

# Two towers preliminary report

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TKR studies with one side readout for two towers configuration

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# Outline

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Some interesting TKR plots:

Compare distributions for selected events in 2 Towers when the TKR is read out by left (135002057) or right (135002103) cables only. Baseline run (135002052) is used by reference.

Hit multiplicity

TOT

DeltaTime

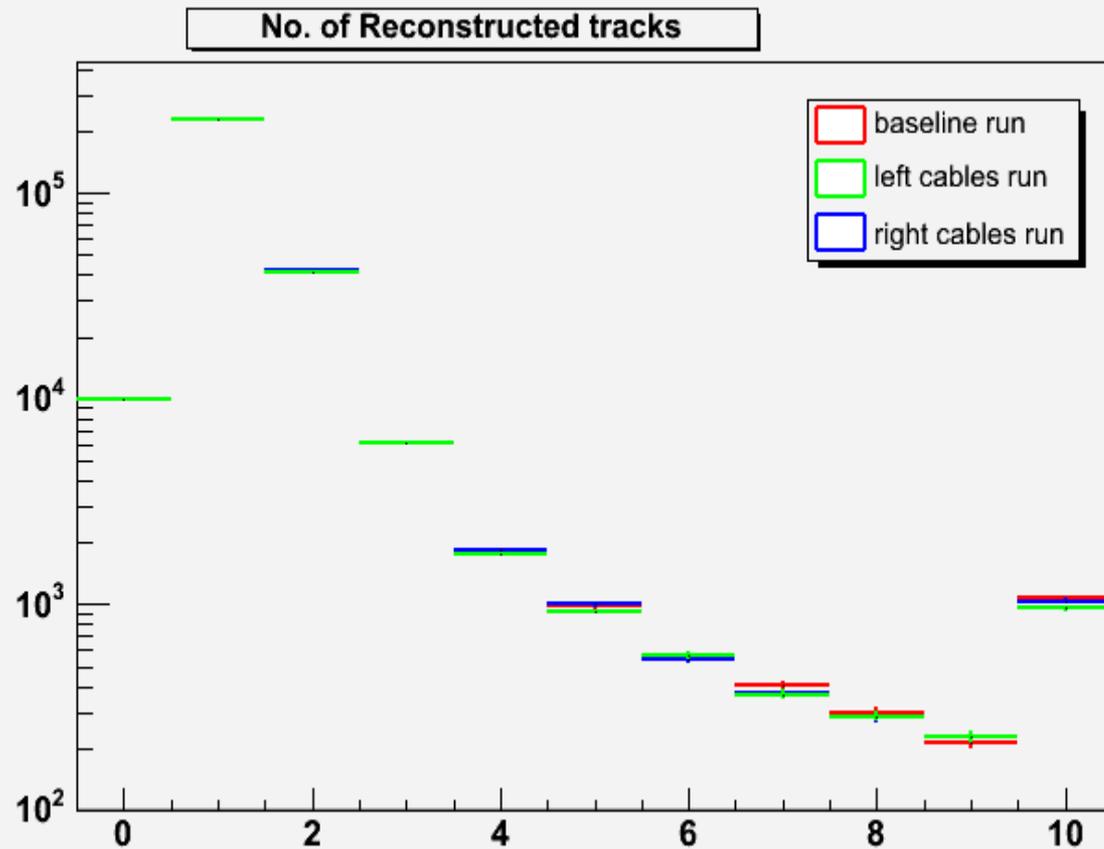
.....

# Two towers runs info (no cuts applied)

<b>Runs</b>	<b>Events</b>	<b>% 0 track</b>	<b>% 1 track</b>	<b>% 2 tracks</b>	<b>% More than 2 tracks</b>
<b>Baseline run 135002052</b>	<b>293710</b>	<b>0.034</b>	<b>0.78</b>	<b>0.14</b>	<b>0.04</b>
<b>"left" run 135002057</b>	<b>291861</b>	<b>0.034</b>	<b>0.78</b>	<b>0.14</b>	<b>0.04</b>
<b>"right" run 135002103</b>	<b>292092</b>	<b>0.034</b>	<b>0.78</b>	<b>0.14</b>	<b>0.04</b>

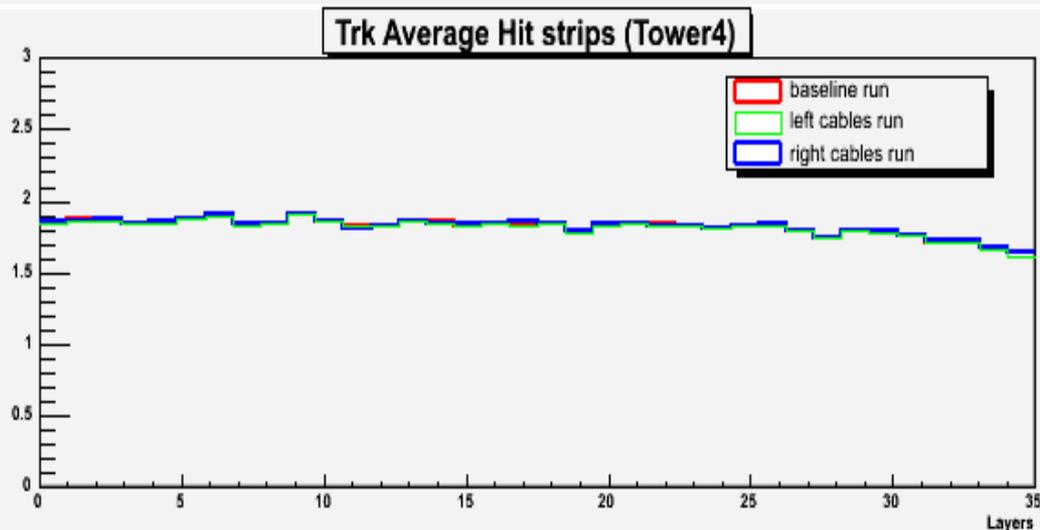
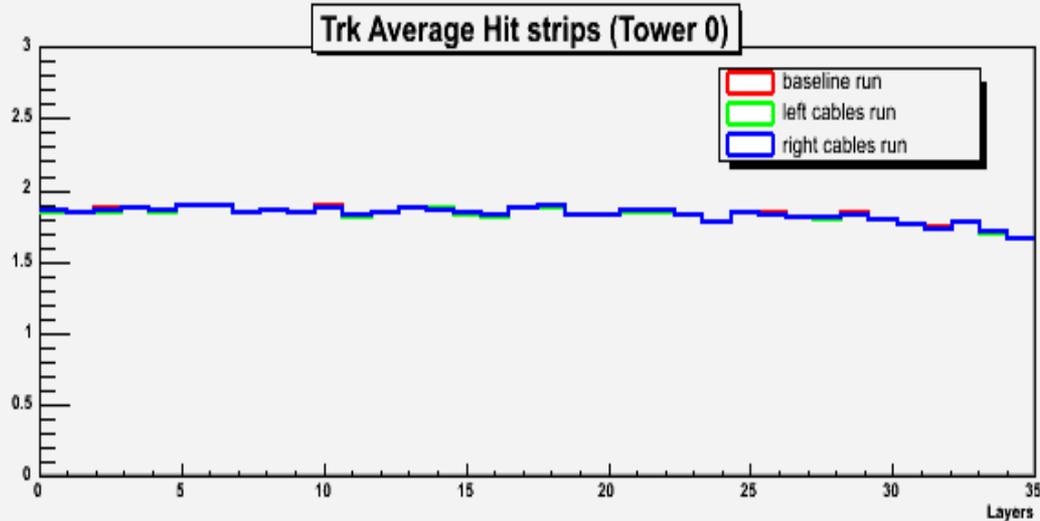
Ratio of events with different number of reconstructed TKR tracks<sup>3</sup>

# Number of reconstructed tracks for "right/left" runs and baseline run



All trigger types  
No cuts applied  
Events triggered by  
Tower 0 AND/OR Tower 4

# Average number of hit strips per layer "right/left" runs and baseline run



All trigger types  
No cuts applied  
No event selection  
(Tower 0 AND Tower 4)

# Events selection

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Events triggered by TKR in Tower0

Cut1 = GemTkrVector[0] == 1 && GemTkrVector[4] == 0 &&  
GemCondWord == 2 (< 50% of events selected)

Cut2 = Cut1 + TkrNumTracks == 1 (40% of events selected)

To select MIPs we used the CalMIPRatio variable from merit root files

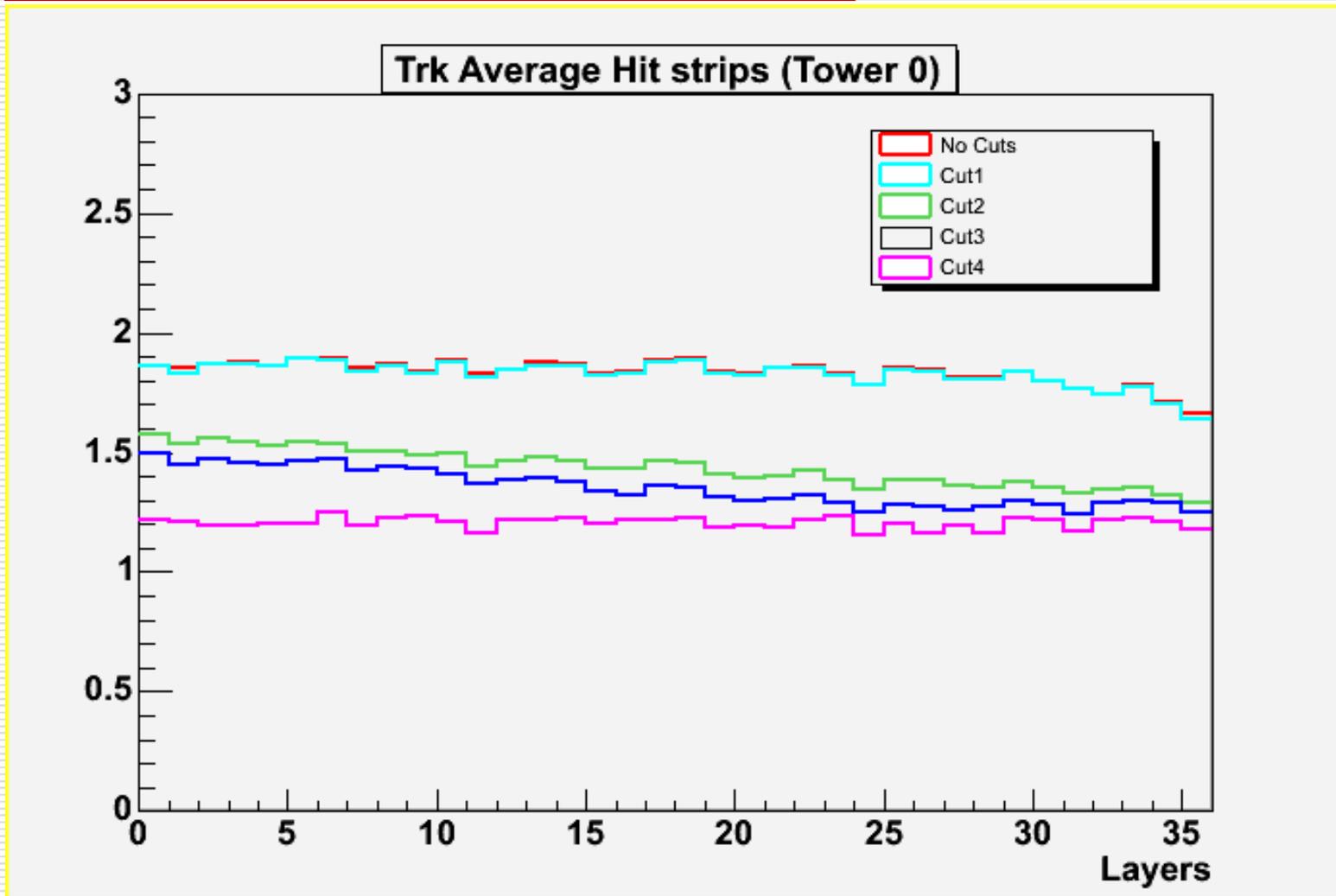
Cut3 = Cut2 + (CalMIPRatio < 1.3 && CalMIPRatio > 0.6)  
&& CalNumHit[4] == 0 (10% of events selected)

Normal tracks selected

Cut4 = Cut3 + VtxZDir < -0.95 (3% of events selected)

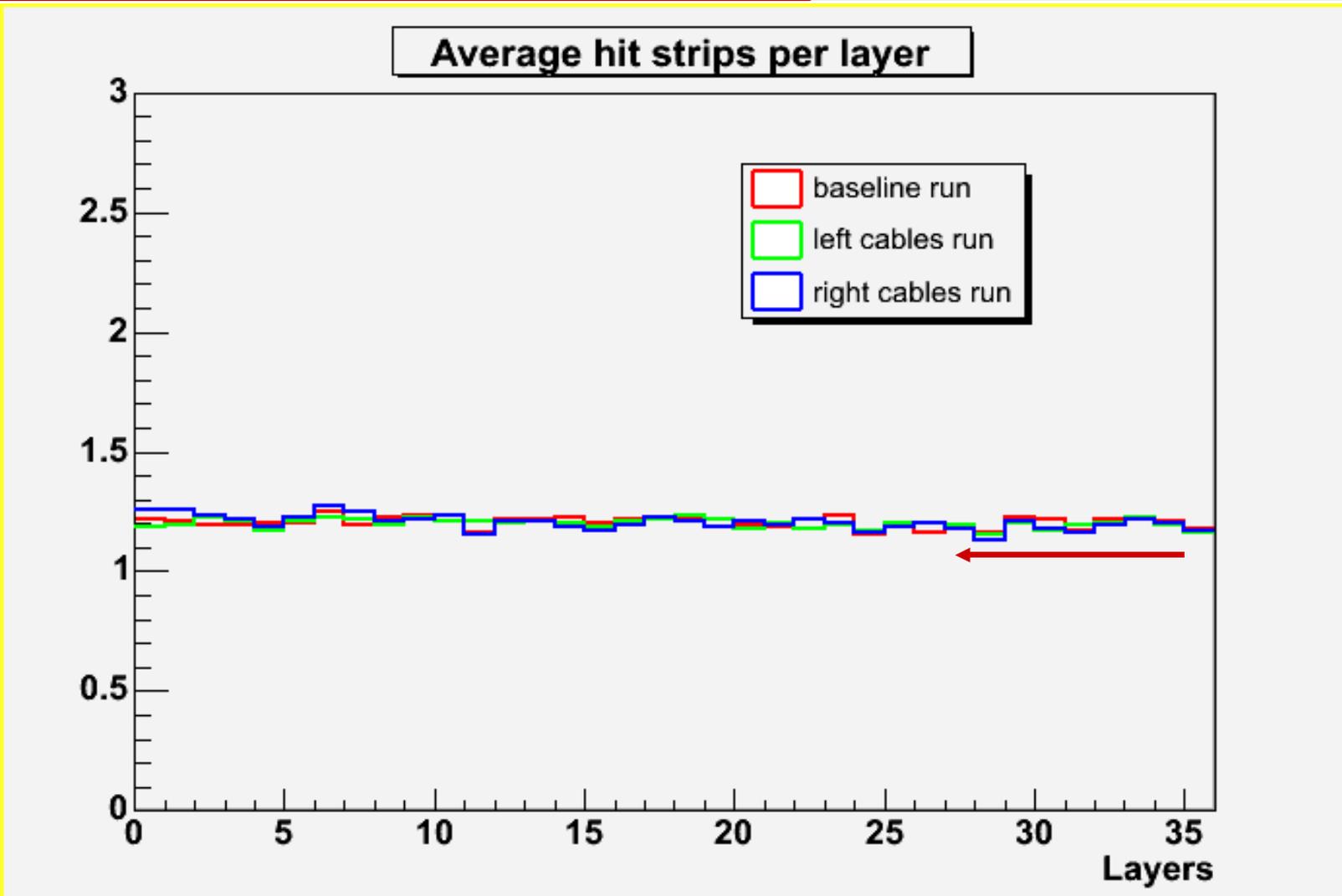
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# Average number of hit strips per layer in **baseline** run vs Cuts applied

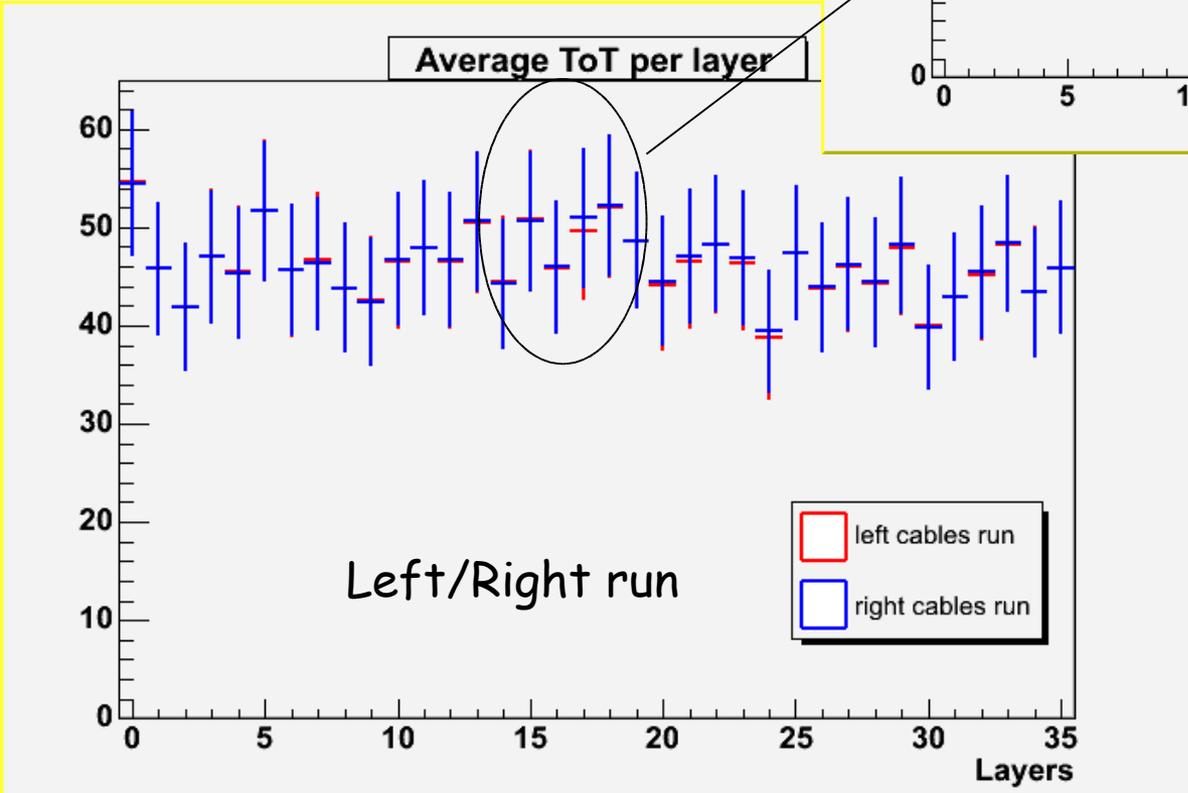
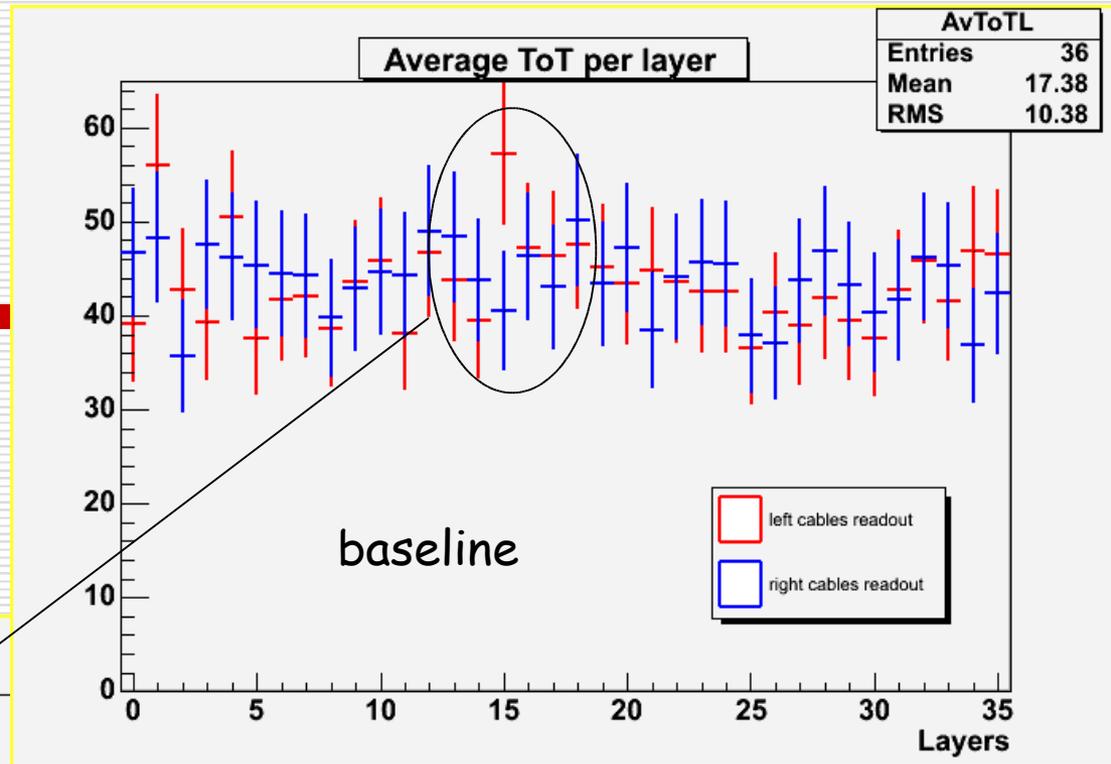


Average number of hit strips per layer: "right", "left" runs and baseline run.

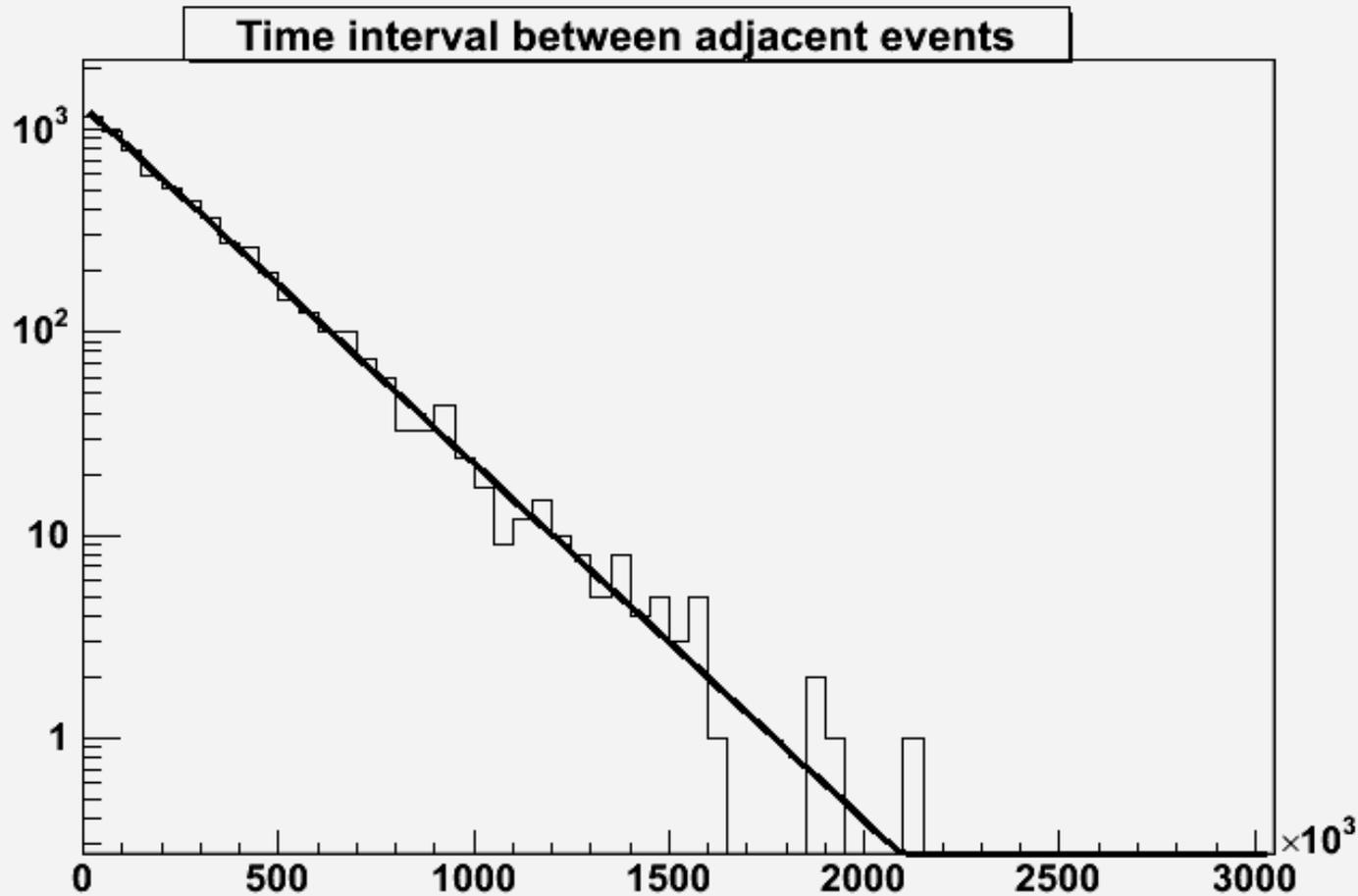
Normal tracks selected ( $cut4 = cut3 \ \&\& \ V_{txZDir} < -0.95$ )



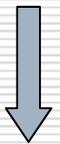
# Average ToT (uncorrected) per layer



# Delta Time between adjacent events (EvtTicks ... unit 50 ns)

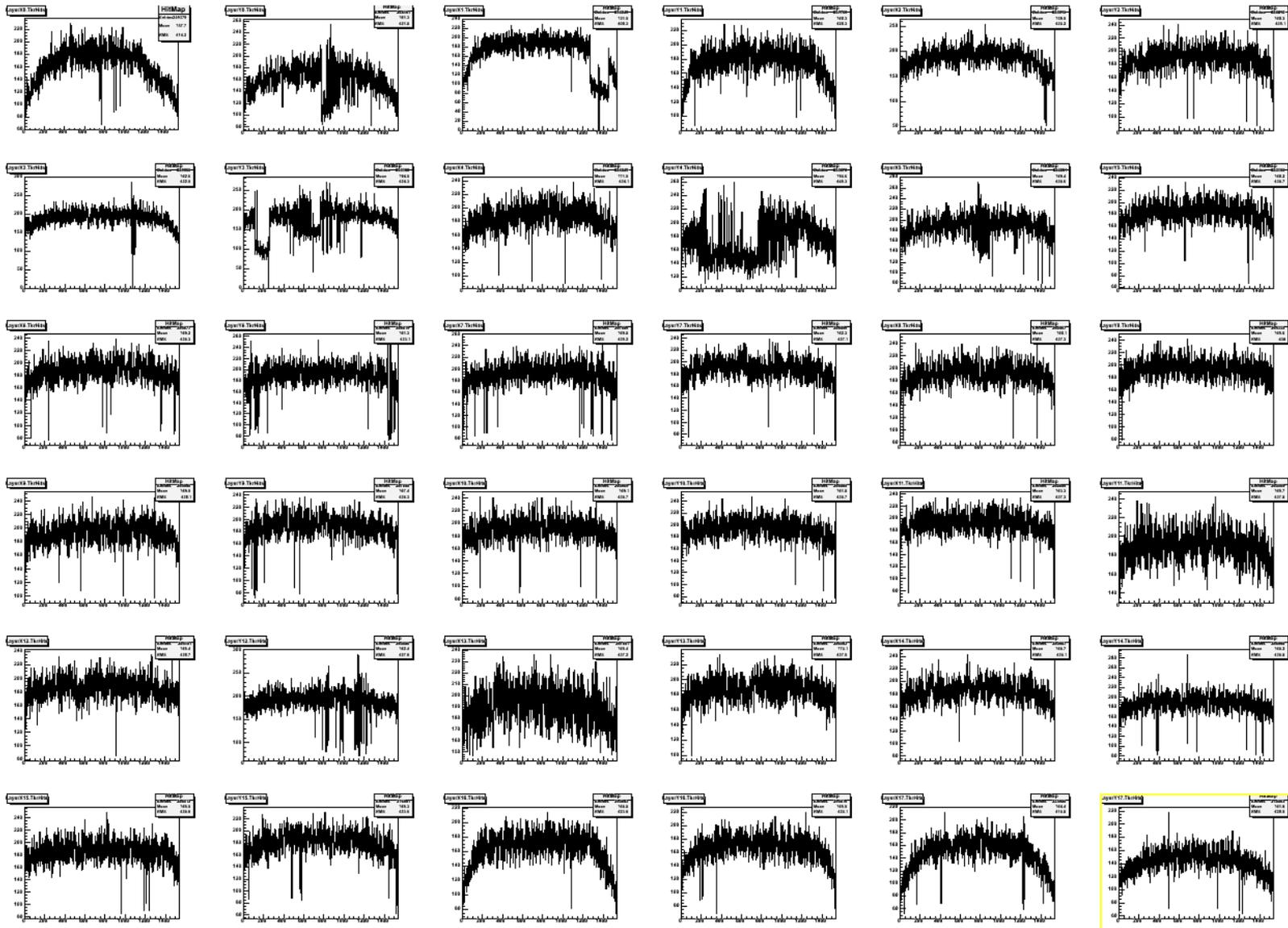


Slope:  $4e-6$

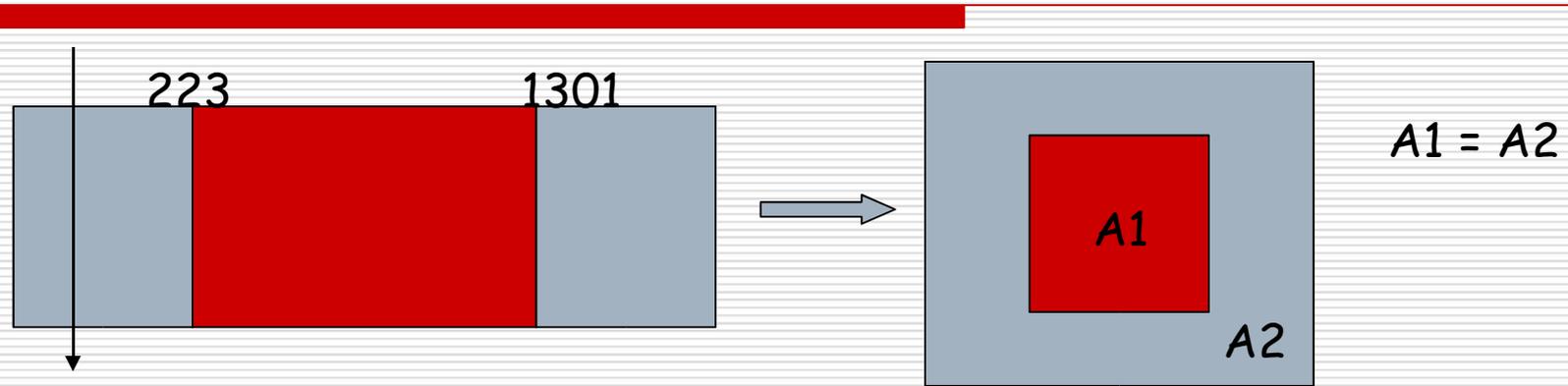


about 80 Hz

# The Hit Map before the cuts



# How to select central and edge events



Vertical tracks selected

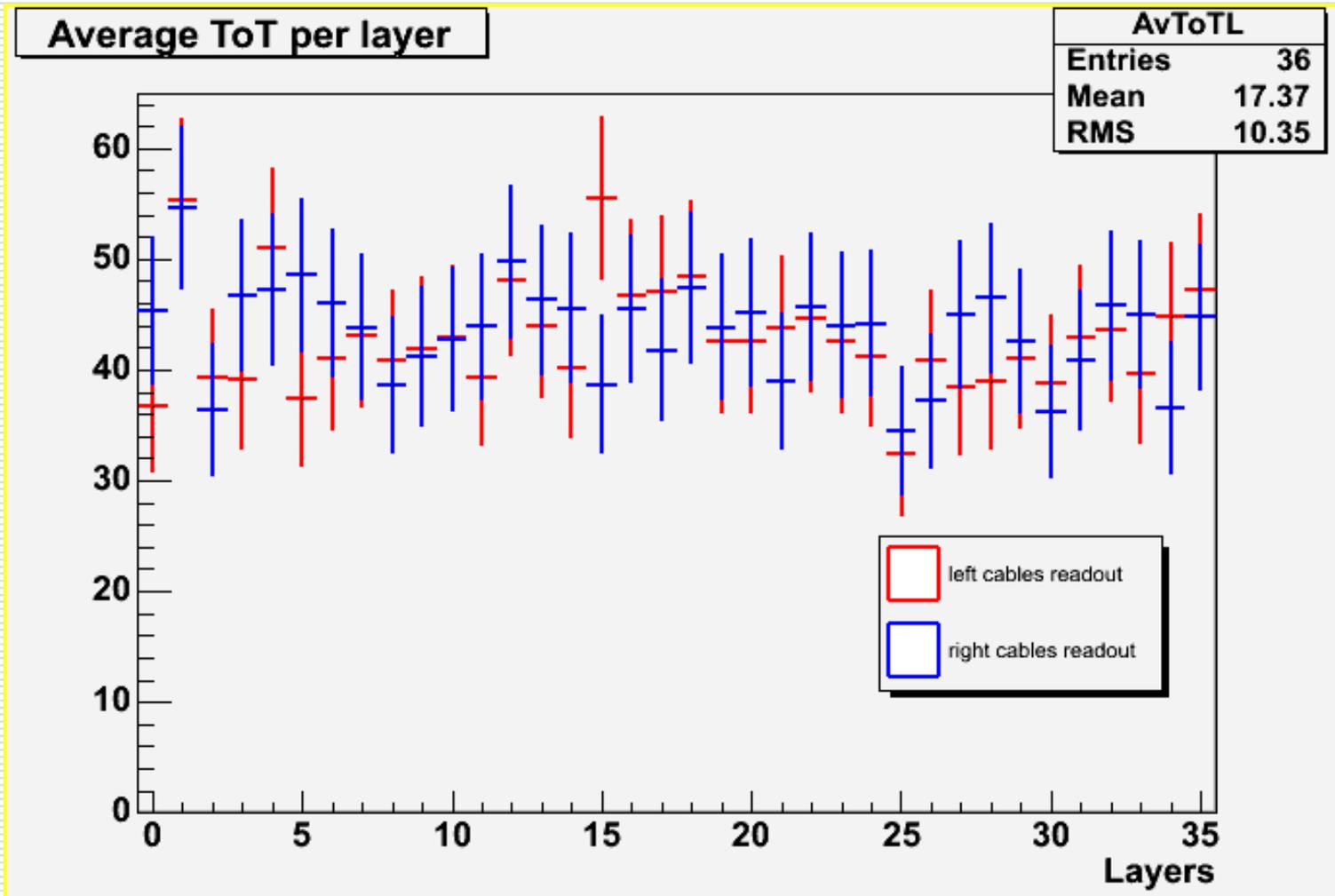
If  $\text{TkrHitNum} > 223 \ \&\& \ \text{TkrHitNum} < 1077 \rightarrow$  central event

If we have more than one hit strip into the layer, we take the average

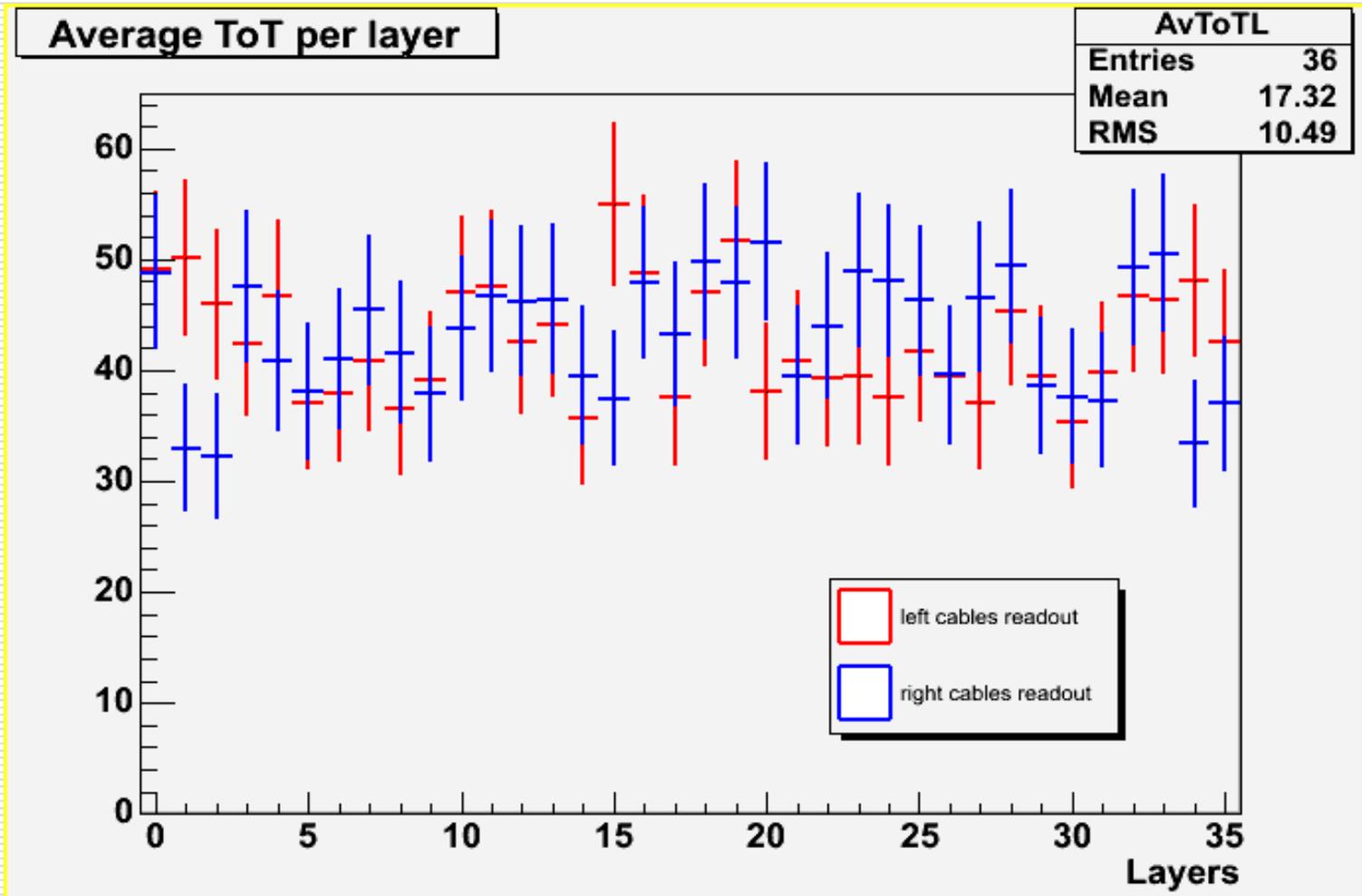
We verified the condition the first and the last layer crossed

Otherwise edge event

... when the cuts are applied and  
"central" events selected for baseline run



... when the cuts are applied and "edge" events selected for baseline run



# To do

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Analysis for "central" and "edge" events to be completed (Tkr plot for baseline and left/right readout runs)

MIPs selection studies .. to be continued  
i.e. Hits out of the tracks must be taken into account ...

ToTs studies vs  $\cos\theta$  and  $\varphi$