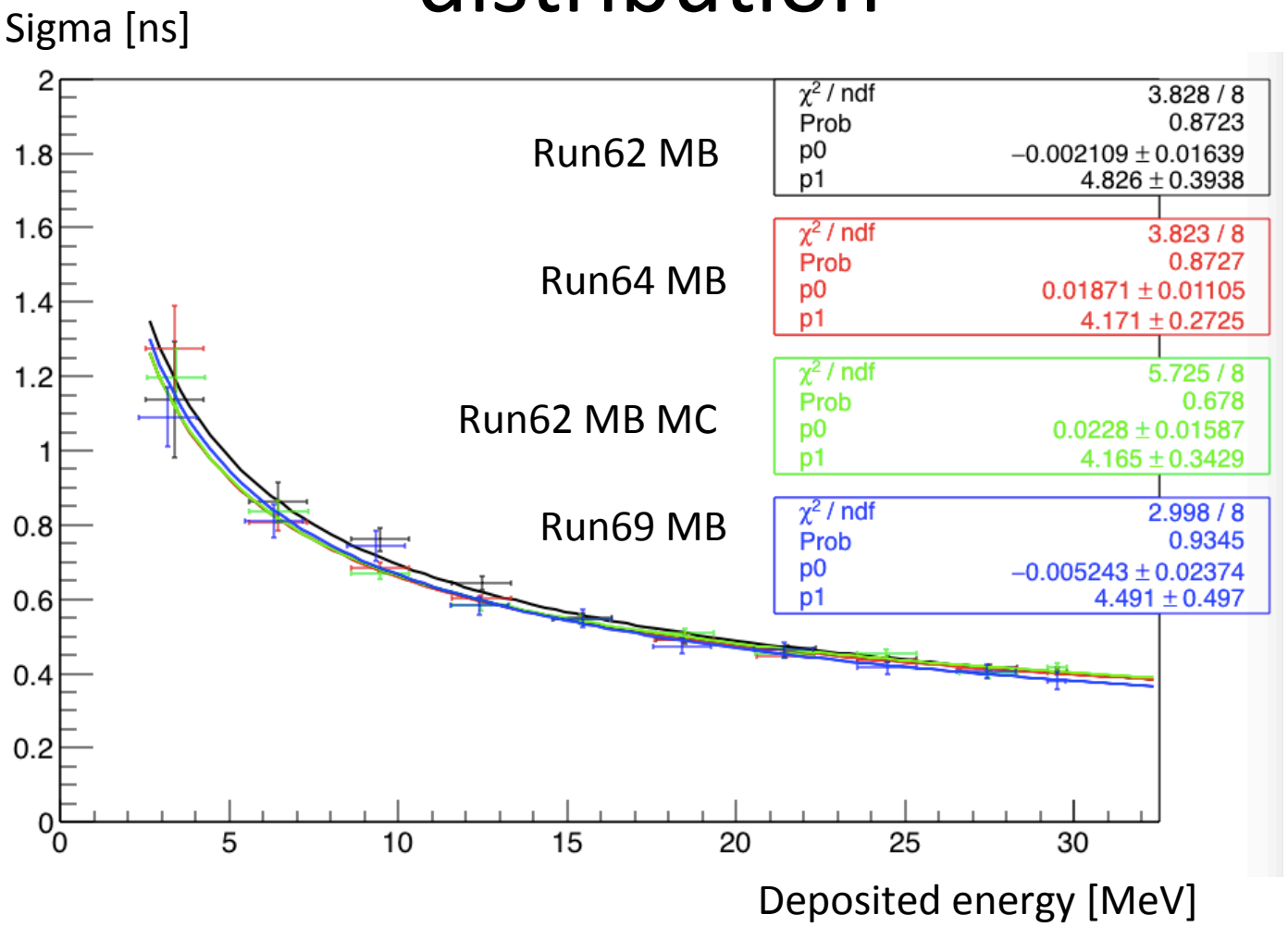
Evaluation of Barrel Resolution

About Final plot,

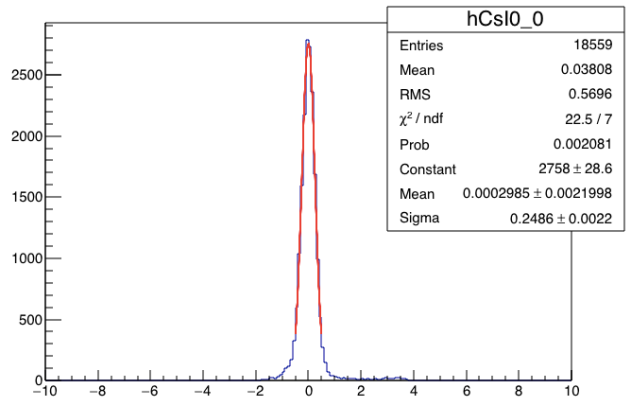
- Re-definition of GammaTime
  - Weighted mean time of CsI which compose cluster
- Vertex Time Difference
  - $T_{VTZ\_Barrel} - T_{VTZ\_CsI}$
    - T_{VTZ_CsI} is Mean of Vertex Time of 5g
  - With selection of deposited energy
- Vertex Time Difference between gammas on CsI
  - $T_{VTZ\_CsI} - T_{VTZ\_CsI\_ith\_gamma}$
    - $T_{VTZ\_CsI\_ith\_gamma}$ is Vertex Time of ith gamma
    - 5 plots for one selection

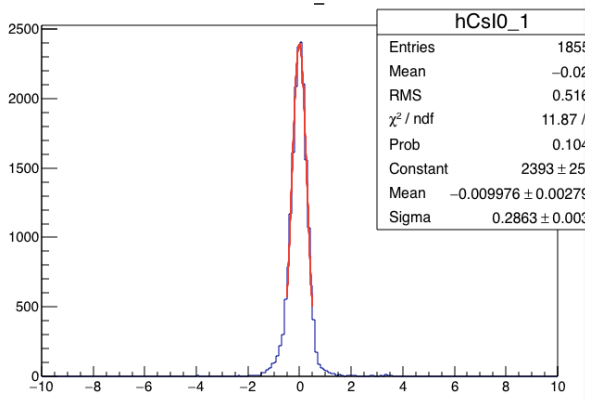
Revised Time Vertex Difference distribution

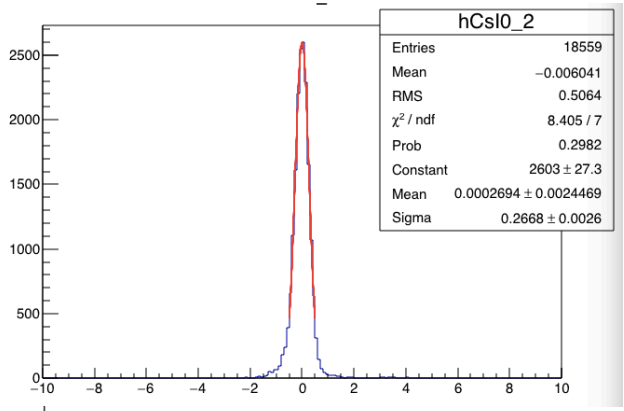


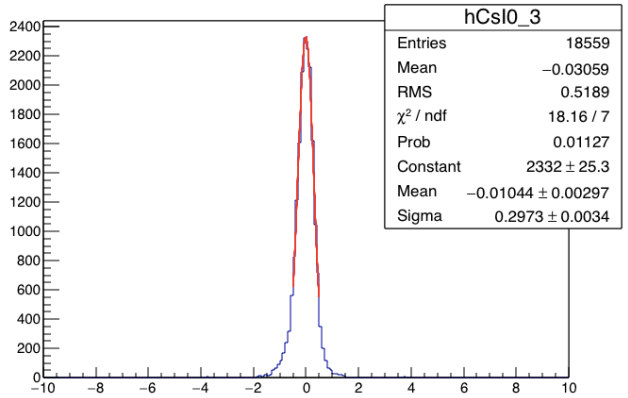
- $T_{VTZ\_Barrel} - T_{VTZ\_CsI}$

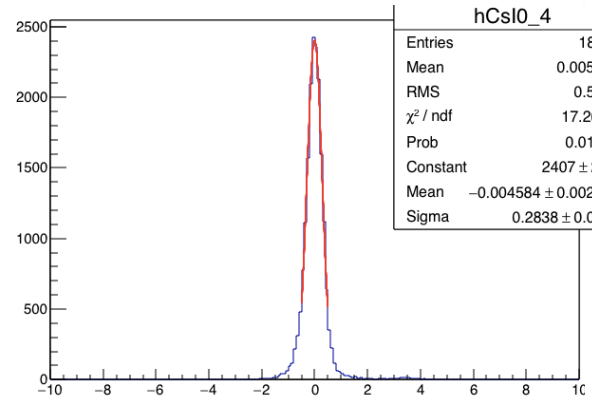
CsI Time with deposited energy on barrel









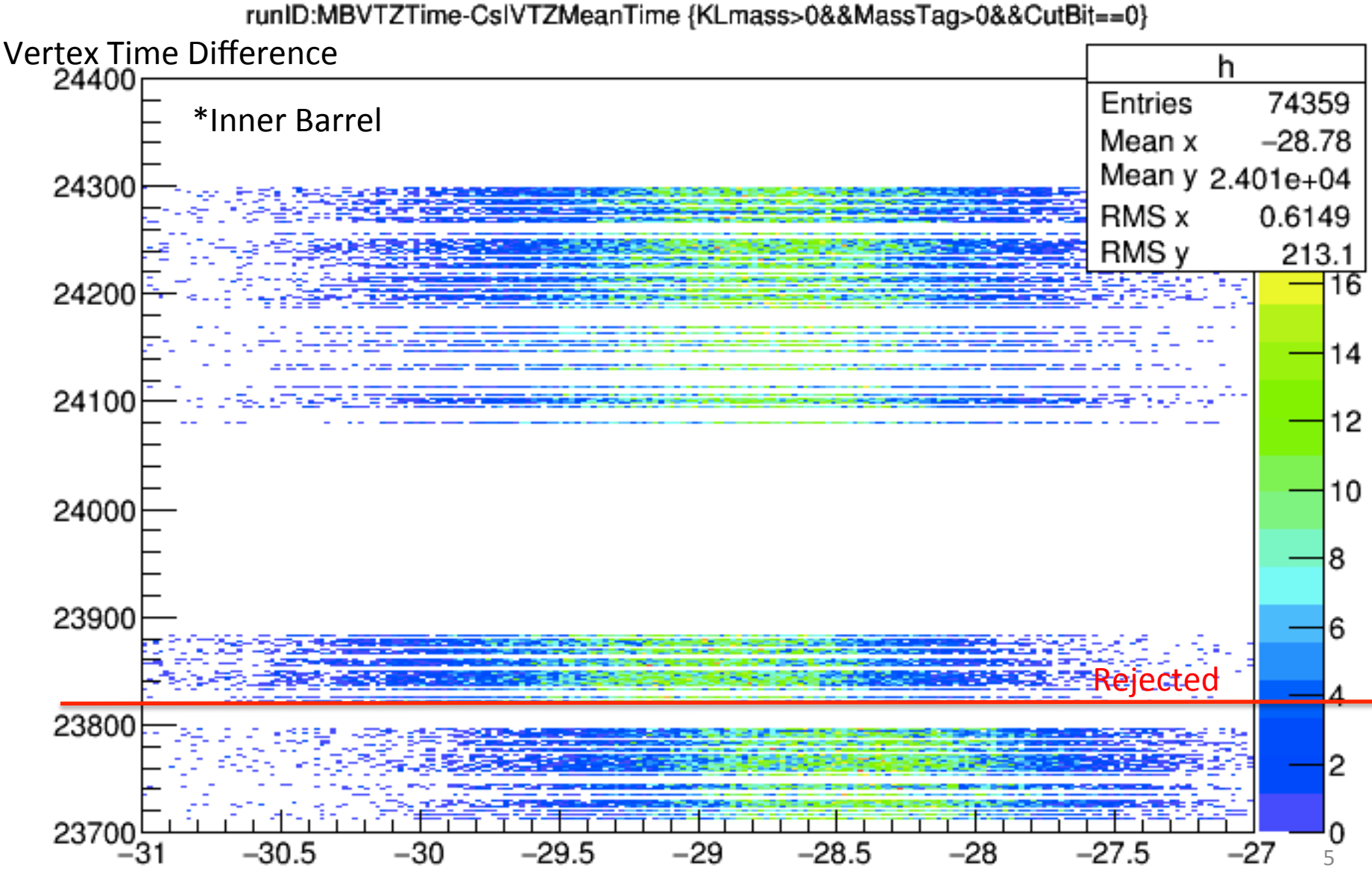


$$\sigma_{0^{th}\ plot} = \sqrt{\frac{g_1 + g_2 + g_3 + g_4 + 16g_0}{25}}$$

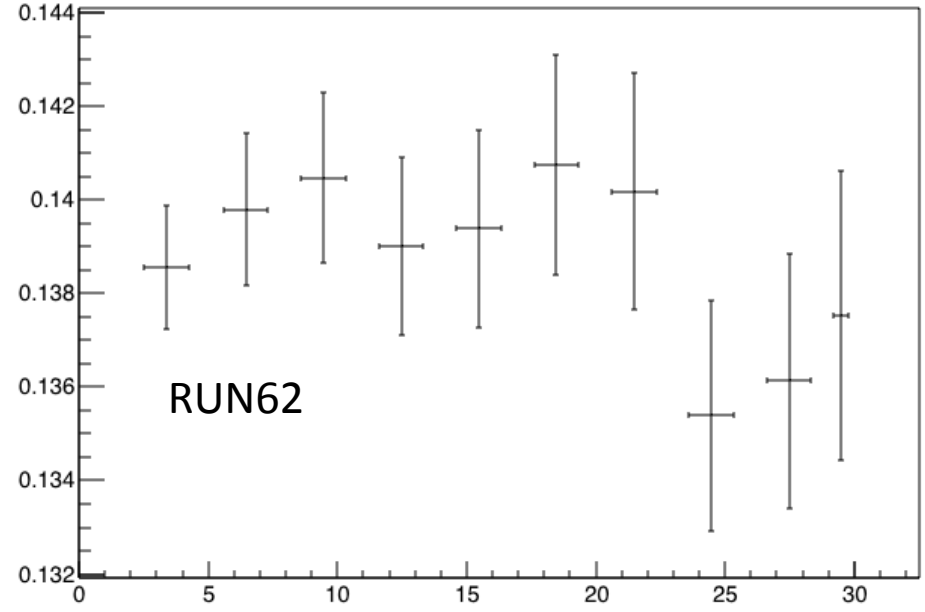
$$\sigma^2_{5g} = \frac{1}{20} \sum_{i=0}^{4} \sigma^2_{i^{th}\ plot}$$

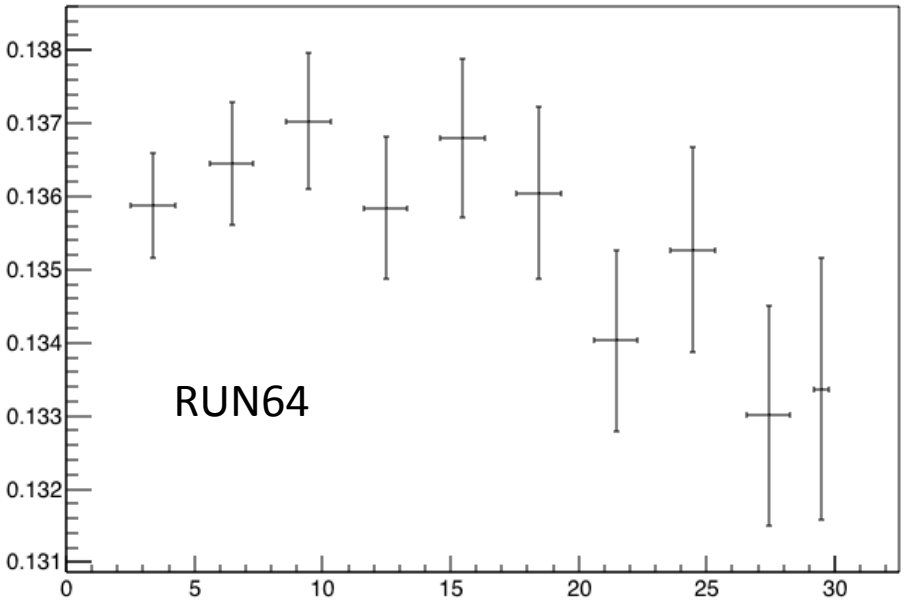
$$T_{VTZ\_CsI\_5G} - T_{VTZ\_CsI\_G^i}$$

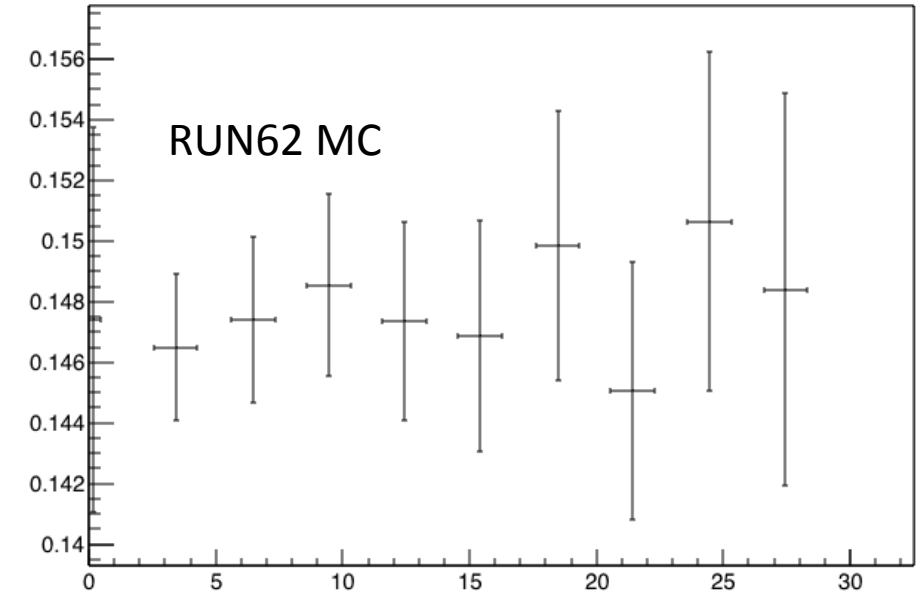
Run by Run

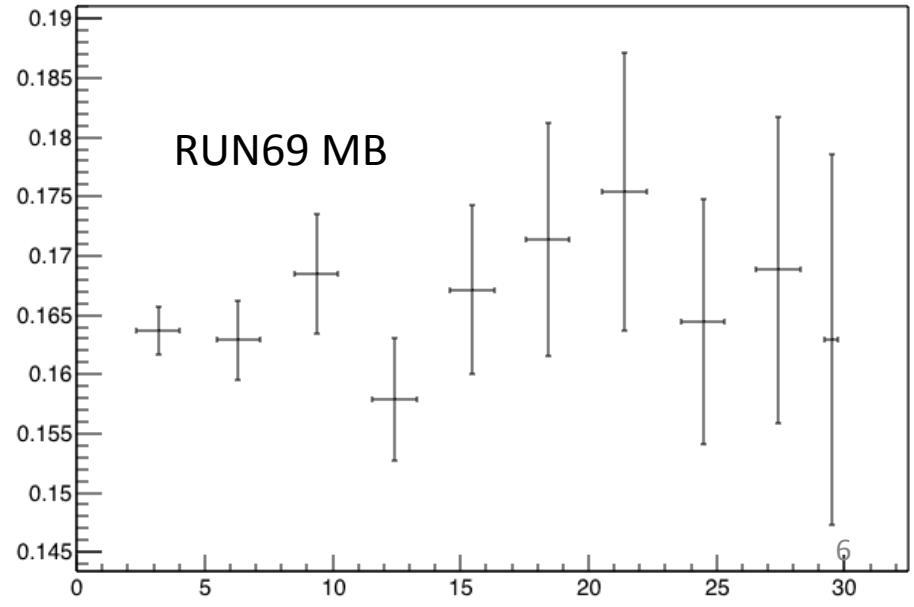

runID:MBVTZTime-CsIVTZMeanTime {KLmass>0&&MassTag>0&&CutBit==0}
Vertex Time Difference
*Inner Barrel
h
Entries 74359
Mean x −28.78
Mean y 2.401e+04
RMS x 0.6149
RMS y 213.1
Rejected
24400
24300
24200
24100
24000
23900
23800
23700
−31
−30.5
−30
−29.5
−29
−28.5
−28
−27.5
−27
16
14
12
10
8
6
4
2
0

Evaluated 5gamma resolution

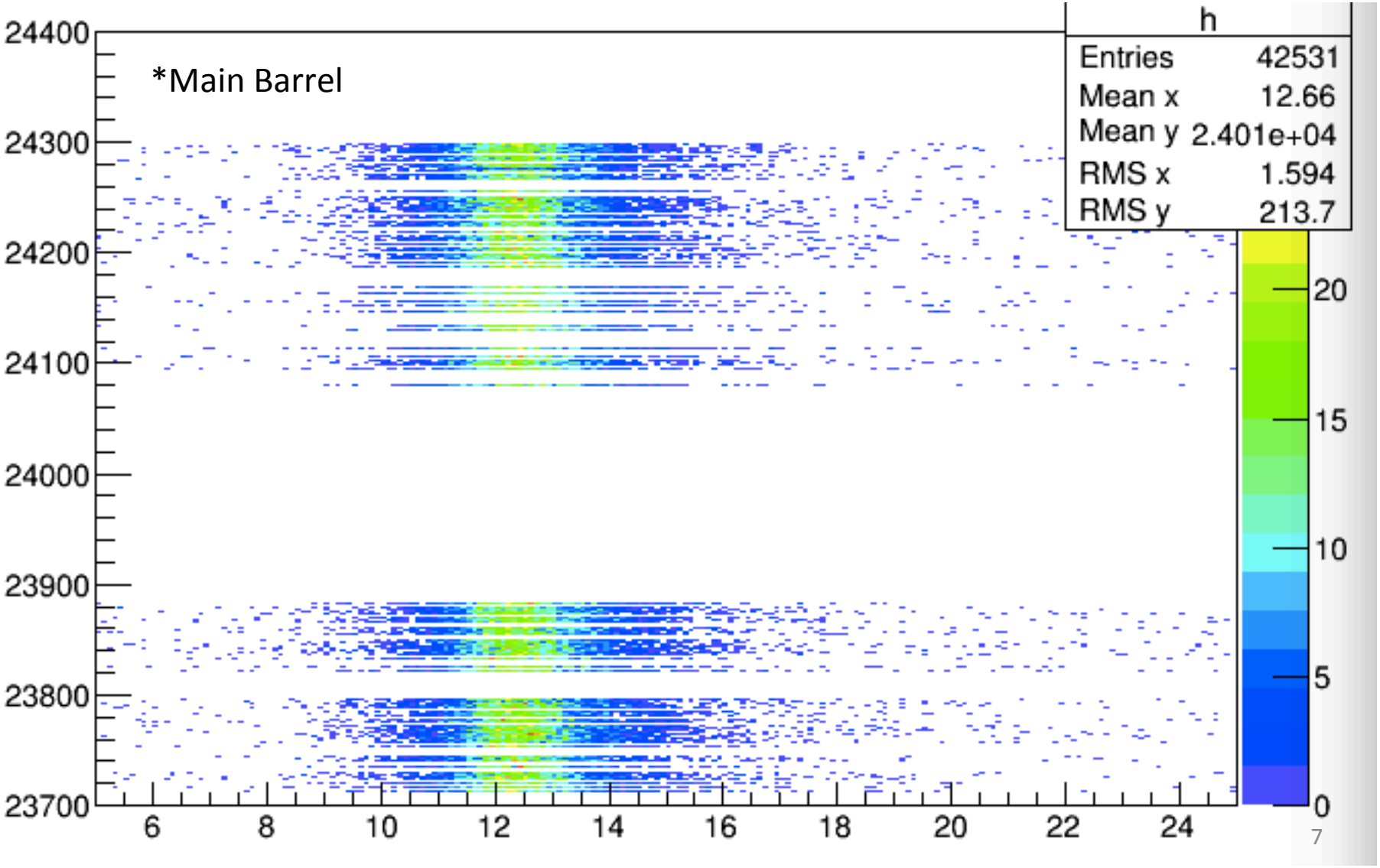




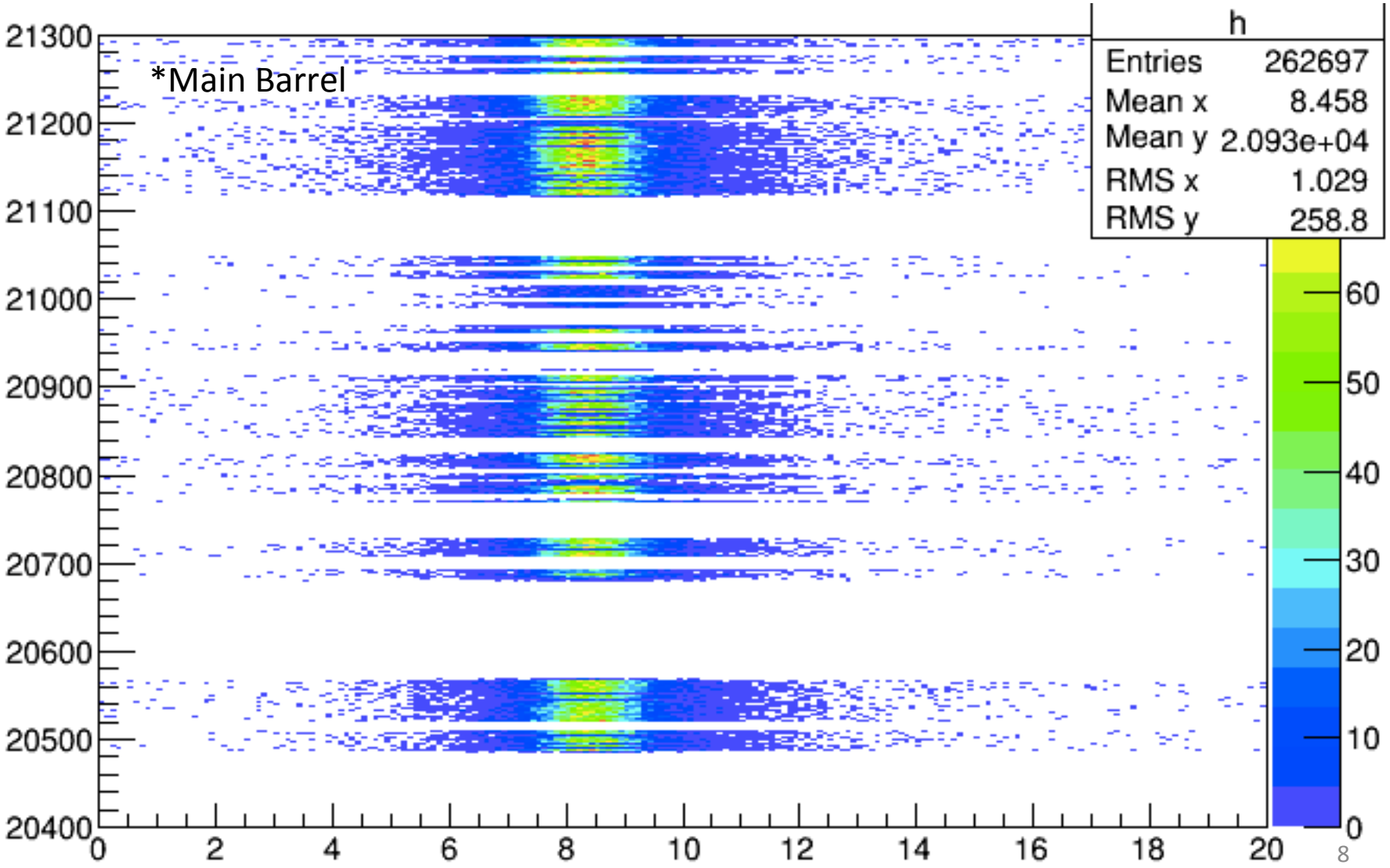




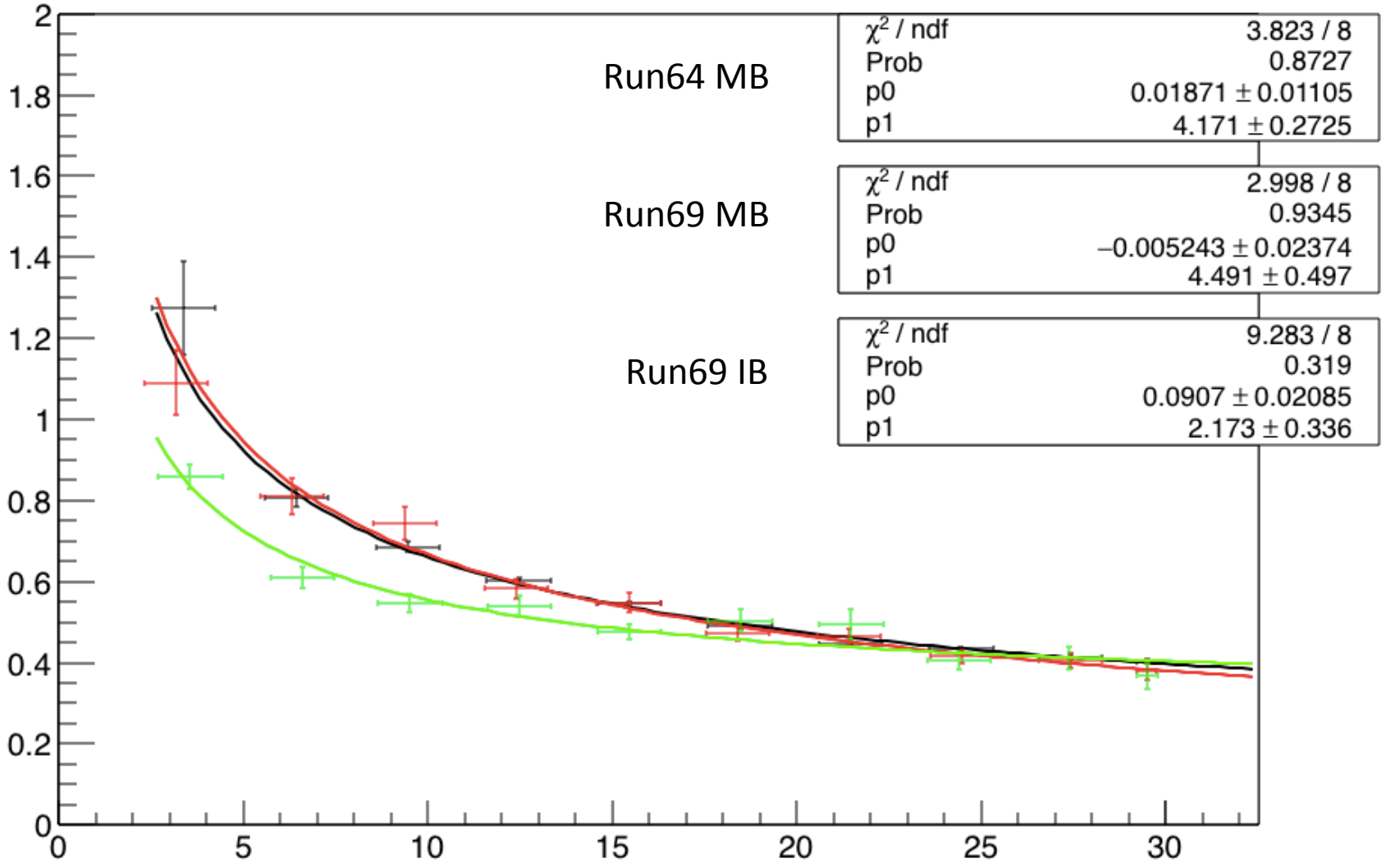
Run by Run


*Main Barrel
h
Entries 42531
Mean x 12.66
Mean y 2.401e+04
RMS x 1.594
RMS y 213.7
24400
24300
24200
24100
24000
23900
23800
23700
6
8
10
12
14
16
18
20
22
24
0
5
10
15
20

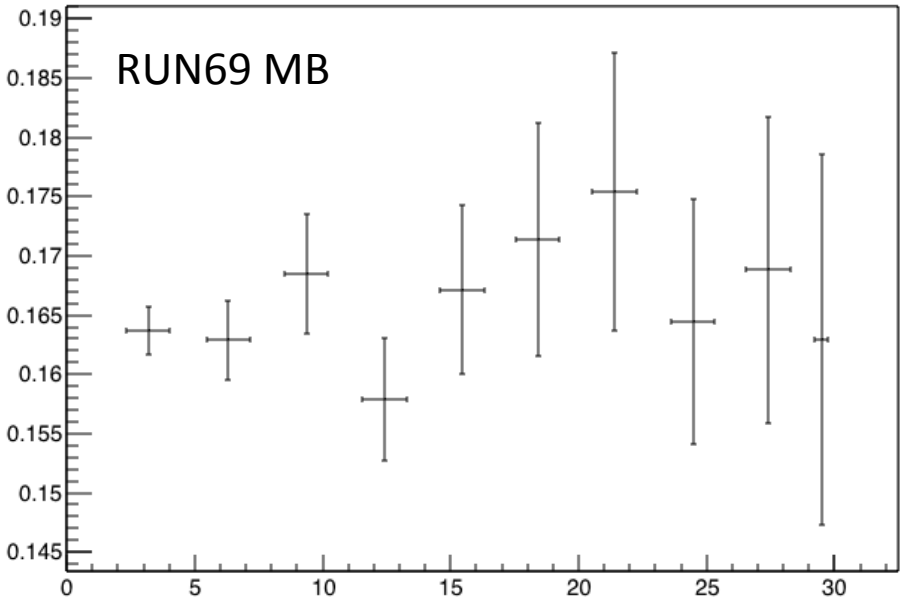
Run by Run (Run64)

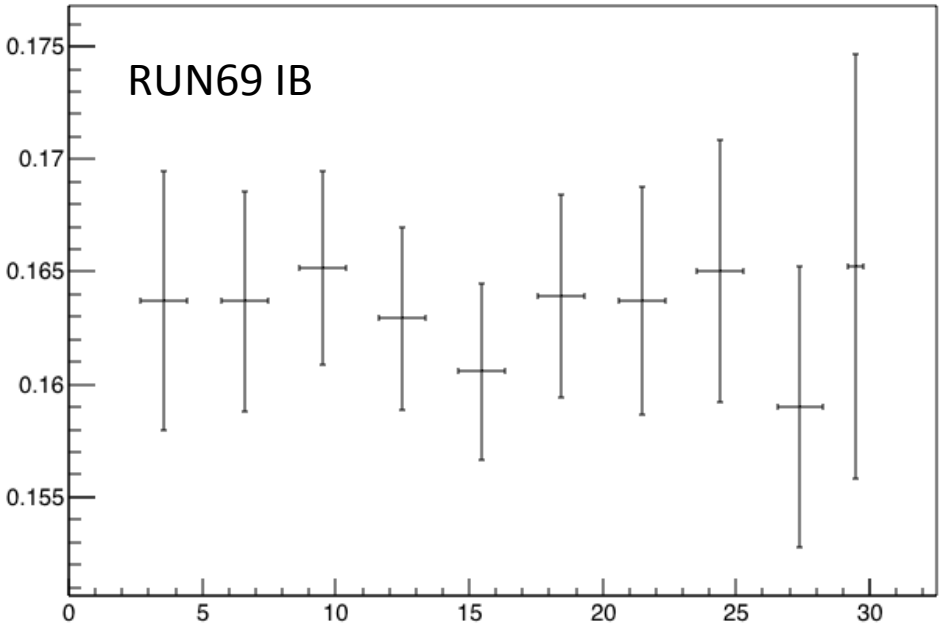


Current status of Inner Barrel



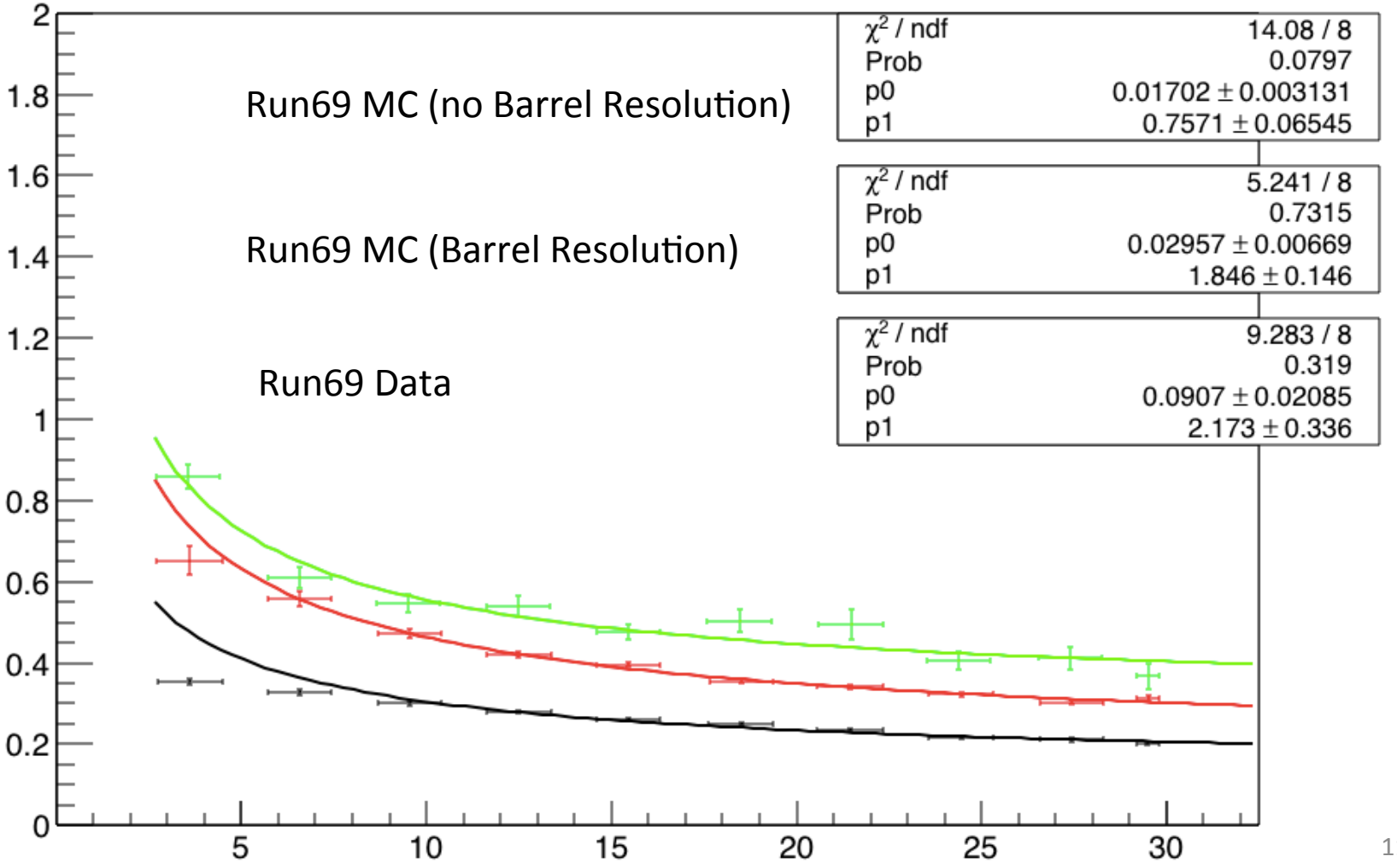
CsI status in Run69 IB





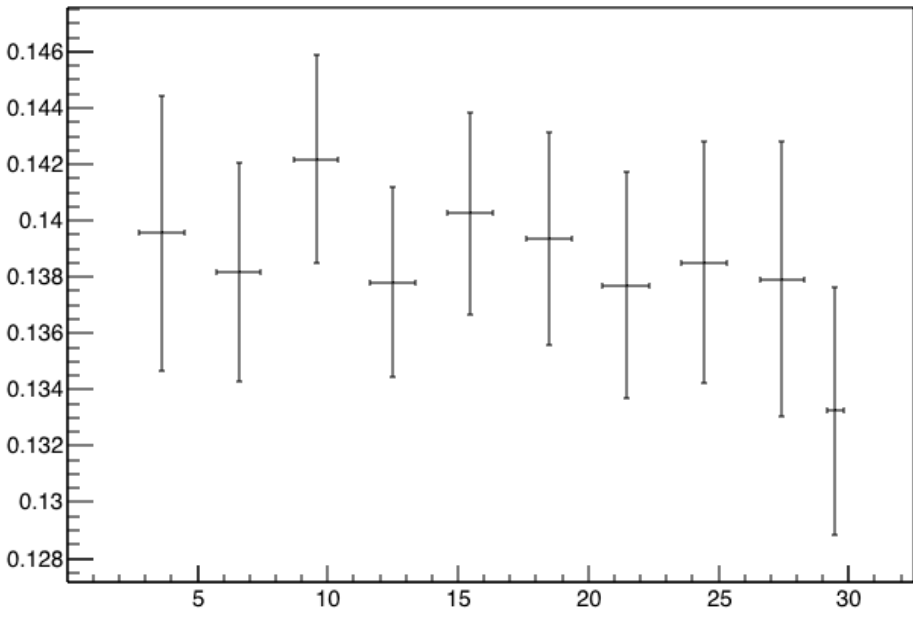
Looks similar

Run69 MC
(without accidental)

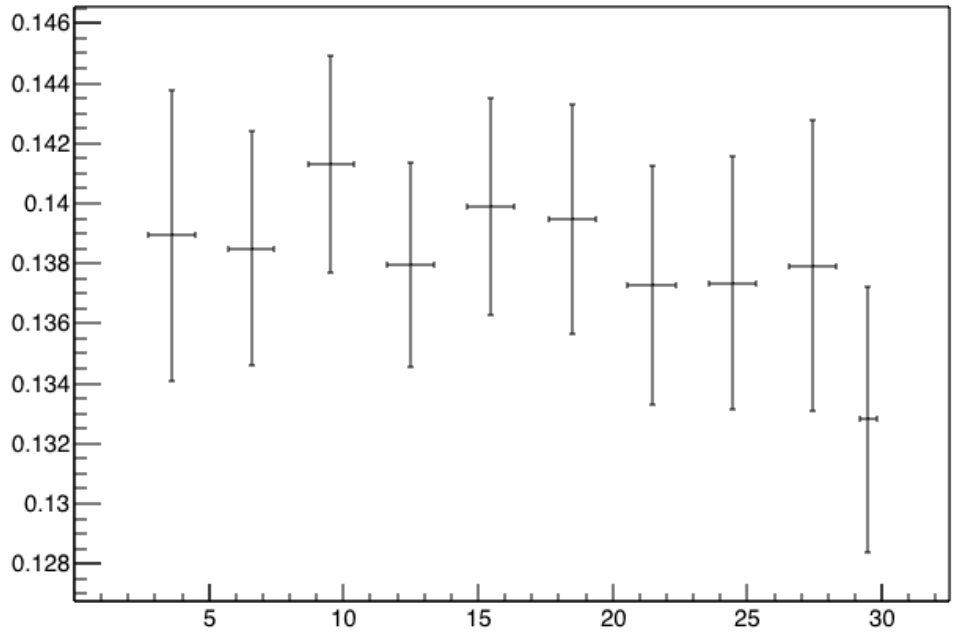


CsI

*Without Smearing on Barrel Time

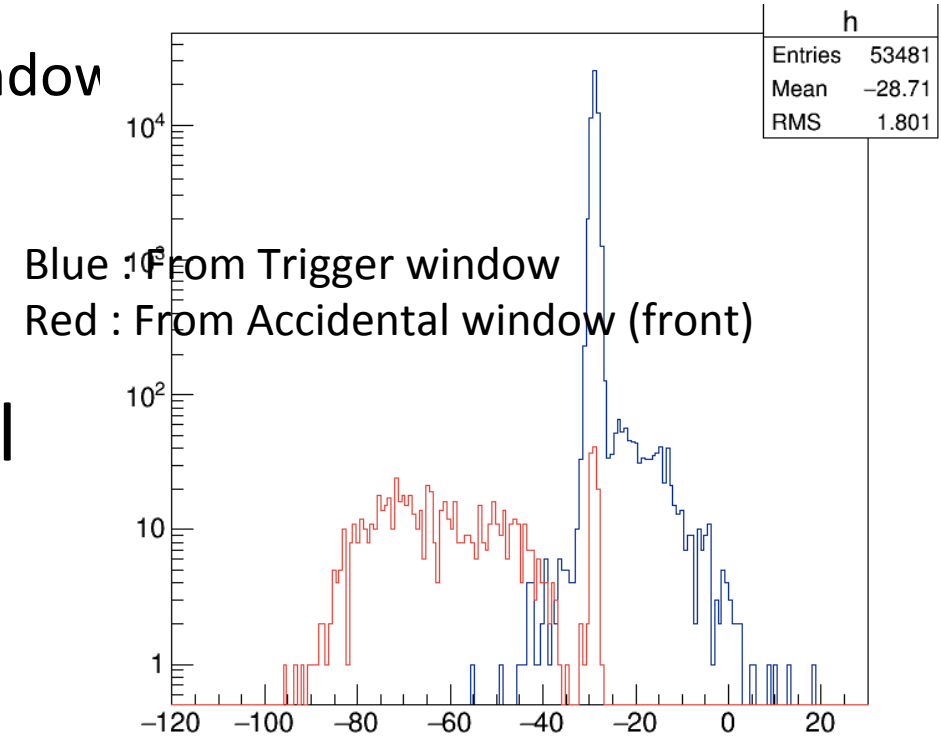


*With Smearing on Barrel Time



Discrepancy between MC and data in Run69

- No accidental overlay is applied on MC
  - Does accidental events affect on timing resolution?
    - Selection of accidental window
- Not So effective.
- Hit selection of IB could be affected by accidental also



summary

- Need to check accidental effect on IB hit selection
- Hit selection study of IB?