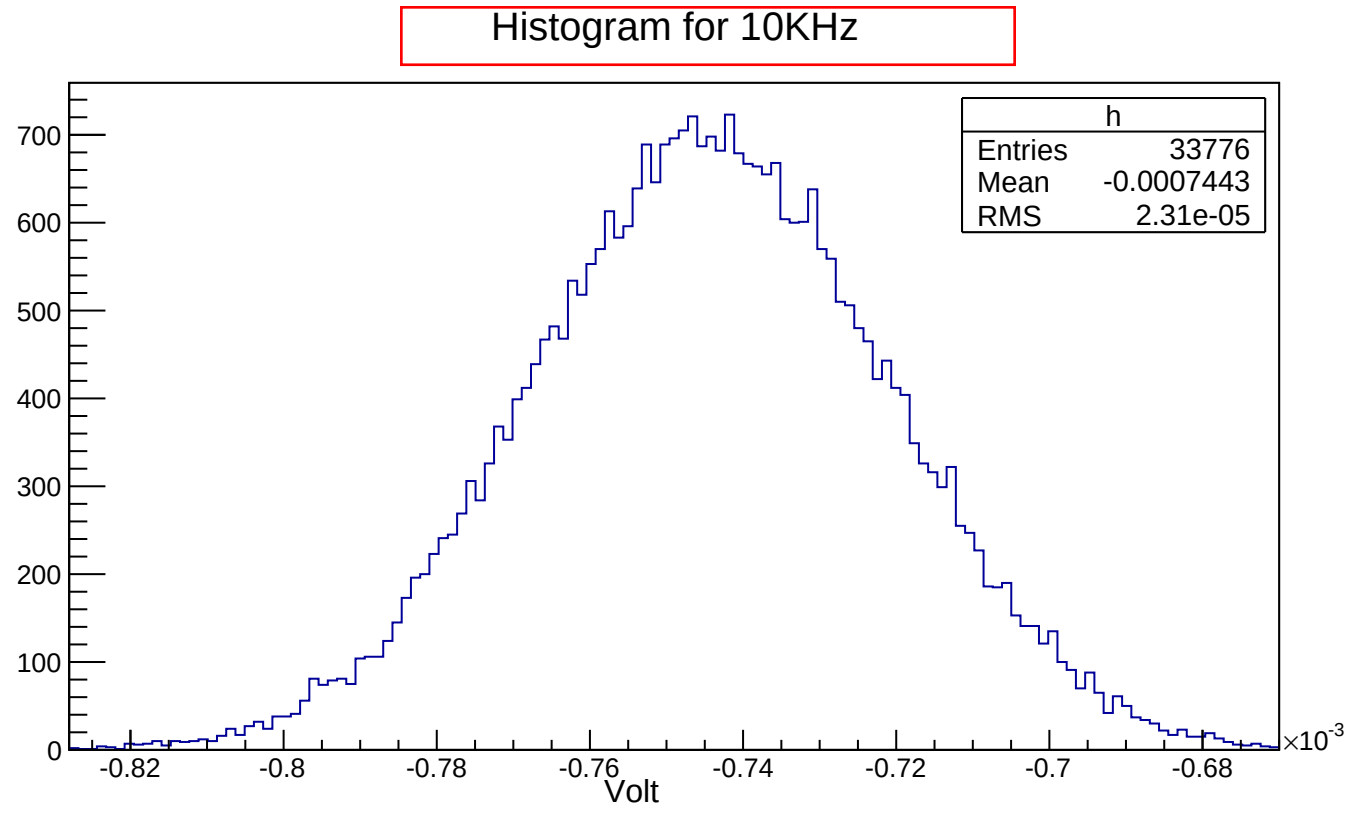
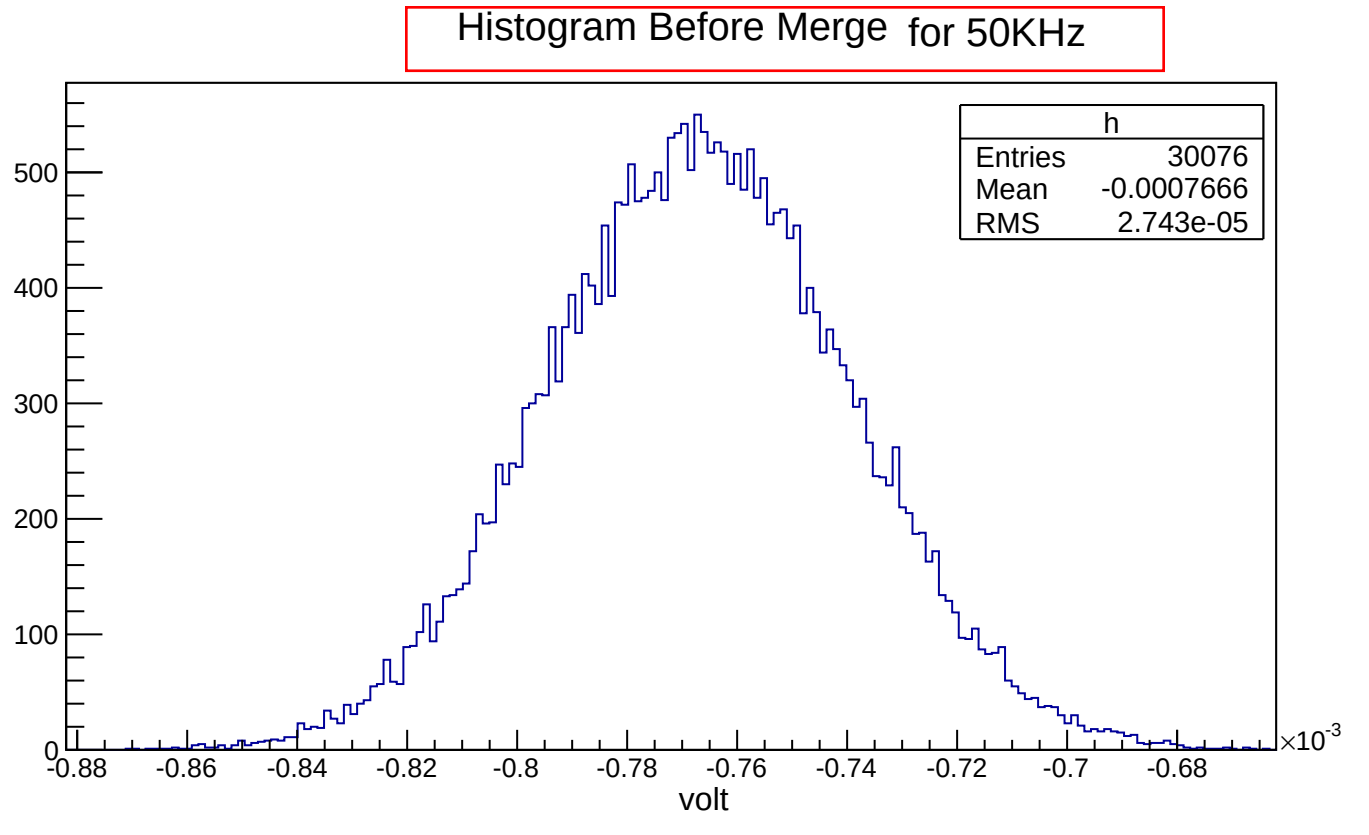
Check if ADC Noise follows Counting Statistics

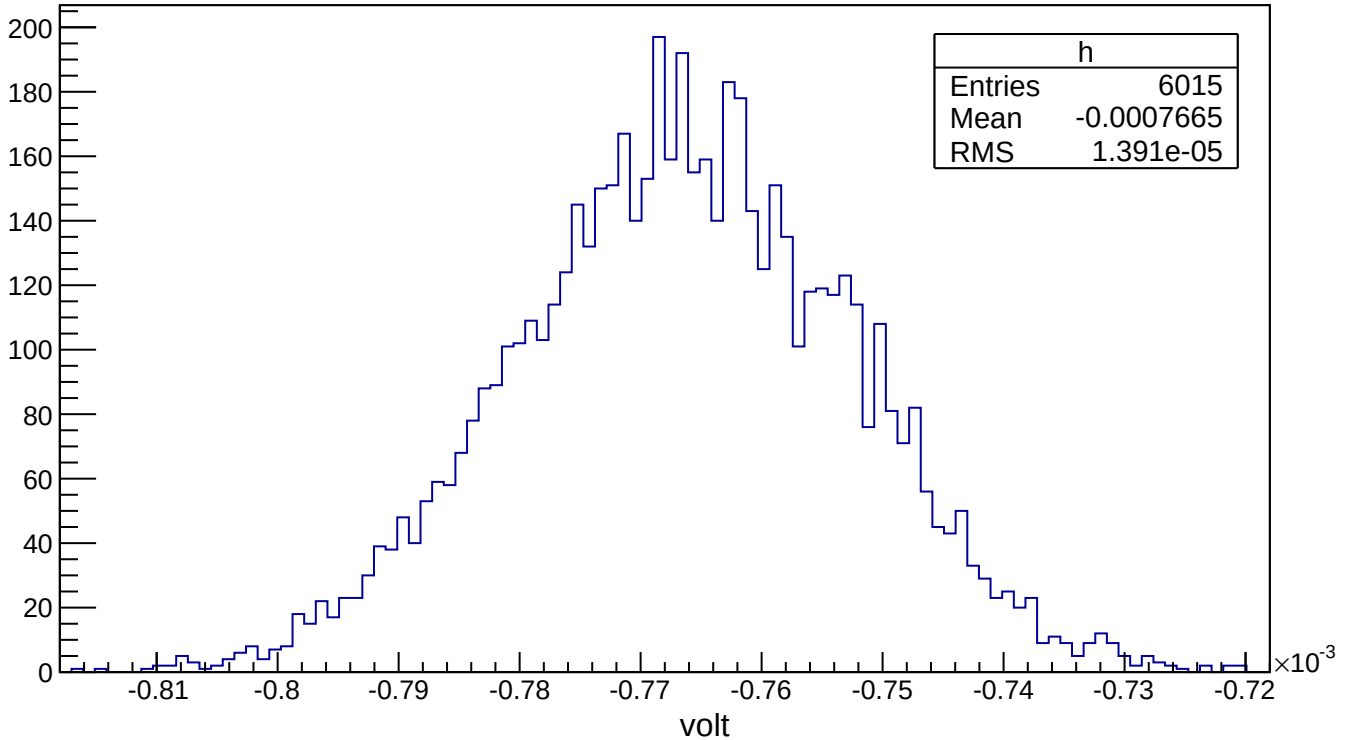
- ADC Noises at 10 KHz and 50 KHz sample rate were measured.
- Then for 50KHz sample rate, 5 successive entries were merged(averaged) to mock 10 KHz sample rate data and RMS vale was calculated.
- The RMS value from merged sample was compared to original 10 KHz and 50 KHz RMS.

Summery:

- ADC noise at 10KHz sample rate = 23.1 micro volt (for 33776 entries)
- ADC noise at 50 KHz sample rate = 27.43 micro volt (for 30076 entries)
- ADC noise after merging 5 entries from 50 KHz rate = 13.91 micro volt (for 6015 entries)
  - Use of counting statistics relation gives = $\sqrt{5}$ x 13.91 micro volt
    ~ 31.10 micro volt.


Histogram for 10KHz
h
Entries 33776
Mean -0.0007443
RMS 2.31e-05
700
600
500
400
300
200
100
0
-0.82
-0.8
-0.78
-0.76
-0.74
-0.72
-0.7
-0.68
×10^-3
Volt


Histogram Before Merge for 50KHz
h
Entries 30076
Mean -0.0007666
RMS 2.743e-05
500
400
300
200
100
0
-0.88
-0.86
-0.84
-0.82
-0.8
-0.78
-0.76
-0.74
-0.72
-0.7
-0.68
×10^-3
volt


Histogram for 50KHz after merging 5 points
h
Entries 6015
Mean -0.0007665
RMS 1.391e-05
200
180
160
140
120
100
80
60
40
20
0
-0.81
-0.8
-0.79
-0.78
-0.77
-0.76
-0.75
-0.74
-0.73
-0.72
×10^-3
volt