

Update: Layer 1 (Long and Short Straws)

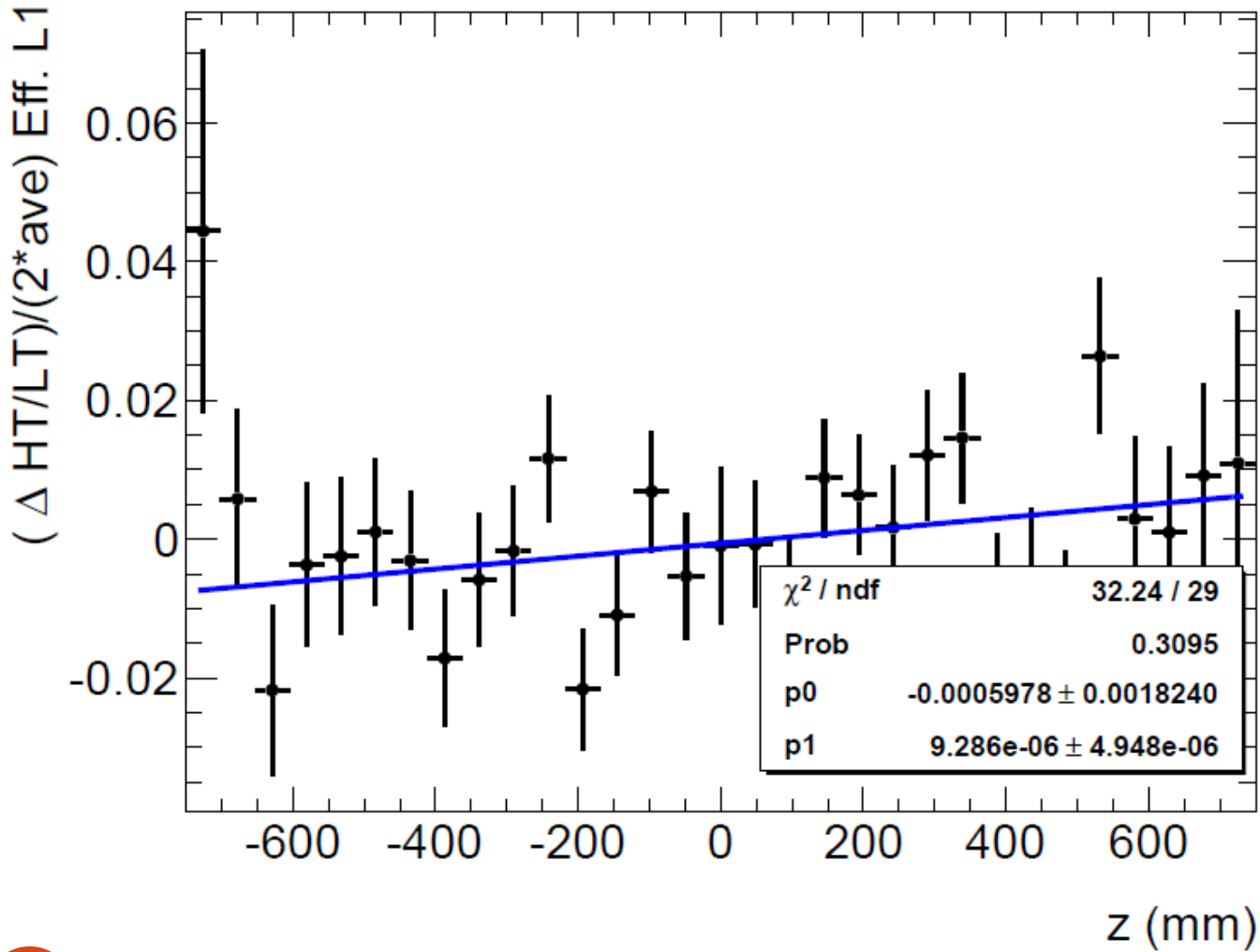
Ben Weinert

Note

- At last weeks meeting it was brought up that I should divide Layer 1 into short and long straws.
- Here are the updated plots for Layer 1.

Period F 2011 Data: Layer 1

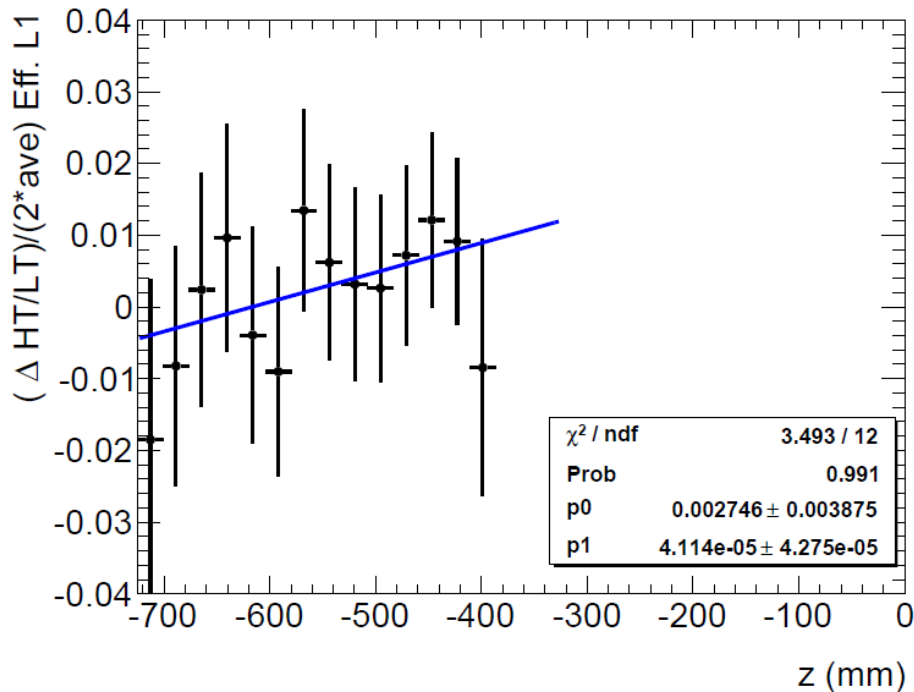
$\Delta(\text{HT}/\text{LT})/(2 * \text{Ave}(\text{HT}/\text{LT}))$ Layer 1 Long



Slope: $9.286 * 10^{-6}$
 $\pm 4.948 * 10^{-6}$

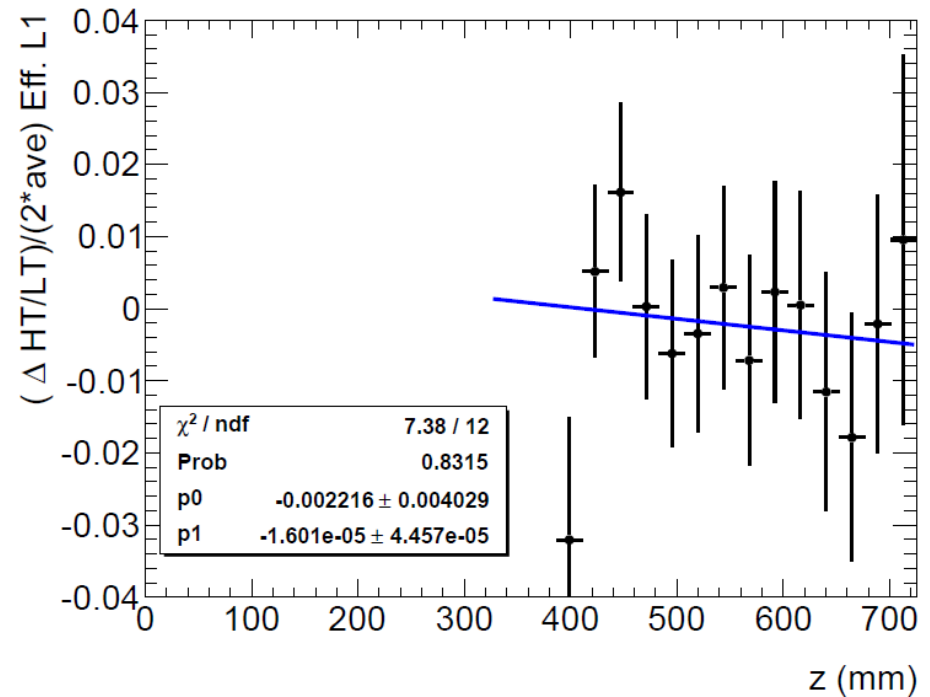
$\Delta(\text{HT}/\text{LT})/(2*\text{Ave}(\text{HT}/\text{LT}))$ Layer 1 Short

Negative



Neg. Slope : $4.114 * 10^{-5} \pm 4.275 * 10^{-5}$

Positive

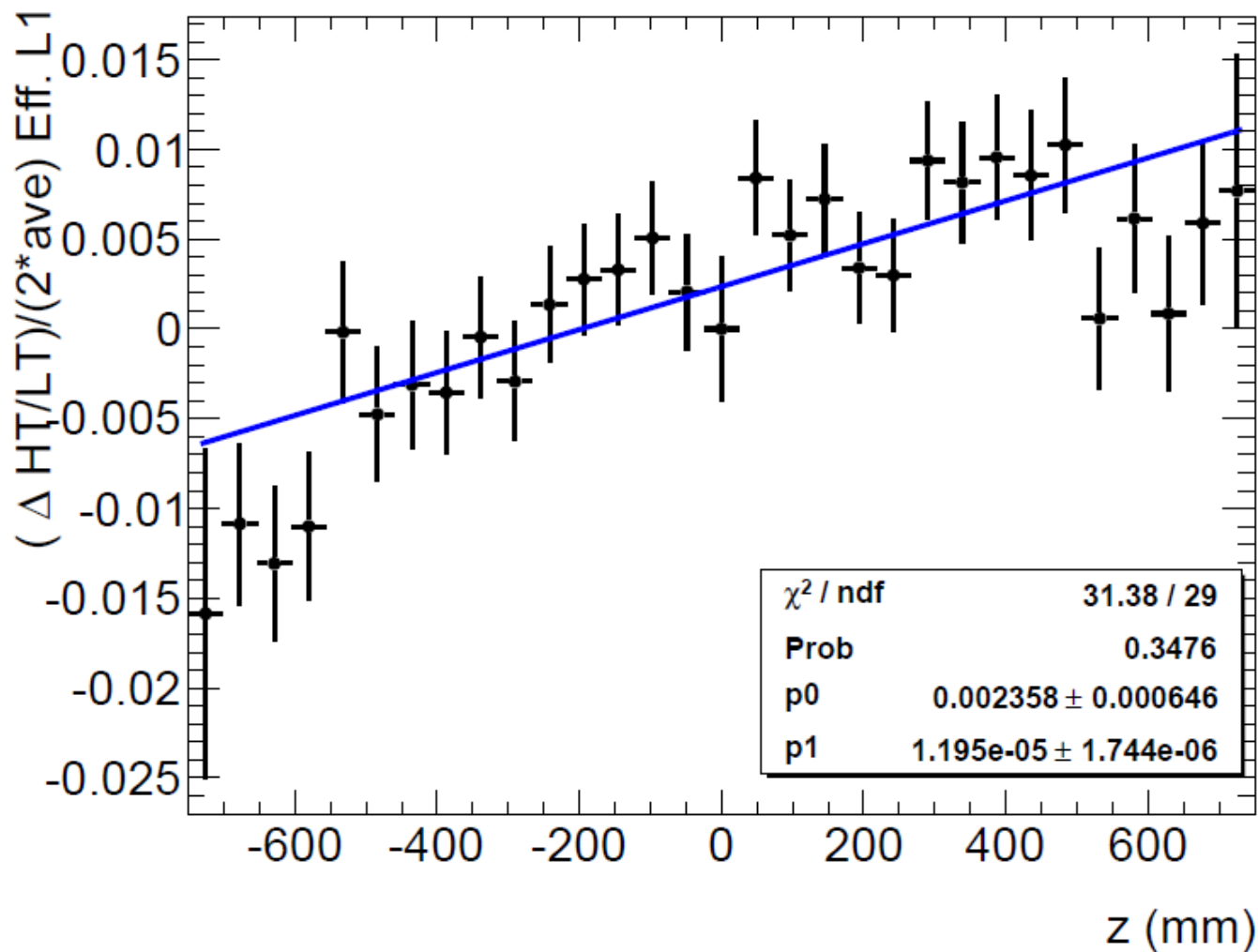


Pos. Slope : $-1.601 * 10^{-5} \pm 4.457 * 10^{-5}$

Long Straw Slope: $.9286 * 10^{-5} \pm .4948 * 10^{-5}$

Period M 2011 Data: Layer 1

$\Delta(\text{HT}/\text{LT})/(2 * \text{Ave}(\text{HT}/\text{LT}))$ Layer 1 Long

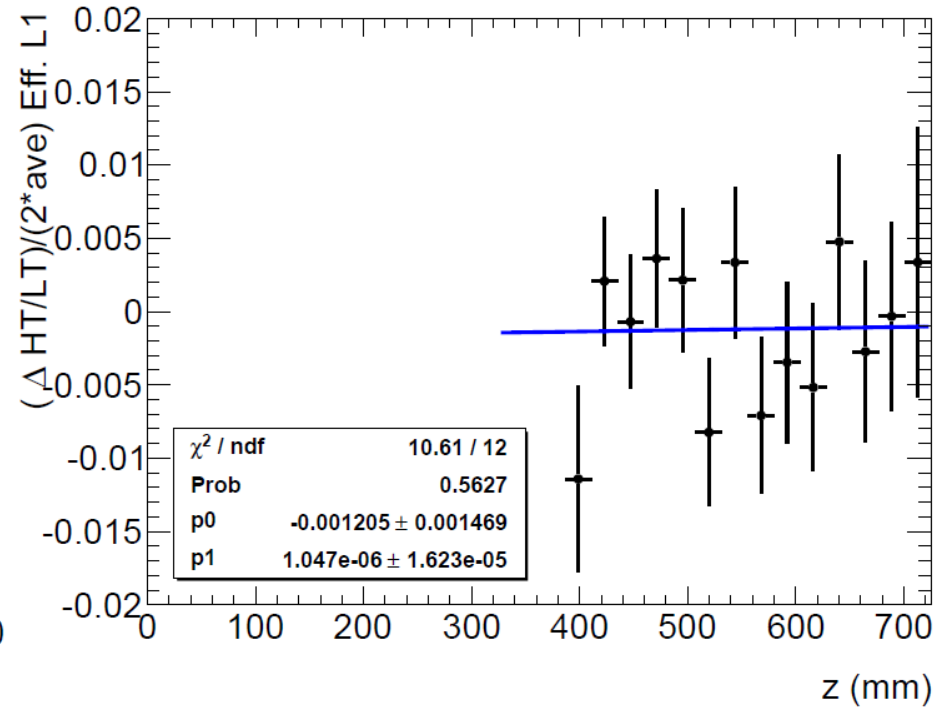
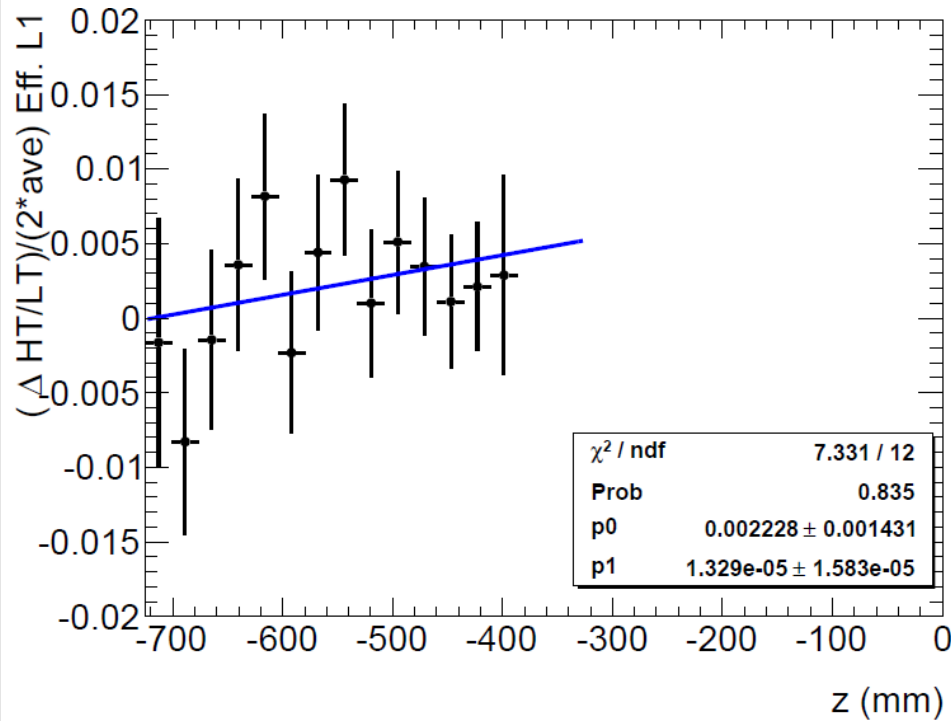


Slope: $1.195 * 10^{-5}$
+/- $.1744 * 10^{-5}$

$\Delta(\text{HT}/\text{LT})/(2 * \text{Ave}(\text{HT}/\text{LT}))$ Layer 1 Short

Negative

Positive



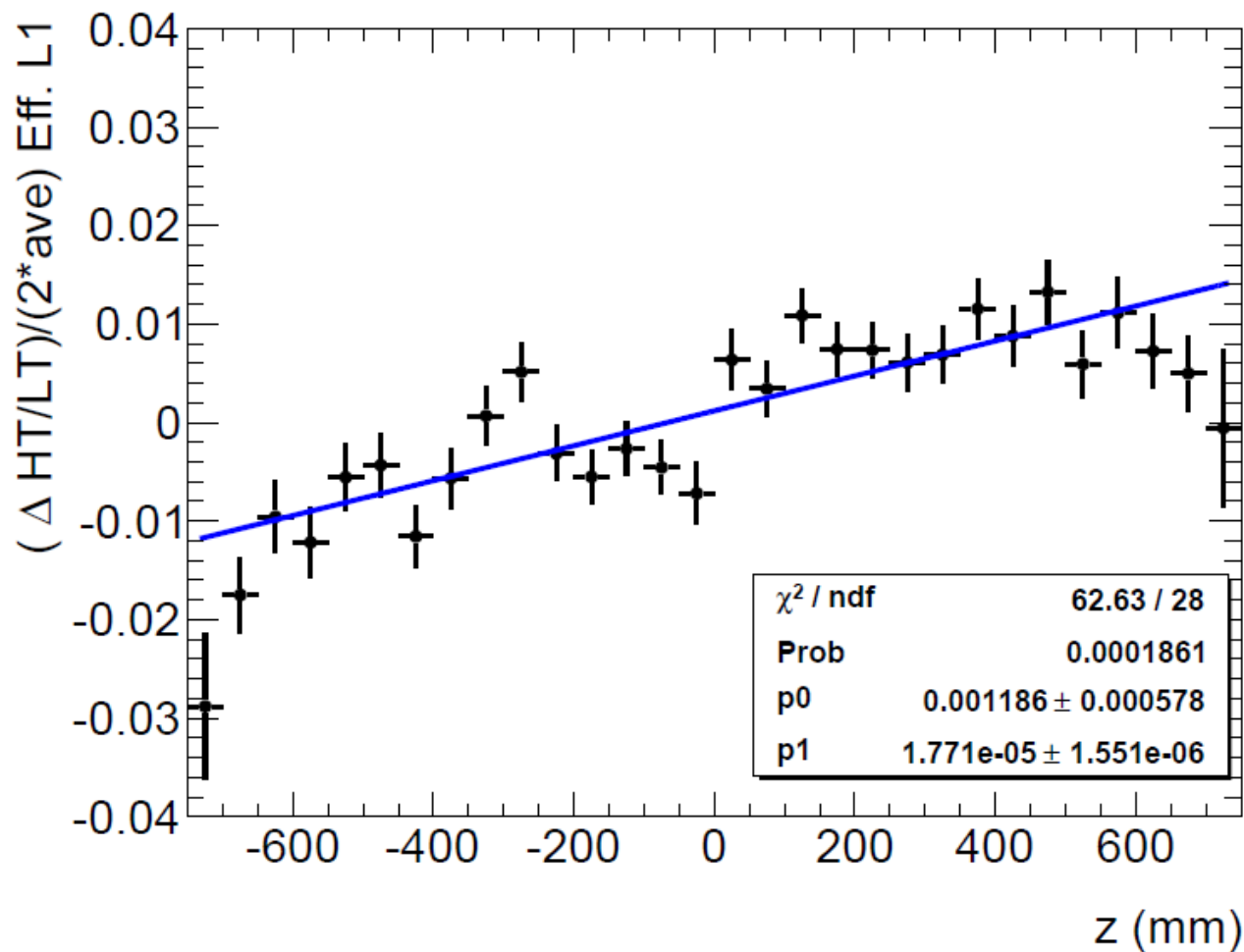
Neg. Slope : $1.329 * 10^{-5} \pm 1.583 * 10^{-5}$

Pos. Slope : $.1047 * 10^{-5} \pm 1.623 * 10^{-5}$

Total Slope: $1.195 * 10^{-5} \pm .1744 * 10^{-5}$

Period A 2012 Data: Layer 1

$\Delta(\text{HT}/\text{LT})/(2 * \text{Ave}(\text{HT}/\text{LT}))$ Layer 1 Long

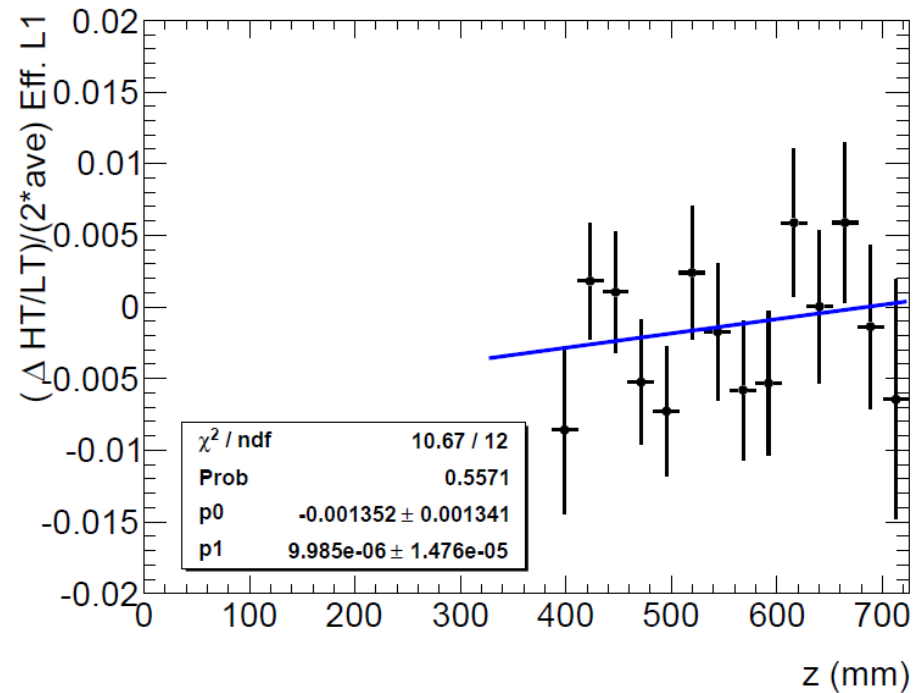
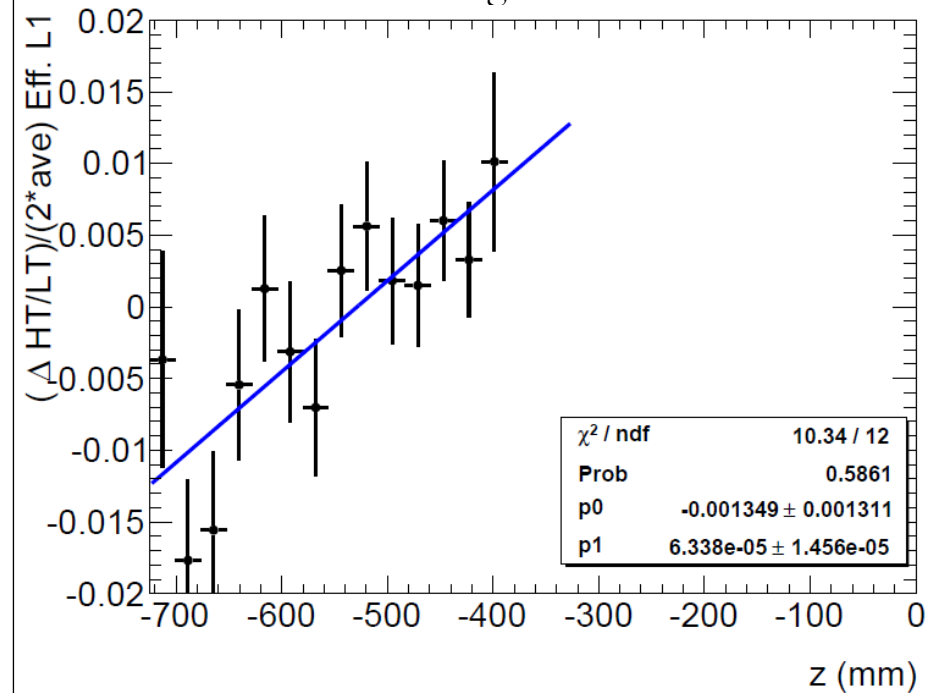


Slope: $1.771 * 10^{-5}$
+/- $.1551 * 10^{-5}$

$\Delta(\text{HT}/\text{LT})/(2 * \text{Ave}(\text{HT}/\text{LT}))$ Layer 1 Short

Negative

Positive



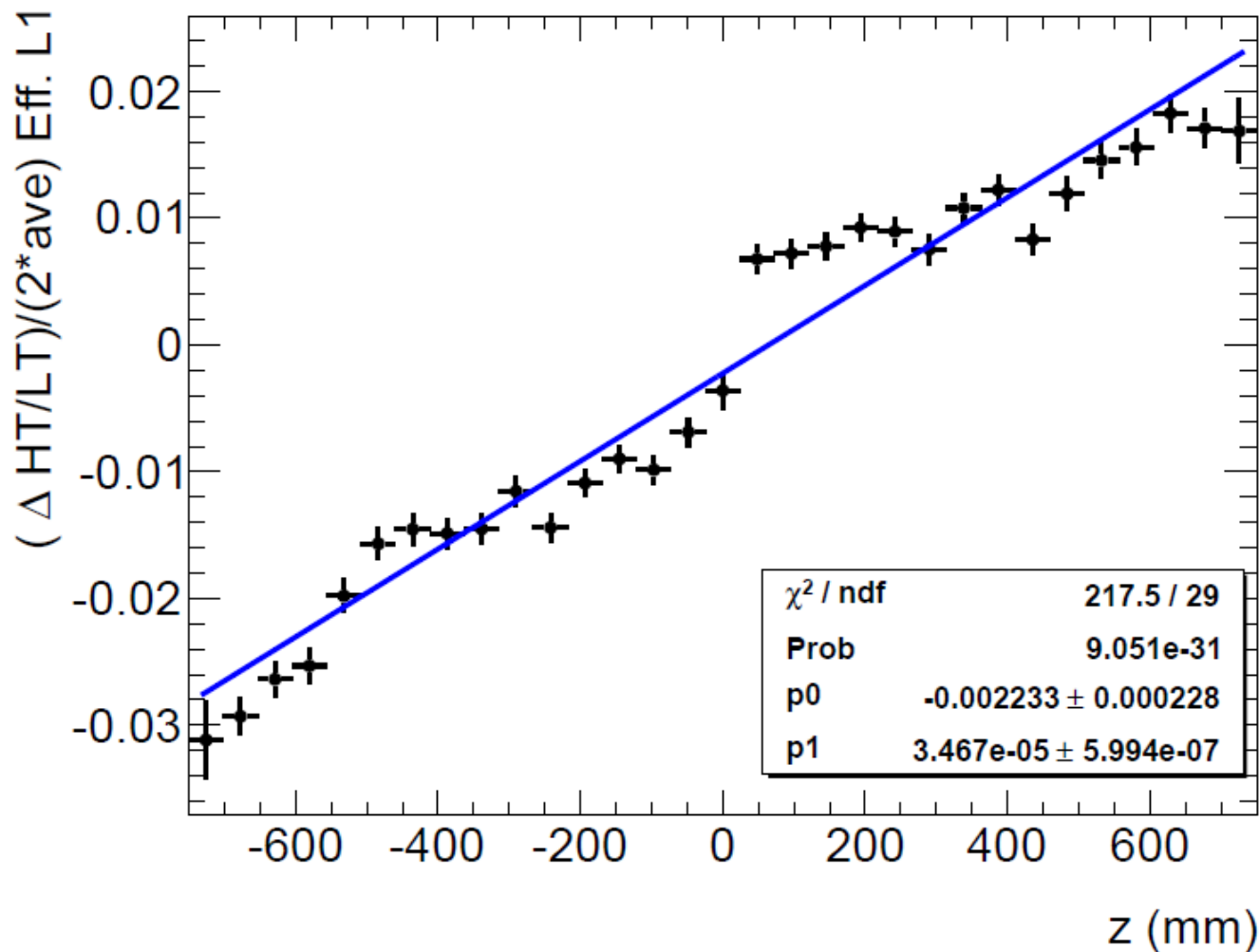
Neg. Slope : $6.338 * 10^{-5} \pm 1.456 * 10^{-5}$

Pos. Slope : $.9985 * 10^{-5} \pm 1.476 * 10^{-5}$

Total Slope: $1.771 * 10^{-5} \pm .1551 * 10^{-5}$

Period B 2012 Data: Layer 1

$\Delta(\text{HT}/\text{LT})/(2 * \text{Ave}(\text{HT}/\text{LT}))$ Layer 1 Long

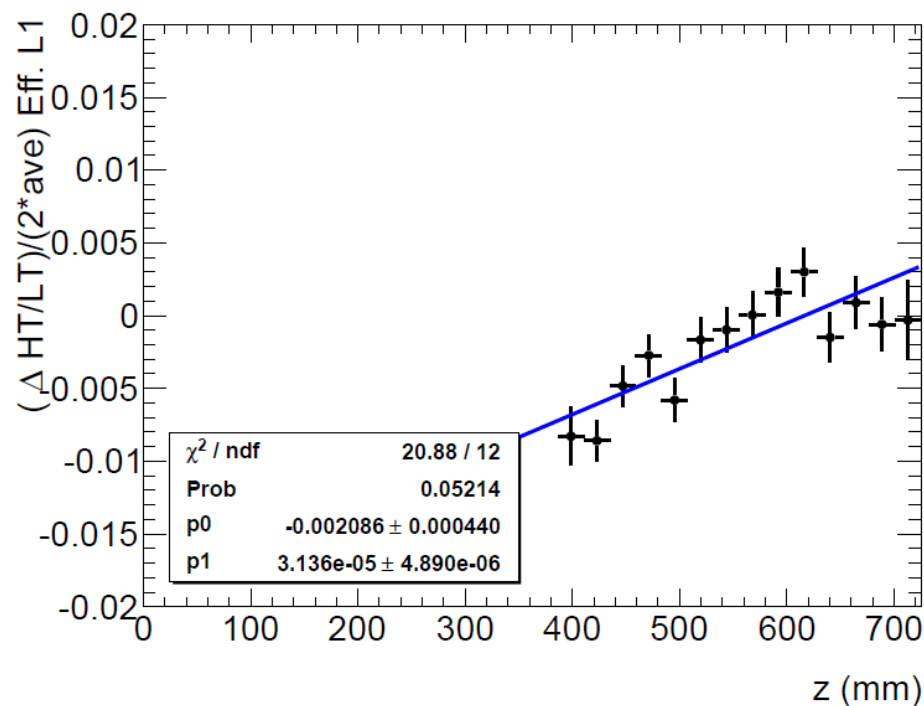
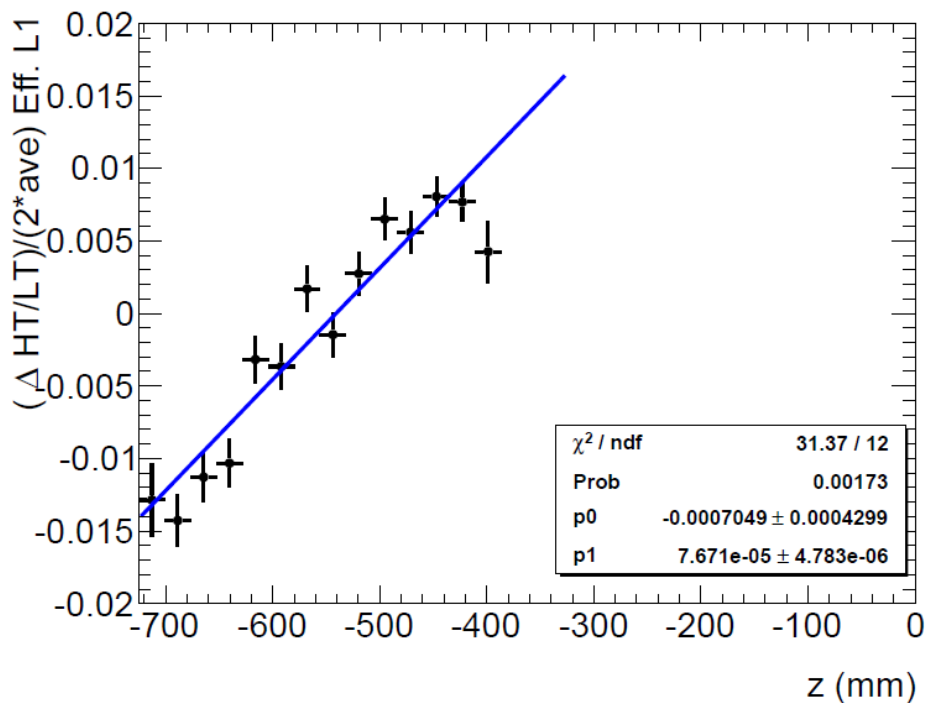


Slope: $3.467 * 10^{-5}$
 $\pm 5.994 * 10^{-7}$

$\Delta(\text{HT}/\text{LT})/(2 * \text{Ave}(\text{HT}/\text{LT}))$ Layer 1 Short

Negative

Positive



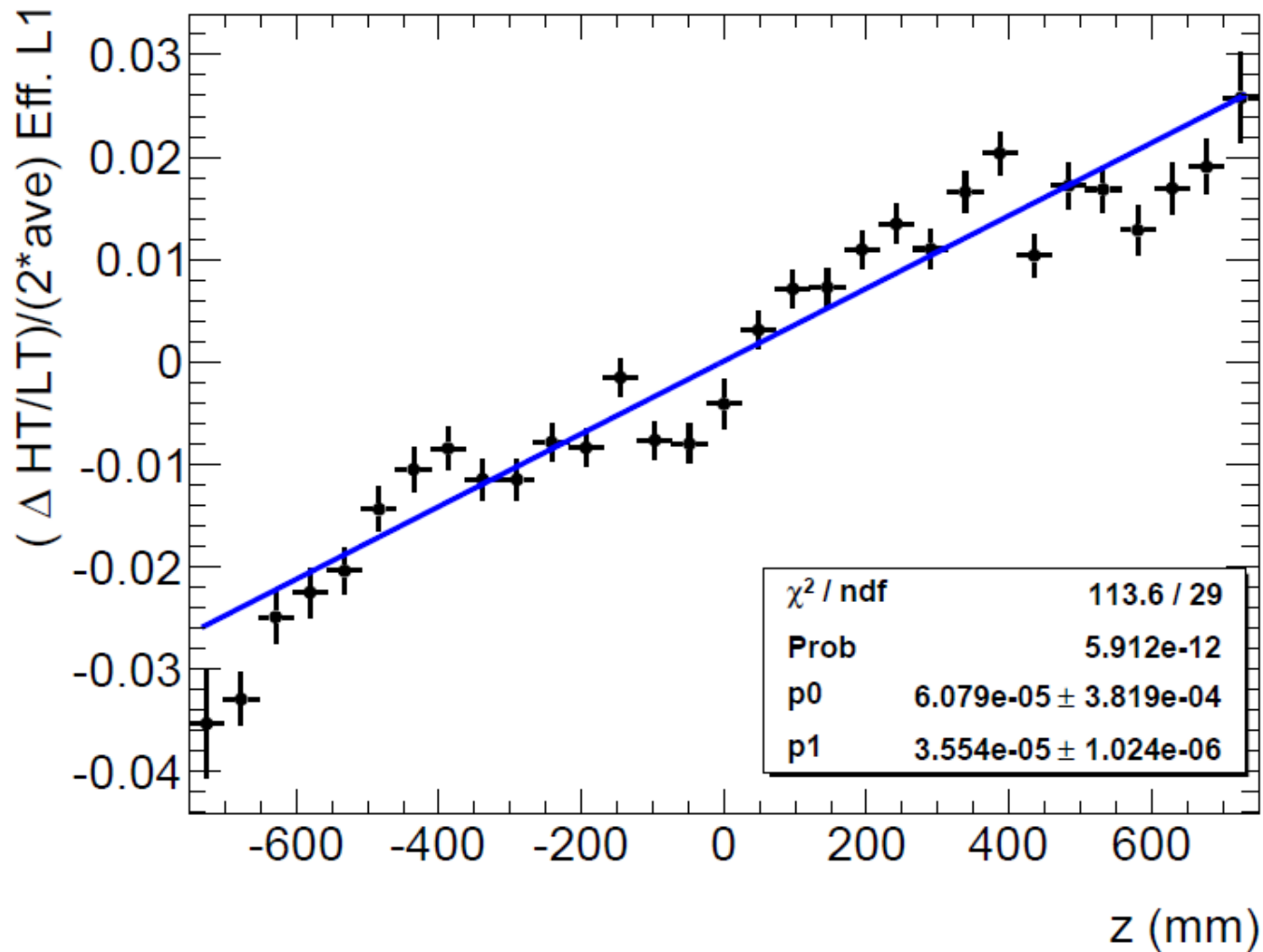
Neg. Slope : $7.671 * 10^{-5} \pm 4.783 * 10^{-6}$

Pos. Slope : $3.136 * 10^{-5} \pm 4.890 * 10^{-6}$

Total Slope: $3.467 * 10^{-5} \pm 0.05994 * 10^{-5}$

Period E 2012 Data: Layer 1

$\Delta(\text{HT}/\text{LT})/(2*\text{Ave}(\text{HT}/\text{LT}))$ Layer 1 Long

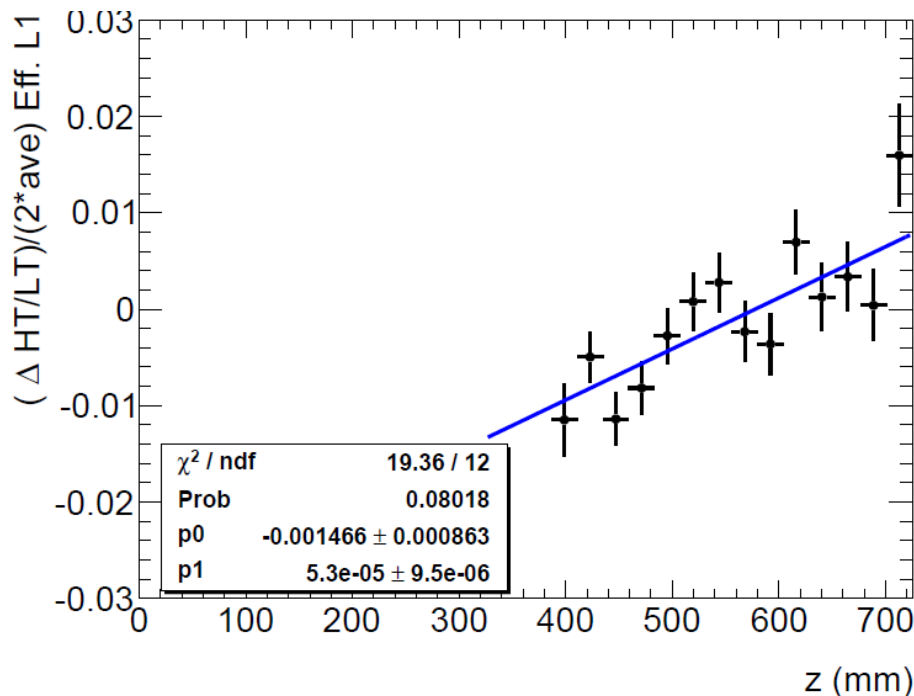
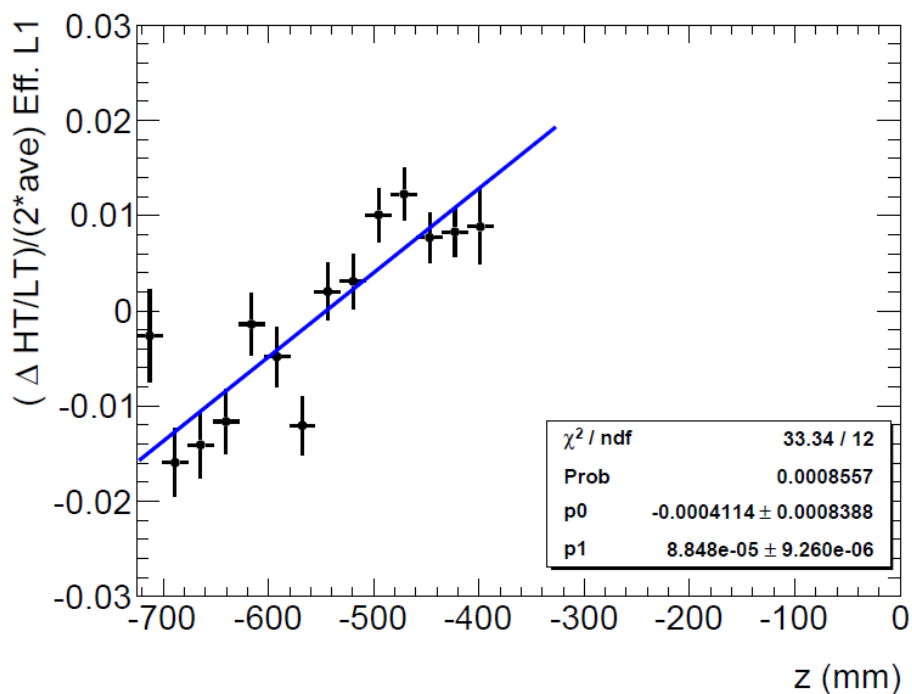


Slope: $3.554*10^{-5}$
 $+/- 1.024*10^{-6}$

$\Delta(\text{HT}/\text{LT})/(2 * \text{Ave}(\text{HT}/\text{LT}))$ Layer 1 Short

Negative

Positive

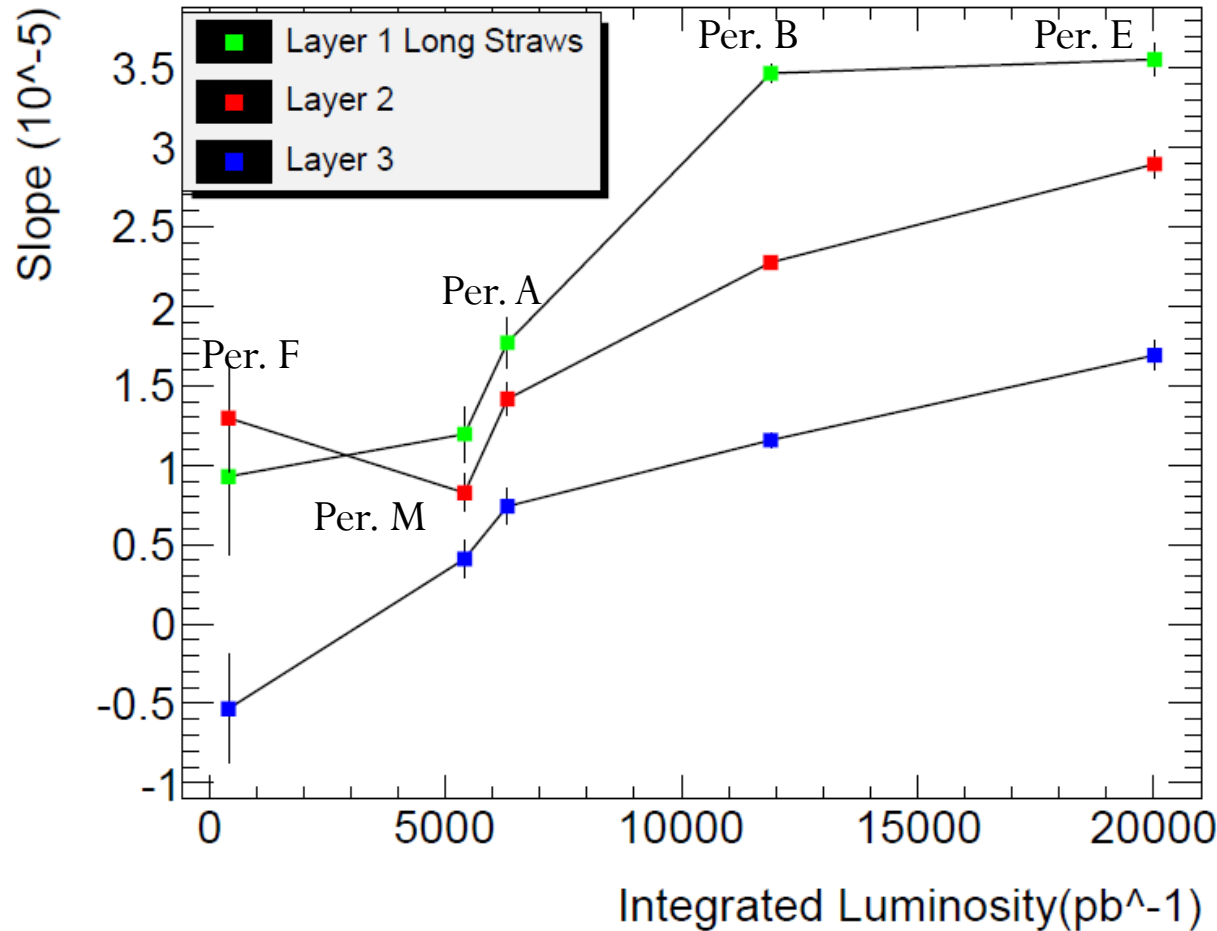


Neg. Slope : $8.848 * 10^{-5} \pm 9.260 * 10^{-6}$

Pos. Slope : $5.3 * 10^{-5} \pm 9.5 * 10^{-6}$

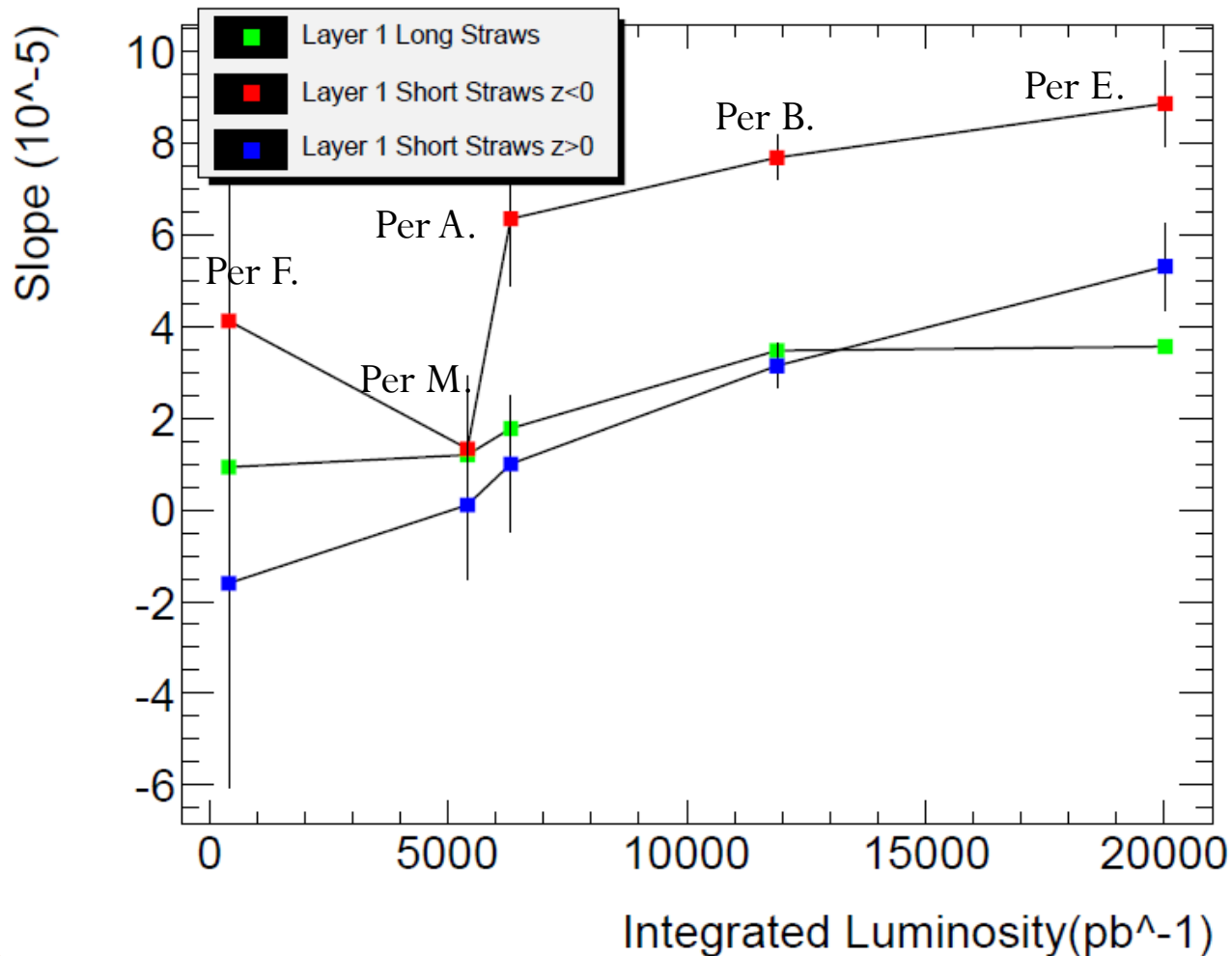
Total Slope: $3.554 * 10^{-5} \pm 1.024 * 10^{-5}$

Slope vs. Integrated Luminosity



- There does seem to be a rising trend with integrated luminosity.
- Although not a perfect fit, this could indicate an aging effect.
- After looking at only the long straws in layer 1 we see that it has the largest effect, which is expected.

Slope vs. Integrated Luminosity Layer 1



- Here we have the slope vs. integrated luminosity of the Long straws, and positive and negative short straws.
- We see a much stronger effect in the short straws negative z in the 2012 data periods.

Short Straws

- The short straws on the input side have about the same slope and about half of the drop in total efficiency as the long straws.
- The short straws on the output side have double the slope and about the same drop in total efficiency as the long straws.
- It does not look like the effect continues at the same rate across the center. It also does not look like the effect stays constant over the non-active central region and then continues in the short straws. It seems like both of these cases could indicate CO₂ or ozone production.
- It instead looks like the two sections of short straws are independent from each other, with a strong effect on the output end. Does the fact that the two sections seem independent indicate aging?