

# Data Quality Check



Summer Blot  
University of Chicago

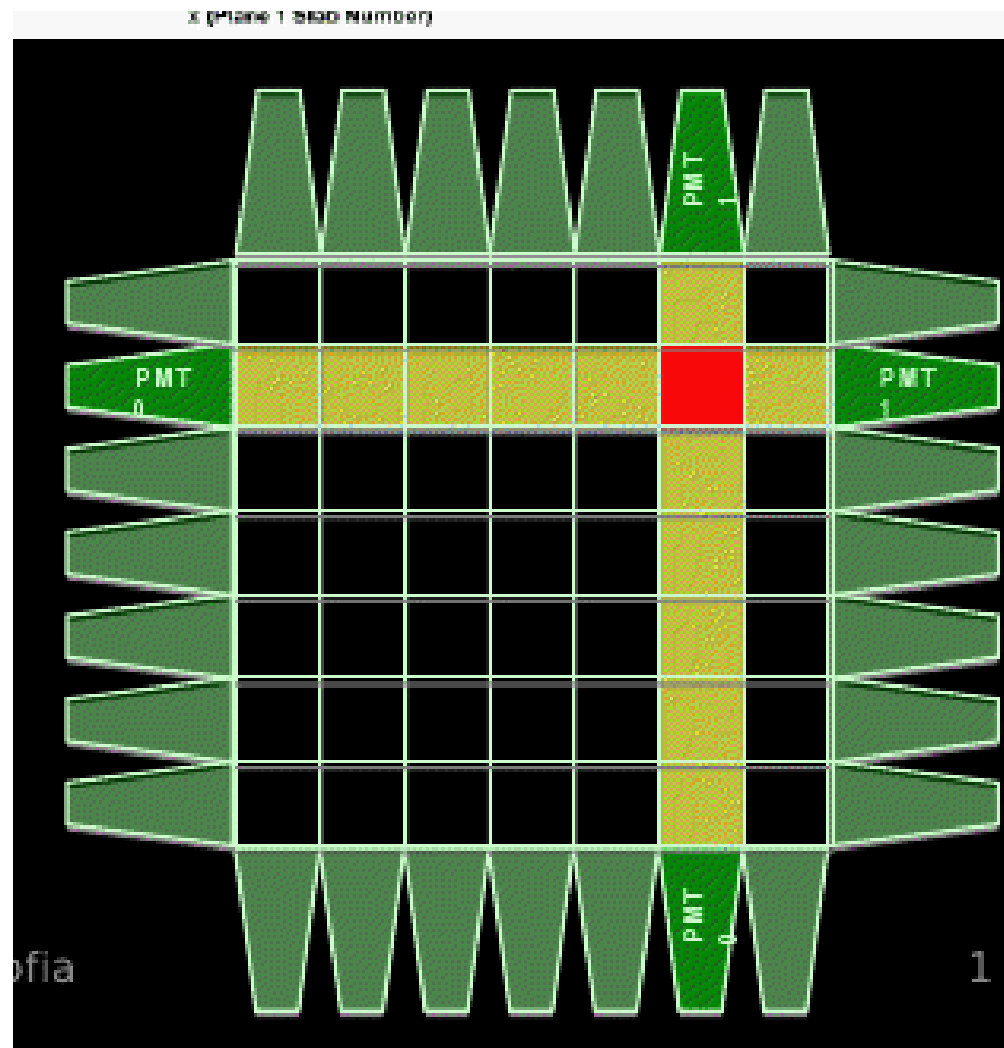


# Agenda

- Data Quality Check of Reference Runs
  - TOF 0, TOF1, TOF2
- fADC hit coincidence of PMT's
- Percentage of hits in each slab for a given run
- Average x and y positions
- Conclusions and what's ahead

# fADC Hits

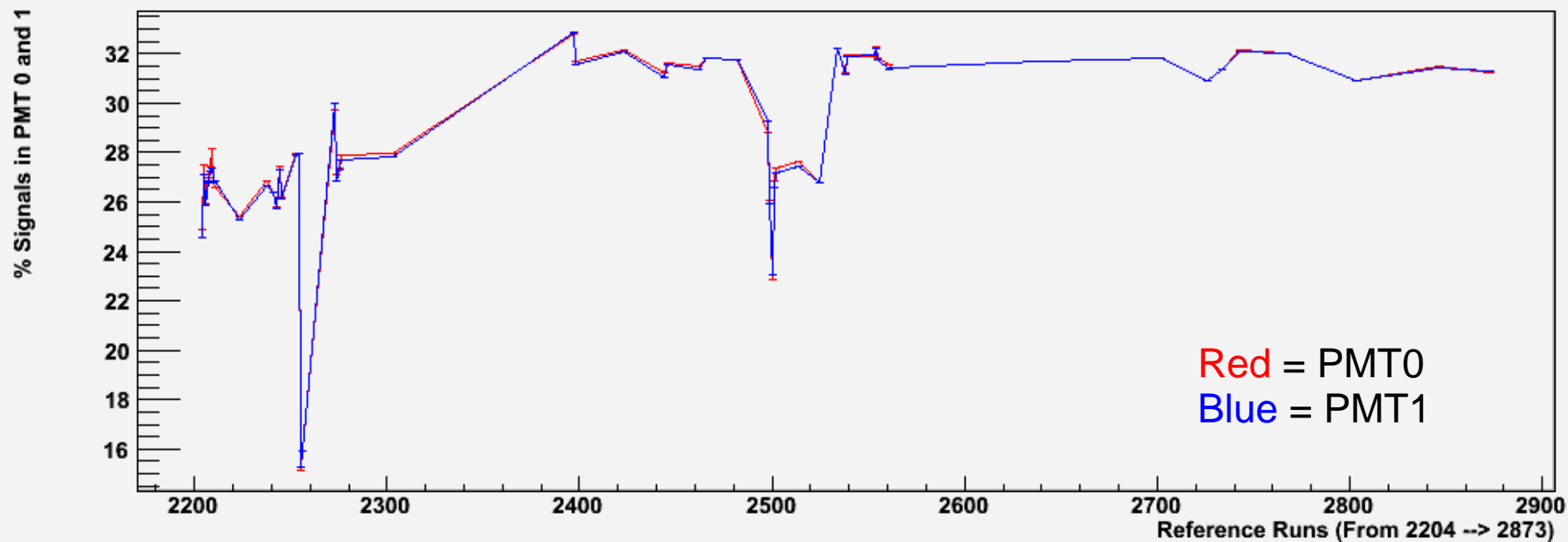
- Checked for coincidence of all PMT's for all slabs in all TOF planes
- Some differences are to be expected since we are not in an ideal world



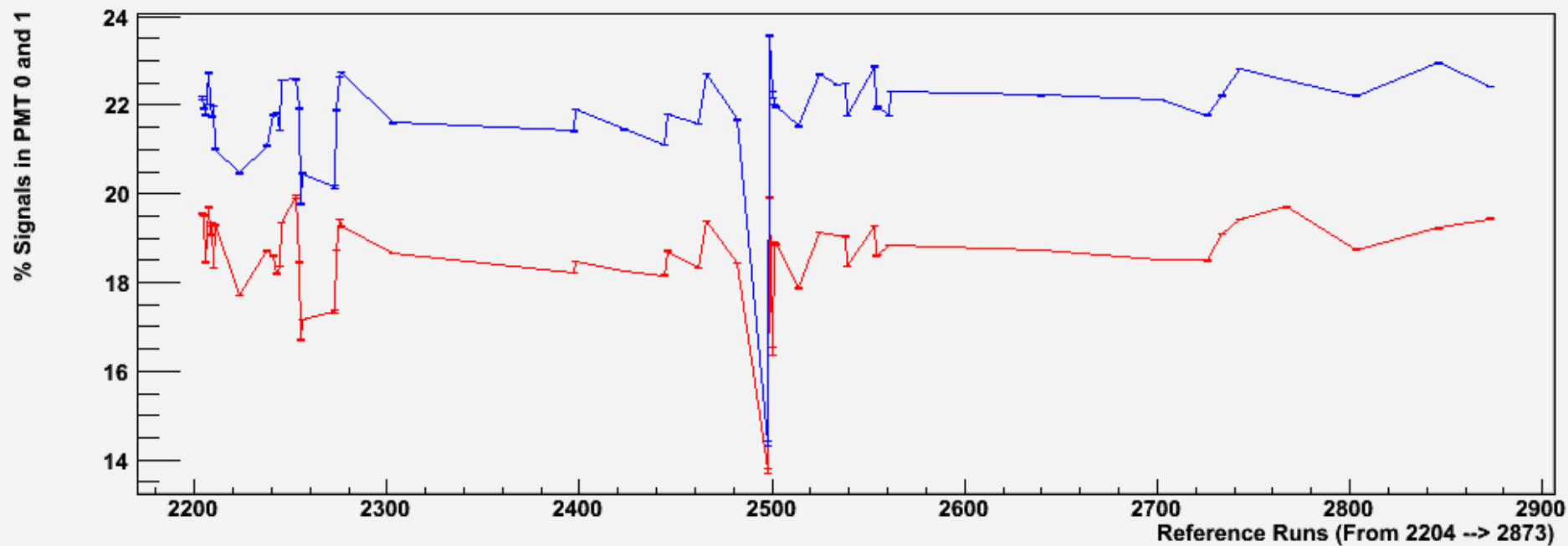
# fADC Hits



Tof1, X Plane, Signals in PMT0 and PMT1 Slab 5



Tof1, Y Plane, Signals in PMT0 and PMT1 Slab 3



# FADC Hits



TOF 0			
X Plane Slab		Y Plane Slab	
1	~Y: 2-12%	1	Y: 0-2%
2	~Y: 1-6.5%	2	Y: 1-4.5%
3	~YL 0-12%	3	Y: 2.5-10%
4	N: 4-15%	4	Y: 15-18%
5	~Y: 5-10%	5	Y: 20-23.5%
6	~Y: 13-18%	6	Y: 19-27%
7	N: 13-22%	7	Y: 15-20%
8	~Y: 10-19%	8	Y: 5-10%
9	~Y: 10-19%	9	Y: 0-4.5%

TOF 1			
X Plane Slab		Y Plane Slab	
1	Y: 0-5%	1	Y: 1-6%
2	Y: 3-8%	2	~Y: 4-8%
3	Y: 15.5 – 18%	3	N: 14-22%
4	Y: 25.5 – 34%	4	N: 26-38%
5	Y: 16-23%	5	N: 21-27%
6	Y: 8-16%	6	N: 8-12%

TOF 2			
X Plane Slab		Y Plane Slab	
1	Y: 1-7%	1	Y: 0-2%
2	Y: 1-3.5%	2	Y: 1-4%
3	Y: 4-7%	3	Y: 6-12%
4	Y: 9-15%	4	Y: 8-14%
5	Y: 14-19%	5	Y: 17.5-22%
6	Y: 18-23%	6	Y: 16-23%
7	Y: 18-23%	7	Y: 17.5-23%
8	Y: 13-17.5%	8	Y: 13-17.5%
9	Y: 4.5-8%	9	Y: 4.5-8%

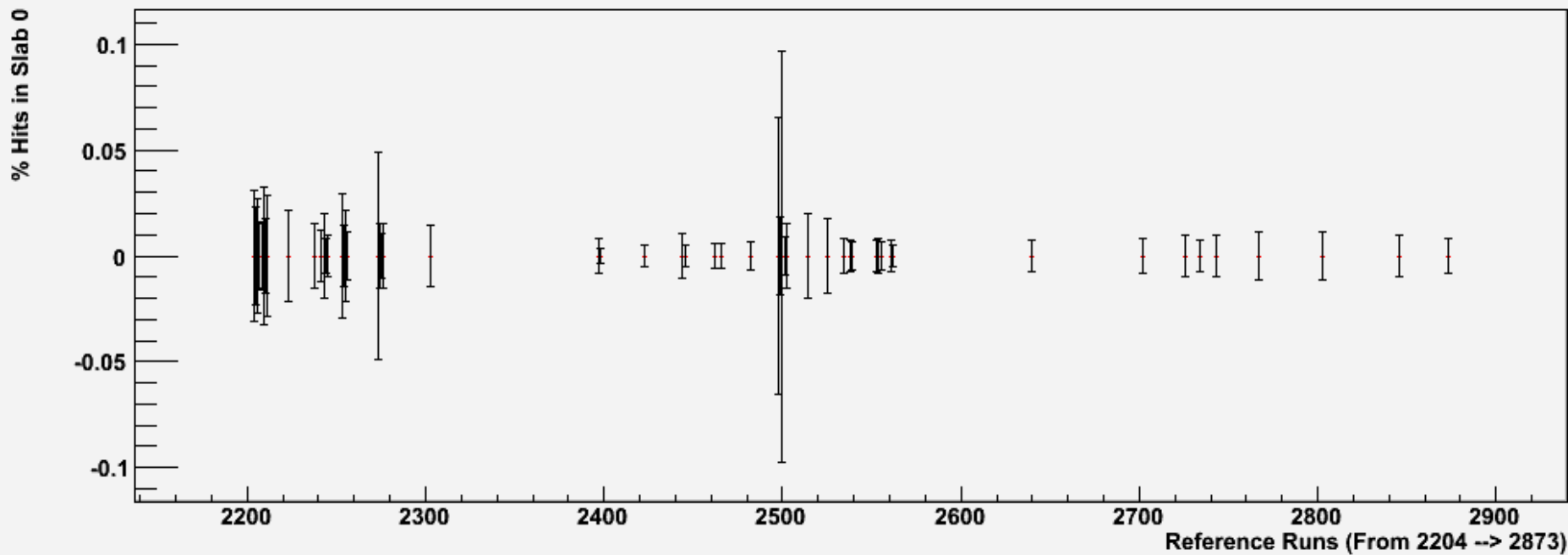
- ~Y means PMT0 != PMT1 but less than 2% difference
- N means greater than 2% difference



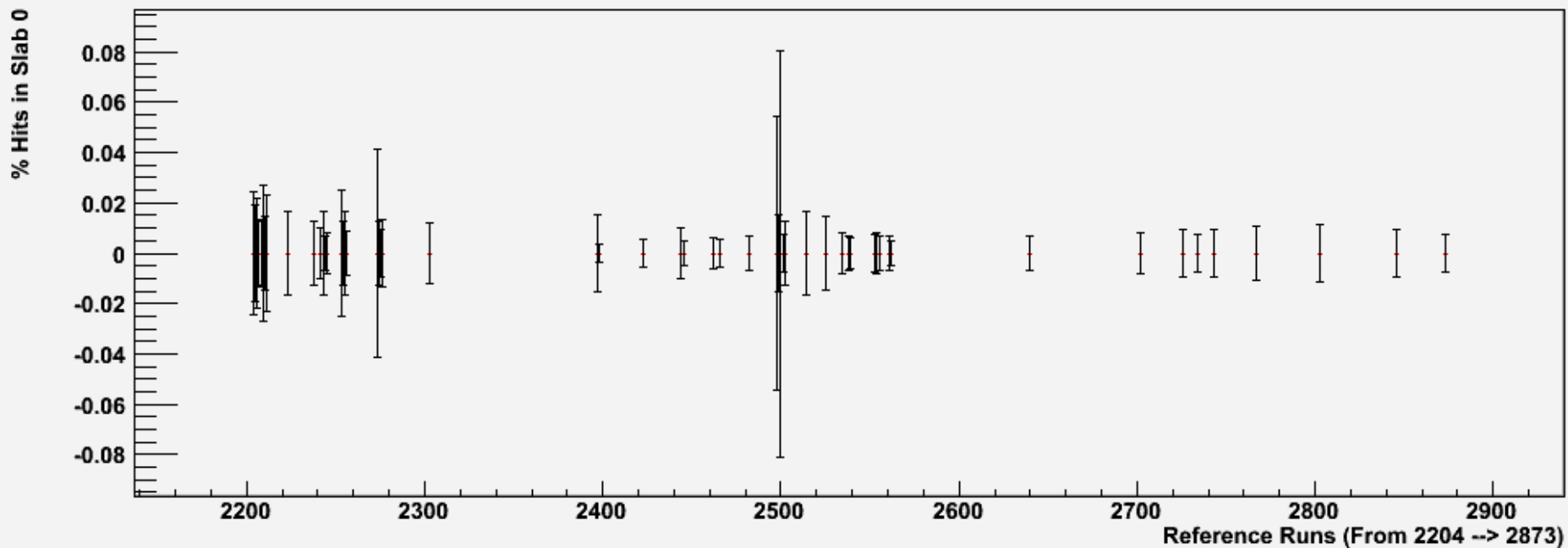
# TOF Slab Hits

- A slab “hit” occurs when there is coincidence between the two PMT's at each end
- Normalized by the total number of events per plane
- Graphs show the percentage of hits per each slab

Tof0, X Plane, % Hits in Slab 0



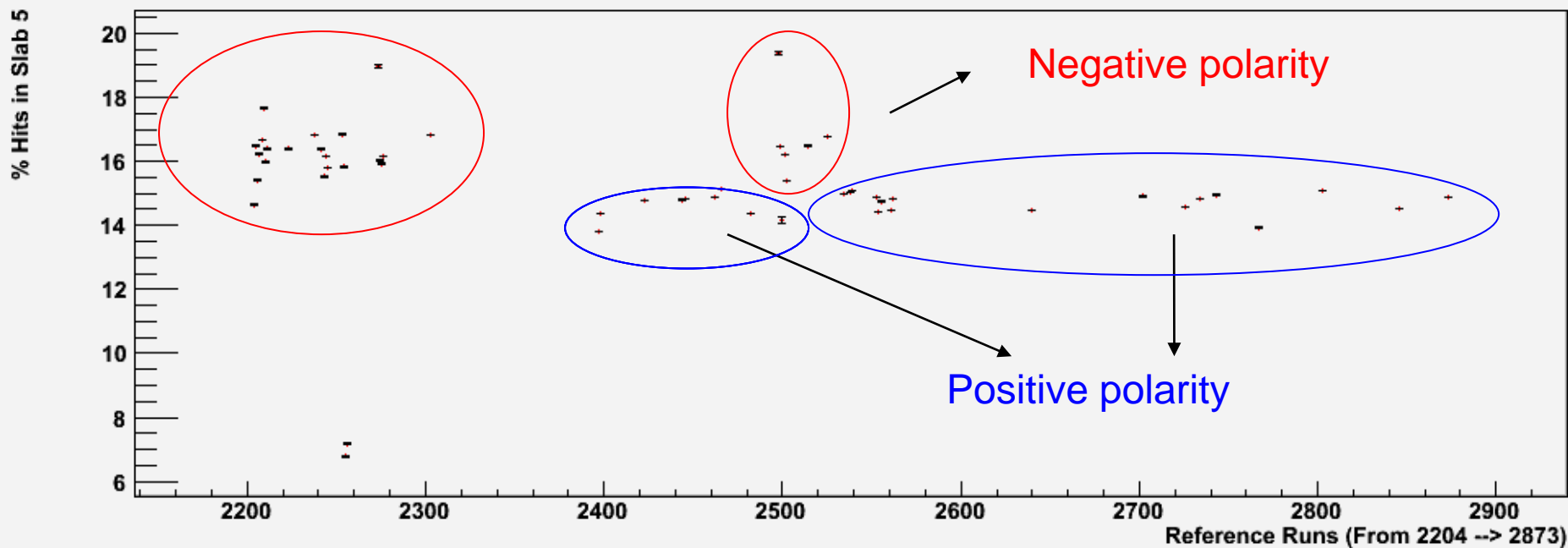
Tof1, Y Plane, % Hits in Slab 0



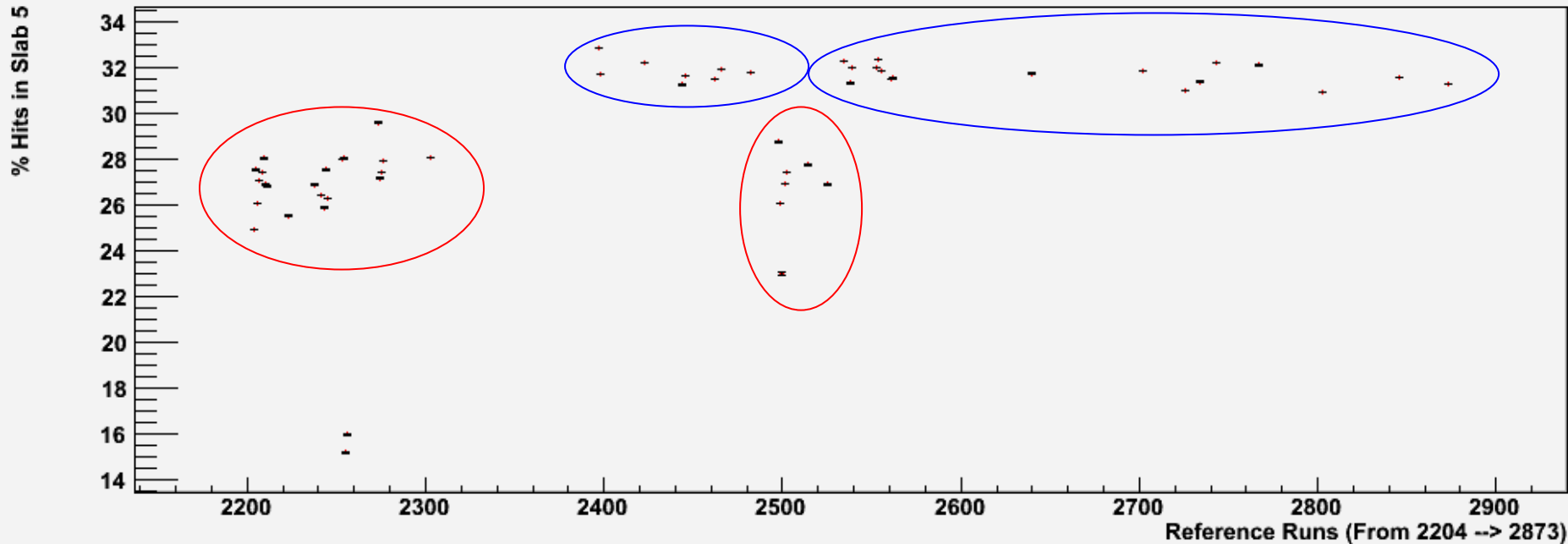




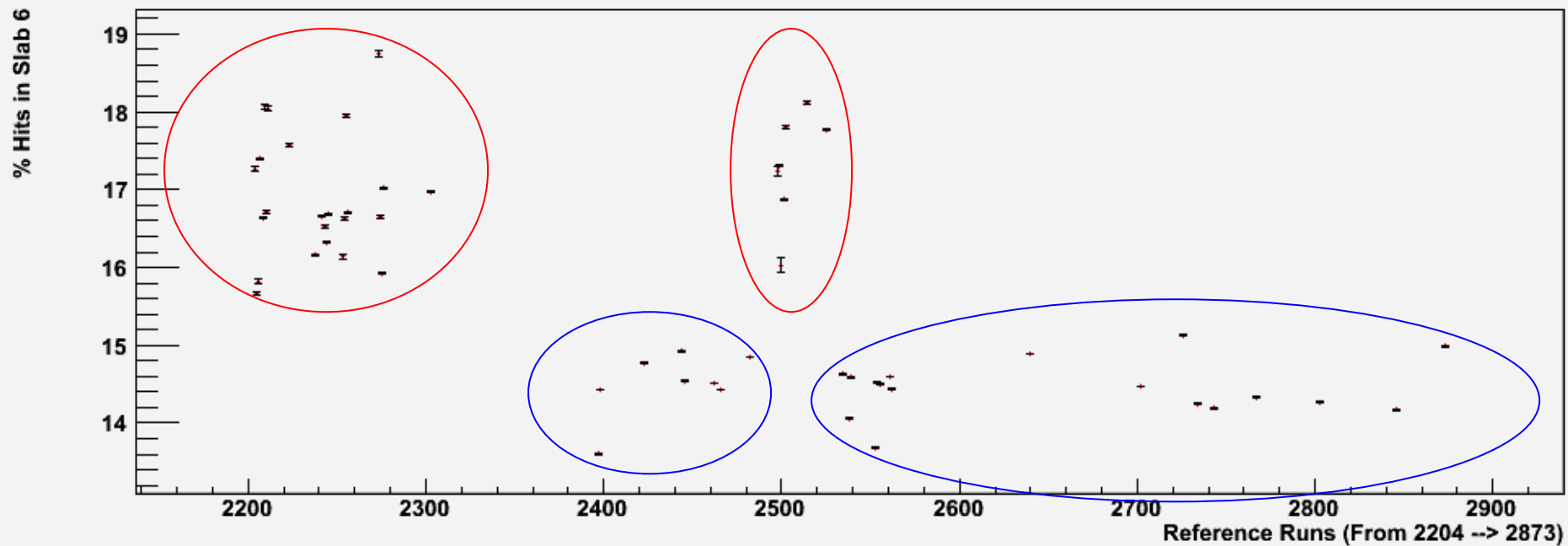
Tof0, X Plane, % Hits in Slab 5



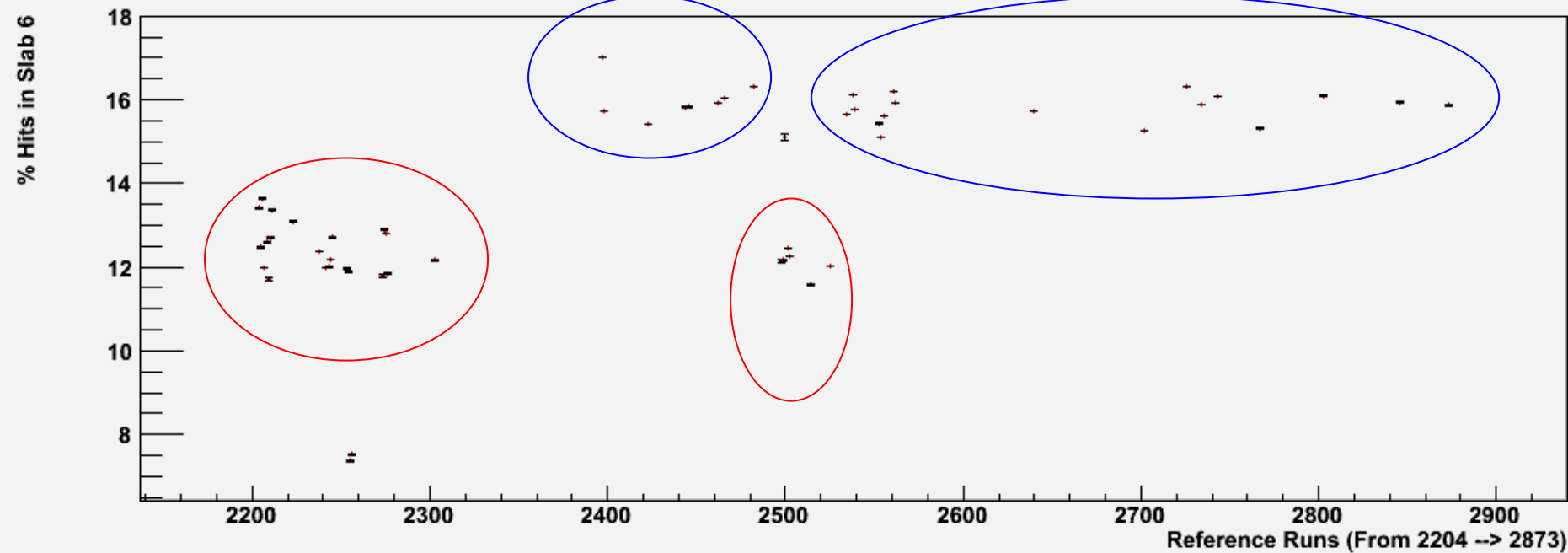
Tof1, X Plane, % Hits in Slab 5

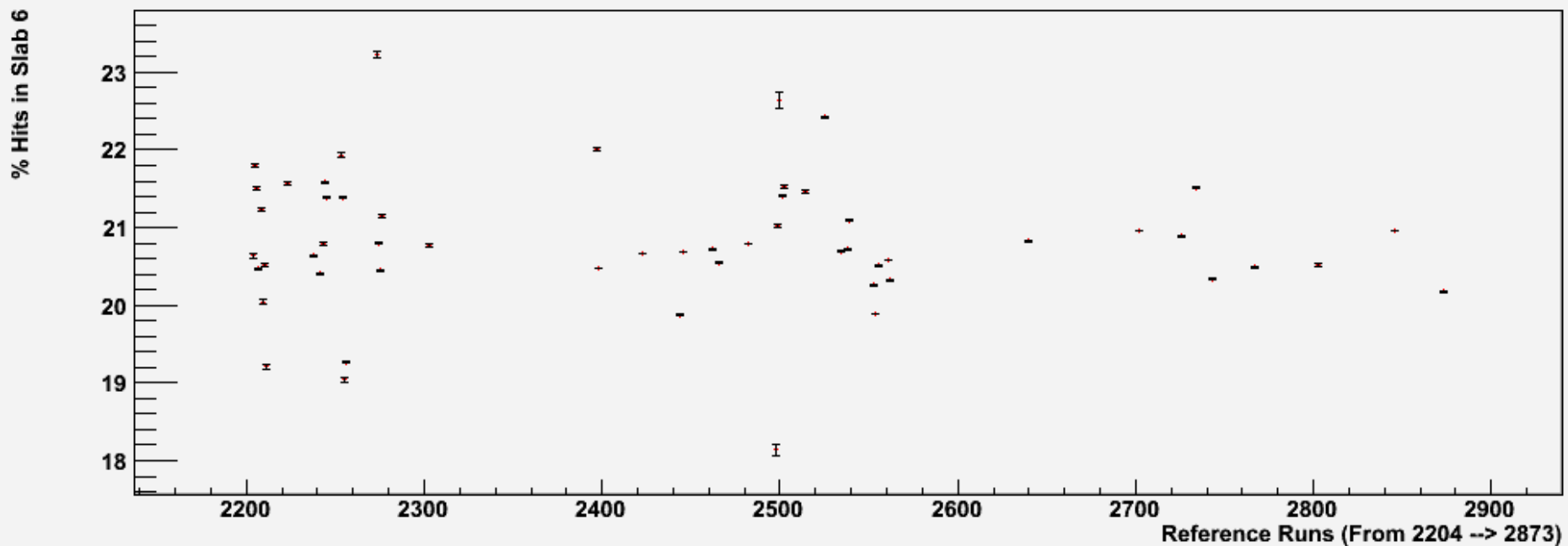


Tof0, X Plane, % Hits in Slab 6



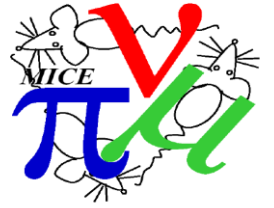
Tof1, X Plane, % Hits in Slab 6





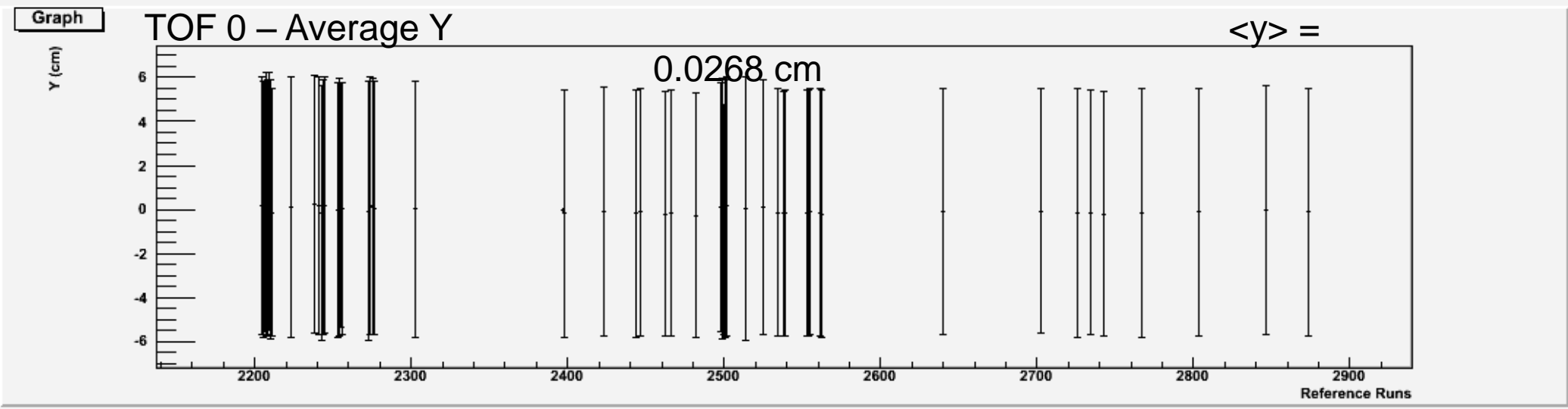
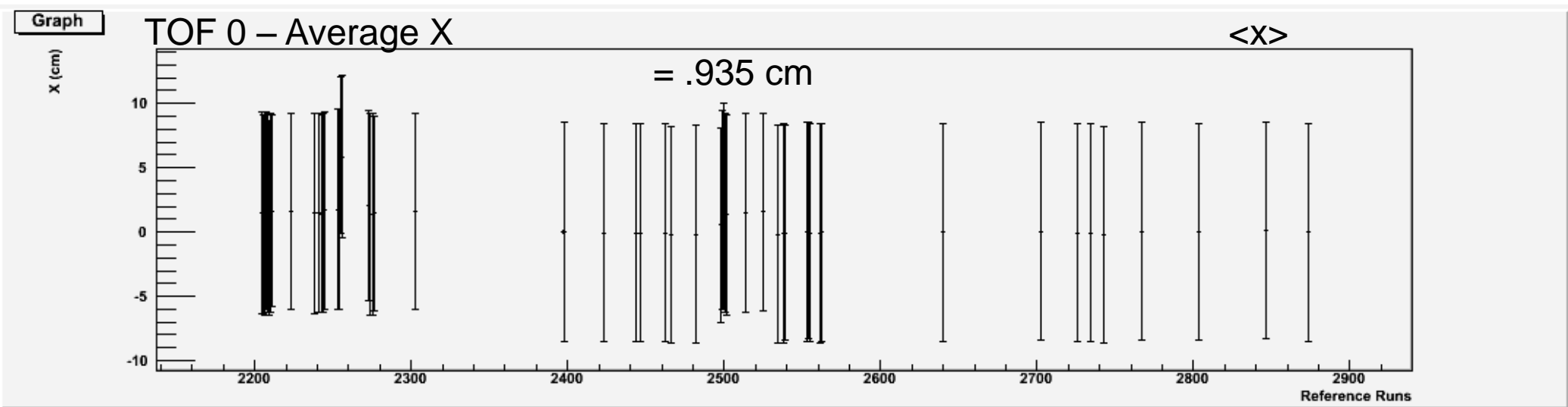
- Overall, %'s seem rather stable, with a few extremes
- Difference between positive and negative polarity is an ongoing investigation
- This effect seems to diminish by the time we get to TOF 2

# X – Y Position and Spread

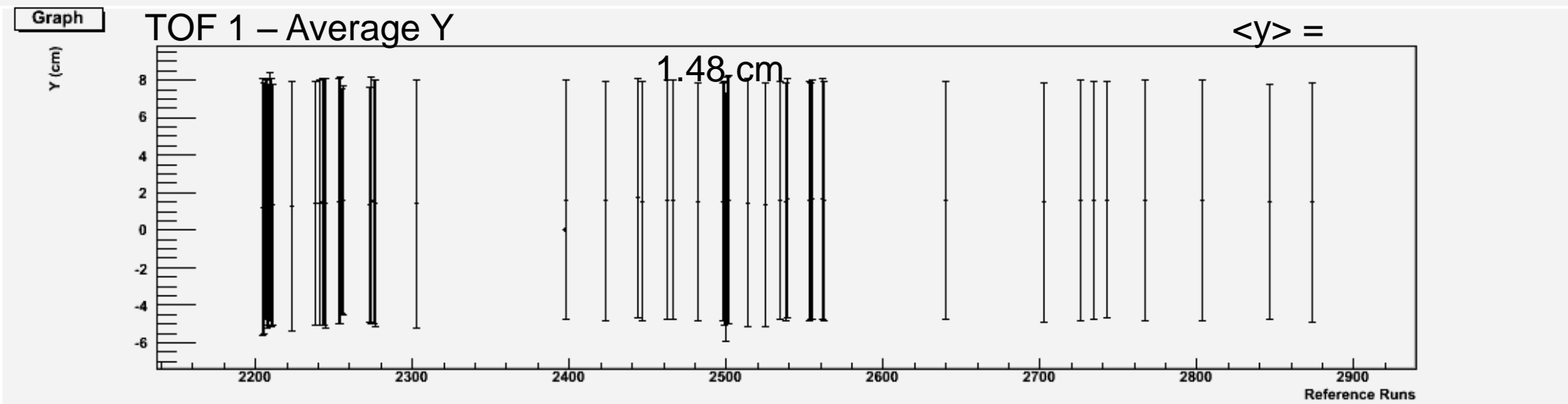
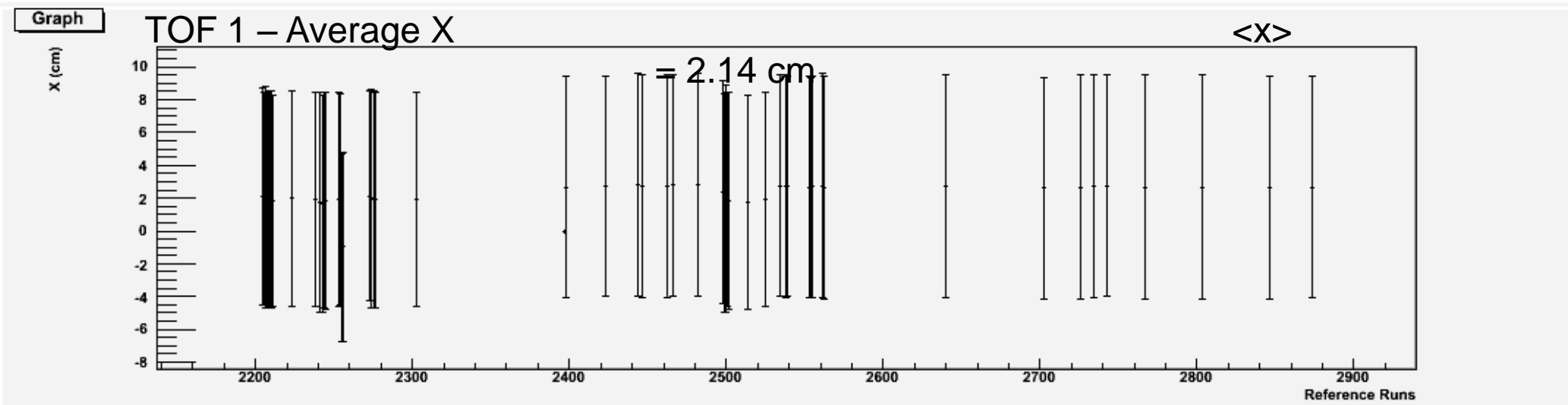


- Un-reconstructed data; therefore dependent on the slab width
- Will notice  $\overline{x}$  is consistently off-zero, whereas  $y$  is fairly centered
  - This is the opposite of what we see when reconstructing the phase space using ToFTrace
    - How it was discovered ToF1 was not in correct position
- Again, will notice slight change between positive and negative polarity in ToF 0 and ToF 1

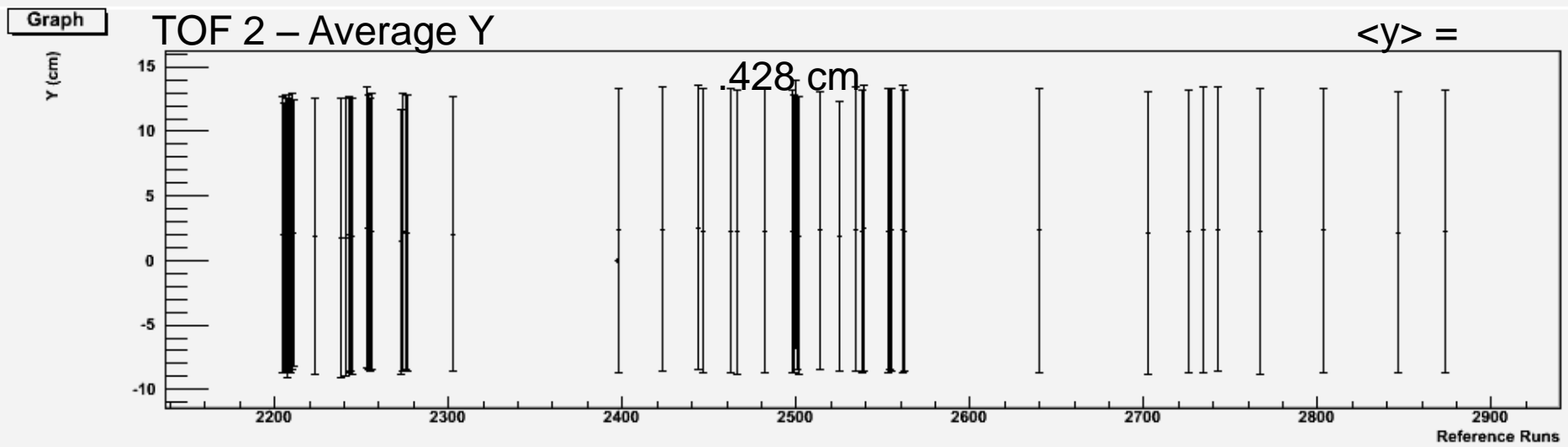
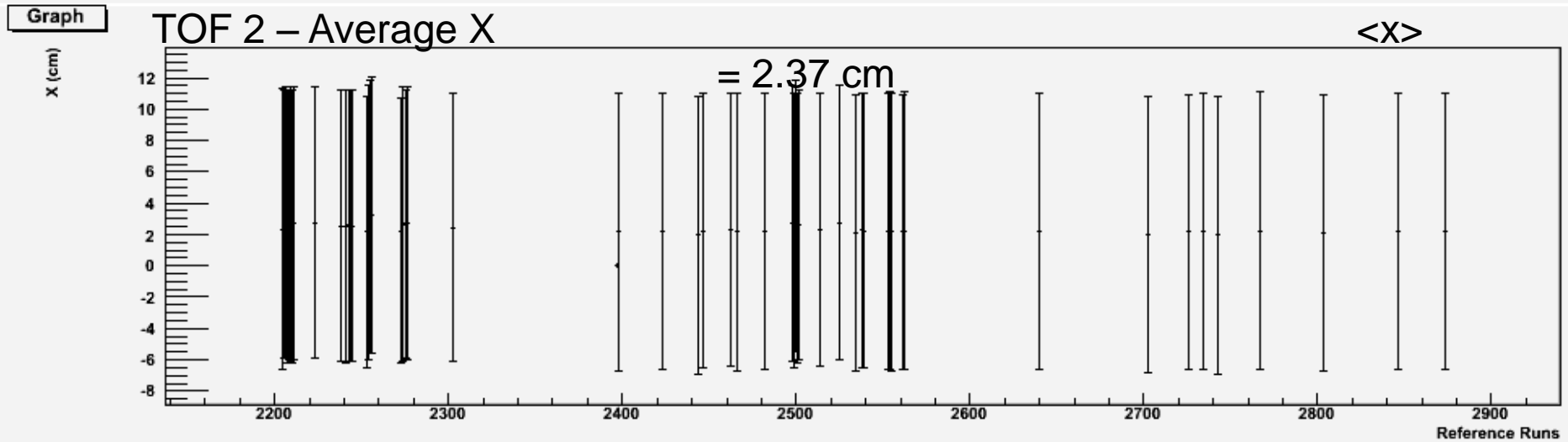
# TOF 0 X – Y Position and Spread



# TOF 1 X – Y Position and Spread



# TOF 2 X – Y Position and Spread



# Conclusions



- fADC hits

- Most of the PMT's see less than 5% fluctuation over all of the reference runs. However, there are some cases where there is large fluctuation. Whether this is *significant* or not is something to be determined.
- Some of the PMT's receive more signals than their counterparts. This difference is steady throughout the runs, and again its *significance* is TBD

- Slab Hits

- Similar to statement above: Some of the slabs see a large fluctuation in hits, but in general it seems pretty steady (except for a few random points that are way off).
- Difference in positive and negative polarity consistent with others' analysis, and seems to be corrected by the time we reach TOF 2





Thank You

