

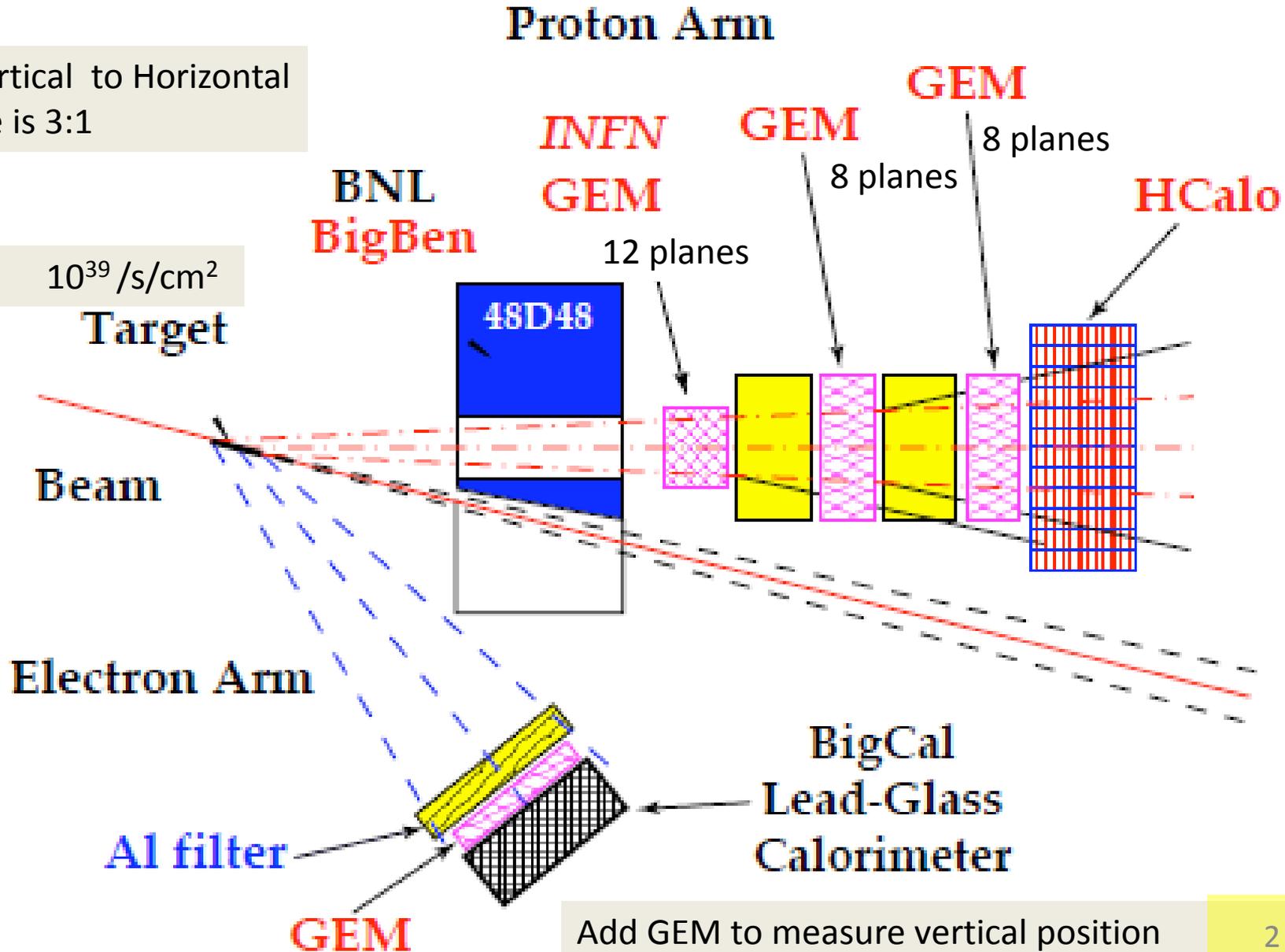
BigCal for GEp5

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for the GEp5 Collaboration

Experiment Setup

Ratio of Vertical to Horizontal acceptance is 3:1

40cm LH2 10^{39} /s/cm²
Target



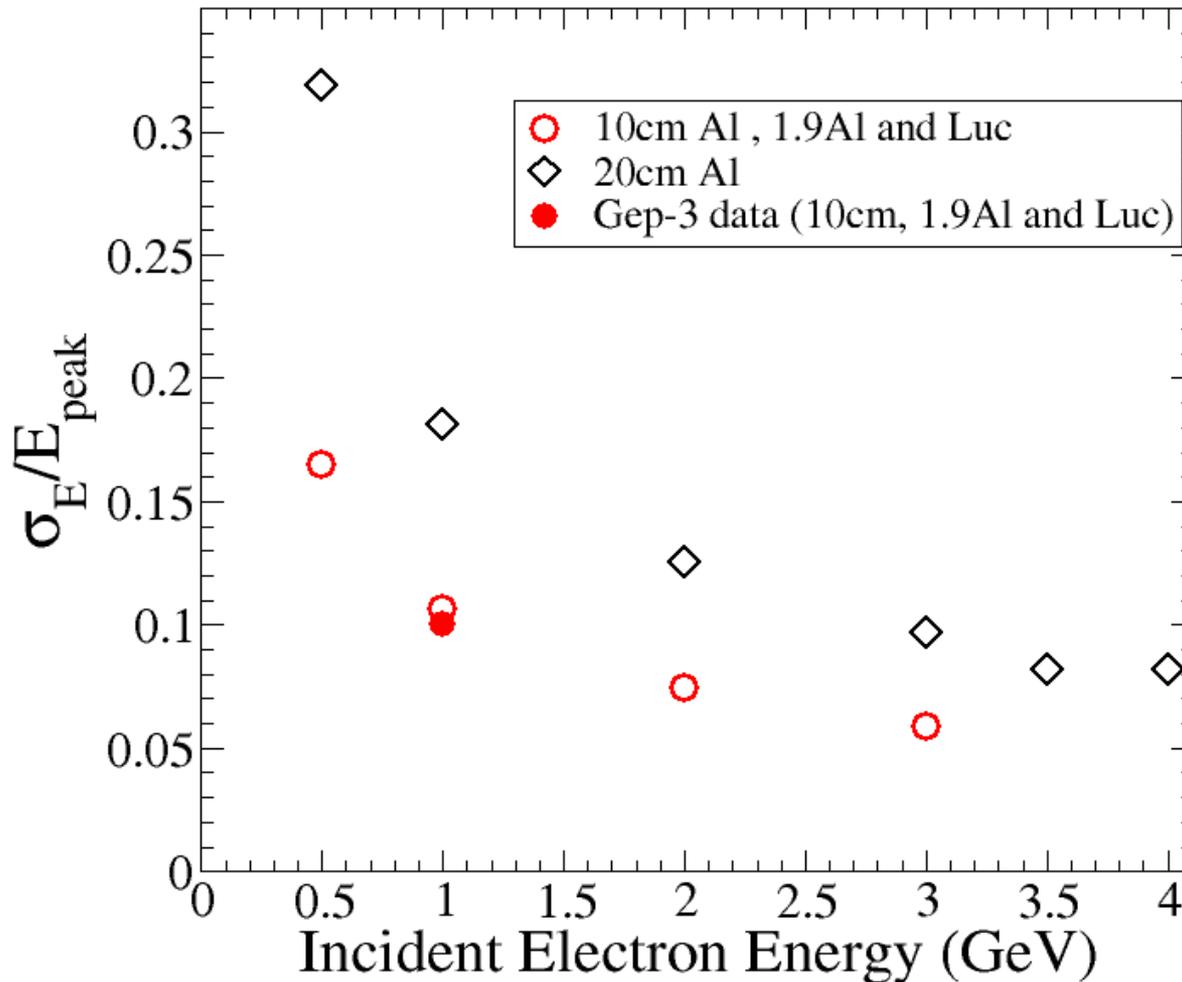
Add GEM to measure vertical position
Improve track matching

Technical Review on GEp5

Recommendations

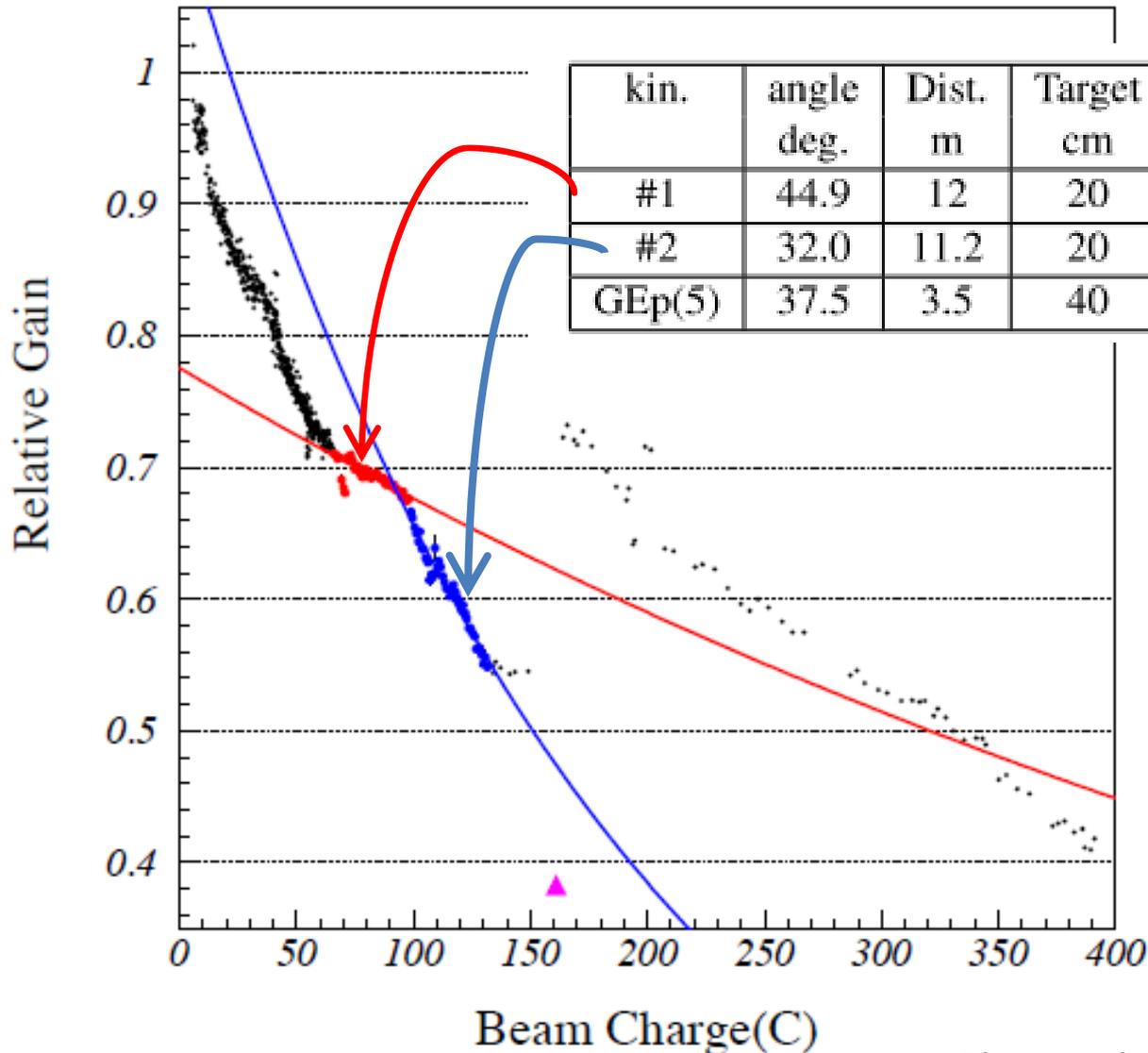
Provide calculations of the energy and spatial resolution with the 20 cm Al absorber taking into account the average radiation damage. Evaluate the impact of the resolutions on the general performance including tracking and trigger rate. Clarify the impact of the expected energy resolution not meeting the requirement on page 107. Provide evidence or arguments that a 5 fold increase in the UV light intensity will increase the rate of curing by a factor of about 5.

Energy Resolution



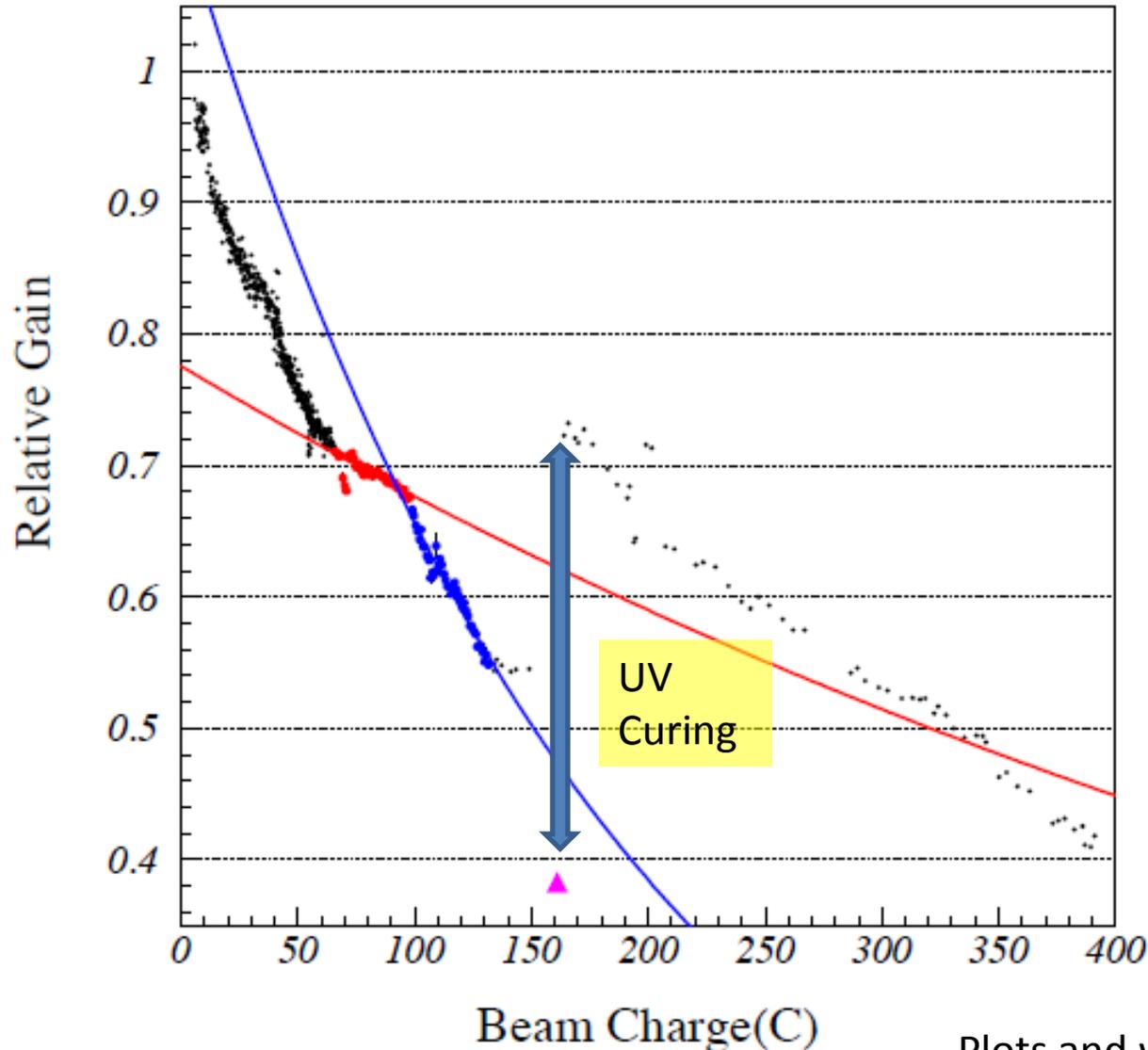
- Energy resolution of about 8.8%
- Found that the position resolution was 0.6cm with almost no dependence on energy. This is a factor of 1.5 worse than assumed in CDR.

Gain loss during Gep-3



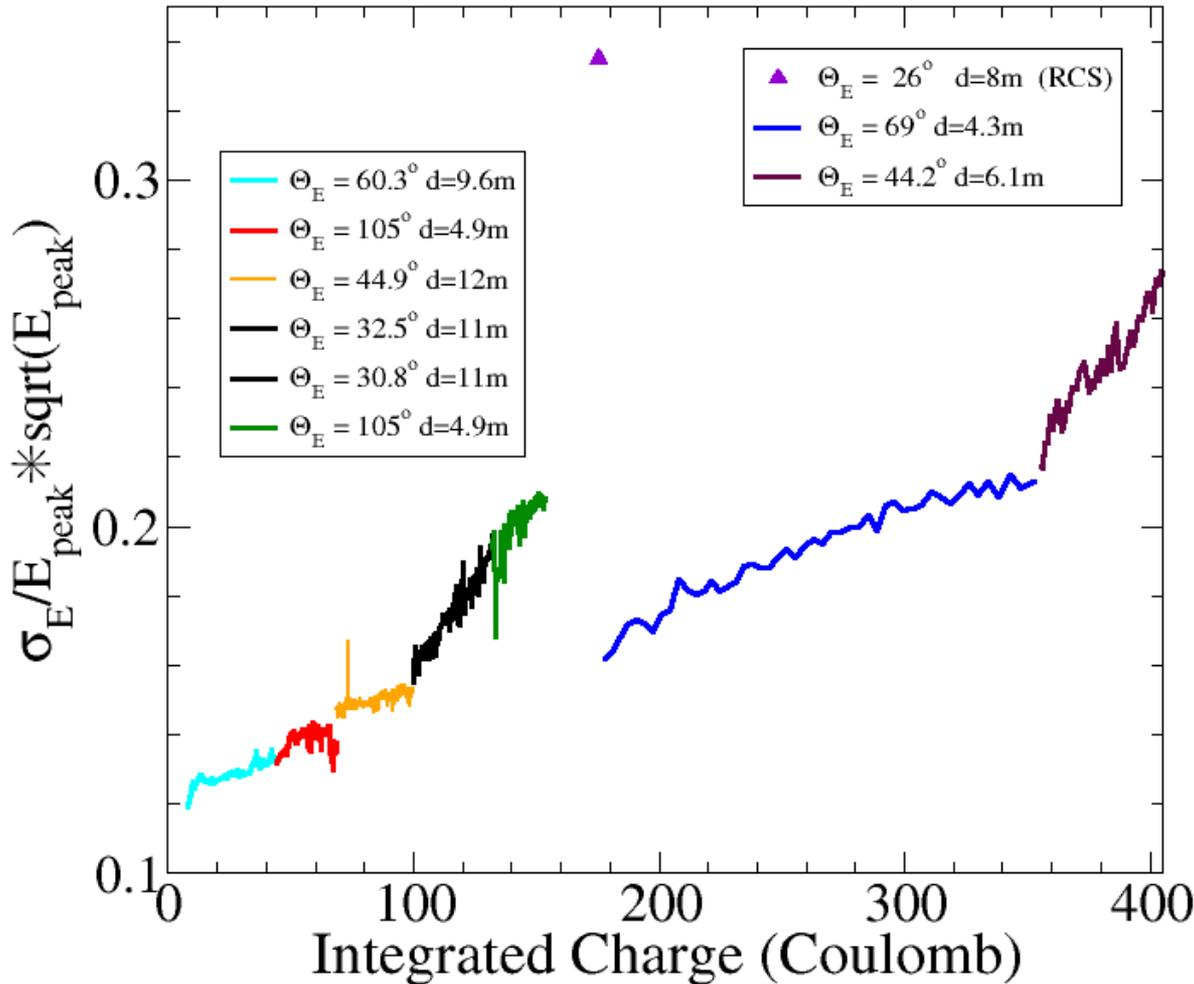
- Expect 13x increase in rate of gain loss for Gep5
- For 75uA beam ,
0.87% gain loss/hr

UV curing during Gep-3



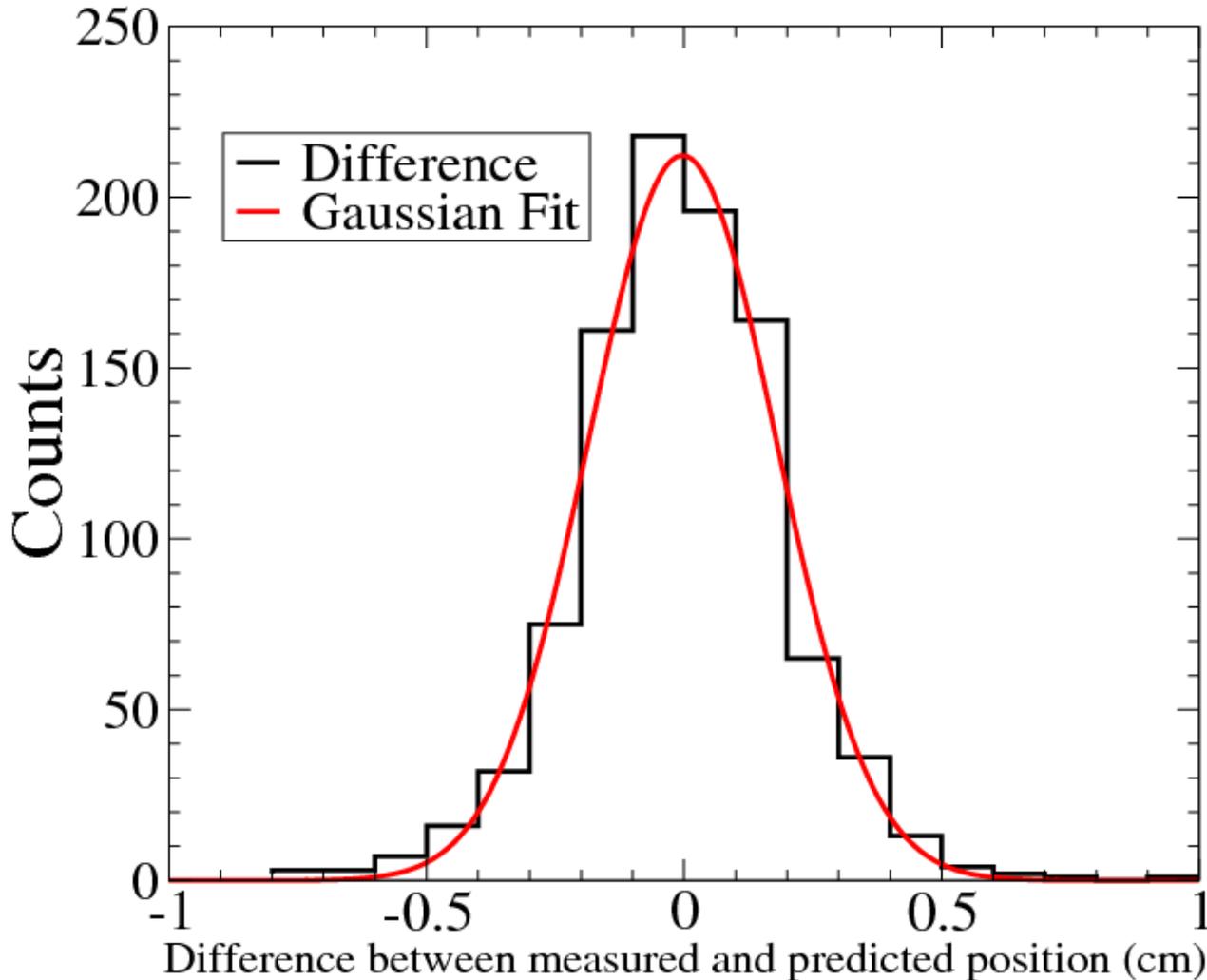
- UV cured the BigCal for 3 days on each $\frac{1}{4}$ of the detector.
- Improved the gain from 39% to 74%
- Rate of improvement is 1.24%/hr
- For Gep5 need to curing glass at rate of 6% /hr
- UV cure for 1hr after 7 hours of running. (Need to have HV off)
- Need to increase UV intensity by factor of 5.

Energy Resolution during Gep-3



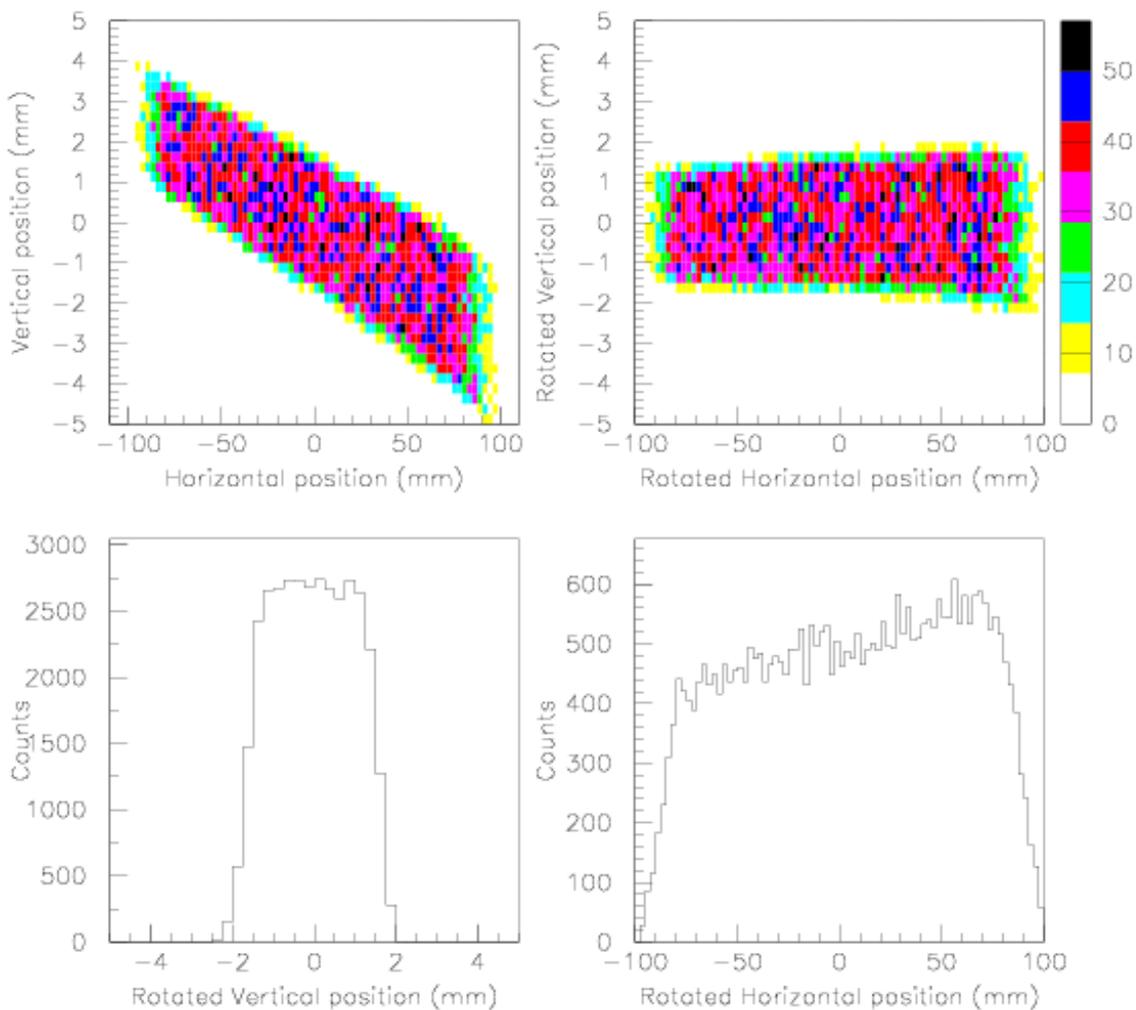
- $\Theta = 32.5$ slope of 0.15%/C during Gep3
- Assume factor of 13 increase for Gep5 so 1.95%/C.
- In 8 hour period expect 2% additive increase in energy resolution

Effect of Aluminum absorber on CD position resolution



- Multiplicity of electrons and positrons is about 8 after passing thru Al
- Per event average the hit position of all charged particles
- $\sigma = 0.2$ cm

Set search region in 1st GEM of SBS



Conclusions

- Plan to do studies of UV curing this summer
- Much work needed preparing BigCal and planning of the infrastructure.