

$n^3\text{He}$ Analysis : Up Down Asymmetry

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Version: 1

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1. Up down analysis with simplest possible cut
2. Cuts:
 - Any bad run
 - Pulses around dropped pulses
3. Run considered: 280 (Between Run#20100-20500)

Algorithm:

1. Pair of events (one up and one down) considered to form each asymmetry for each wire.
2. Each detector signal is normalized by sum of all the detector signals for that event.
3. Asymmetry for pair of events,

$$A_K = \frac{Y_+^K - Y_-^K}{Y_+^K + Y_-^K} \quad K = \text{pair of events index}$$

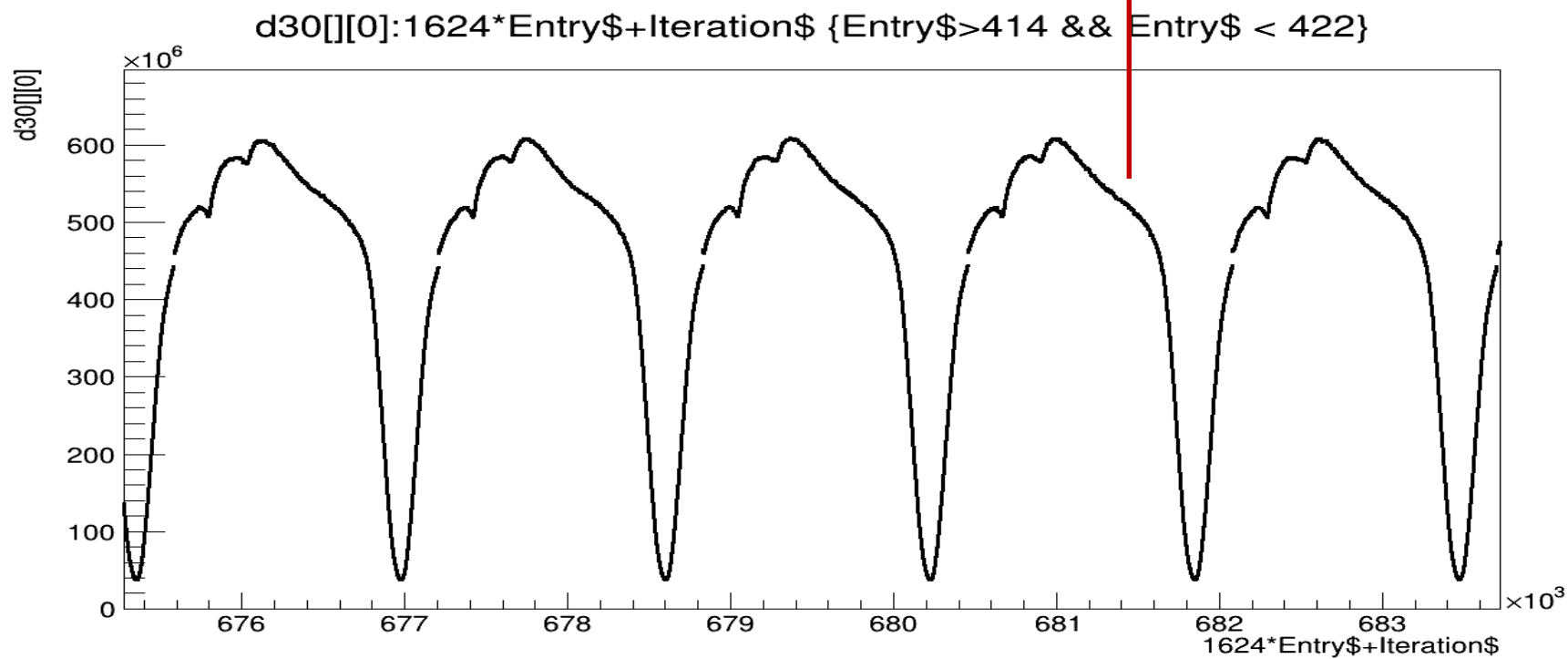
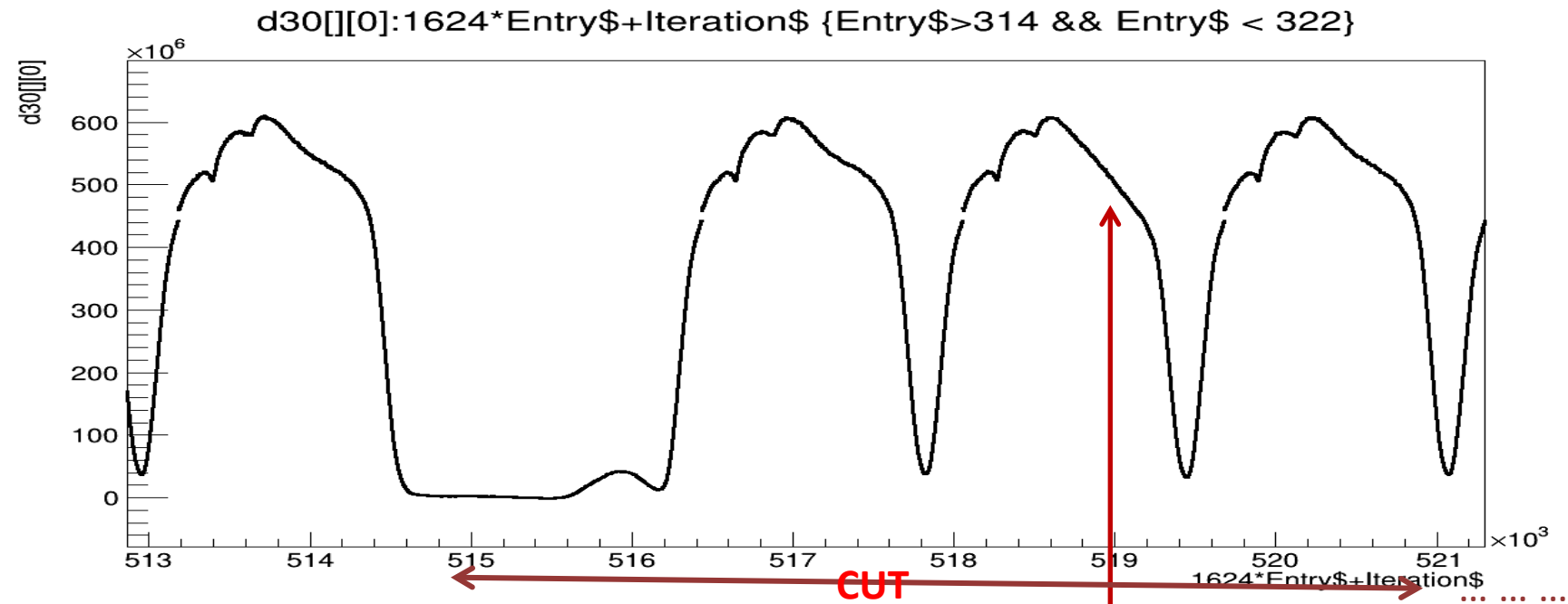
4. Physics asymmetry for each wire is calculated using,

$$\alpha_K = \frac{1}{G_K} \frac{Y_+^K - Y_-^K}{Y_+^K + Y_-^K} \quad K = \text{wire index}$$

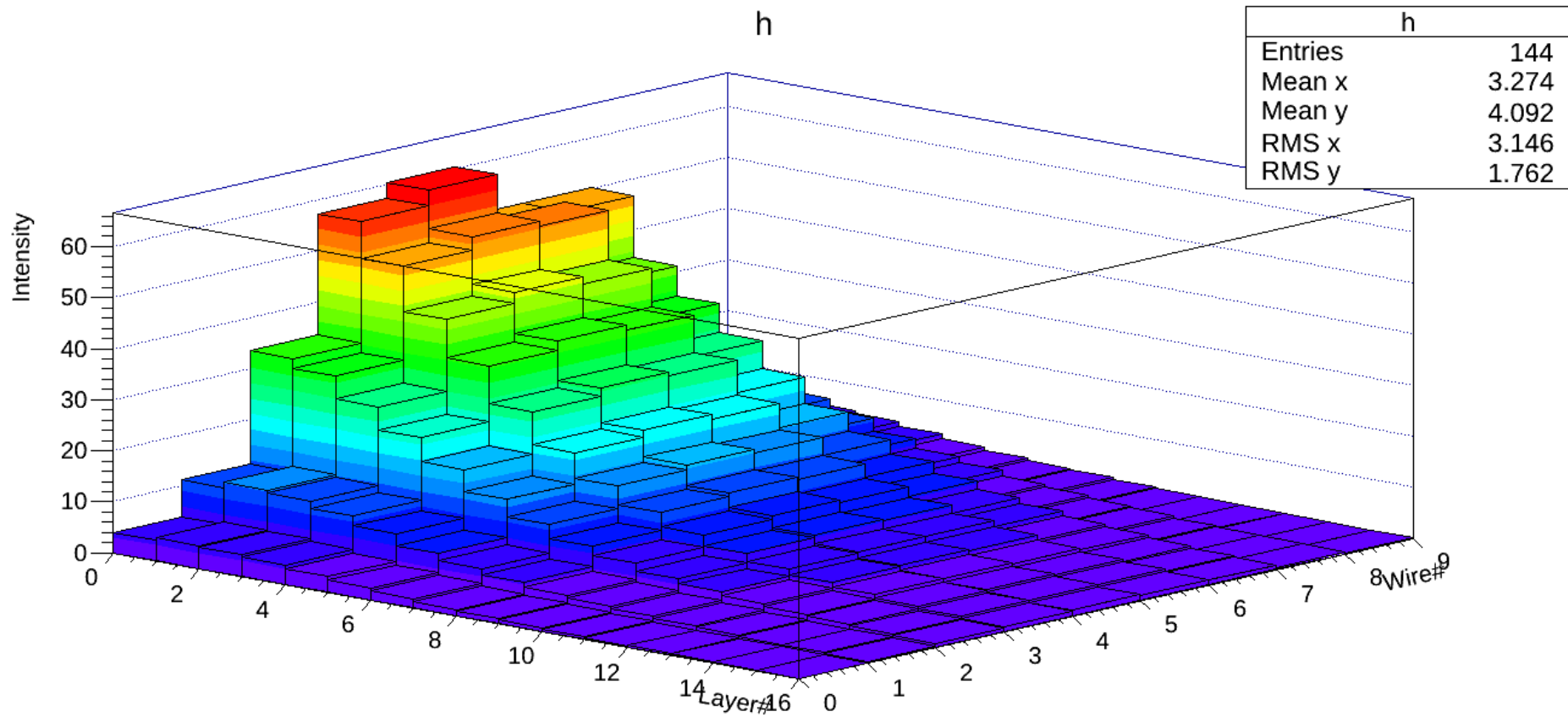
$$\text{And error, } \delta\alpha_k = \frac{1}{|G_k|} \delta A_k$$

Where G_K is the geometric factor for that wire.

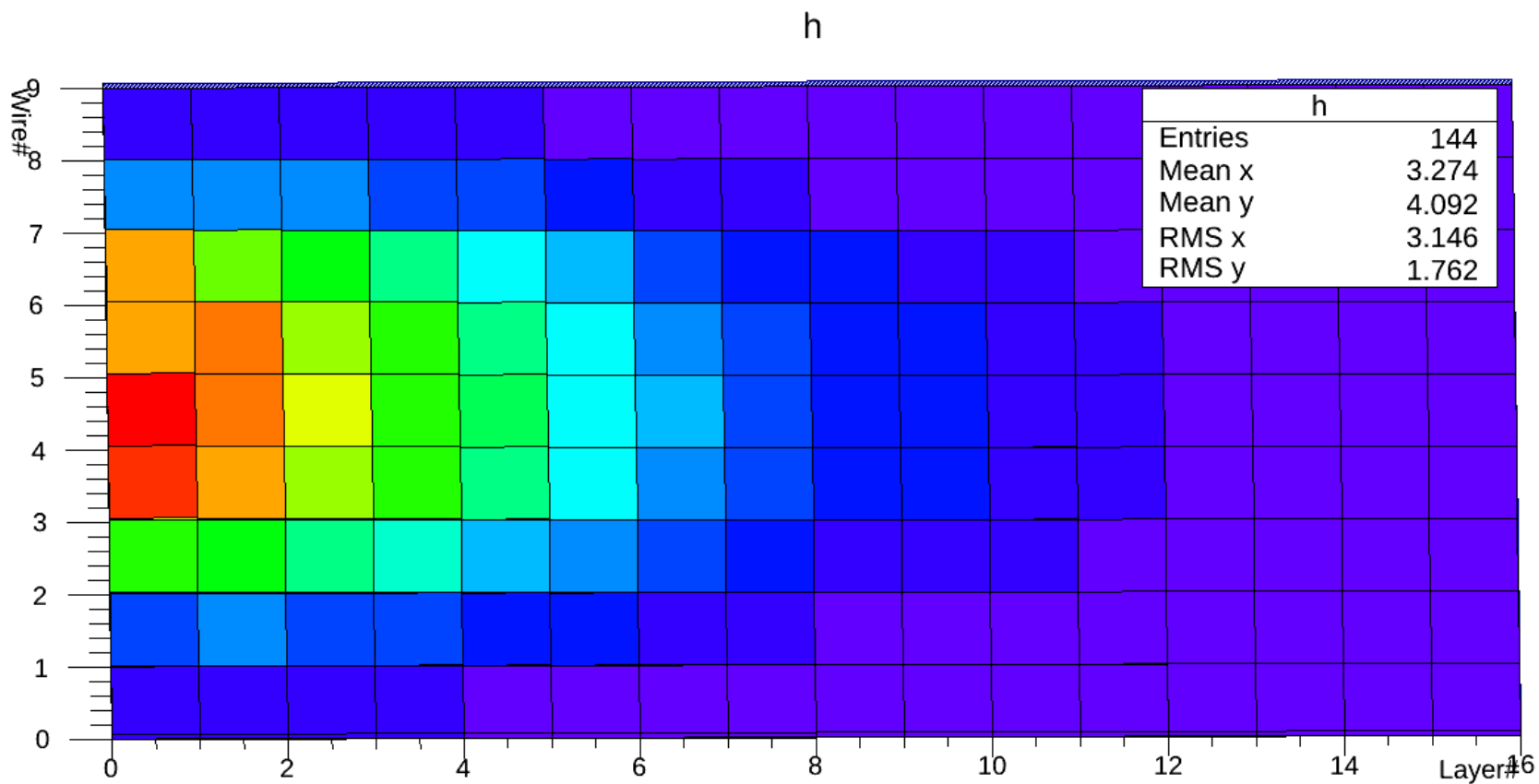
5. The correction for correlation is NOT included yet.



Intensity Distribution

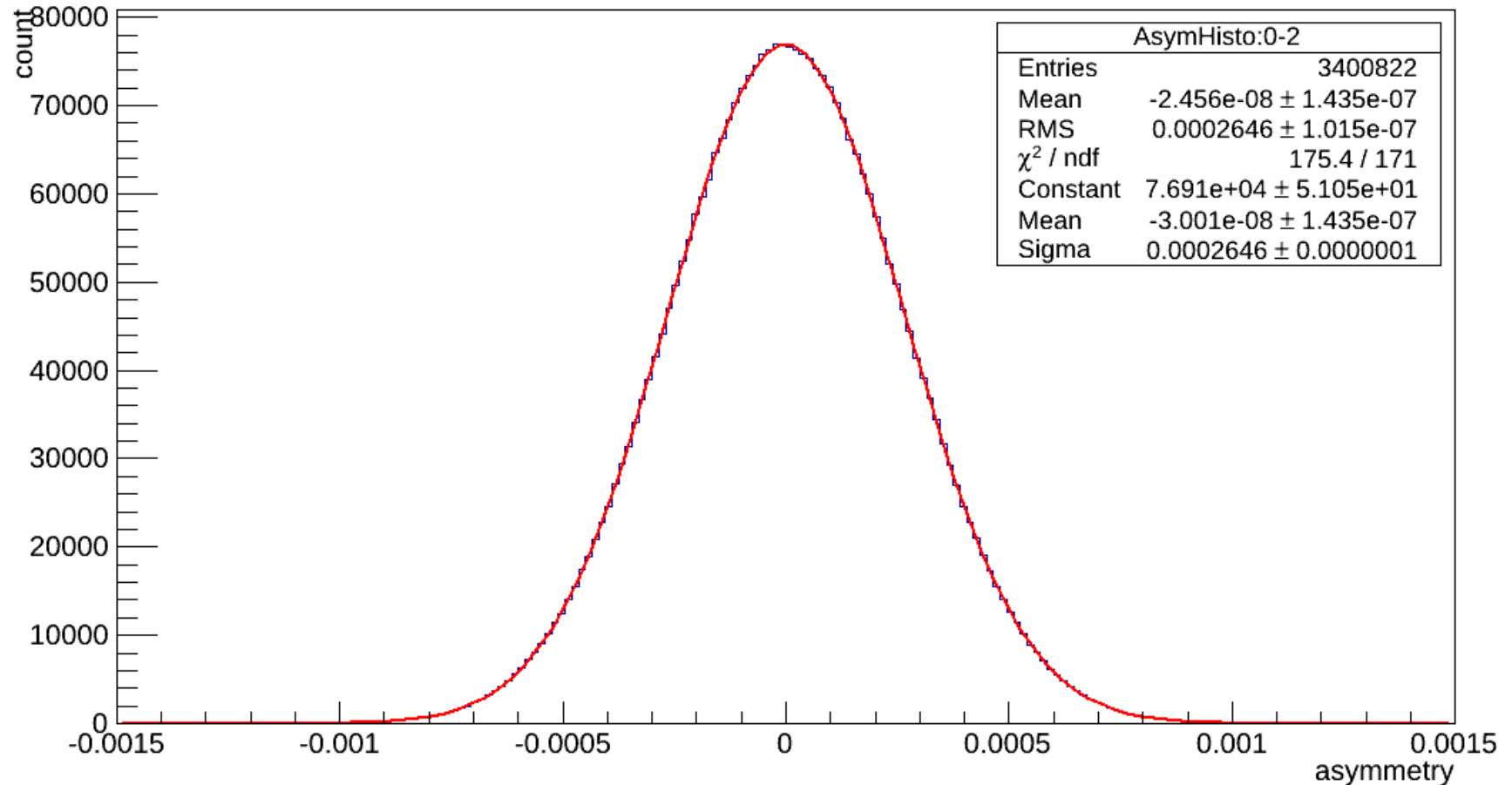


Intensity Distribution

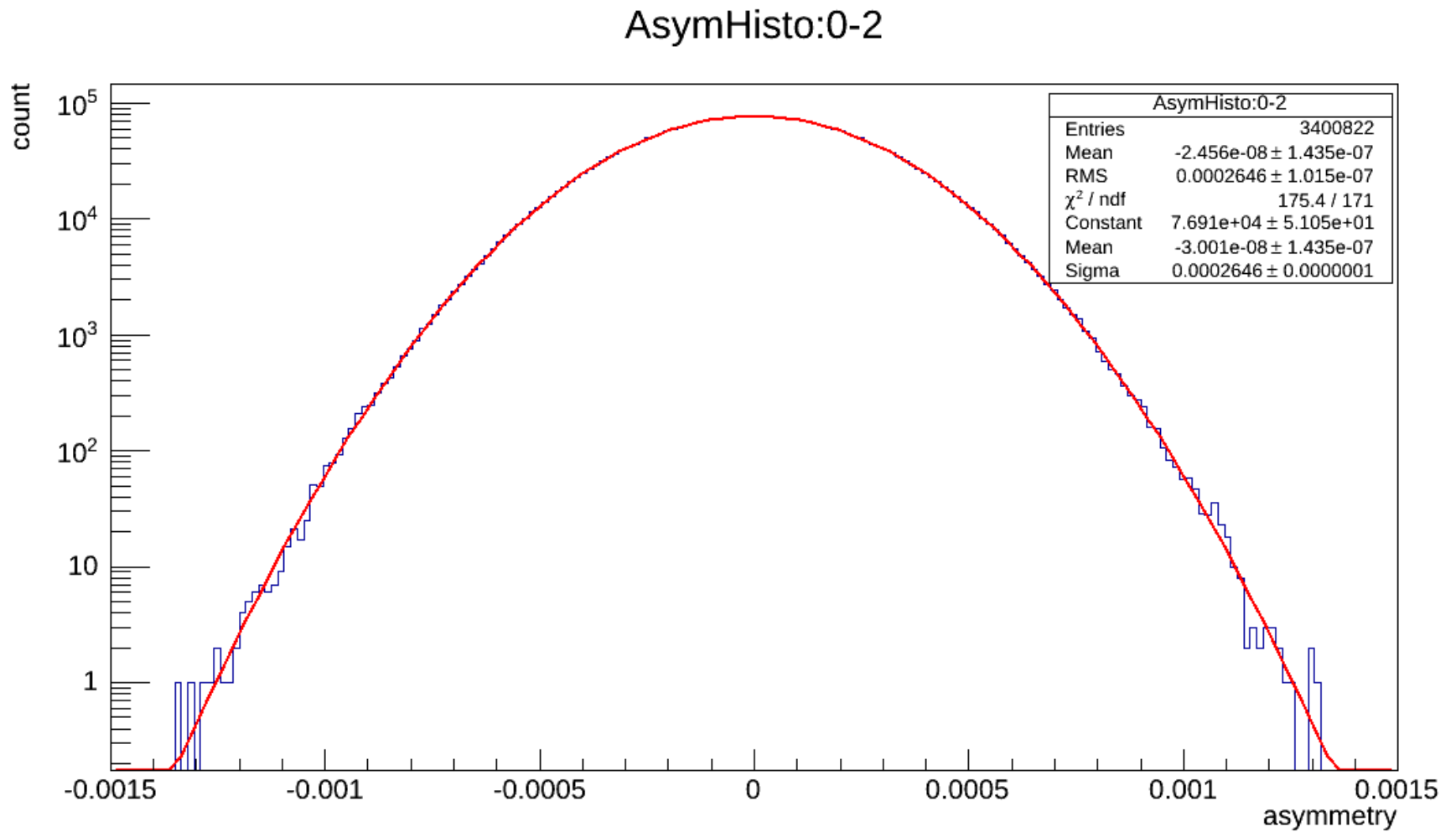


Raw Asymmetry Histogram for Layer-1 Wire-3

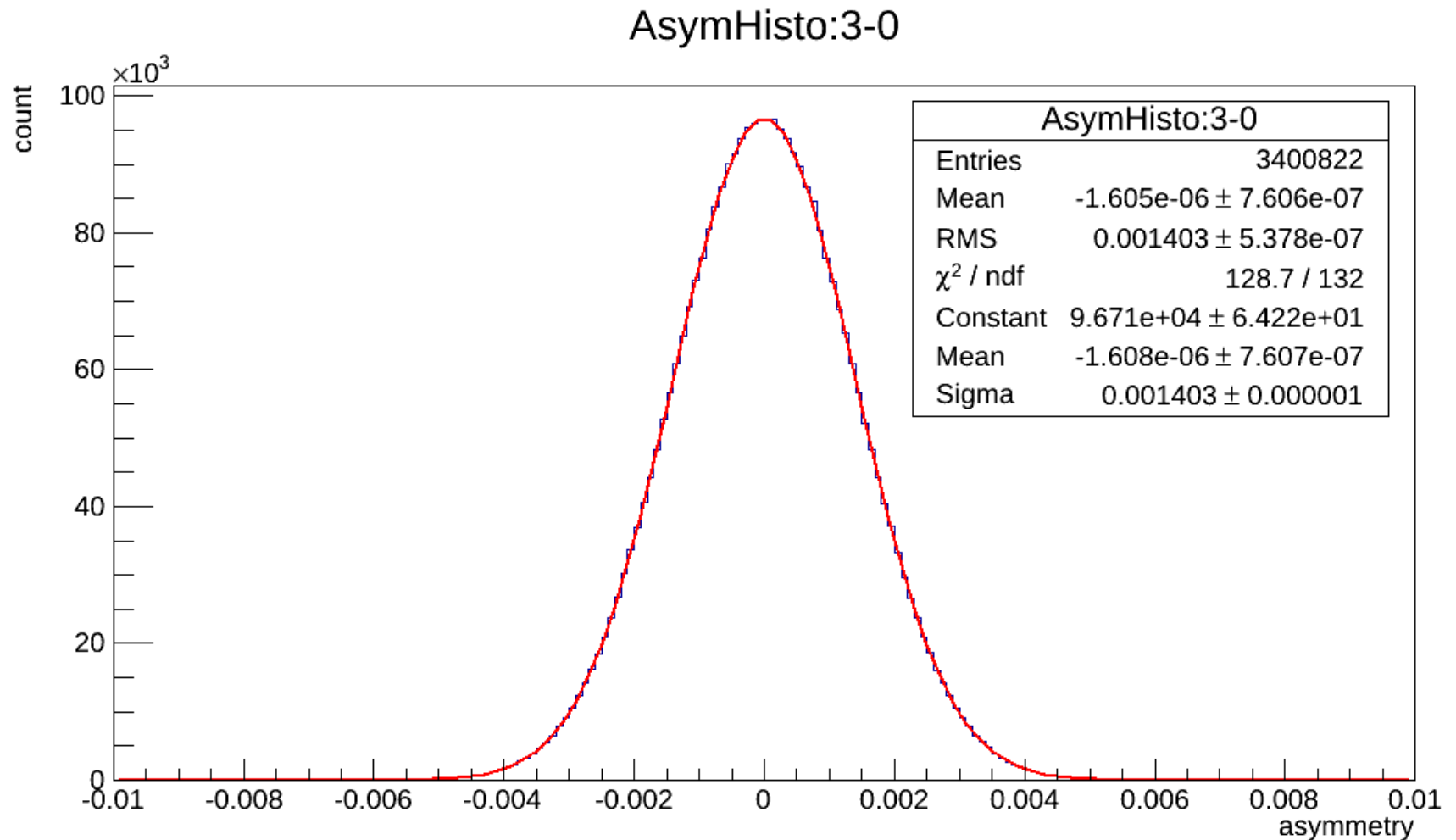
AsymHisto:0-2



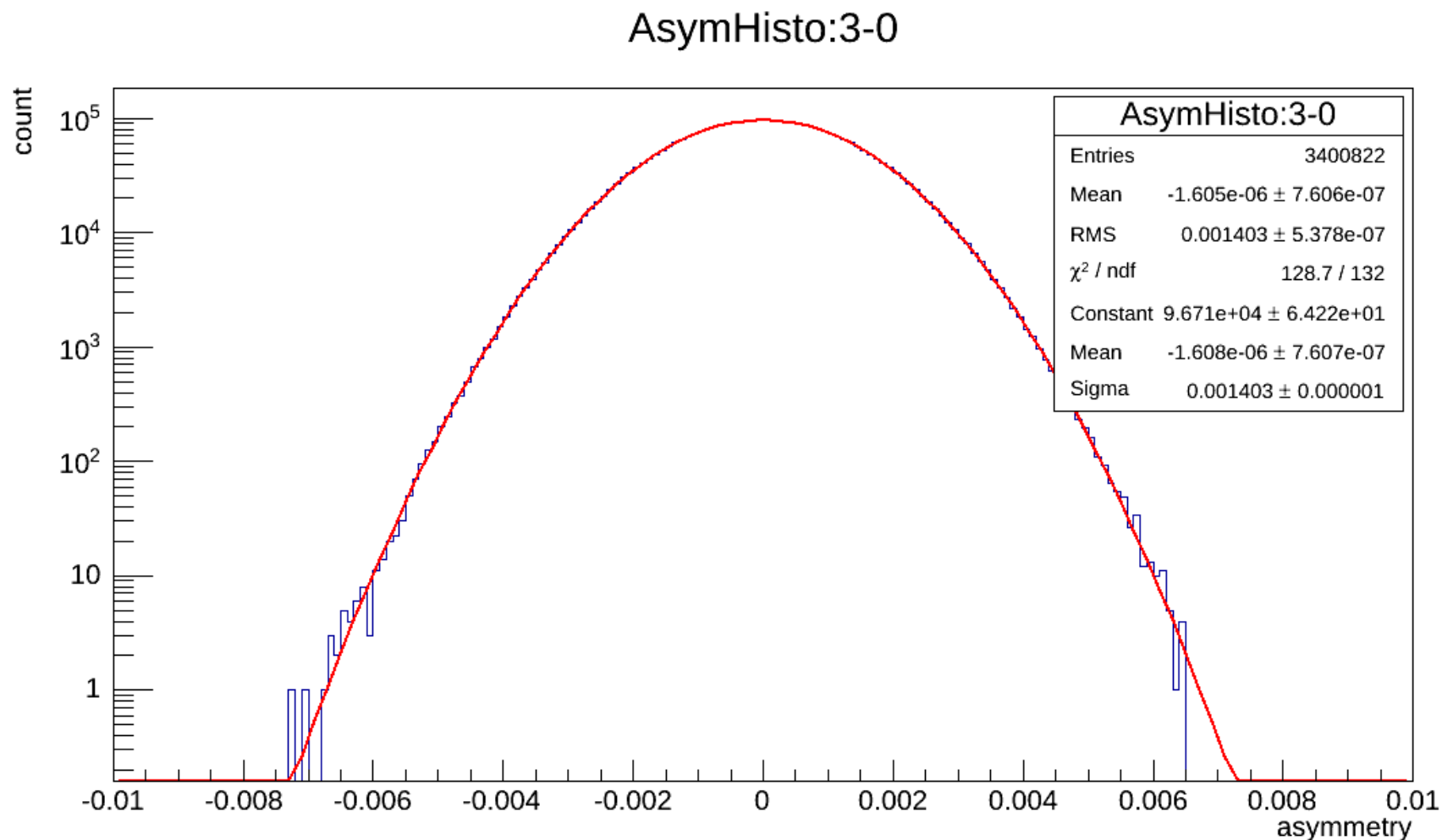
Raw Asymmetry Histogram for Layer-1 Wire-3(Log scale)



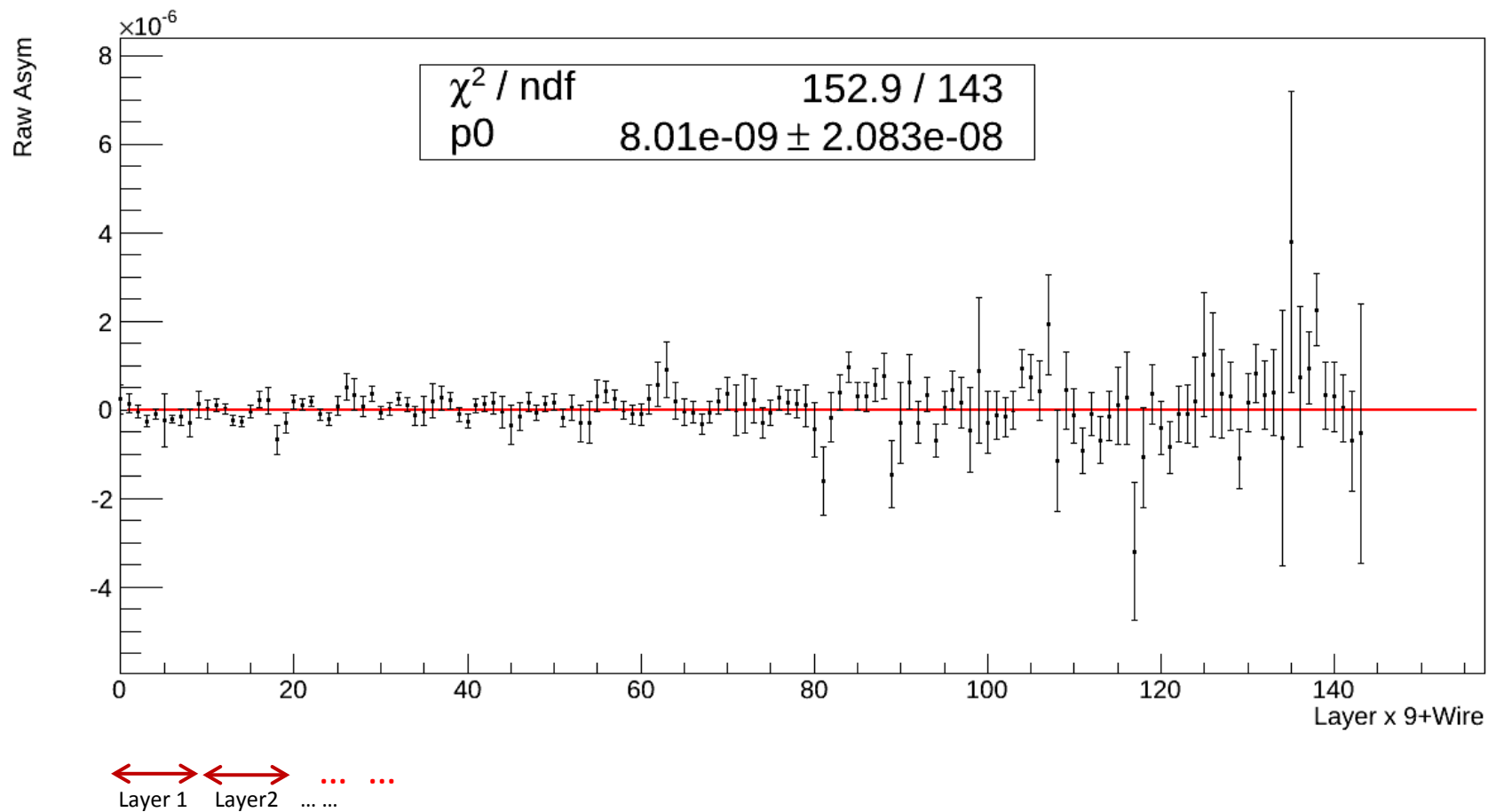
Raw Asymmetry Histogram for Layer-10 Wire-1



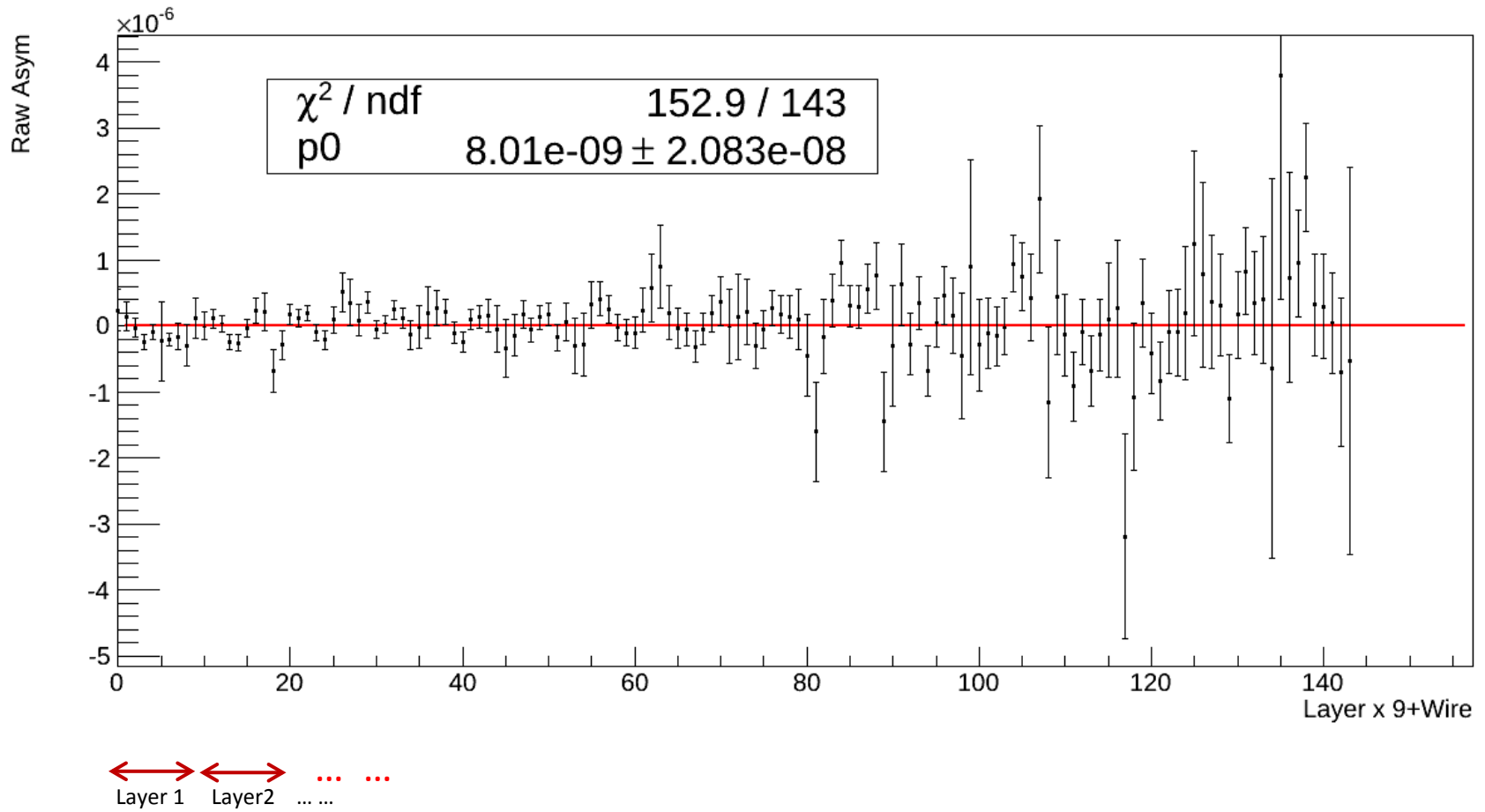
Raw Asymmetry Histogram for Layer-10 Wire-1(Log Scale)



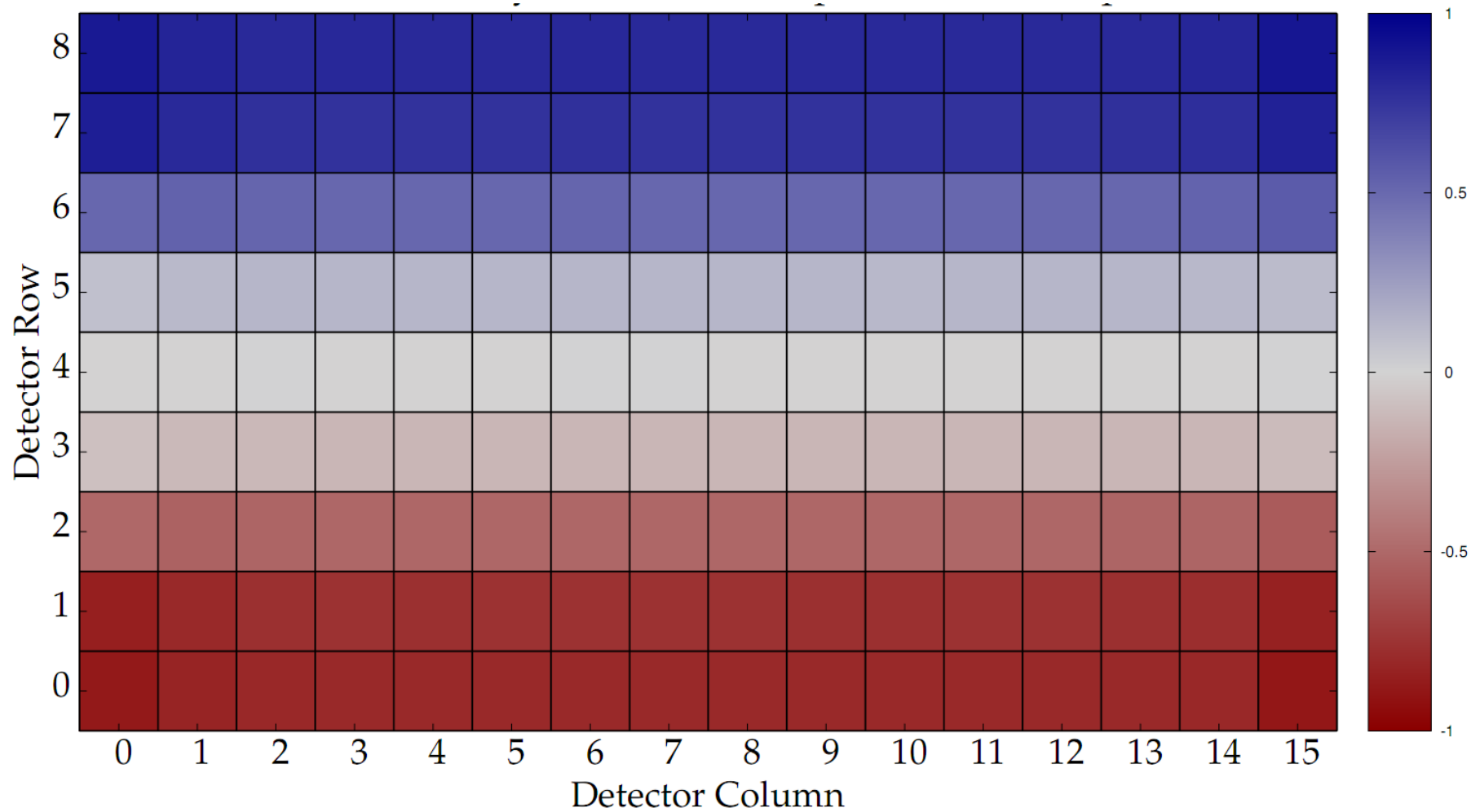
Raw Asymmetry for all the wires



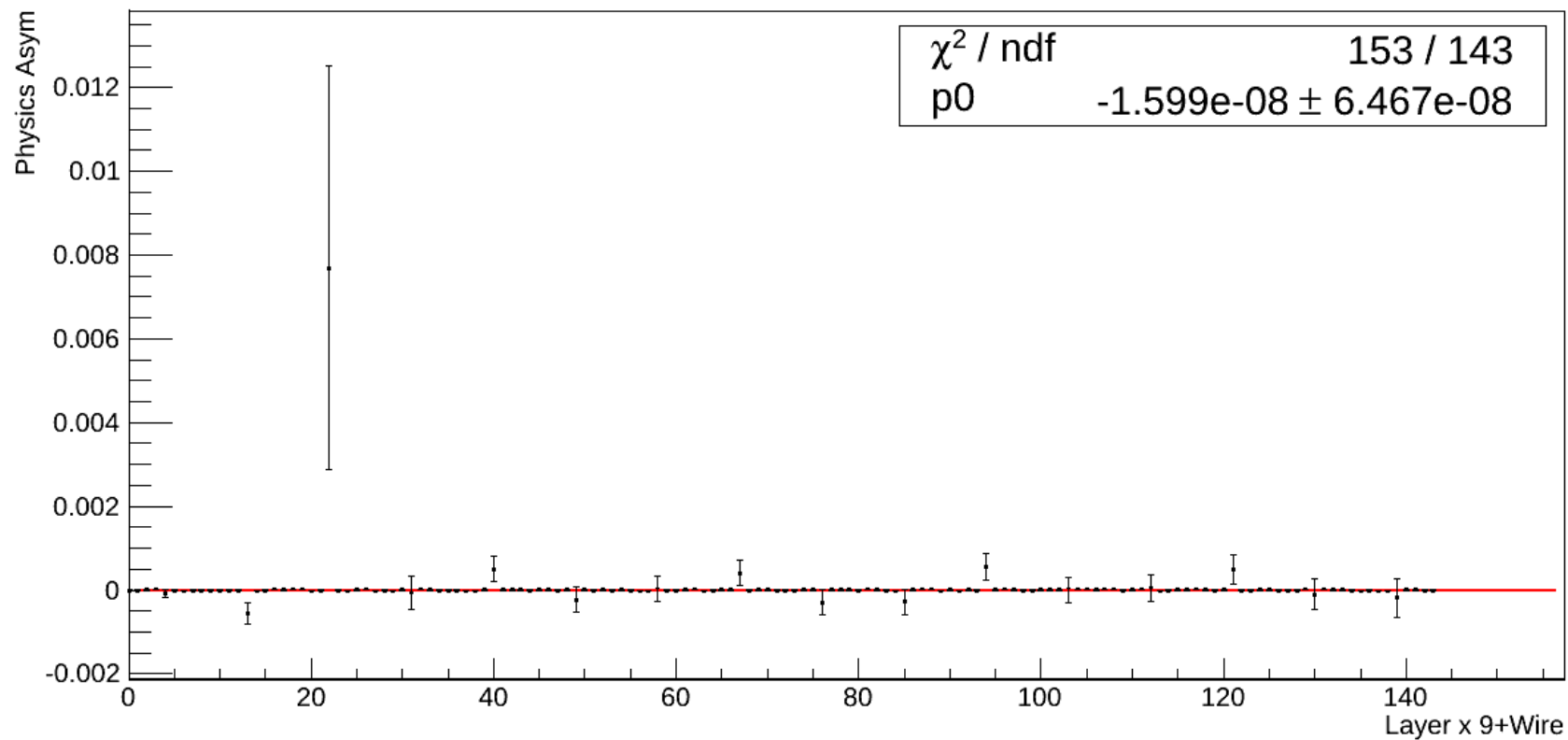
Raw Asymmetry for all the wires



The Geometry Factor Distribution

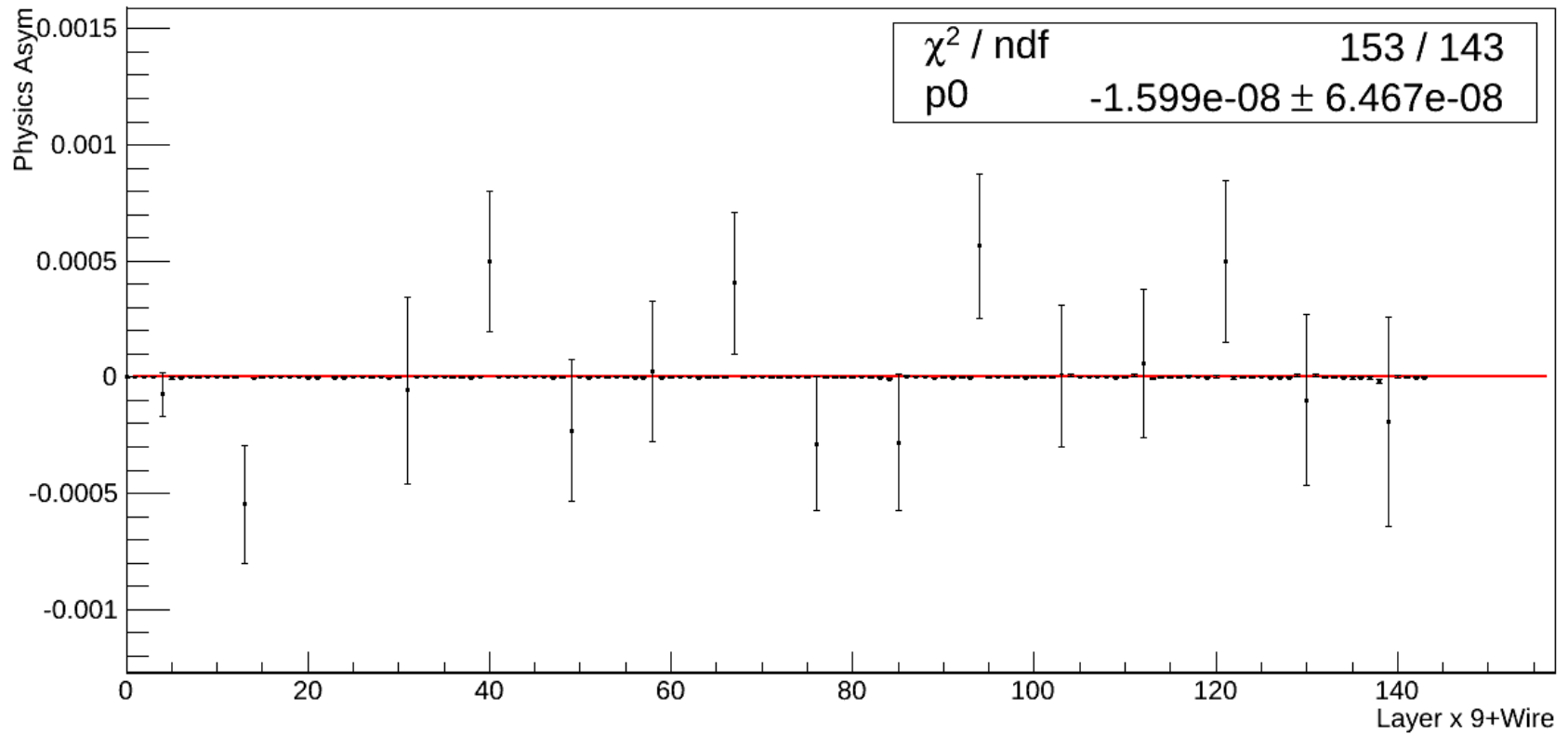


Physics Asymmetry for all the wires



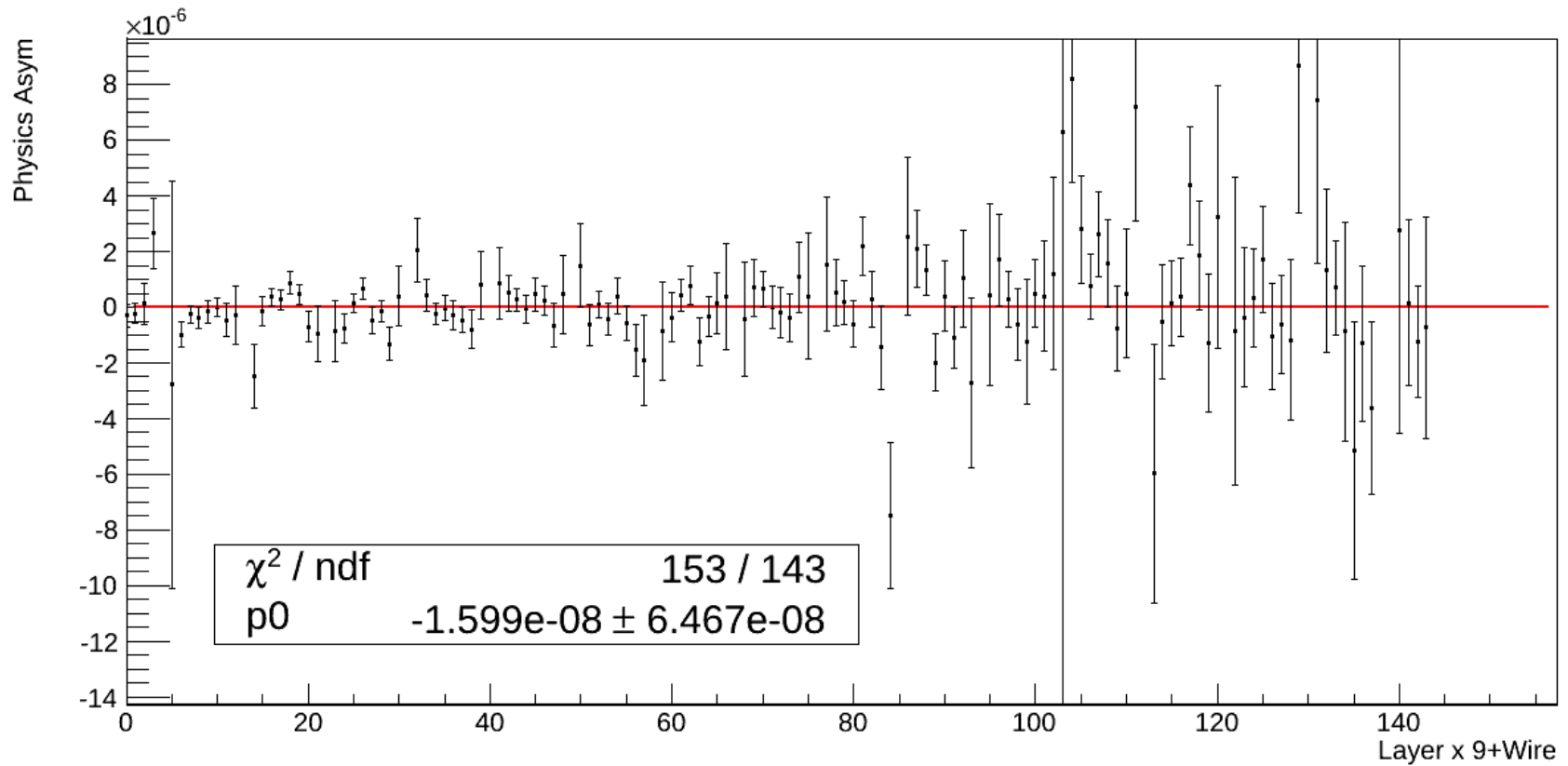
← → ← → ...
Layer 1 Layer 2 ...

Physics Asymmetry for all the wires (Zoomed In)



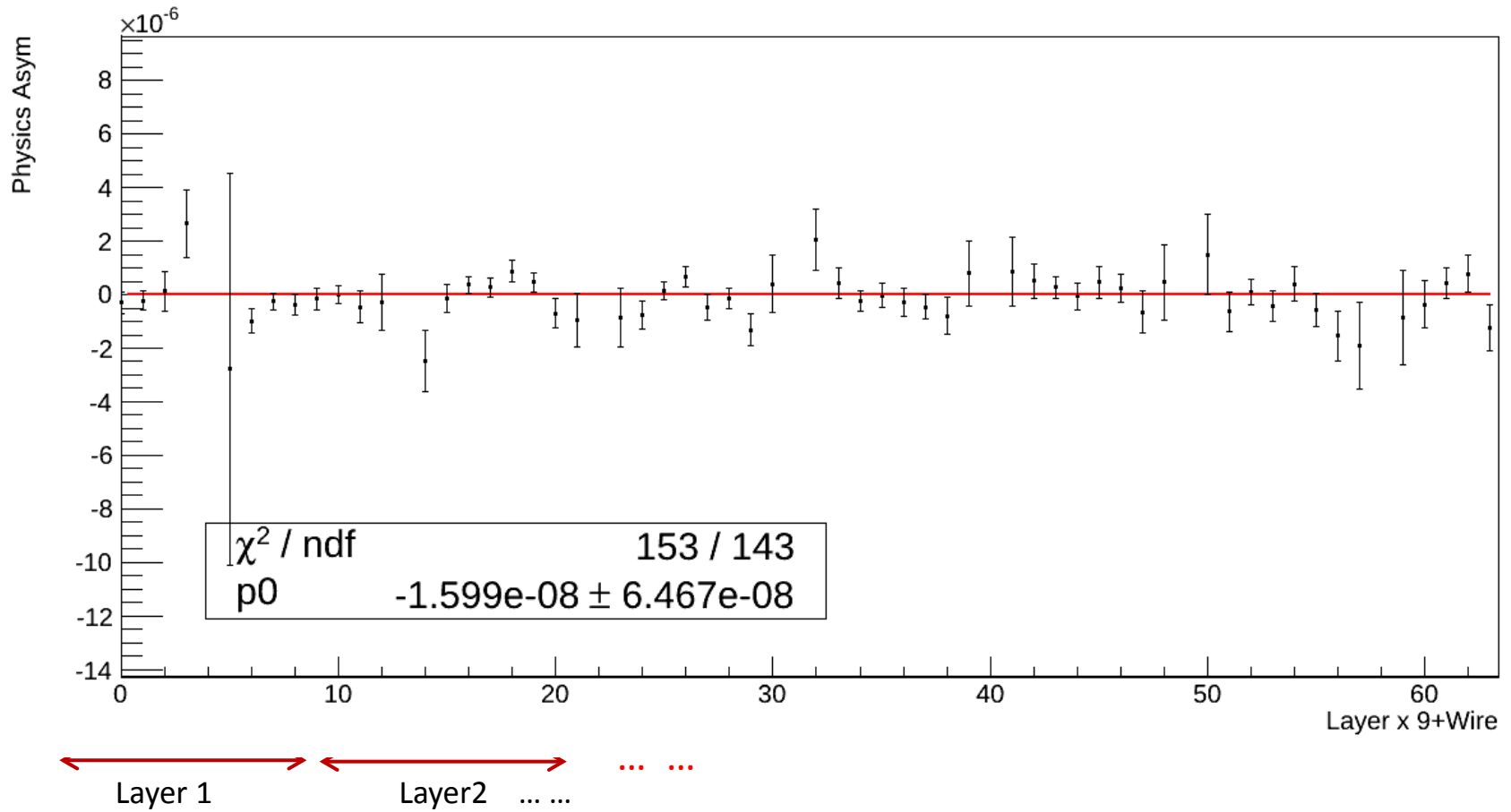
↔ ↔ ...
Layer 1 Layer2 ...

Physics Asymmetry for all the wires (Zoomed In)

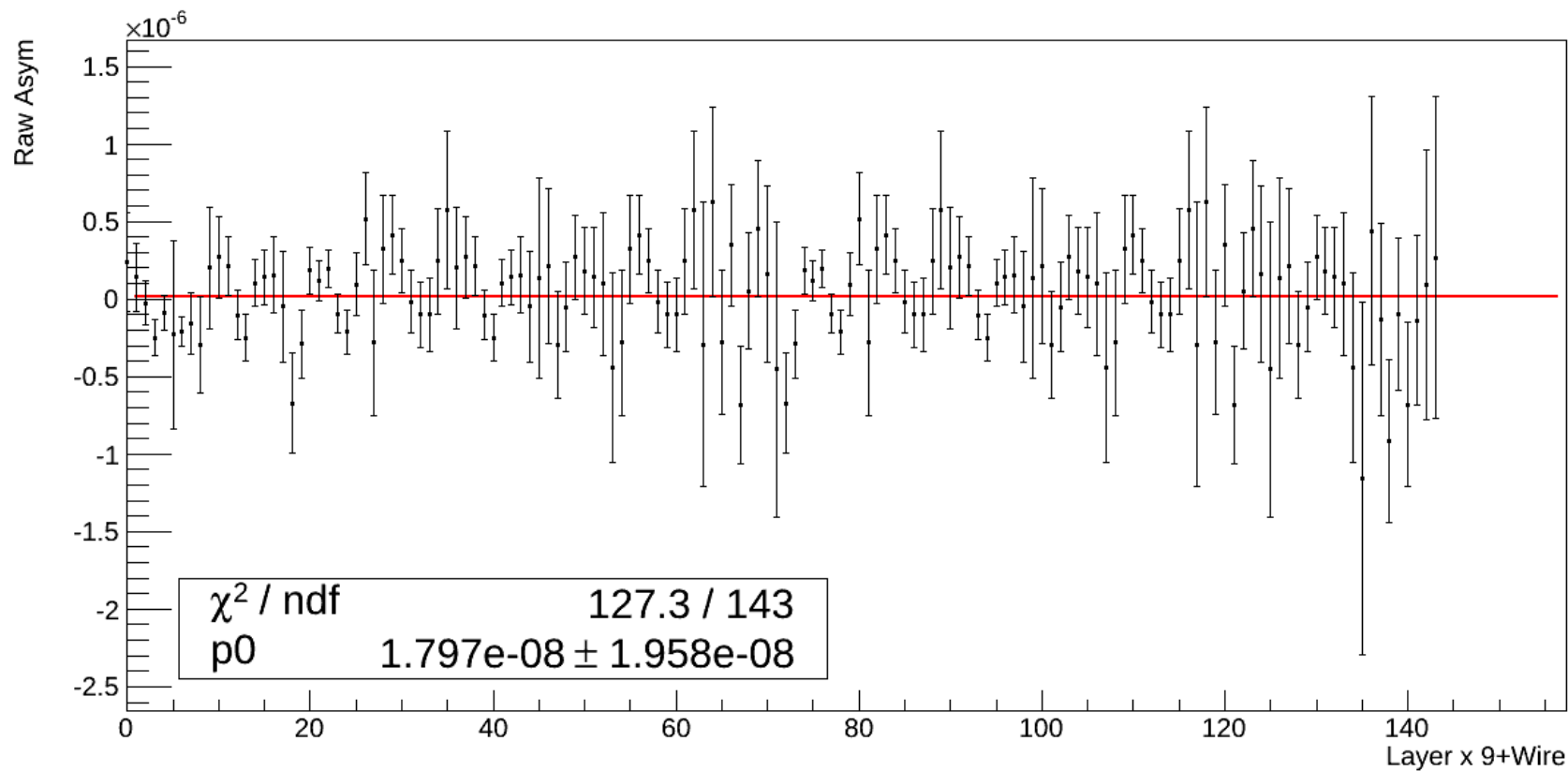


↔ ↔ ...
Layer 1 Layer 2 ...

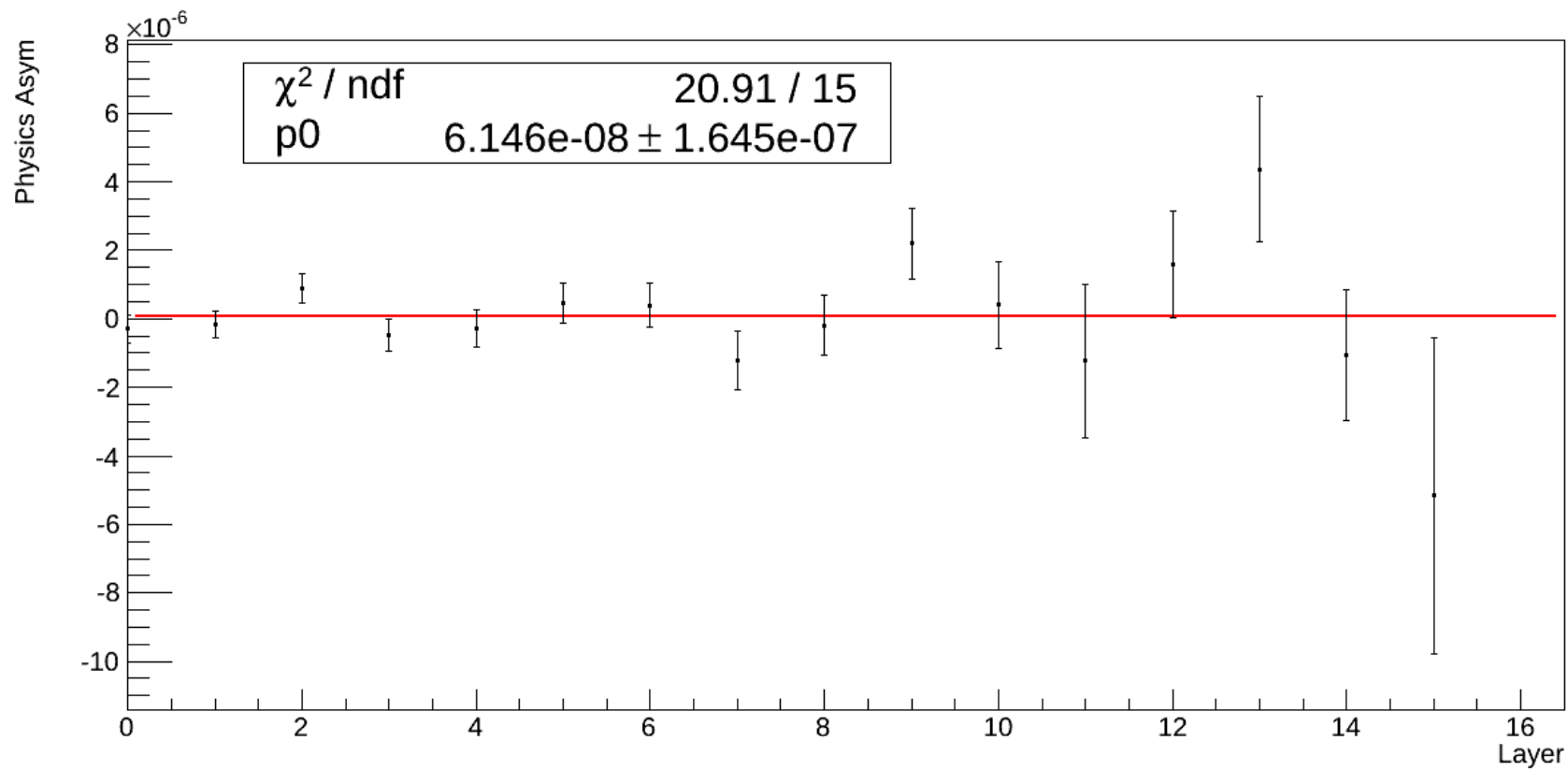
Physics Asymmetry for front layer wires (Zoomed In)



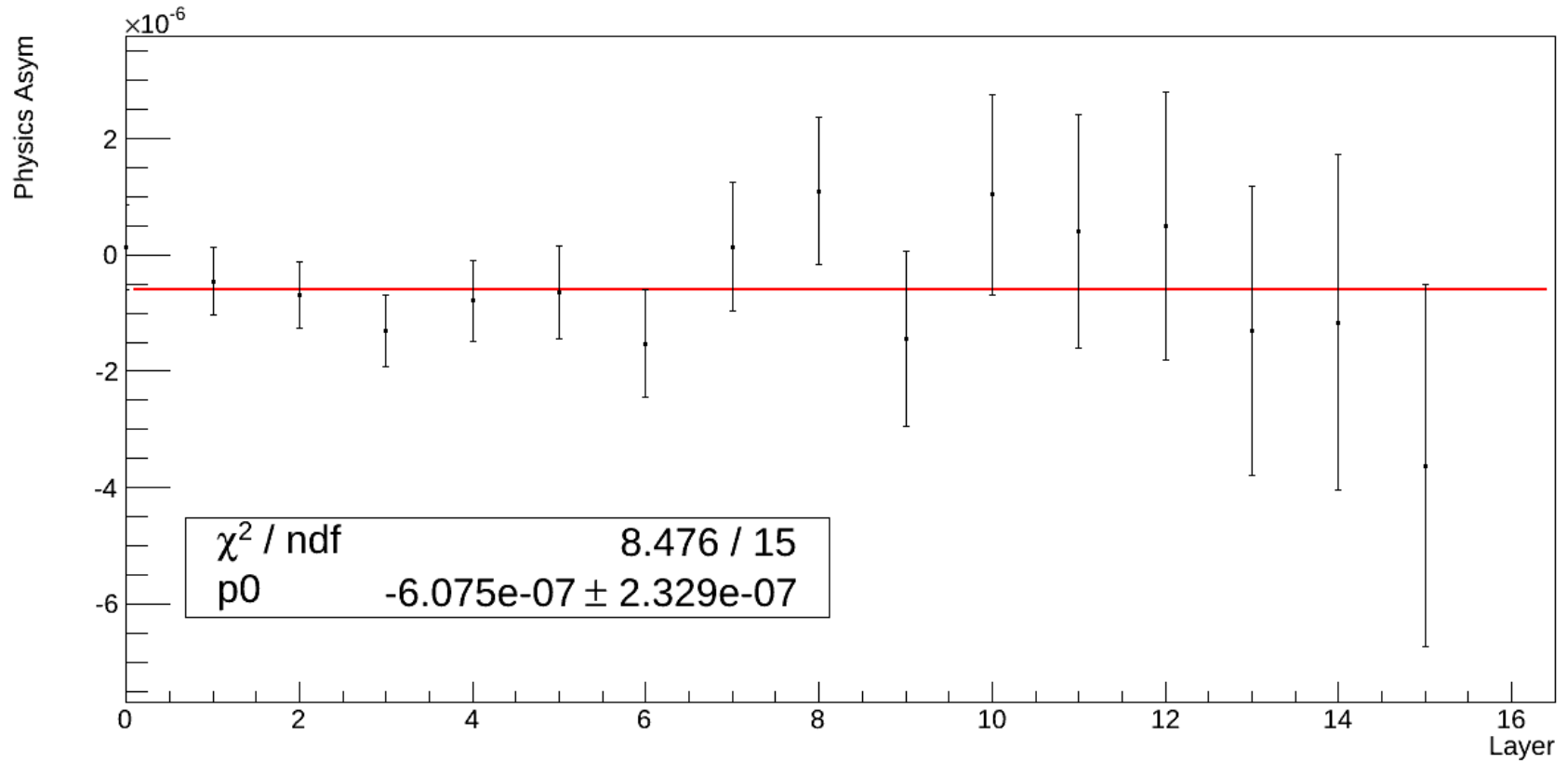
Physics Asymmetry for back layer wires (Zoomed In)



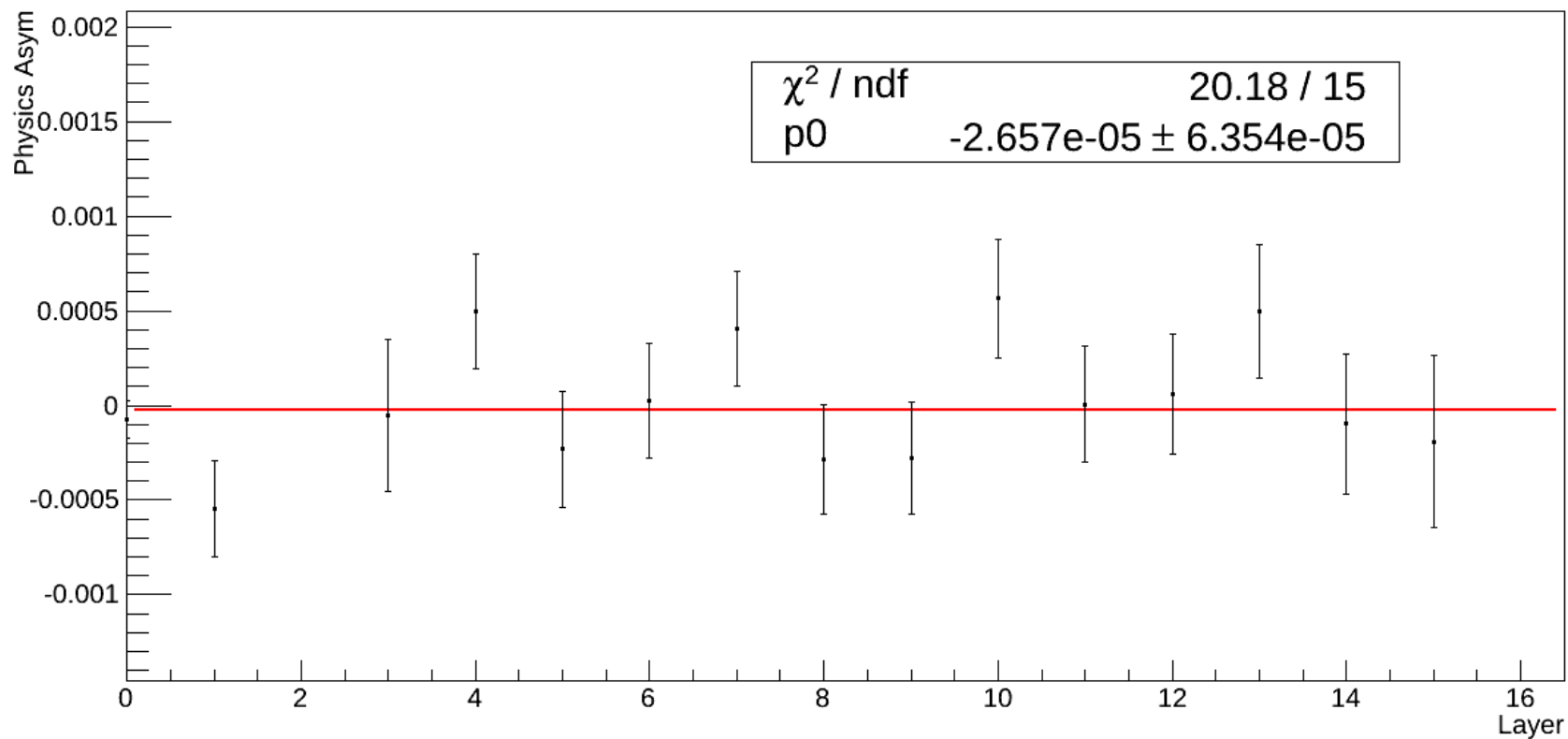
Wire 1



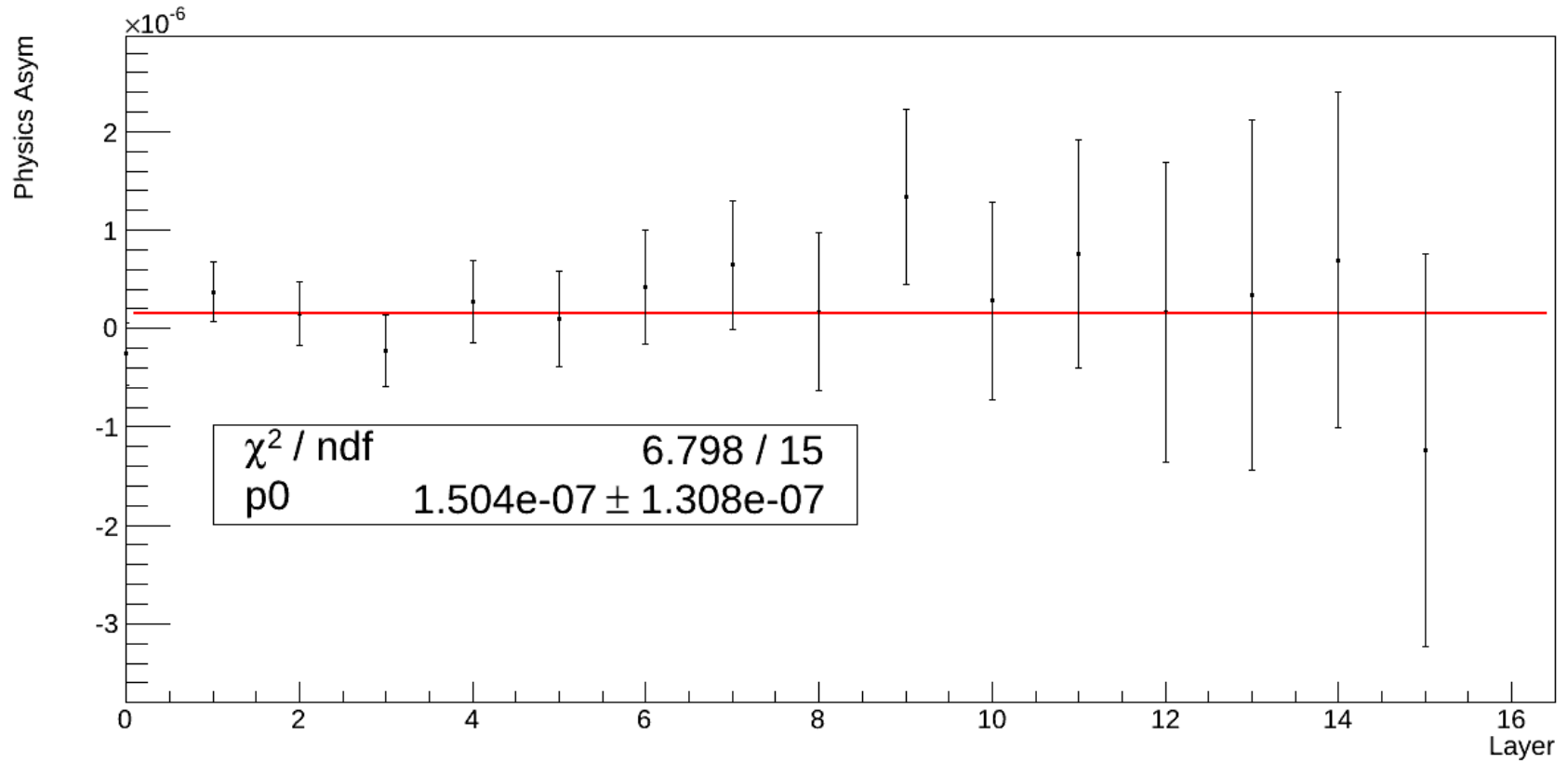
Wire 3



Wire 5



Wire 8



Next:

- Use corrected geometry factor
- Include corrections for correlations between wires.