Test of Averaging & Decimation

Test # 02: An Interpolation Approach

The Algorithm

❑ For a pulse, with rising and falling edge, the data is recorded in resync mode without Averaging, then for the same signal with averaging.

❑Since they are recorded in Resync mode, for both data set the entries of a single pulse just after the trigger are expected to be consistent (up to the measured jitter of the ADC).

❑So from “without averaging data set” case one can interpolate(by just taking the arithmetic average) the date set of “with averaging/merging” case.

❑So in the analysis what I did is, on a single canvas I compare the plot for-----

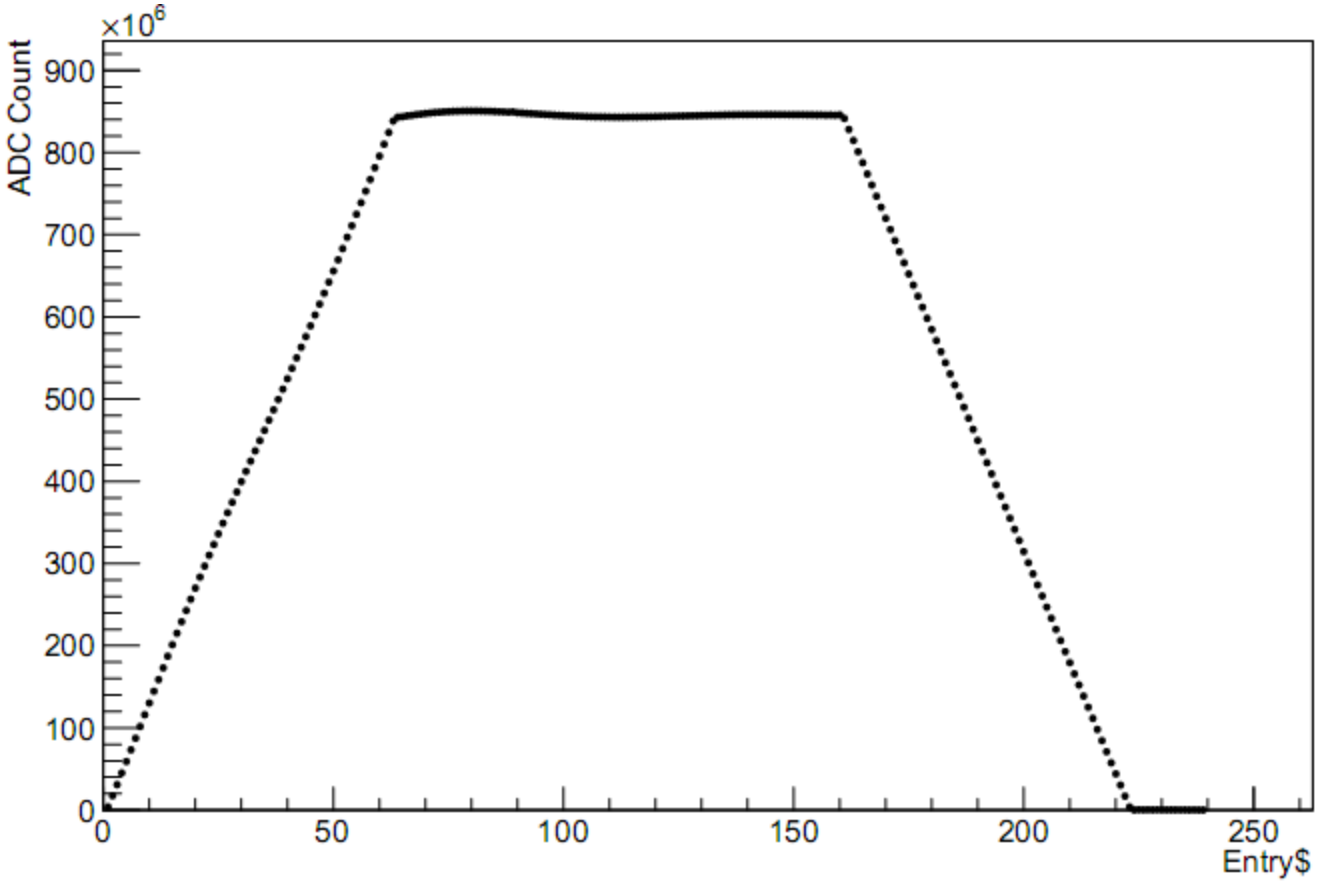
1) The data set without averaging (nacc=1,1 data)
2) The data set with merging four points (nacc=4,4 data)
3) The data set obtained by taking average of four points from first data set/without merge (Interpolated data).

Run configuration:

❑The DAQ is running at 50KHz, hi resolution mode, Resynchronized mode, Triggered on rising edge and configured to take 700 entries per event.

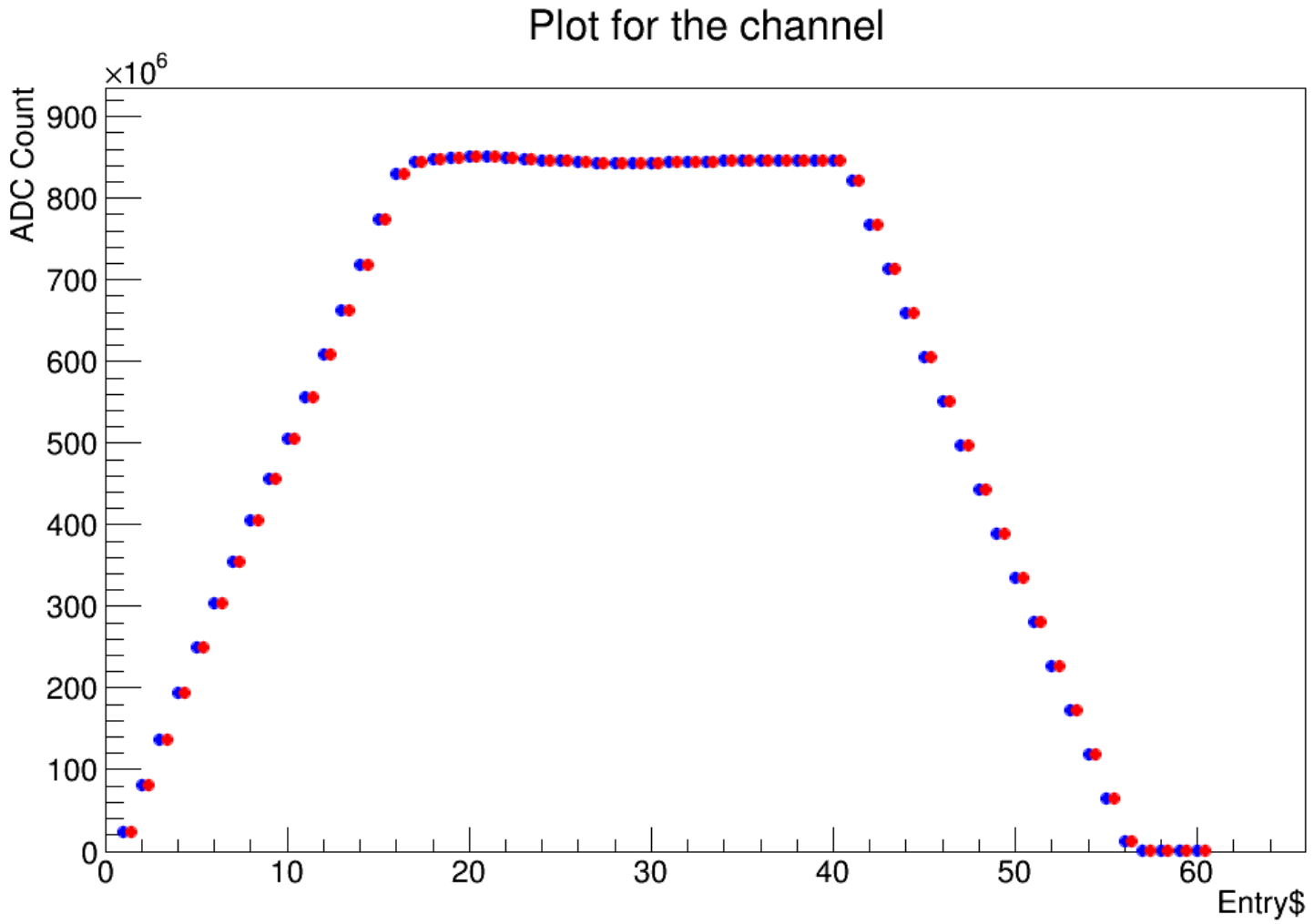
❑Input Signal:60Hz pulse of 4Volt width, with lower value=0V,
Rising edge=falling edge=1ms
Width=3.2ms

nacc-=1,1 data i.e. data without averaging



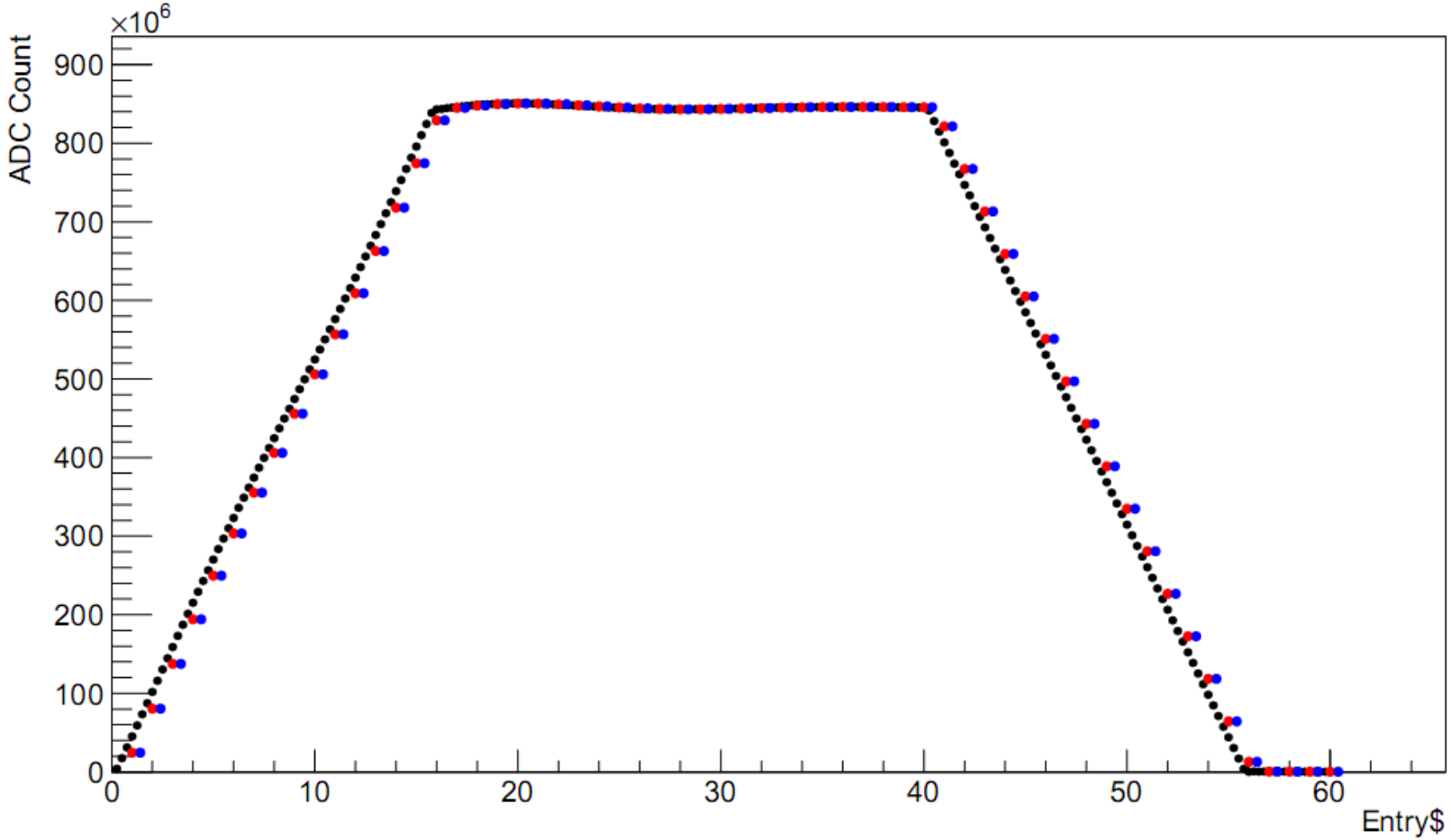
In red circle: nacc =4,4 data
In blue circle : Interpolated data

Note: A tiny X+(+0.4) offset for red points has been added by hand so that we can see both blue and red points.



In black circle: nacc=1,1 data
In red circle: nacc =4,4 data
In blue circle : Interpolated data

Note: A tiny X+(+0.4) offset for blue points has been added by hand so that we can see both blue and red.



X axis Unit:
Blue points: 1 Entry$ = 1 x 1 Entry
Red Points: 1 Entry$ = 1 x 1 Entry
Black Points: 1 Entry$ = 4 x 1 Entry

In black circle: nacc=1,1 data
In red circle: nacc =4,4 data
In blue circle : Interpolated data

If we remove the offset,
the red and blue points
coincide with each other.