FCAL monitoring, test of a quadrant.

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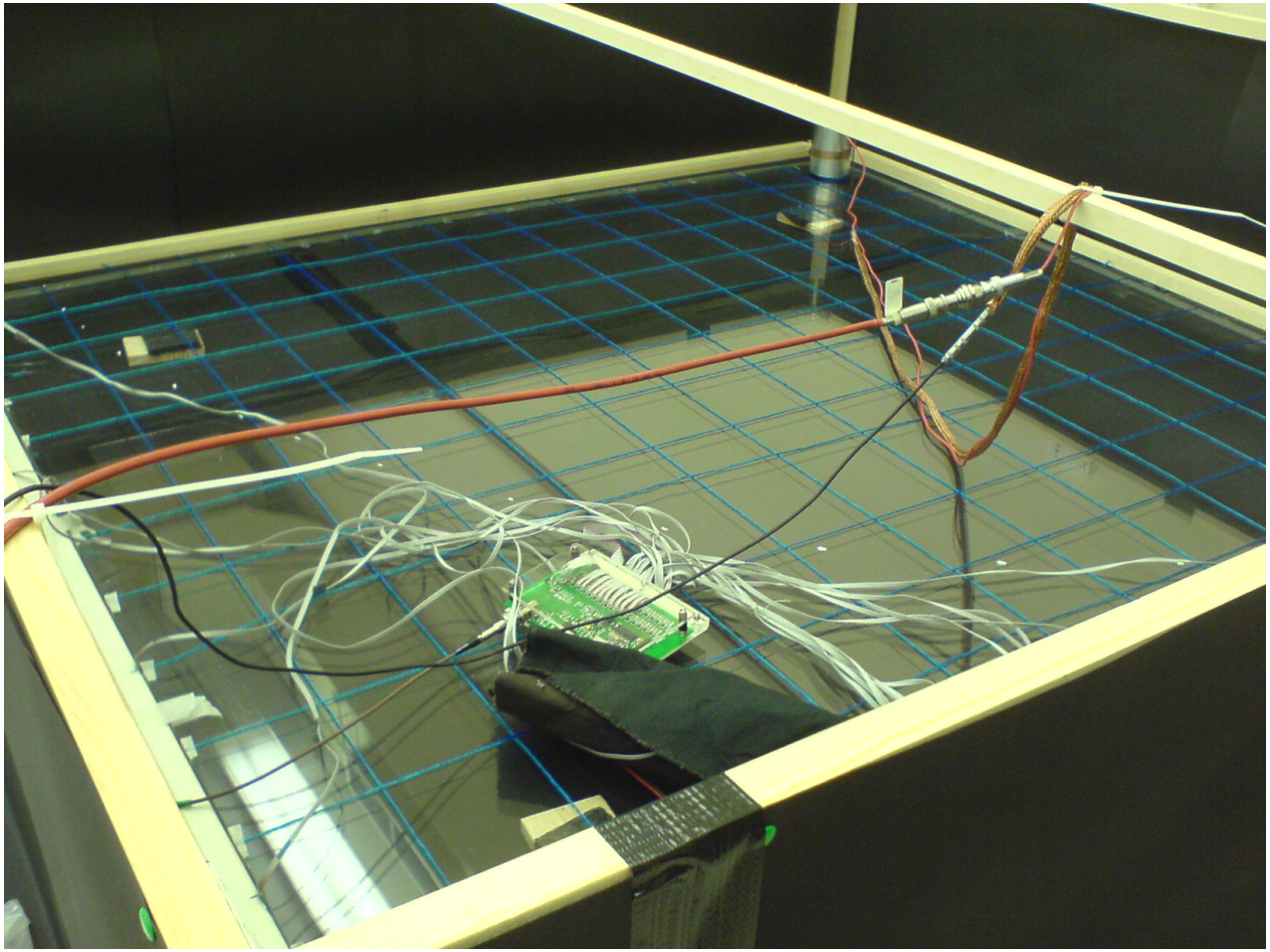
Set-up



Test setup

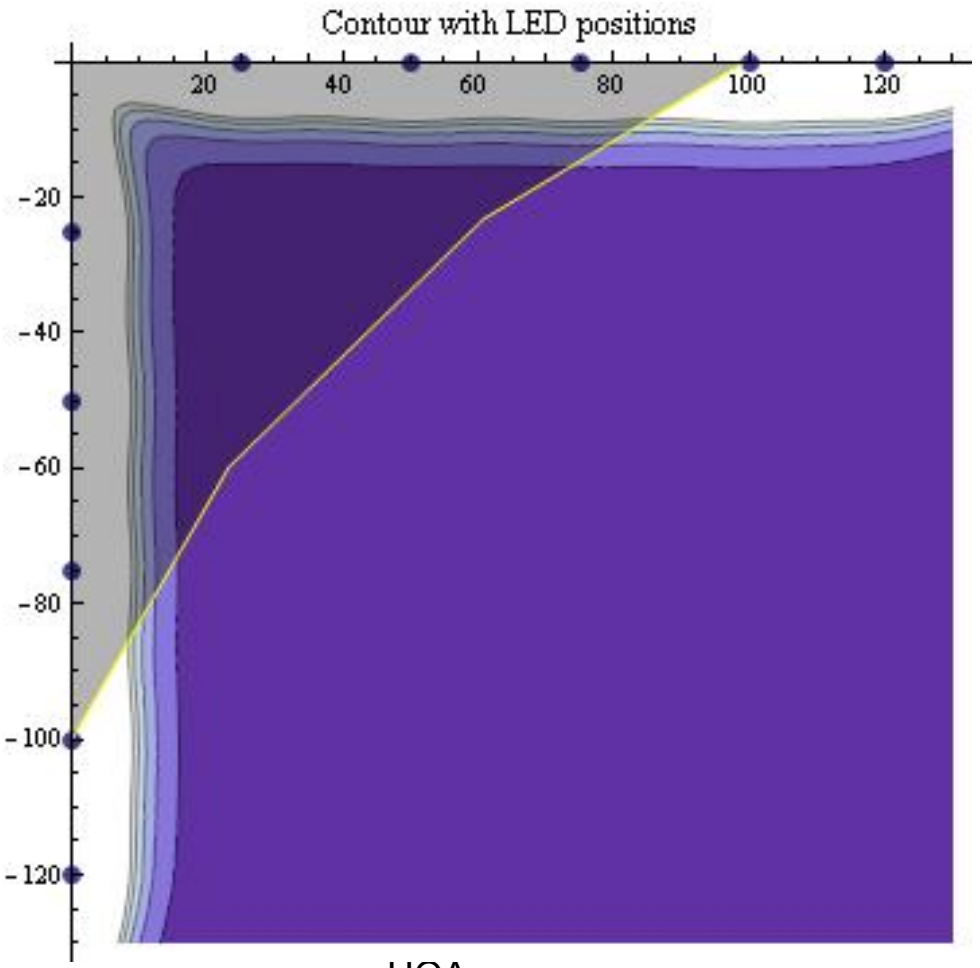
- A pane of plexiglass 130cm x 130 cm,15 mm thick.
- Two adjacent edges polished, two edges worked with abrasive paper.
- Two rows of 5 violet LEDs were placed on the polished sides. The positions from the origin (at corner of the frame), are : 25, 50, 75, 100, 120 cm.
- We used the old LED boards with controller.
- We used 2 plastic channels with adhesive tape to position the LEDs and secure their positions
- The set-up was enclosed in a box made from black paper and covered with black cloth.
- We used a 2 inch PMT with a window on its face.

- The stretched strings form a grid with 10 cm spacing, so that we could easily position the PMT.
- We measured the pulse high with a digital scope.

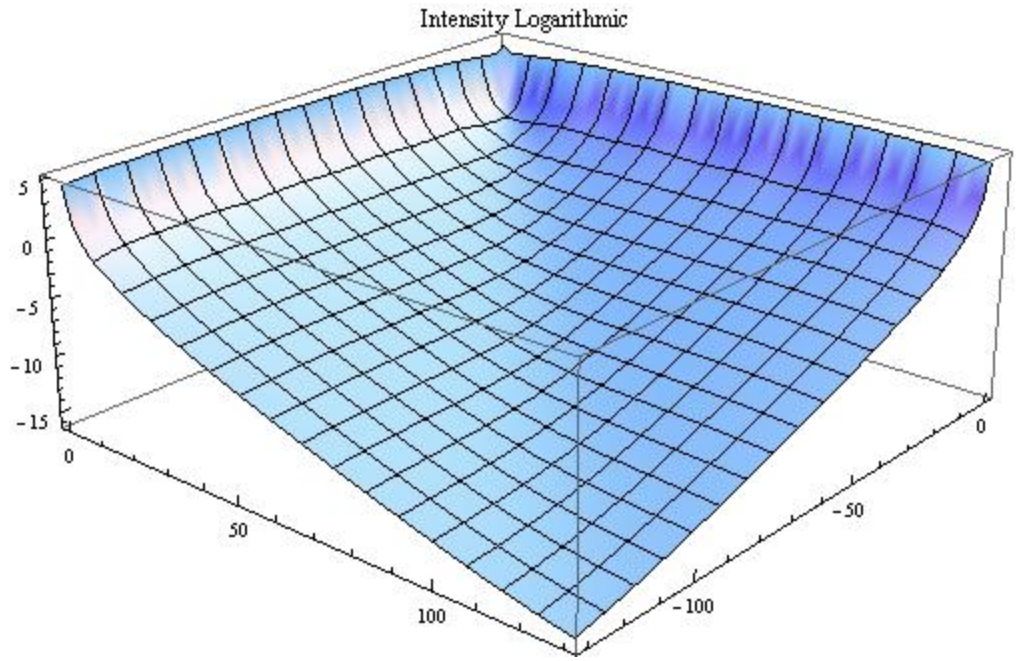
A first approach

- We performed a study using parameterized data from previous tests.
- The plots were produced in mathematica.
- The assumptions were:
  - Light intensity pattern: $\cos^2 \cdot$
  - Attenuation described by 32 cm attenuation length.

Estimated light intensity contour with LED positions.



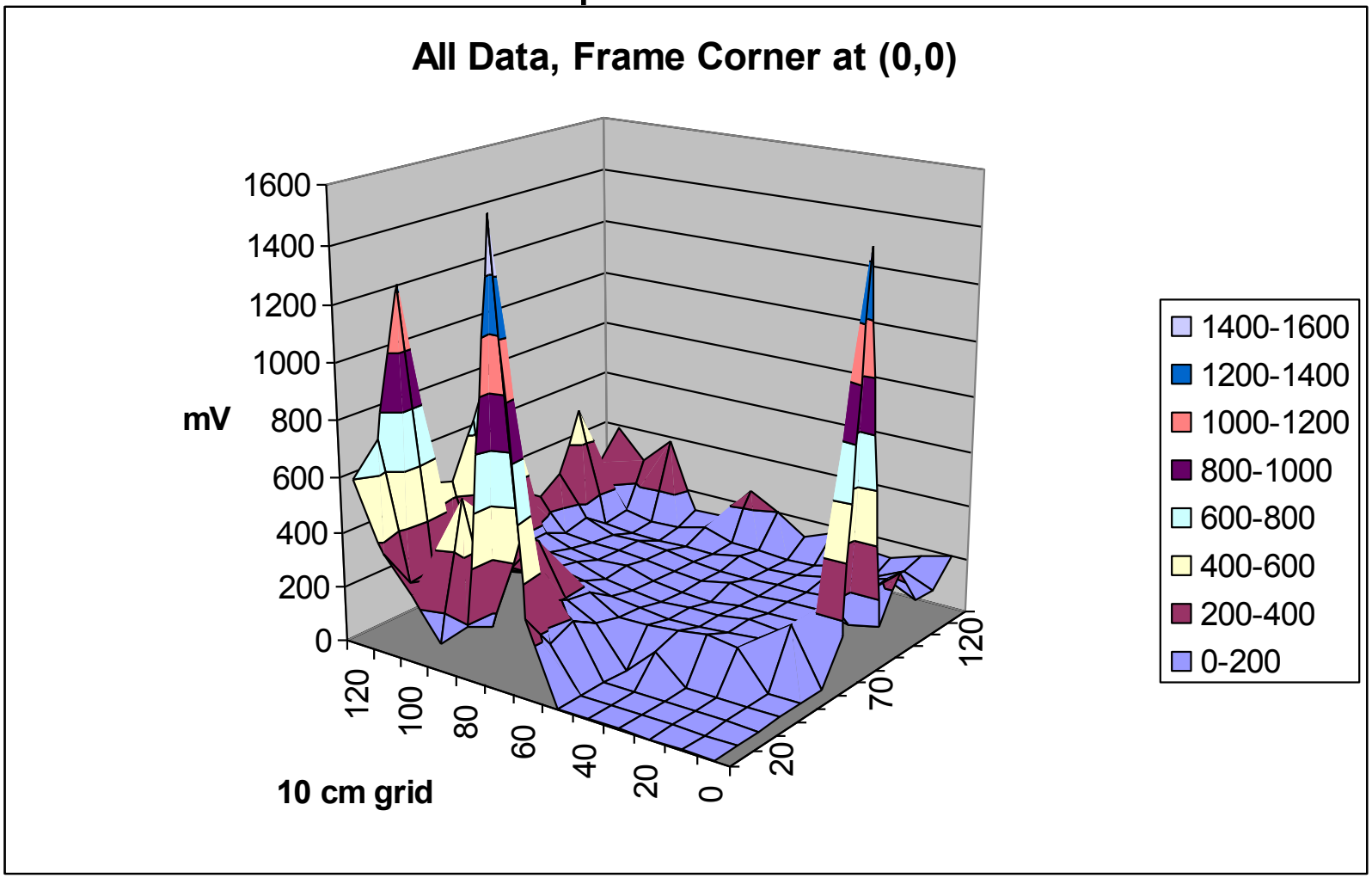
Intensity Calculation, Logarithmic Plot



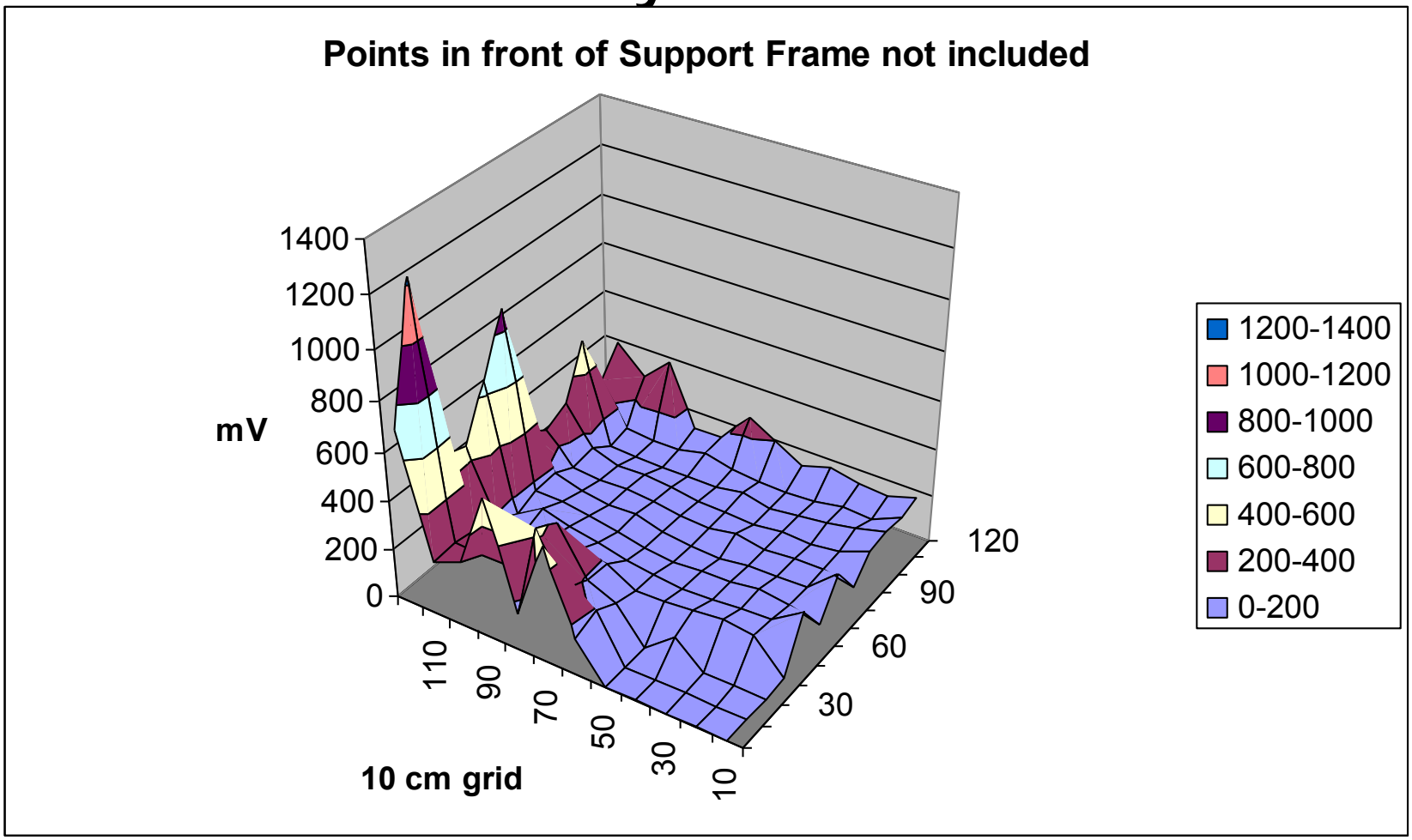
Results

Pulse X,Y scan.

10 cm per division.

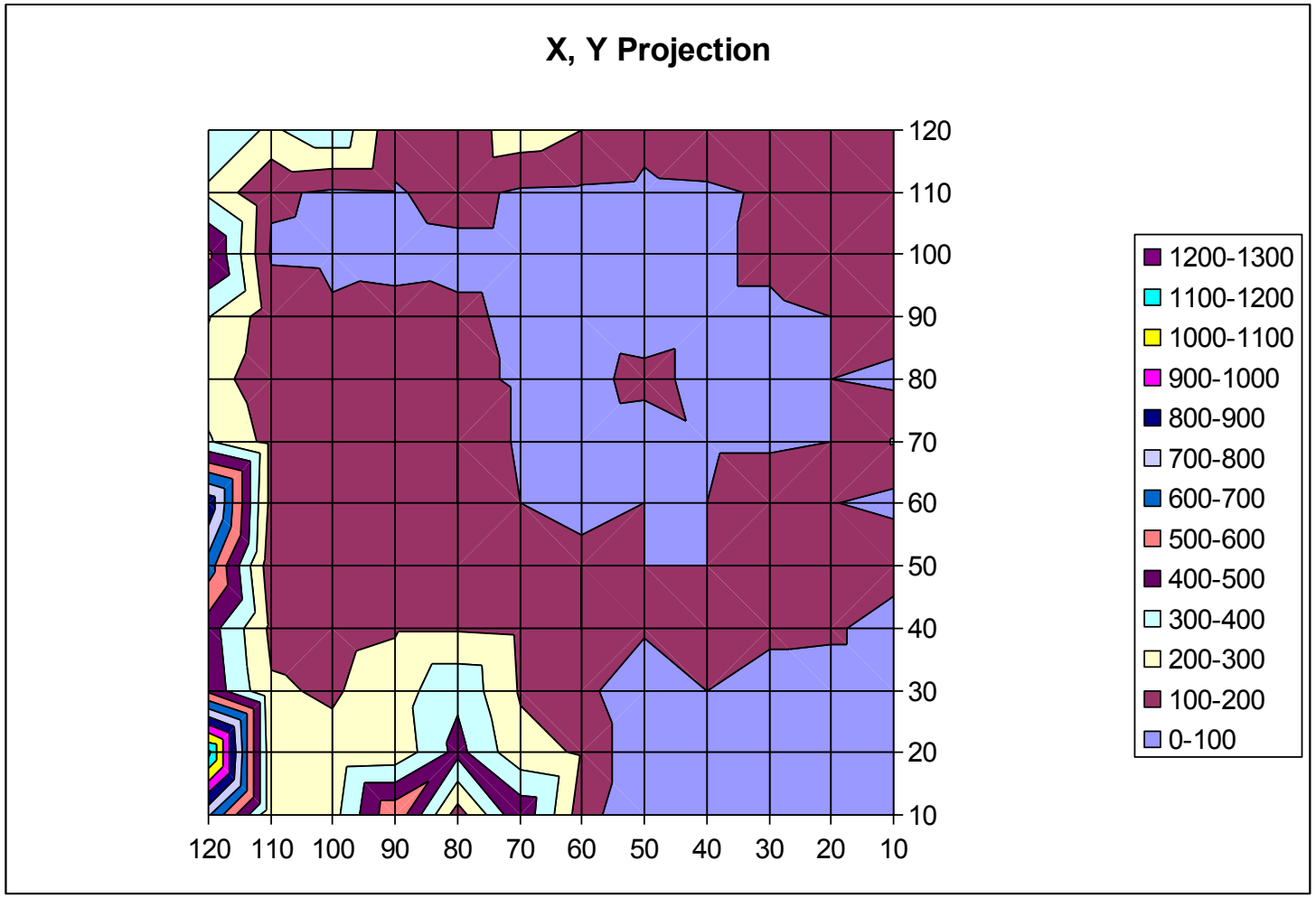


Area Covered by Frame not Shown



Intensity contour.

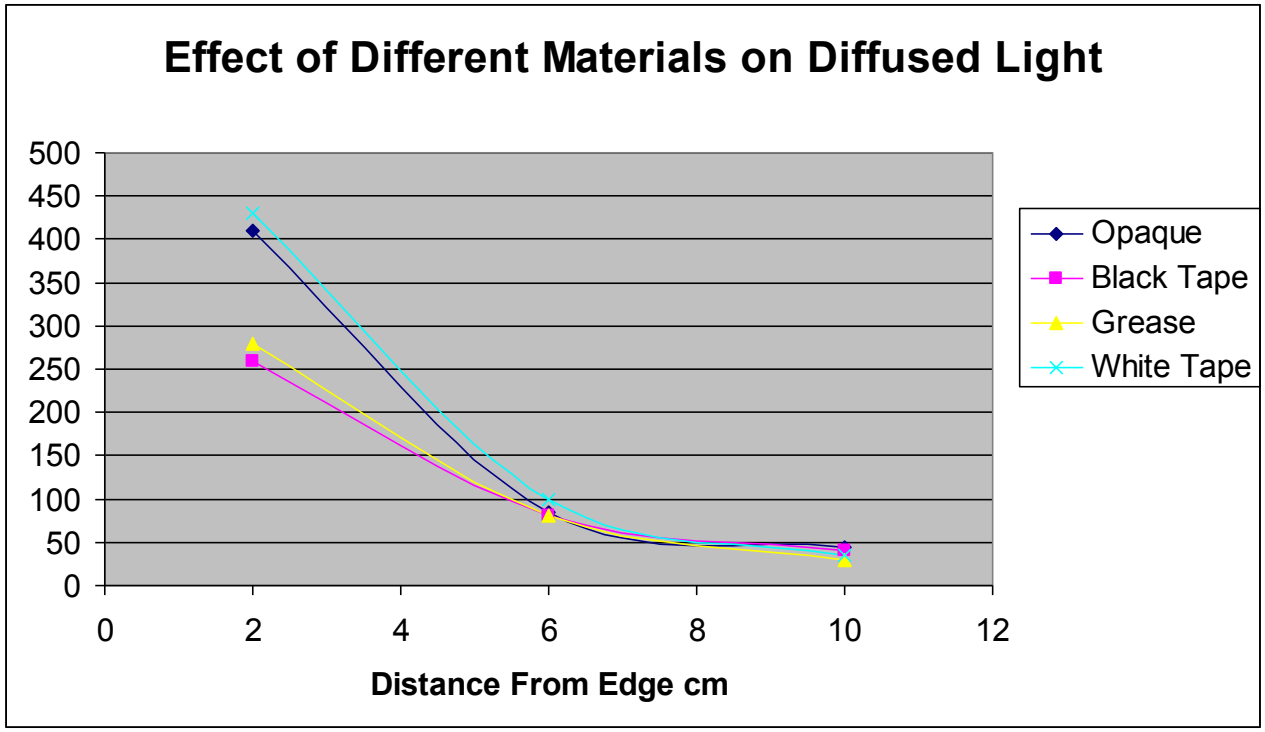
X,Y projection of the previous image



Study of the diffused light on the edges.

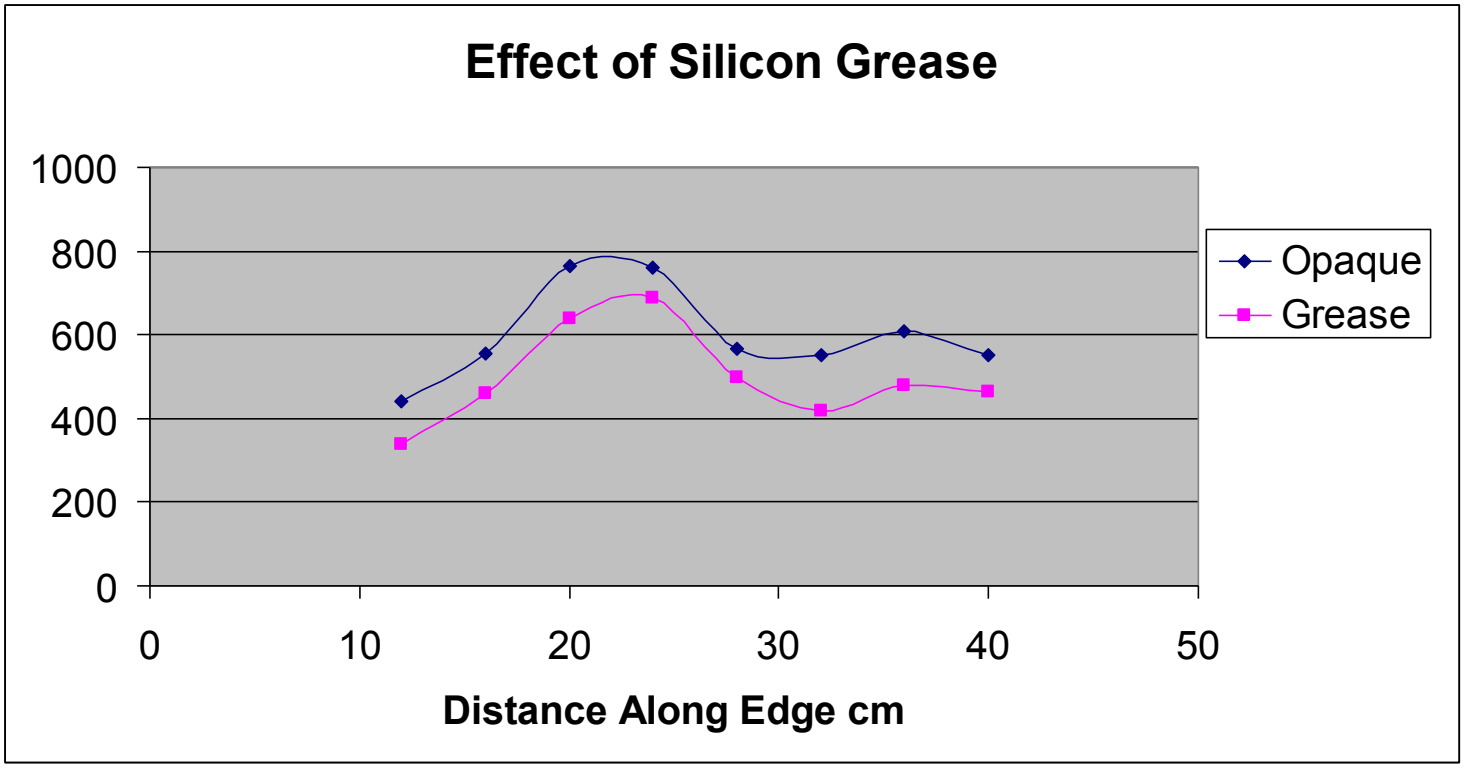
- The effect of diffused light is more pronounced close to the edge opposite to the LEDs.
- We used a 4x4 cm window on the PMT.
- Moved the PMT at positions 2,6,10 cm from the edge.
- Covered the edge with different materials.

Effect of Different Materials



We used silicon grease to simulate the effect of polished surface.

Effect of Silicon Grease



Moved the PMT along the edge 2 cm from edge.

Conclusion

- A transparent edge is preferable.
- Next we shall polish the opaque edges.
- Use the new LED boards.