

Waveform Summing Methods Update 2

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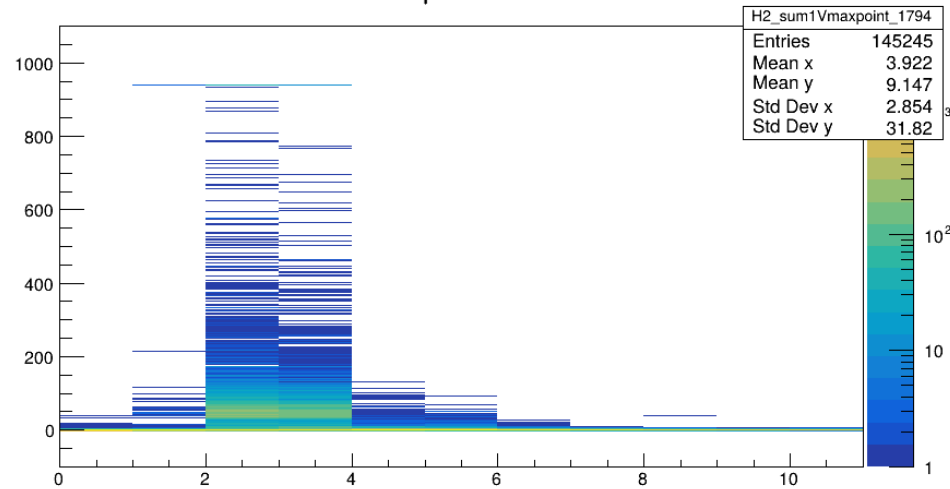
ePIC LFHCAL Test Beam Analysis Meeting

Goals/Recap

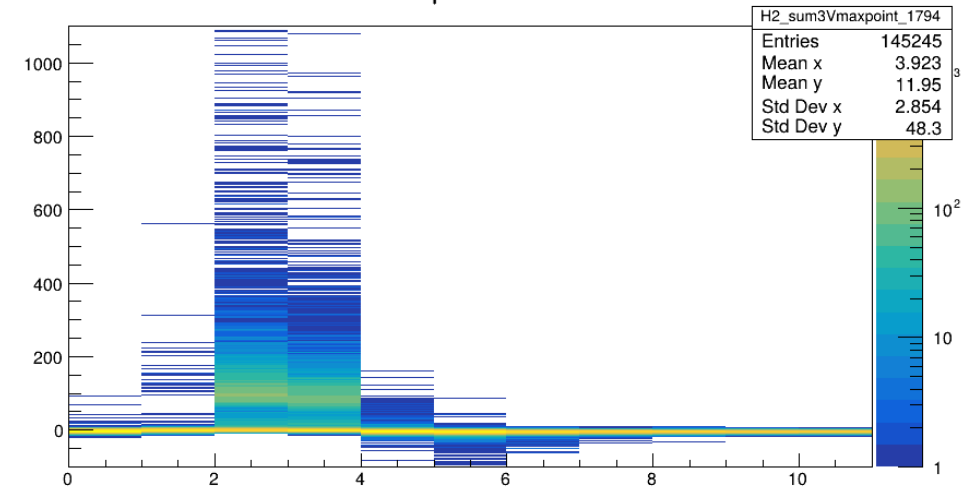
- To understand the effects of different summing methods
 - Run 266 from SPS (Pedestal 264), same as last update
 - Looked at various summing methods from single cellID 1794 (same as last update): Max, Max $\pm$ 1 (Sum3), Max $\pm$ 2 (Sum5), All
- Concluded that MIP shape from different summing methods are roughly the same
- Pedestals looked very different
 - Expected better resolution with higher summing methods but cross talk could be contaminating signals
- Concluded that MIP maximum was occurring at same sample number for this cell and run so need to understand cross talk effects
 - Maximum occurred at 2 or 3
- This update look at sums around sample number of 2
 - Sum3->Sum samples [1,3] (brackets mean inclusive; counting starts at 0)
 - Sum5->Sum samples [1,5]

Sum vs. Maximum position

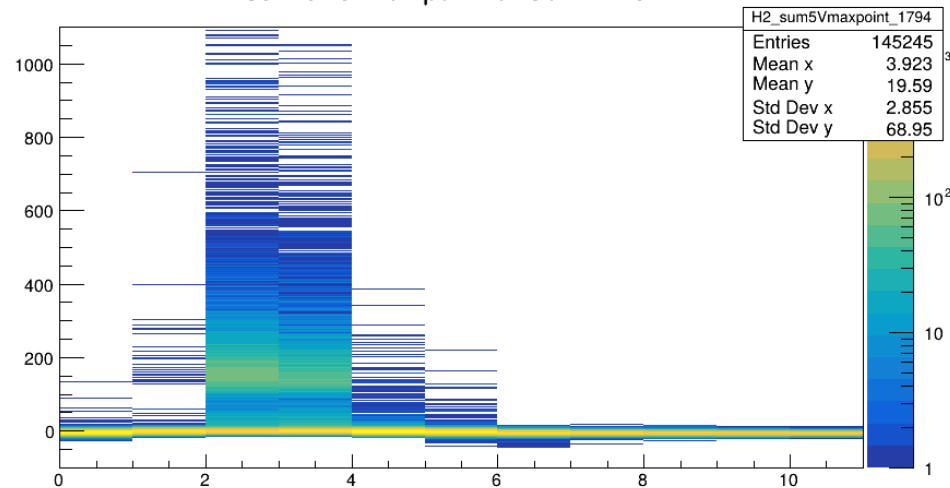
Sum 1 vs. max point for CellID 1794



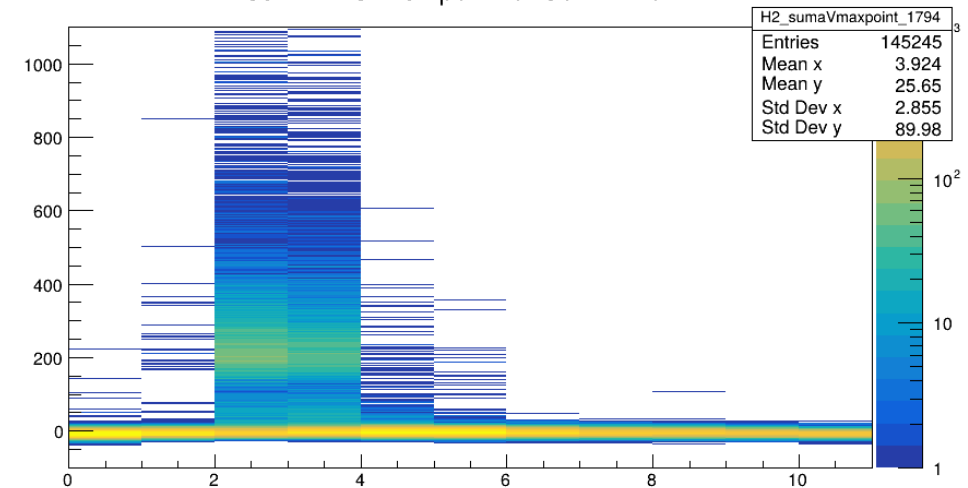
Sum 3 vs. max point for CellID 1794



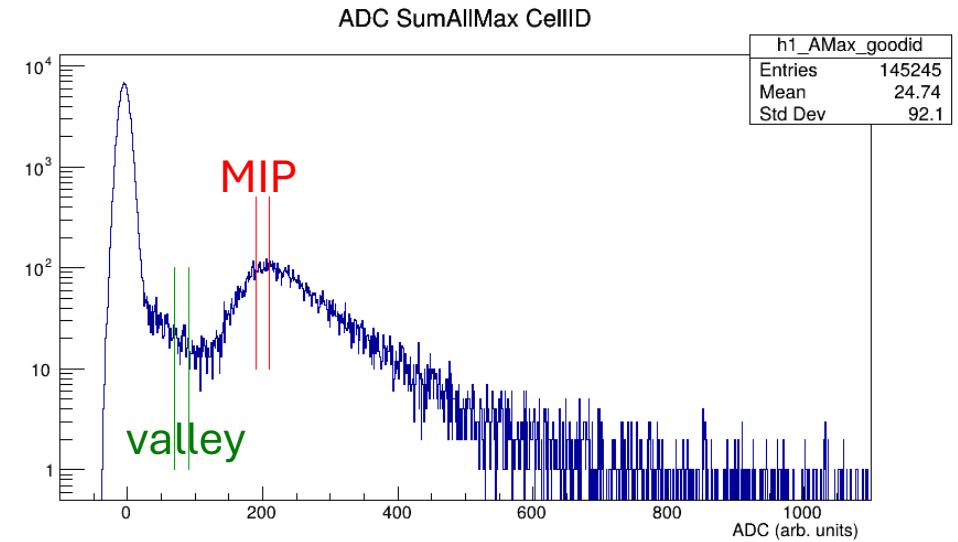
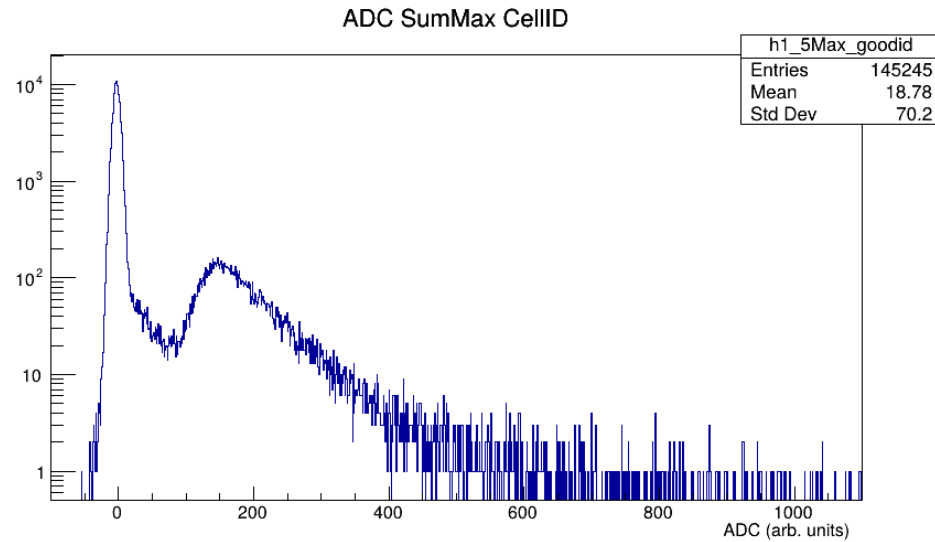
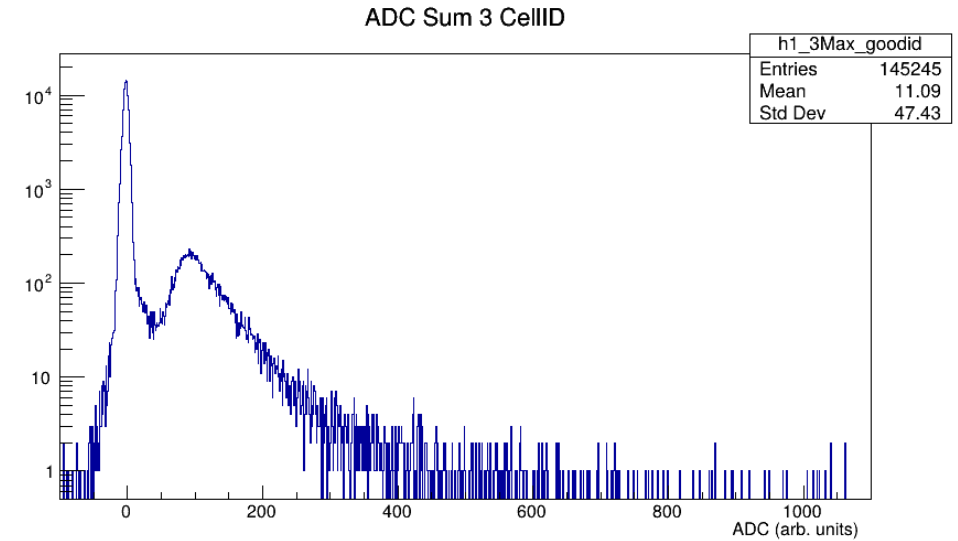
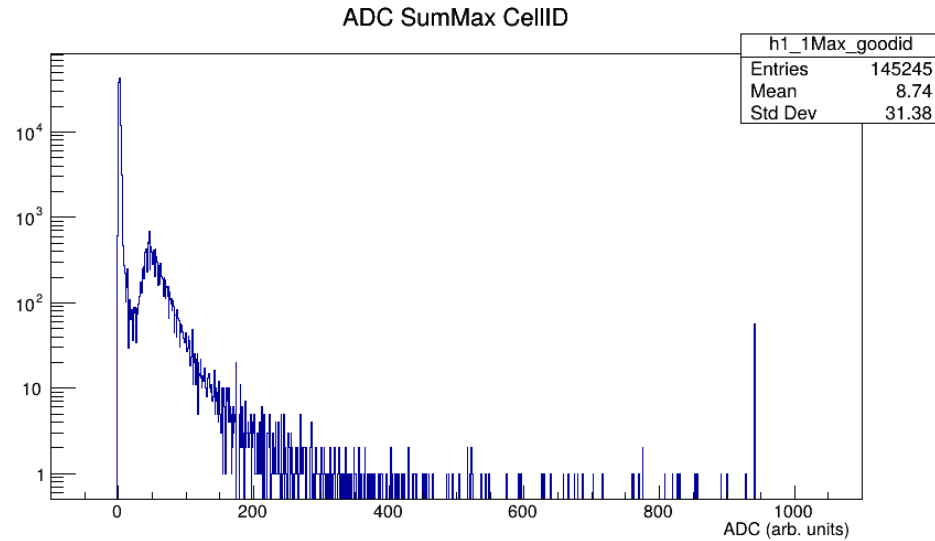
Sum 5 vs. max point for CellID 1794



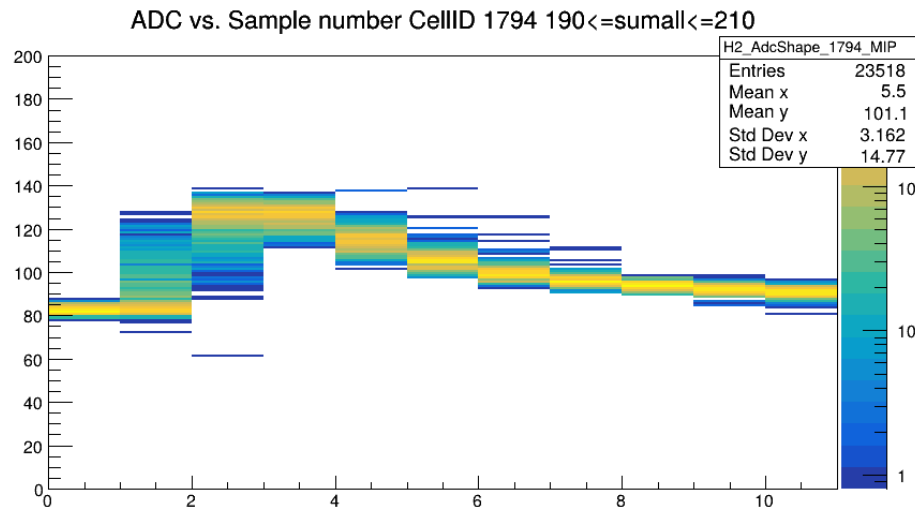
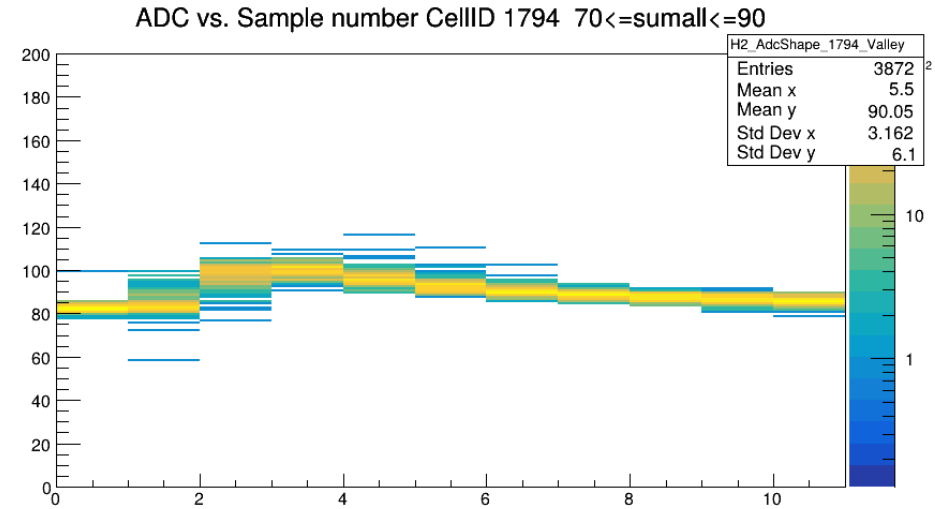
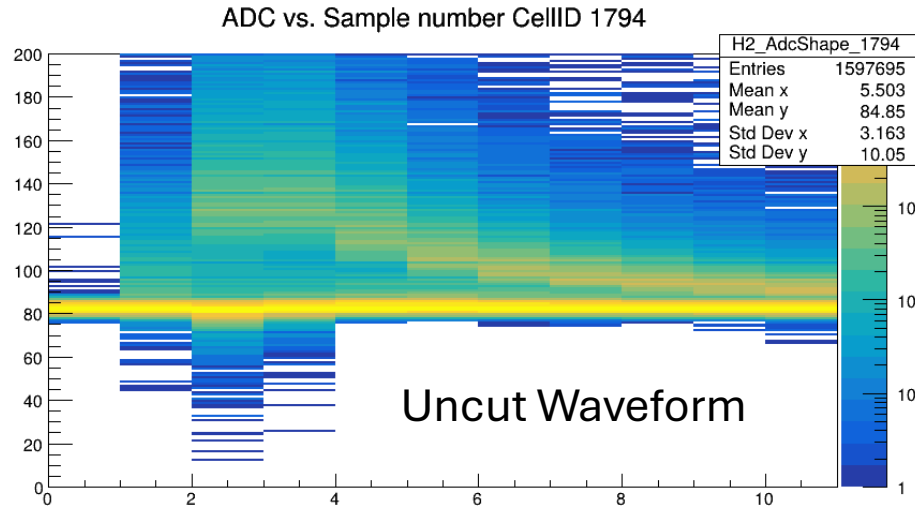
Sum All vs. max point for CellID 1794



Unscaled ADC histograms



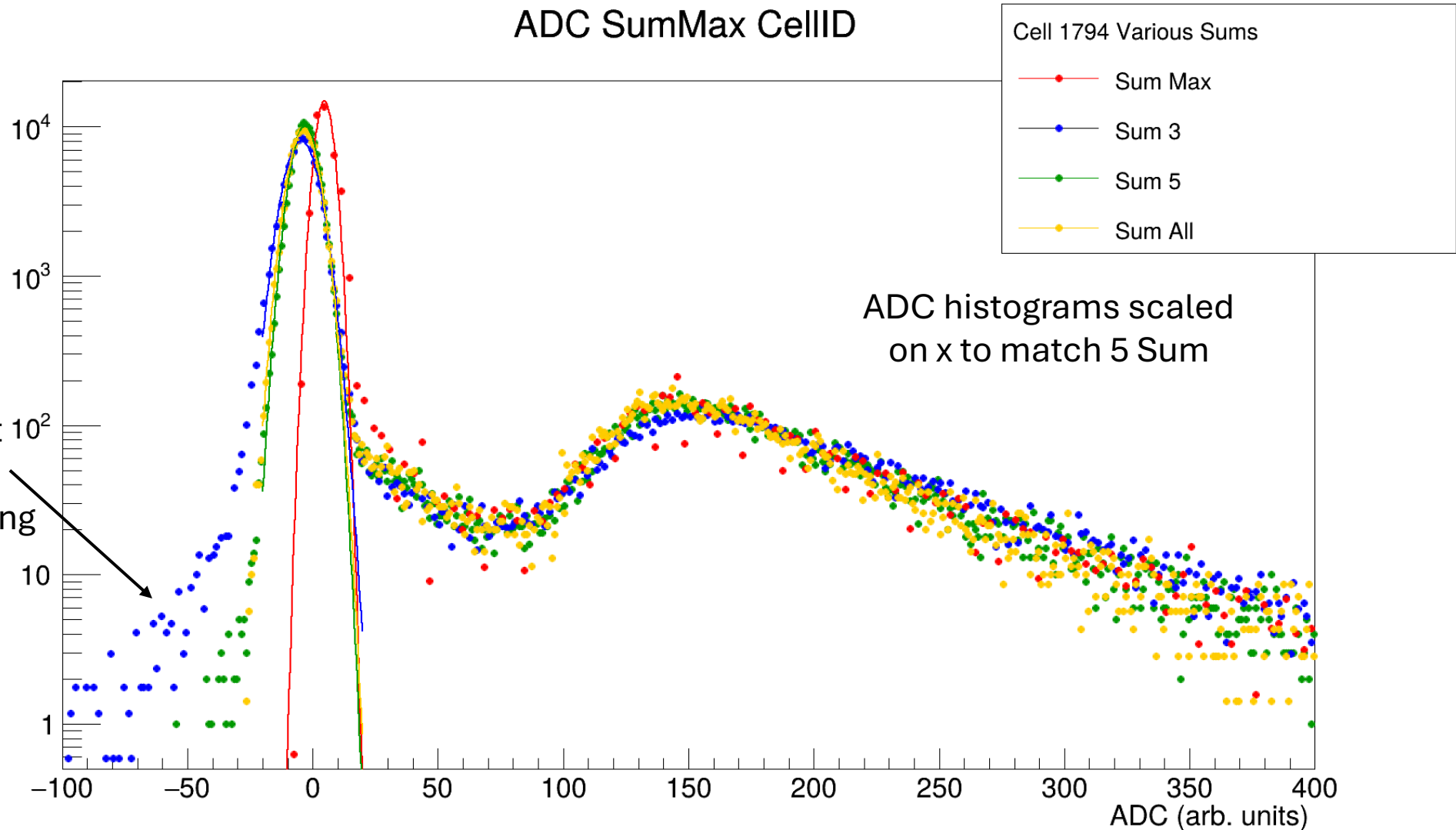
Valley vs. MIP Waveforms



- Is there a qualitative difference here?
- Is what we see in the valley a pedestal?
 - How significant is 20 ADC counts?
- Could cross talk be contributing to “reduced” peak sizes?

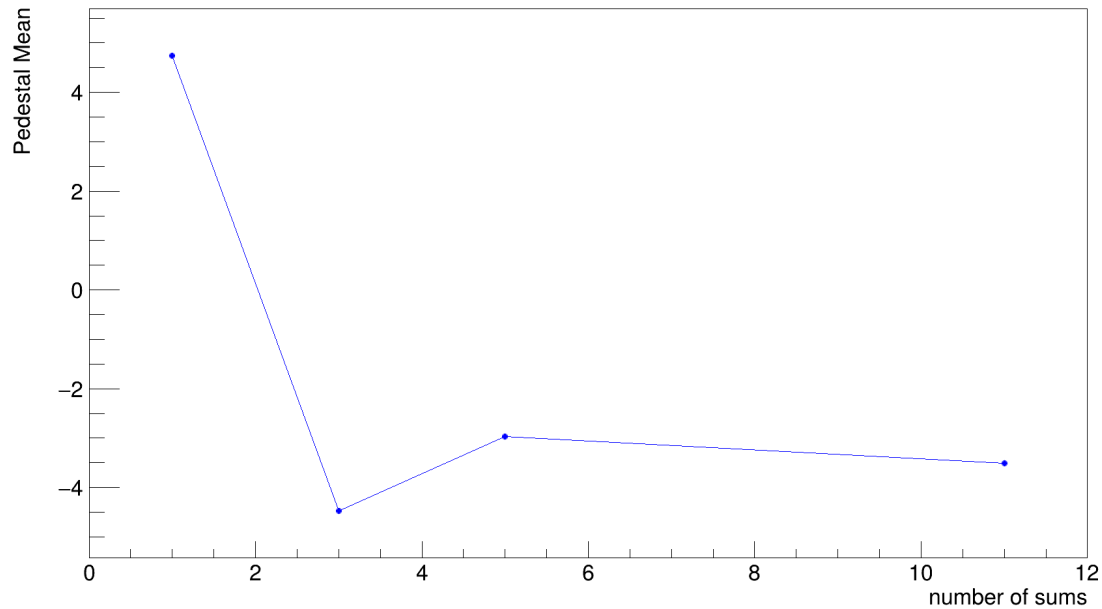
Scaled ADC histograms

ADC SumMax CellID

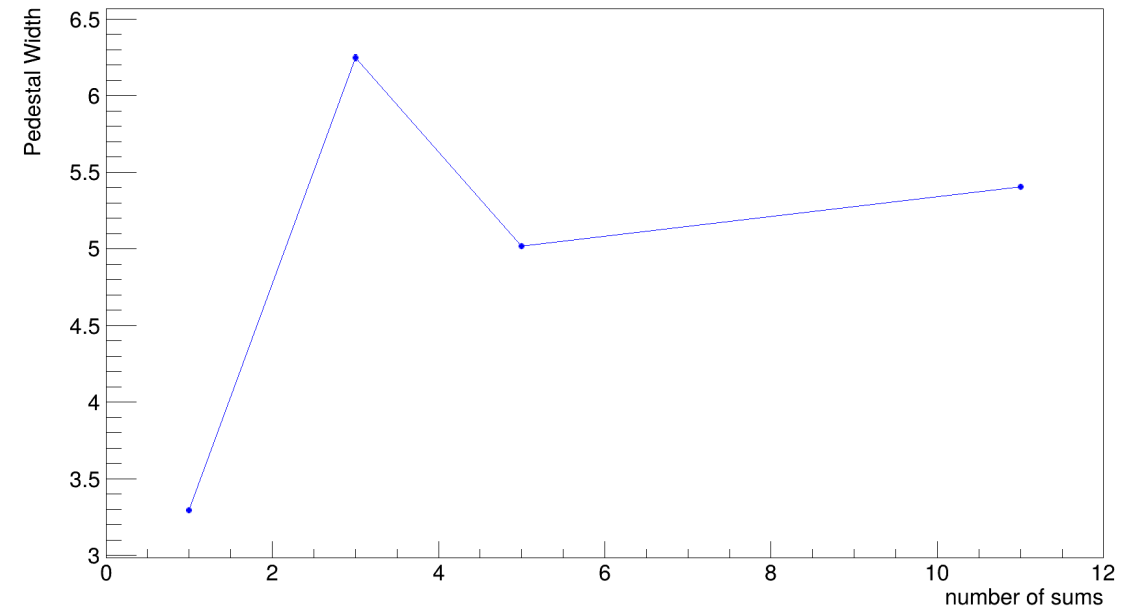


Pedestal Mean and Width from different sum methods

Mean vs. Sum number



Width vs. Sum number



Conclusions

- Fixed sum intervals shows spreading out of the pedestal
- Not much improvement seen over summing methods in last update
- Valley vs. MIP waveforms shows some interesting characteristics