

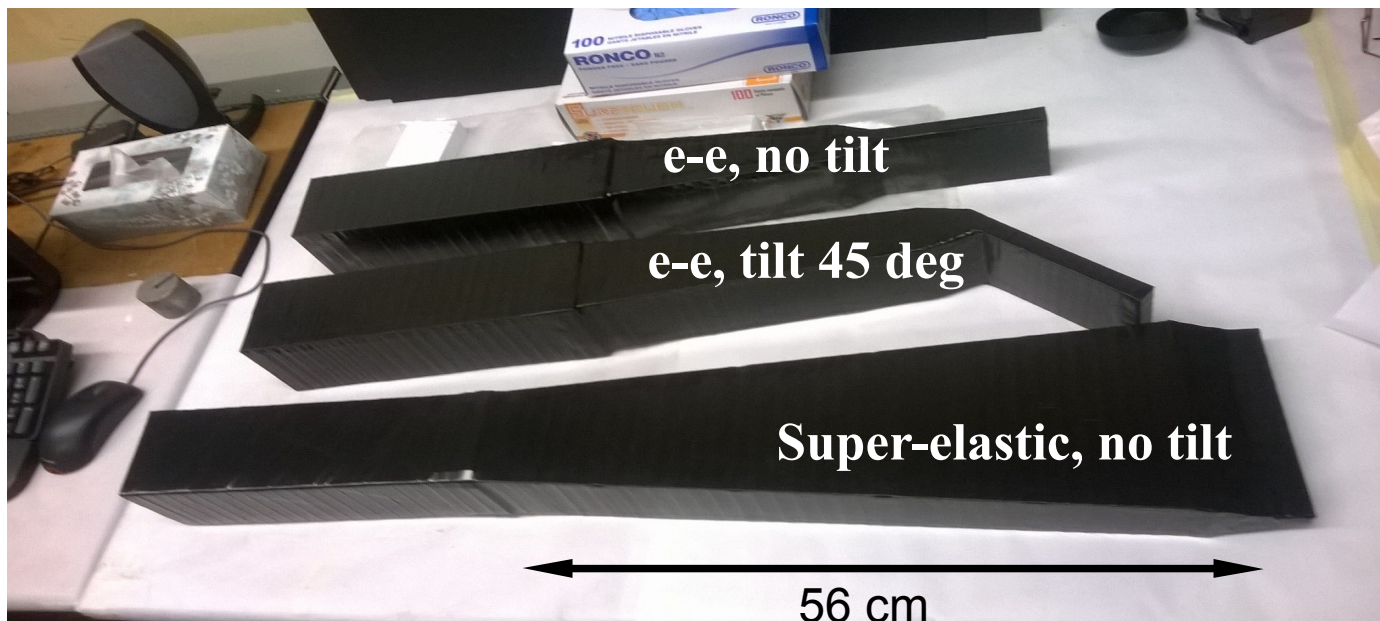
Moller Detector Prototype Update

Manitoba Group
May 7, 2015

Prototypes for e-e and super-elastic Rings

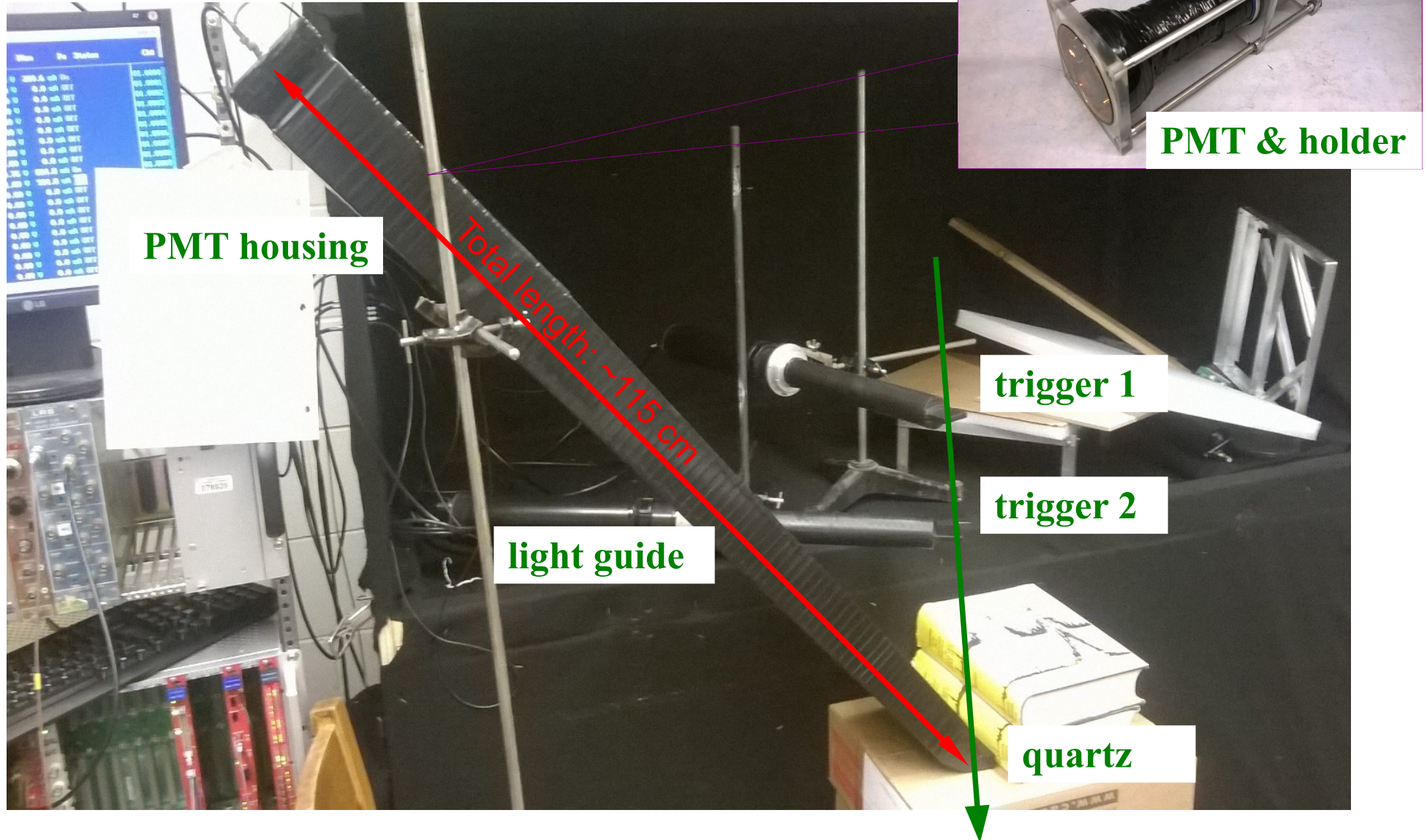
Four Prototypes were made: two for e-e and two for super-elastic rings

- New quartz:
 - e-e quartz: 8.4 cm x 16.0 cm x 1.5 cm, single 45 deg cut at bottom;
 - super-elastic quartz: 17.2 cm x 4.0 cm x 1.5 cm, single 45 deg cut at bottom;
 - sharp edge and beveled edge quartz, well polished
- 3-inch PMTs
- Miro-silver 27 as lining material for light guides

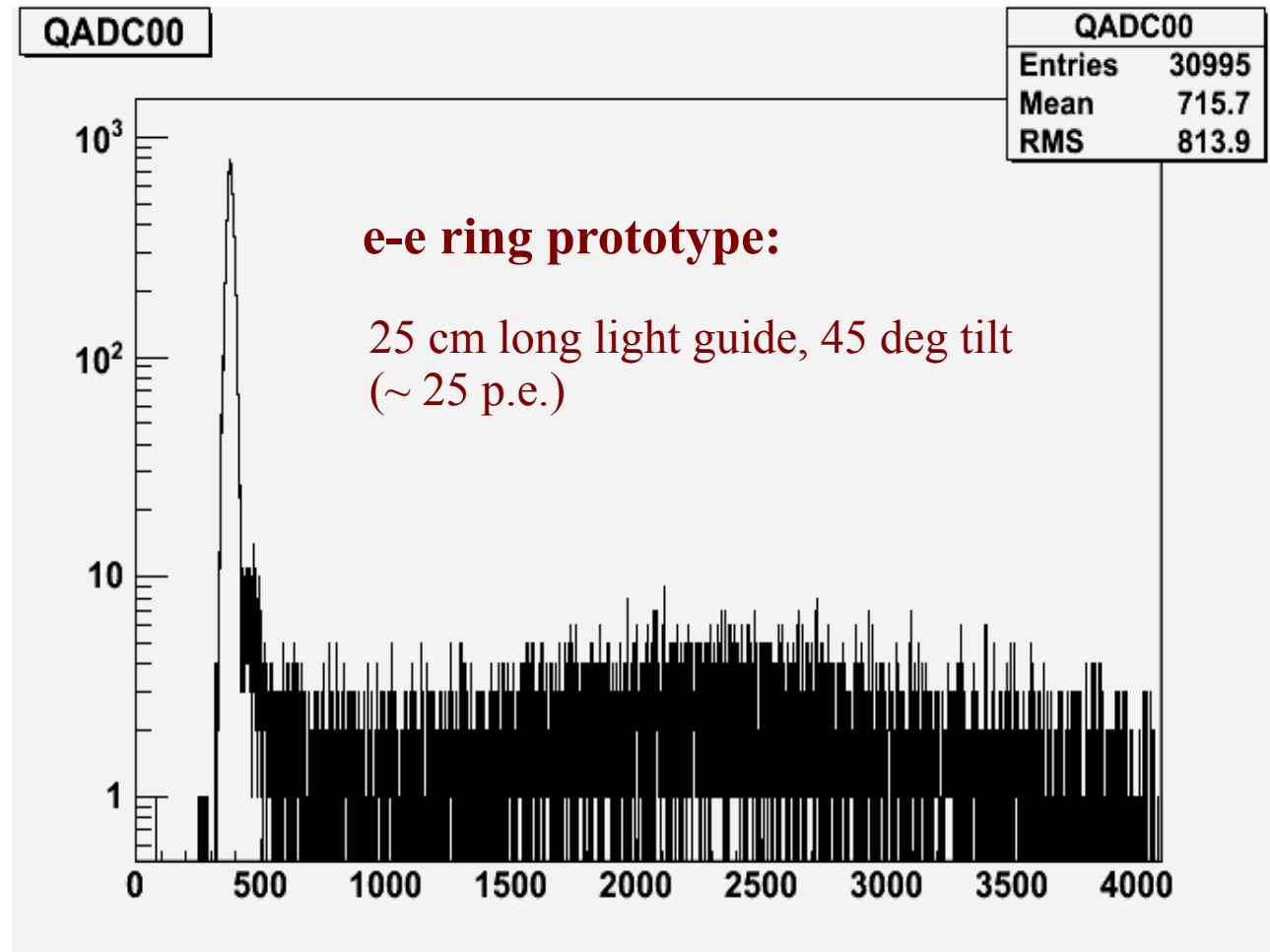


Cosmic Ray Test

A super-elastic prototype (tilt 45 deg) under cosmic ray test



Cosmic Ray Test

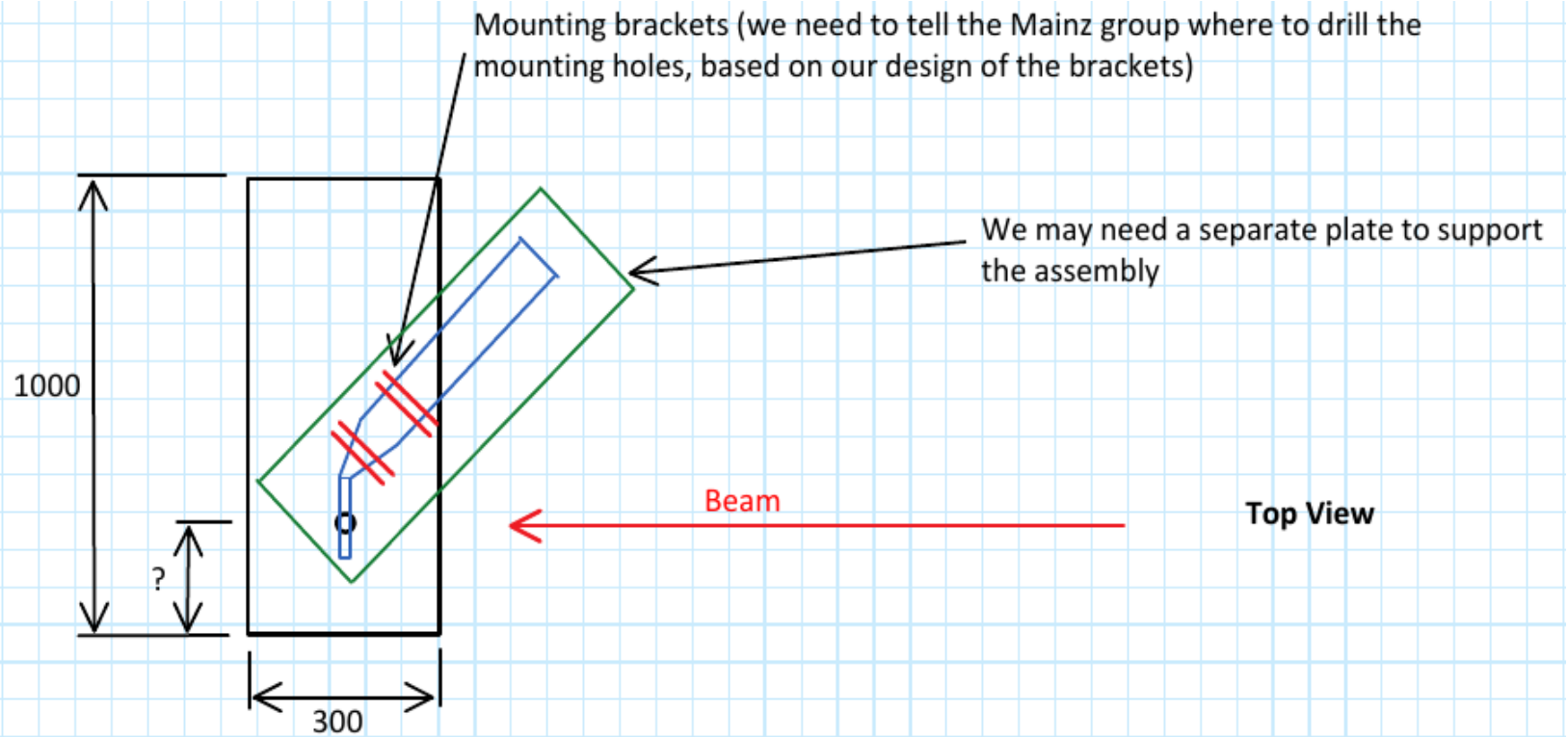


- All prototypes are under cosmic ray test
- PMT SPE calibration is underway

Example of cosmic ray test spectrum

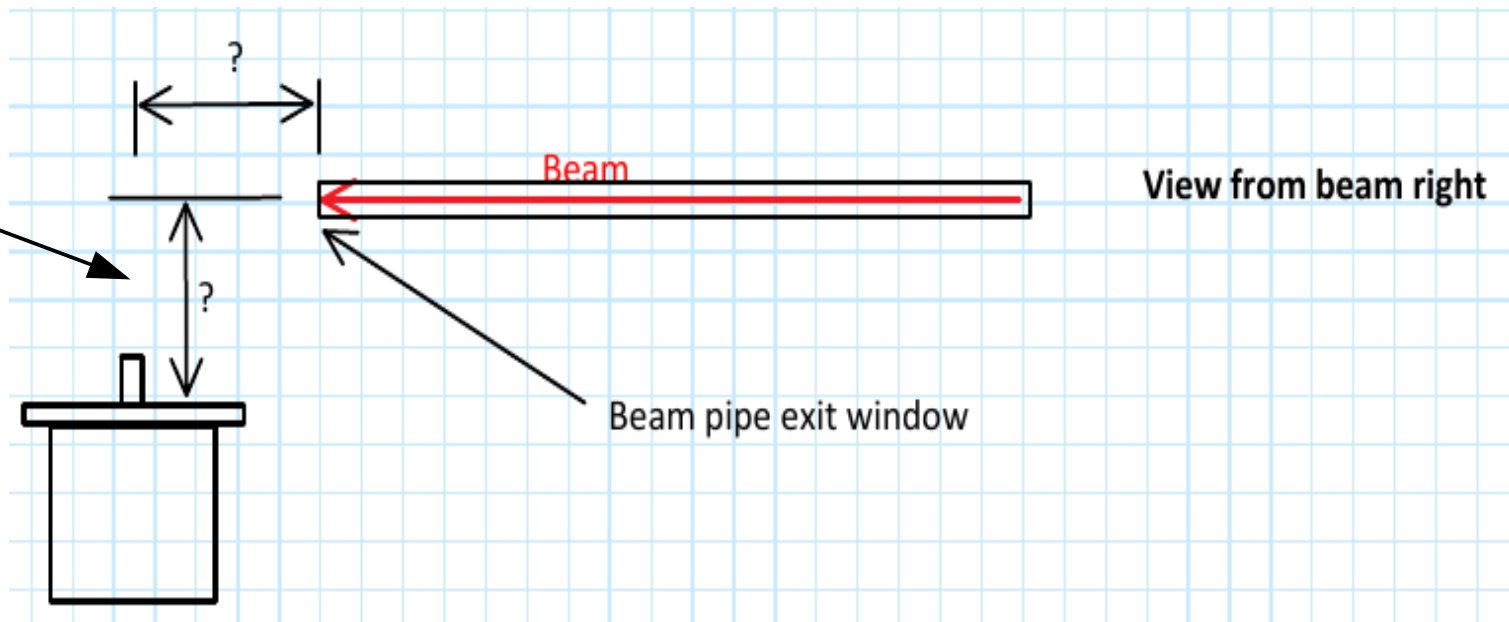
Concept
design:

Horizontal
mounting



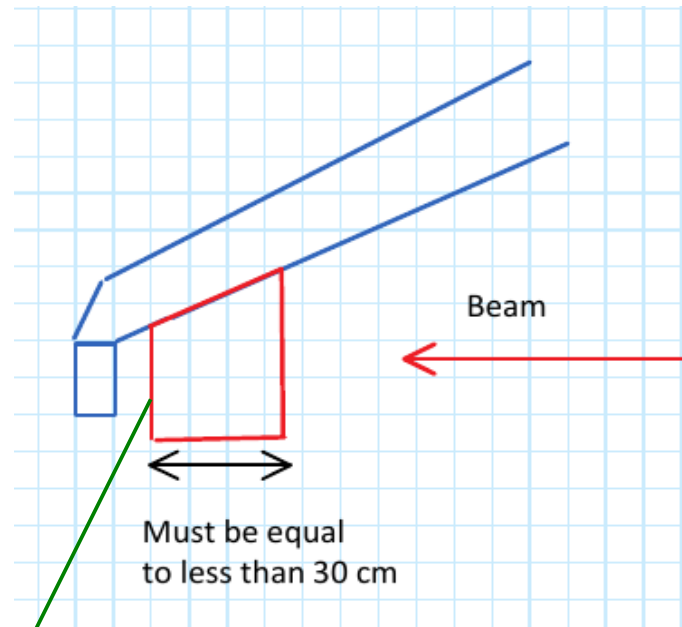
Space: 5 - 10 cm

~ 5 cm motion
range makes it
difficult to do a full
position scan
along 17 cm wide
super-elastic
quartz



Concept design:

Vertical mounting for
detector with 45 tilt angle



Should be high enough to have the lower quartz edge 10.2 cm above Table, since that is the minimum vertical distance between the table and the beam line.

Top plate could have holes to screw down straps that hold the assembly in place.

The final design
might be different.
We are still working
on this.

Must be large enough to let the beam through over the entire width of the detector. So I would say the opening has to be at least 20 cm but preferably larger to prevent a possible beam halo from hitting the mount.

Test Plan for the Manitoba Prototypes

In order of priority:

1. Simple PE comparison of all four detectors with beam centered on quartz at normal incidence
2. Position scans for all detectors with some step size that will be determined by how long it takes and how much time there is.
3. Angle scans at the outer corners and along the outer edges of the quartz pieces (center has been done).

We may have to do a single PE calibration of the tubes ...

I estimate 3 shifts maximum, one for each of bullets above.