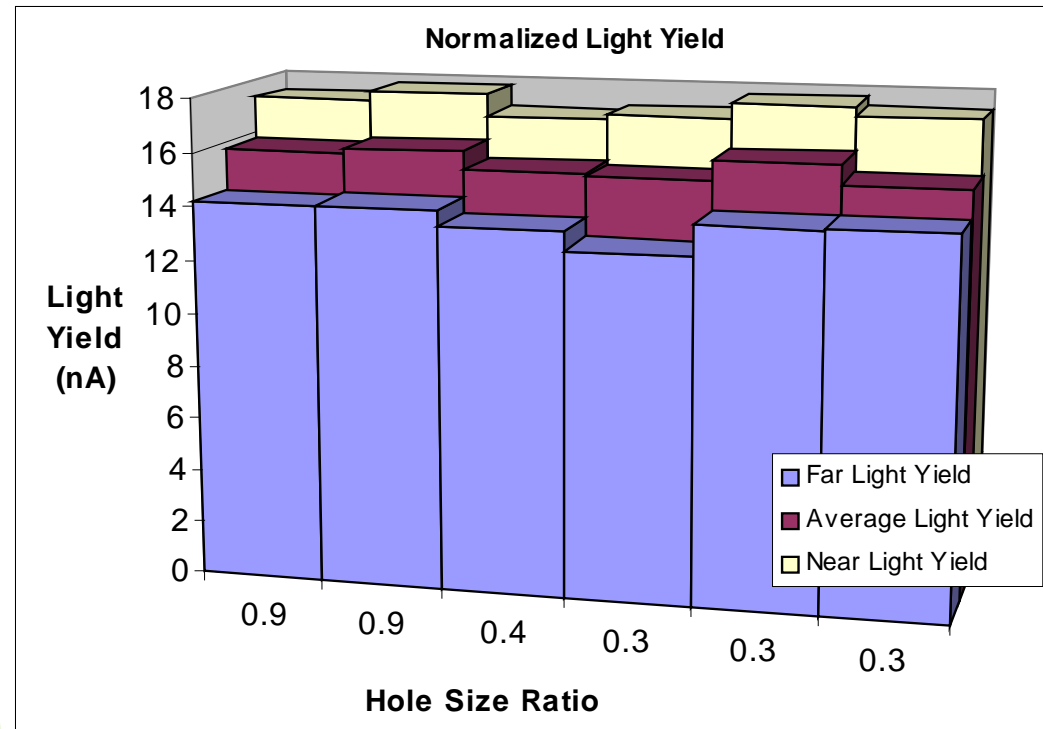
Spread:

Far: 11.92% Ave: 9.01% Near: 6.76%

Fiber + the same strip calibration



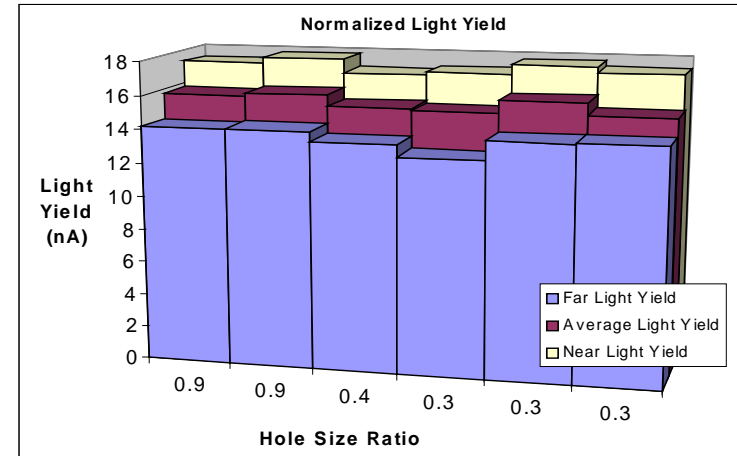
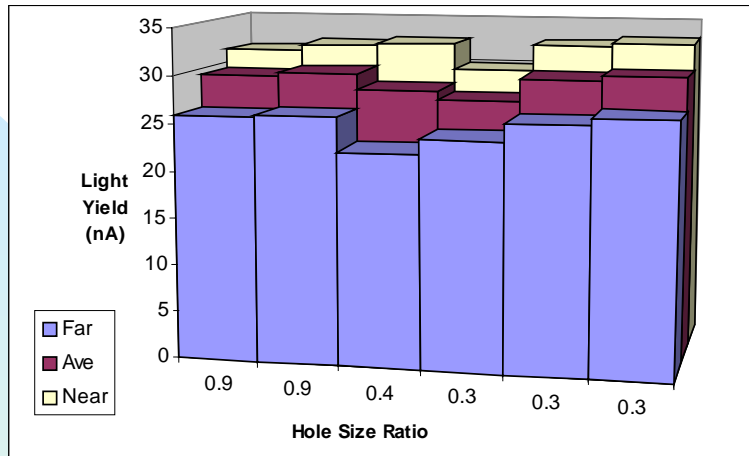
Normalized strip +fiber LY (no glue)



Far: 3.66% Ave: 2.18%

Near: 1.83%

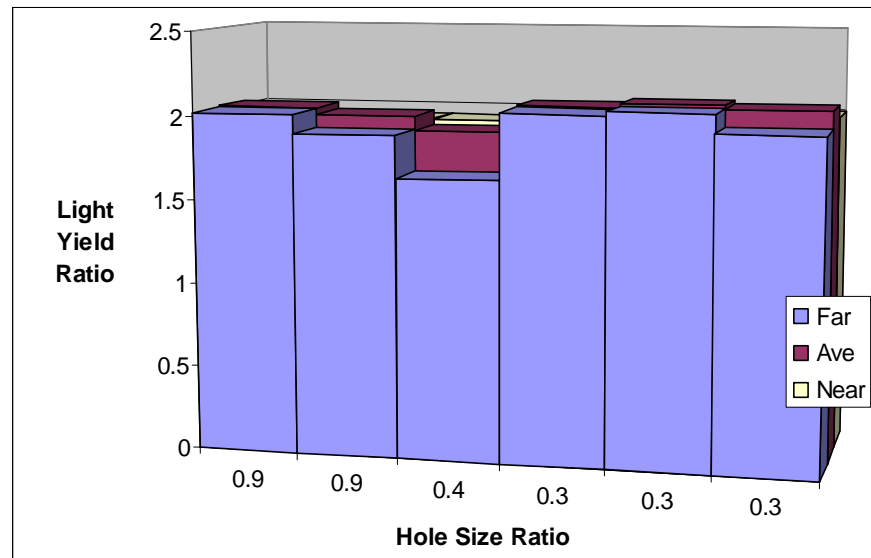
LY with/without glue(BC600)



Far: 5.90% Ave: 4.25%Near: 3.91%

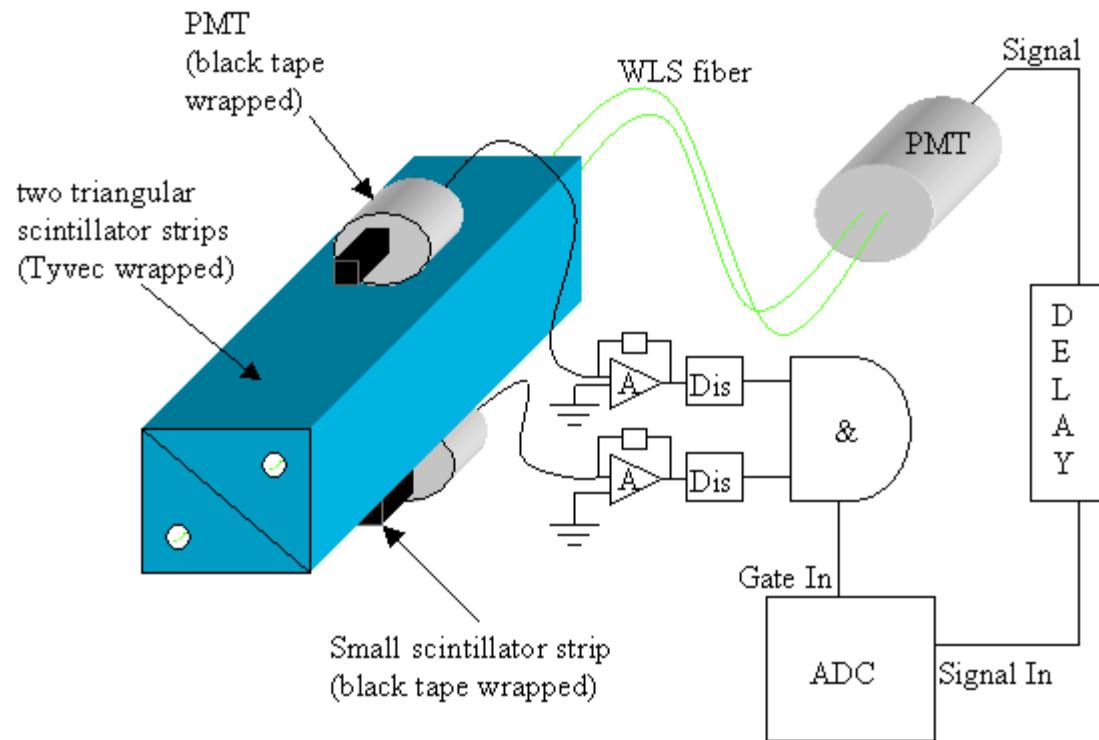
Far: 3.66% Ave: 2.18% Near: 1.83%

Aver. Ratios:
Far = 1.94
Ave = 2.02
Near = 1.95



Setup we used

- Cosmic rays test





Cosmic test result, LY, preliminary.

Ped= 47 ADC counts.

Aver=87 ADC counts.

First electron~49 counts

**Scaling to the first electron Npe
~ 20**

**Correction to the scintillator
thickness (1.7 cm) gives ~15.4
PE**

H3178-61 was used

**The fibers without reflective
end where used !**

<u>Measurement Synopsis</u>	<u>Number of Strips Measured</u>	<u>Results</u>	<u>Comments</u>
Measured Attenuation Lengths	40 (20 1.2mm hole) (20 1.5mm hole)	1.2mm hole: 30.52±0.74 cm 1.5mm hole: 30.33±0.77 cm	Witness to even distribution of dopants inside plastic (2-3% Spread)
Effect on Light Yield due to hole size (without reflective end)	15	Spread: Far: 11.92% Ave: 9.01% Near: 6.76%	No visible relationship between light yields and hole sizes for the ratio(0.9-0.4)
Measured Light Yields with WLS Optical Fibers	6	Far: 3.66% Ave: 2.18% Near: 1.83%	Calibrated and Normalized fibers
Measured Light Yield of strips	6	Far: 5.90% Ave: 4.25% Near: 3.91%	No visible relationship between light yields and hole sizes
Measured Light Yield of strips, each with their own fiber and glue	6	Without Glue: Ave: 14.39 nA With Glue: Ave: 29.02 nA	~190-200% increase in light yield compared to without BC600 glue
Cosmic Light Yield	2	15.4	Have to repeat measurements