



GlueX FCAL monitoring & calibration system (update since Febr. Coll.meeting)

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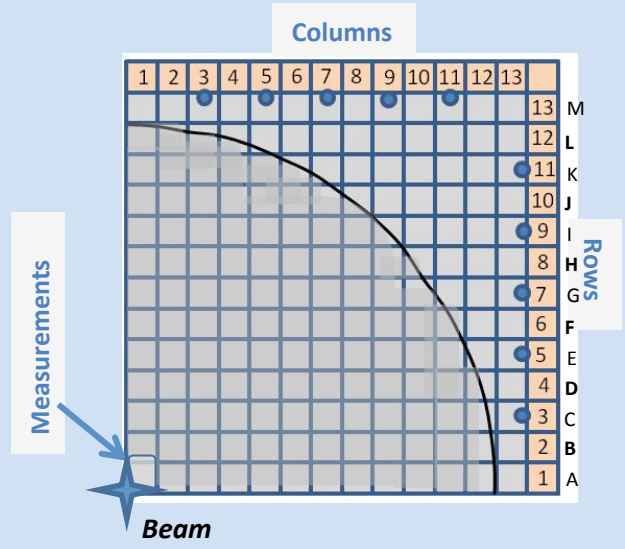
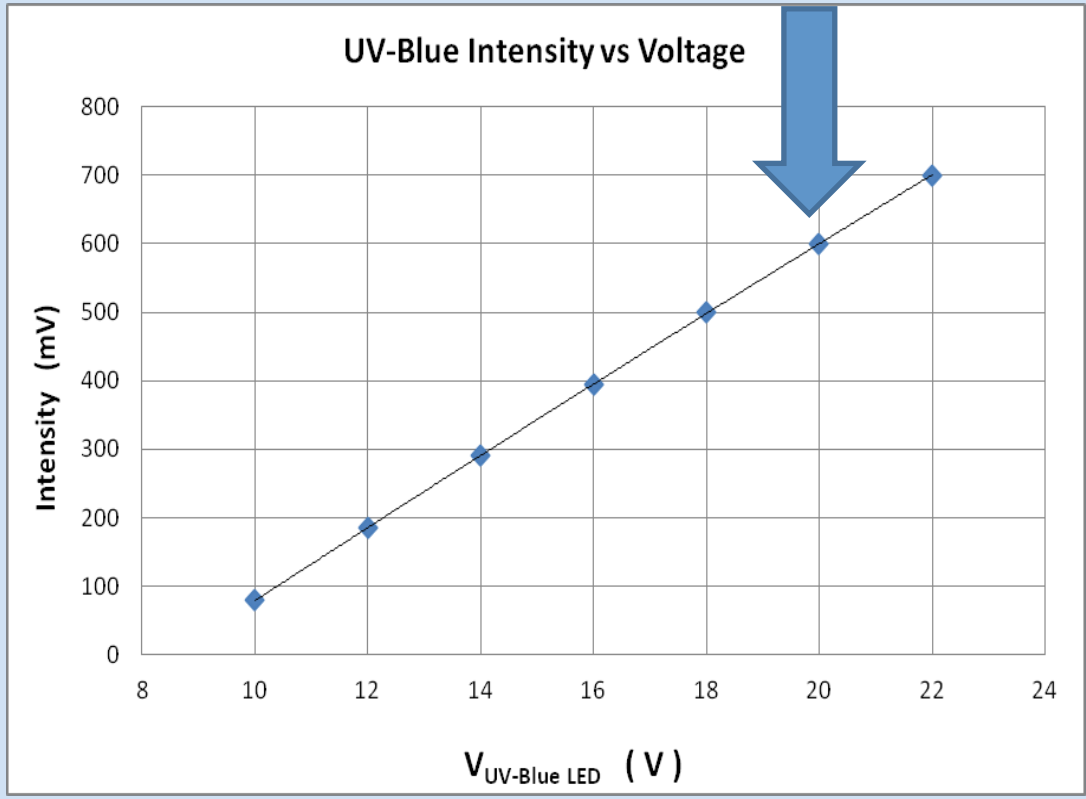
with lots of help from Elton, Zisis, George L. and Matt

Measurements shown at the collaboration meeting Feb. 2013

Colour	Bias Voltage (V)	Ratio of small PMT/array	Predicted light output with array at the far corner
Violet @390nm	22	6.8 +/-1.3	~60 mV marginal (have to increase V_{bias})
Blue @470nm	10	5.4 +/-1.0	~60mV marginal (have to increase V_{bias})
Blue-Green @525nm	18	3.6 +/-0.6	~85mV OK wide pulse
Green @574nm	28	2.3 +/-0.4	~30mV hopeless

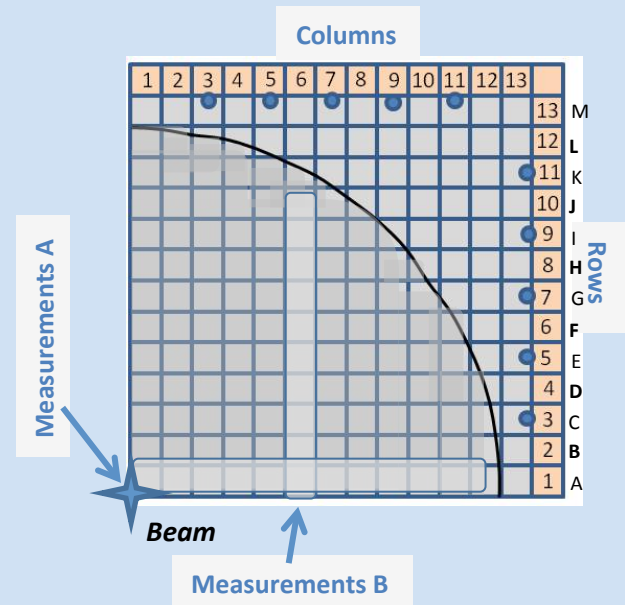
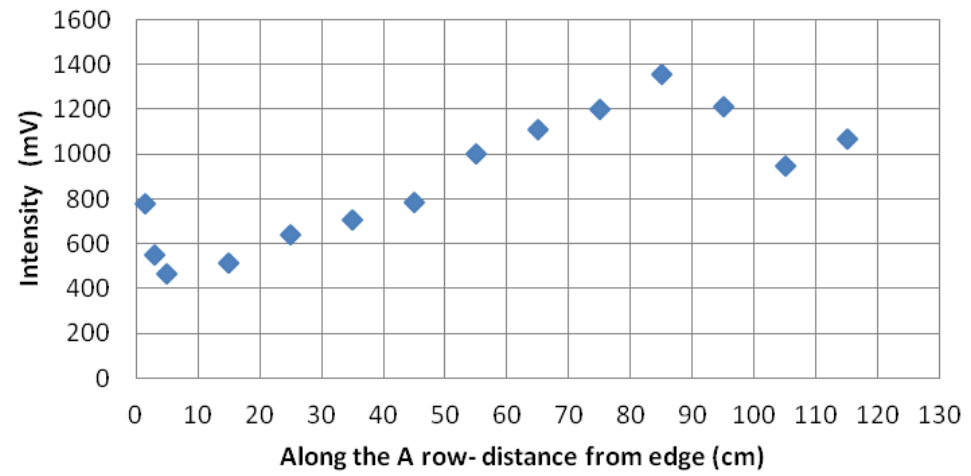
The Violet measurement was probably wrong re-measured twice and gave larger values (see next slide)

Intensity at A1 corner of UV-blue at the far corner



Detailed scan of UV –Blue/violet @ 18 V (was 22 V)

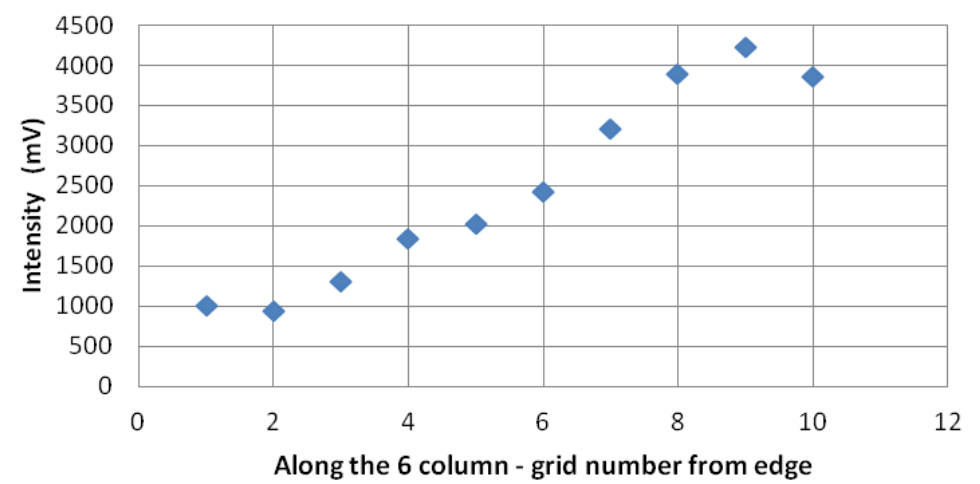
UV-Blue@18V



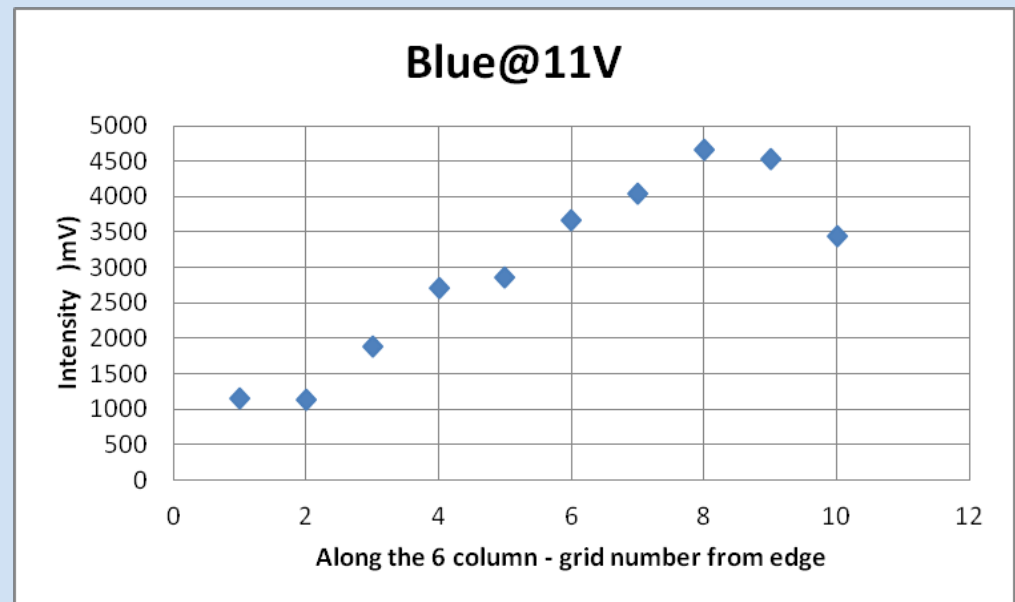
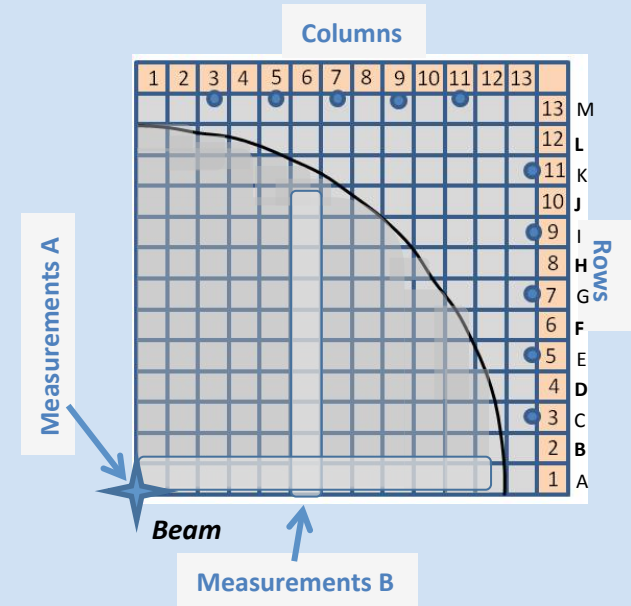
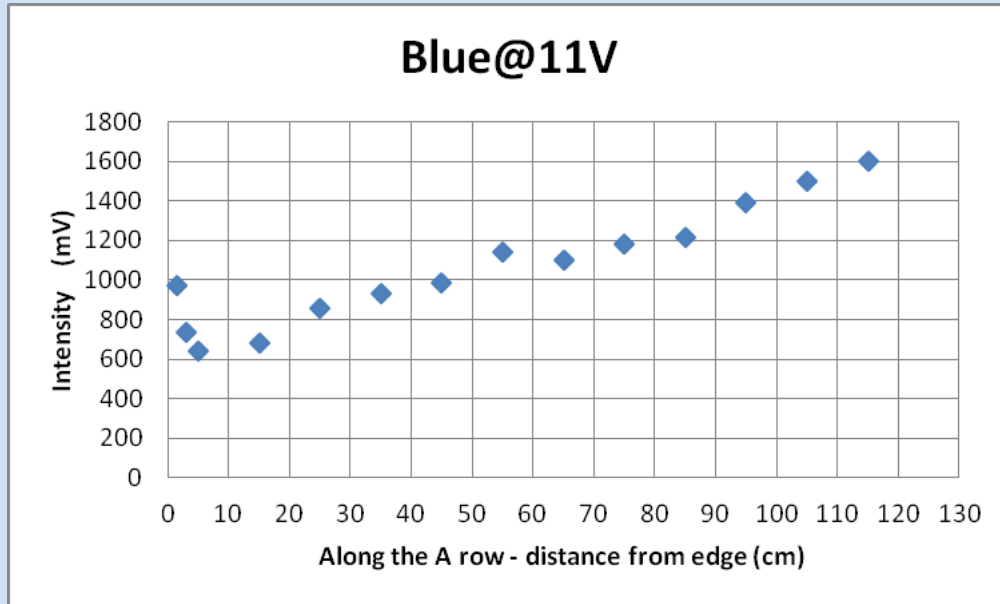
Intensity at A1 (far) corner

UV-Blue@18V	470 mV
Blue@11V	645 mV
Green-Blue@20V	570 mV

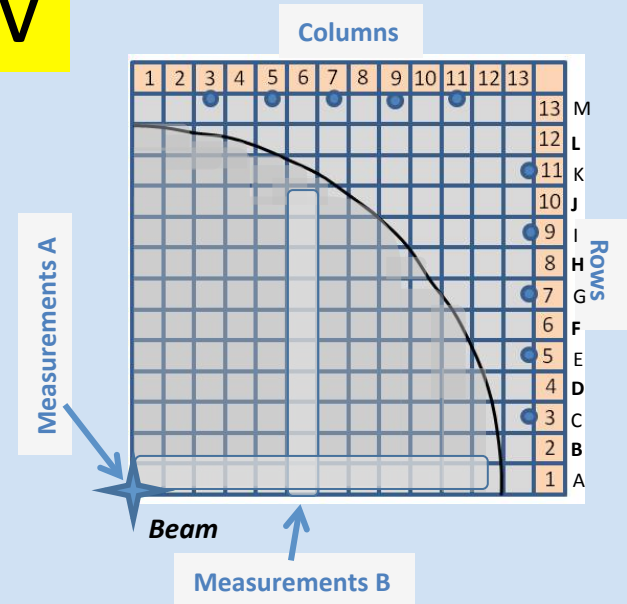
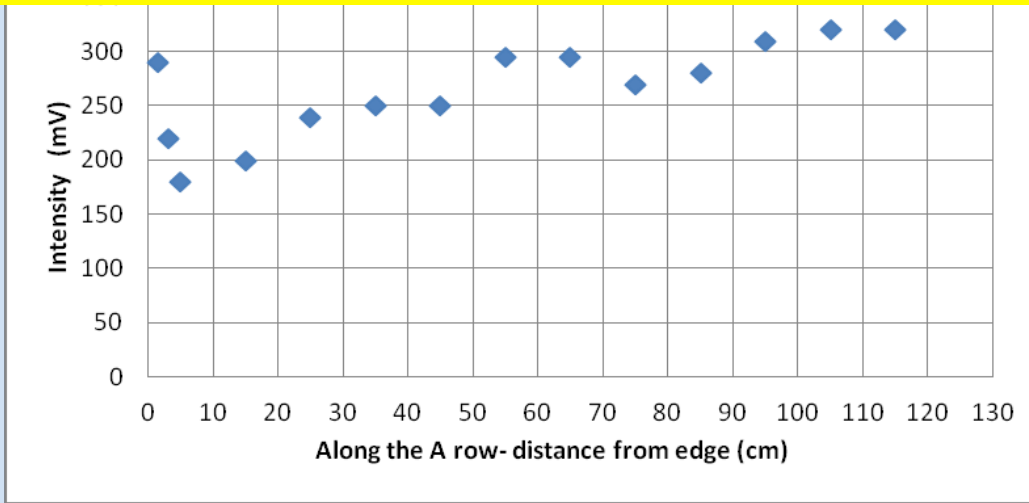
UV-Blue@18V



Detailed scan of Blue @1 V higher

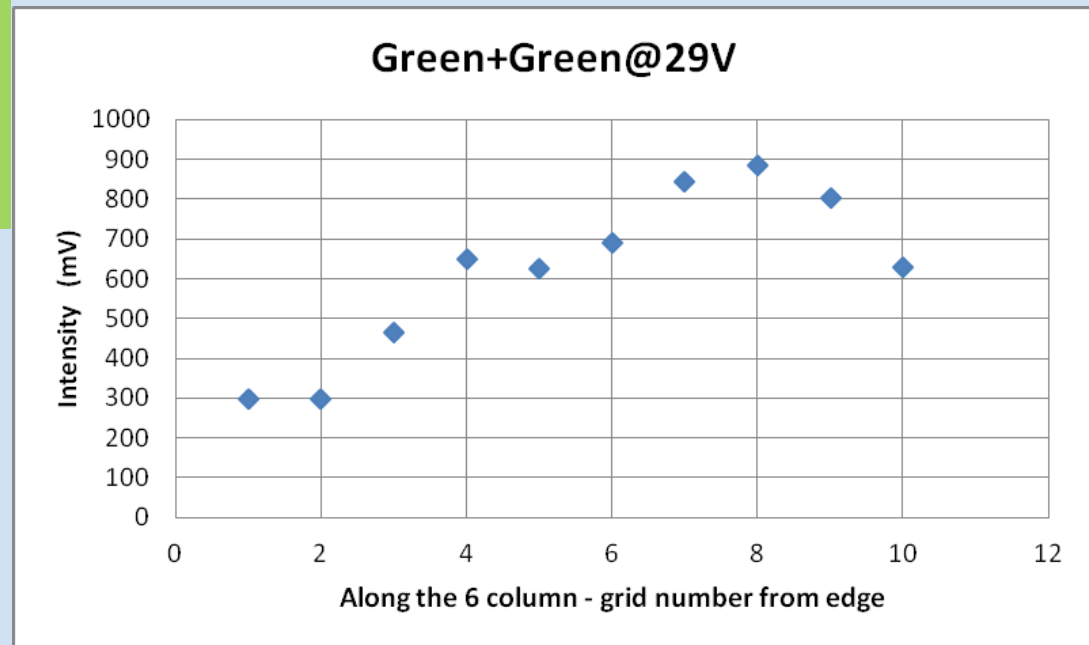


Two Green @ 574nm @ 28 V



Signal of Green LEDs (each and both) versus voltage at A1 position (far corner)

LED	@V	mV
G1	20	55
G2	20	55
G1+G2	20	105
G1+G2	25	148
G1+G2	28	170
G1+G2	30	190

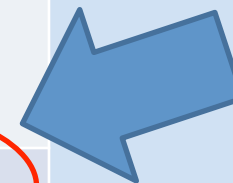


Signal comparison between Small and Block PMTs (re-measuring ratio with two Green LED's at three positions)

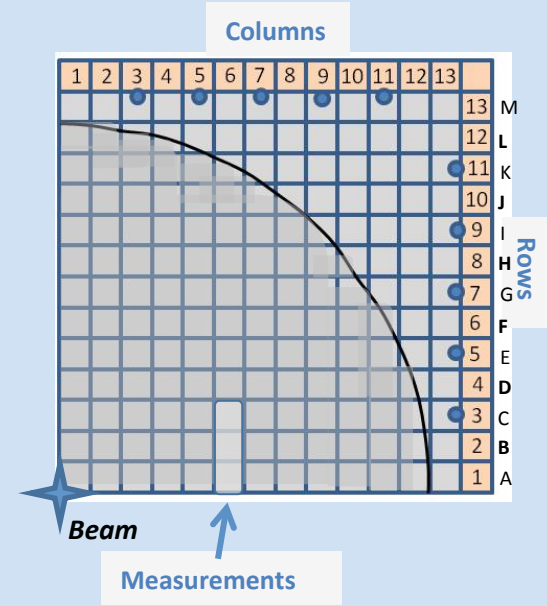
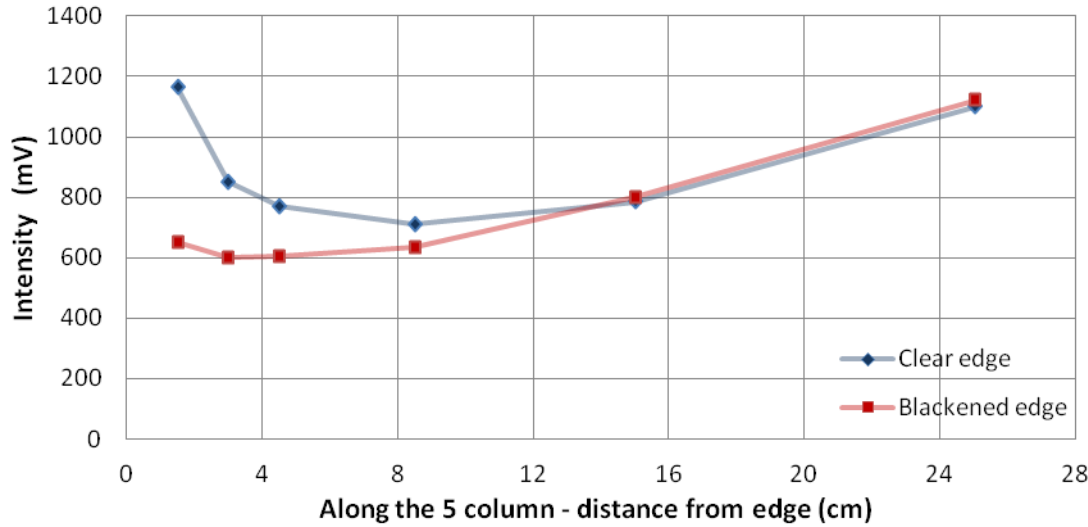
Position	Small PMPT	Array PMT	Small/array
6D	650	310	2.1
6F	690	340	2.0
6H	885	470	1.9

Colour	Bias Voltage (V)	Ratio of small PMT/array	Predicted light output with array at the far corner
Violet @390nm	22	6.8 +/-1.3	~90 mV <i>(new)</i>
Blue @470nm	11	5.4 +/-1.0	~120mV
Two Green @574nm	28	2.3 +/-0.4	~80mV OK

We can work with two Green

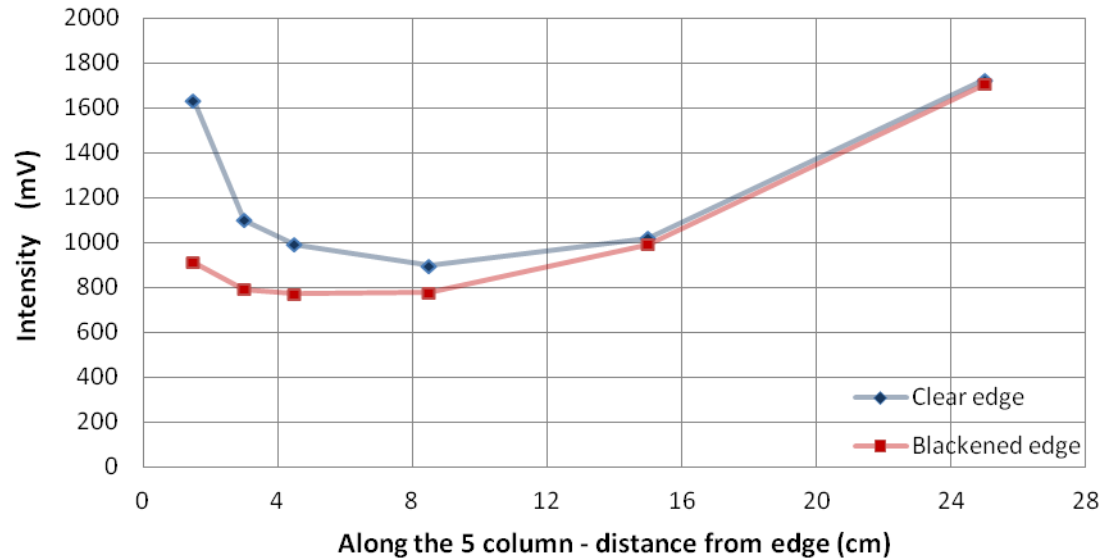


UV-Blue@18V



Reflection problem very close to the edge solved with black emulsion paint

Blue@11V



FCAL Conclusions

- With one UV-blue + one Blue +two green LED's:
 - ✓ we can cover the 390nm-→574nm region
 - AND
 - ✓ have enough light at the far corner
- The Plexiglas board surface should be "blasted" to increase the light collected from its top side
 - A uniform "blast" should be applied very lightly; abrasive: CAMI Grit designation 1000 (P2000) or higher
- To decrease high signal very near the Plexiglas edges, the non LED edges of each quadrant should be "blackened" with emulsion black paint or Deep-black optical paint

**Propose to proceed now stuffing
the 50 LED boards + 5 controllers accordingly**