Parameters at 1.2 V over BDV

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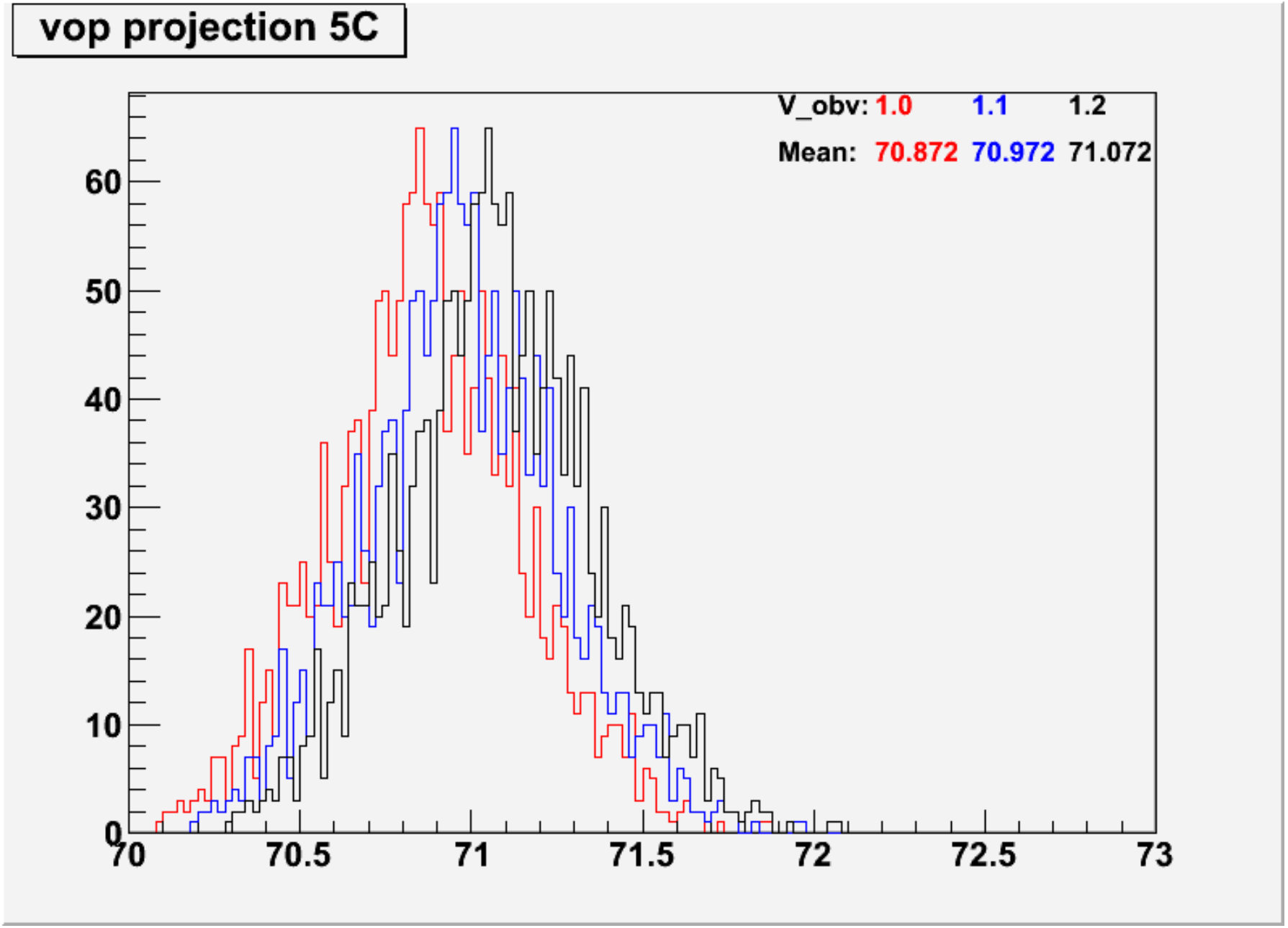
In the next slides differents parameters are shown at 1.0, 1.1 and 1.2 [V] over breakdown voltage.

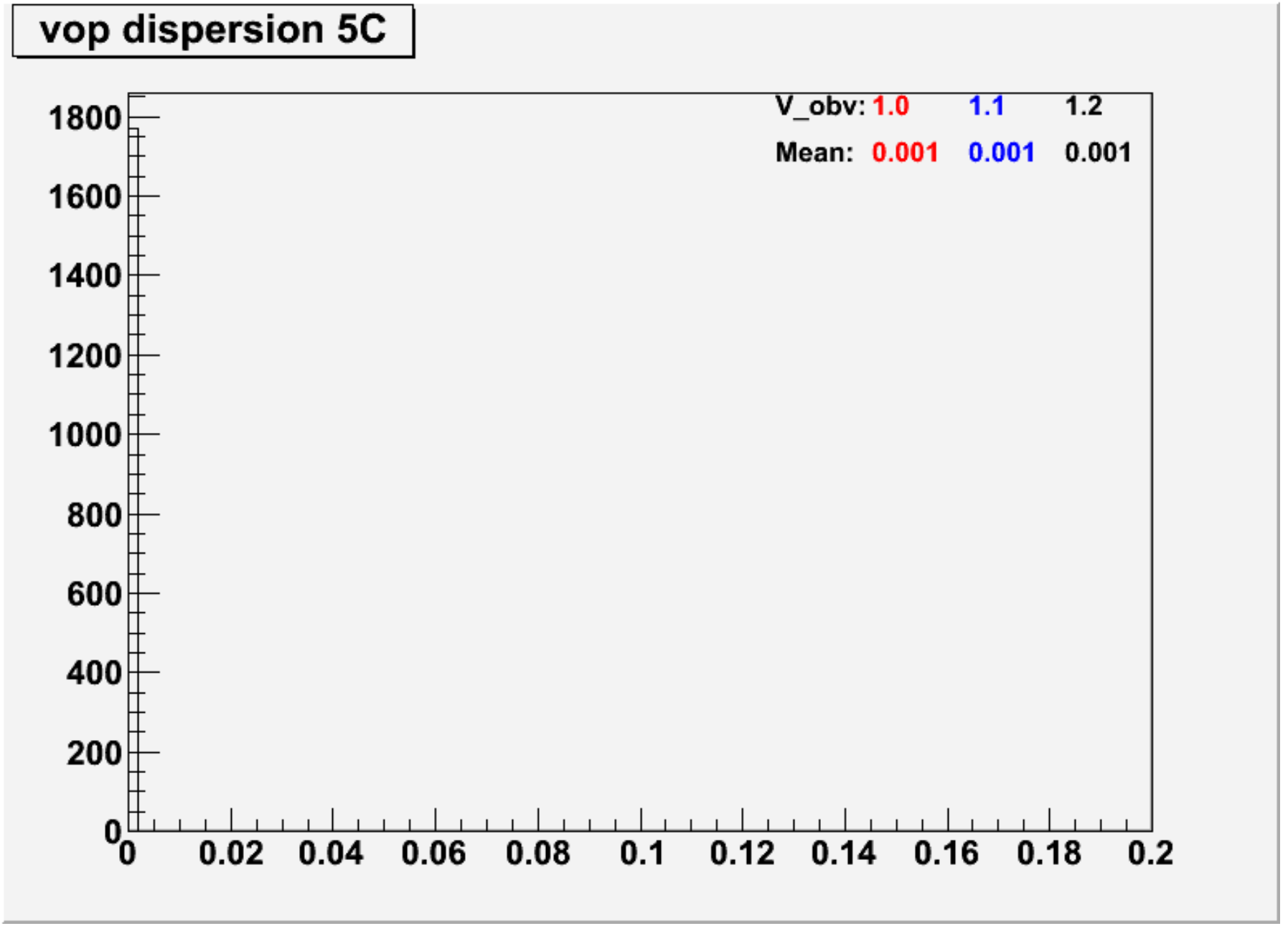
There are two slides per each temperature and parameter. The first one shows the parameter histogram over all mppcs, the last one shows the dispersion of the 16 cells within each mppc.

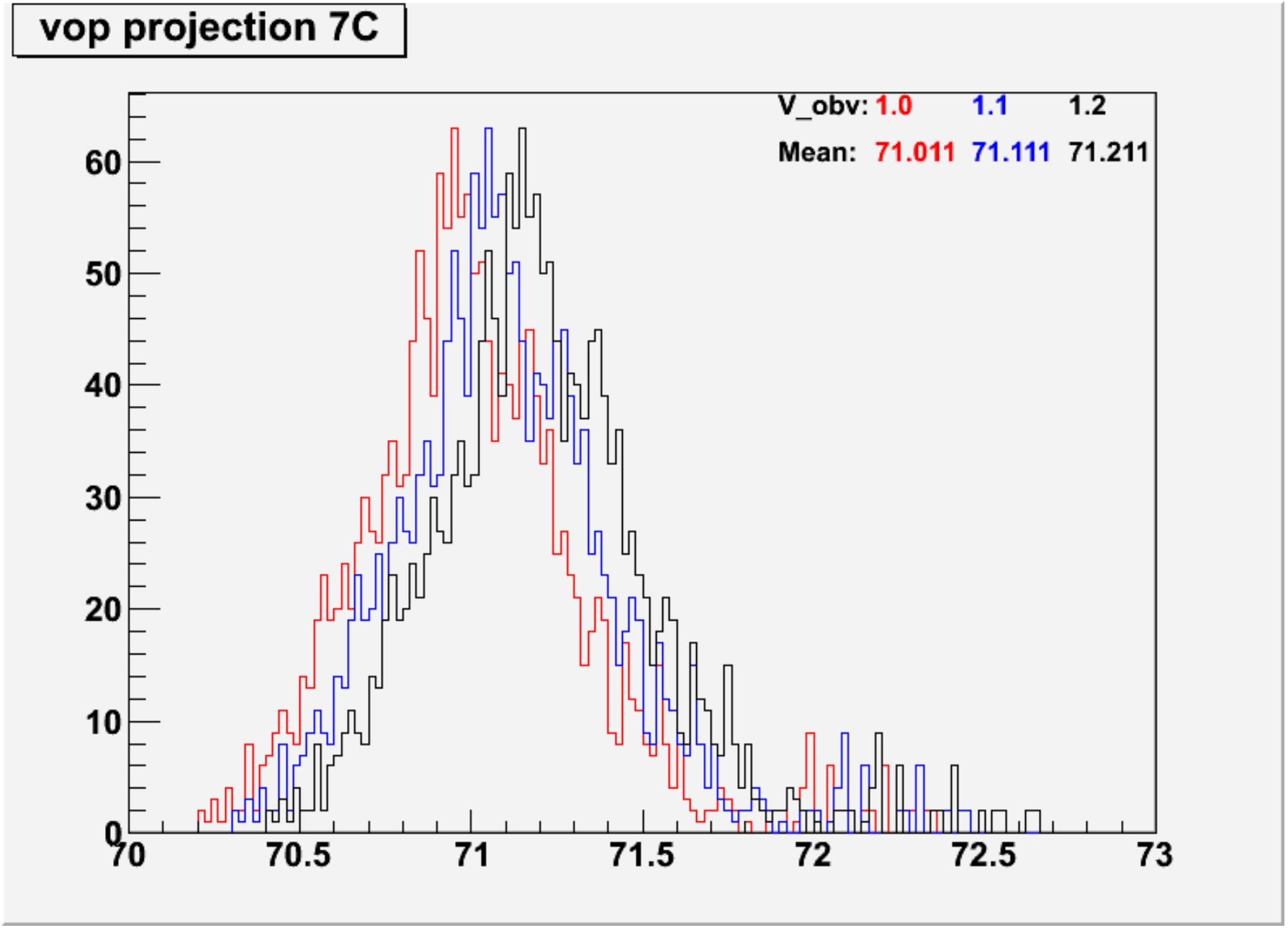
The parameters are: Operational Voltage, Gain, Cross-Talk, Dark Rate

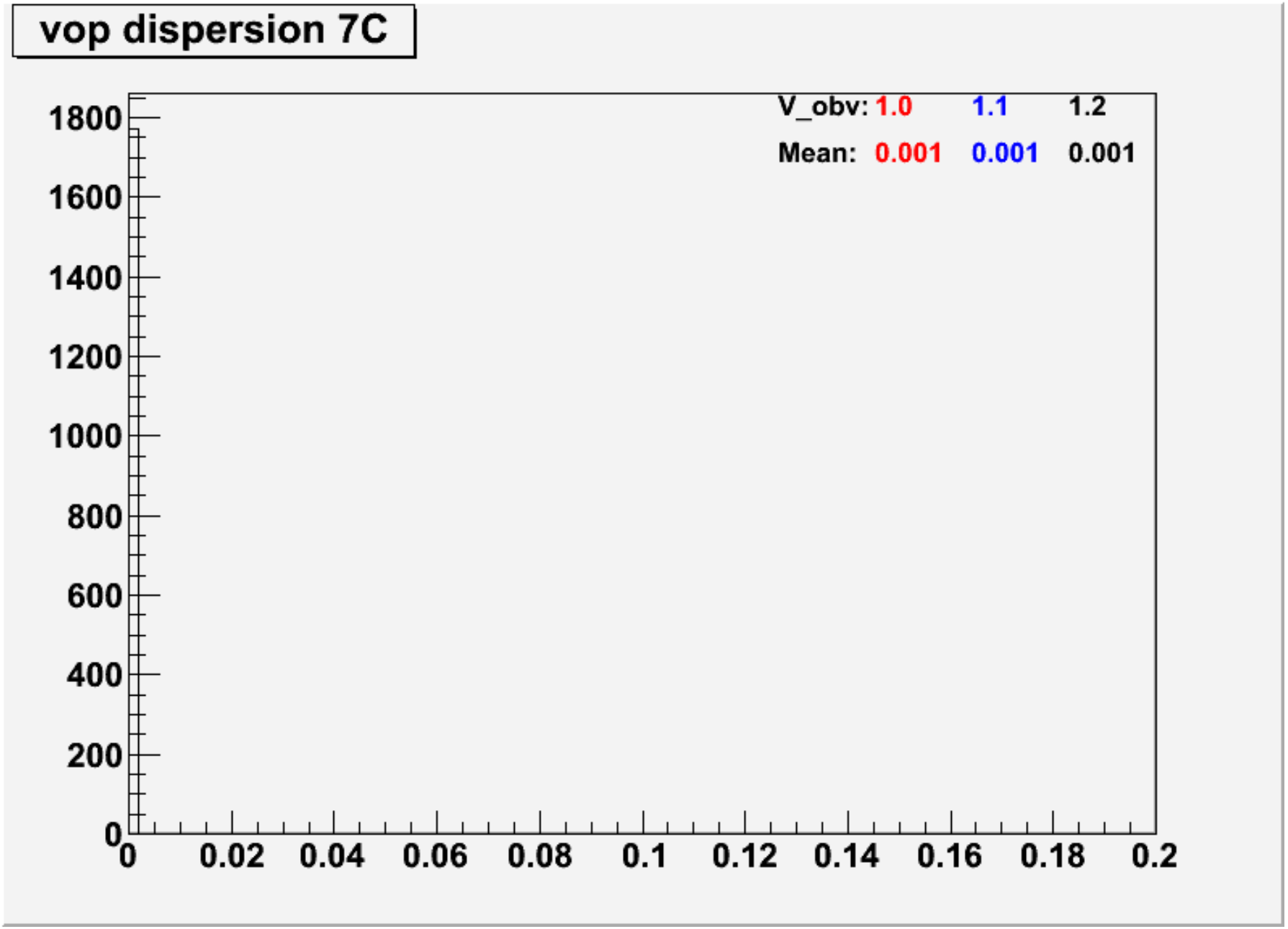
The formulas used in Dark Rate:

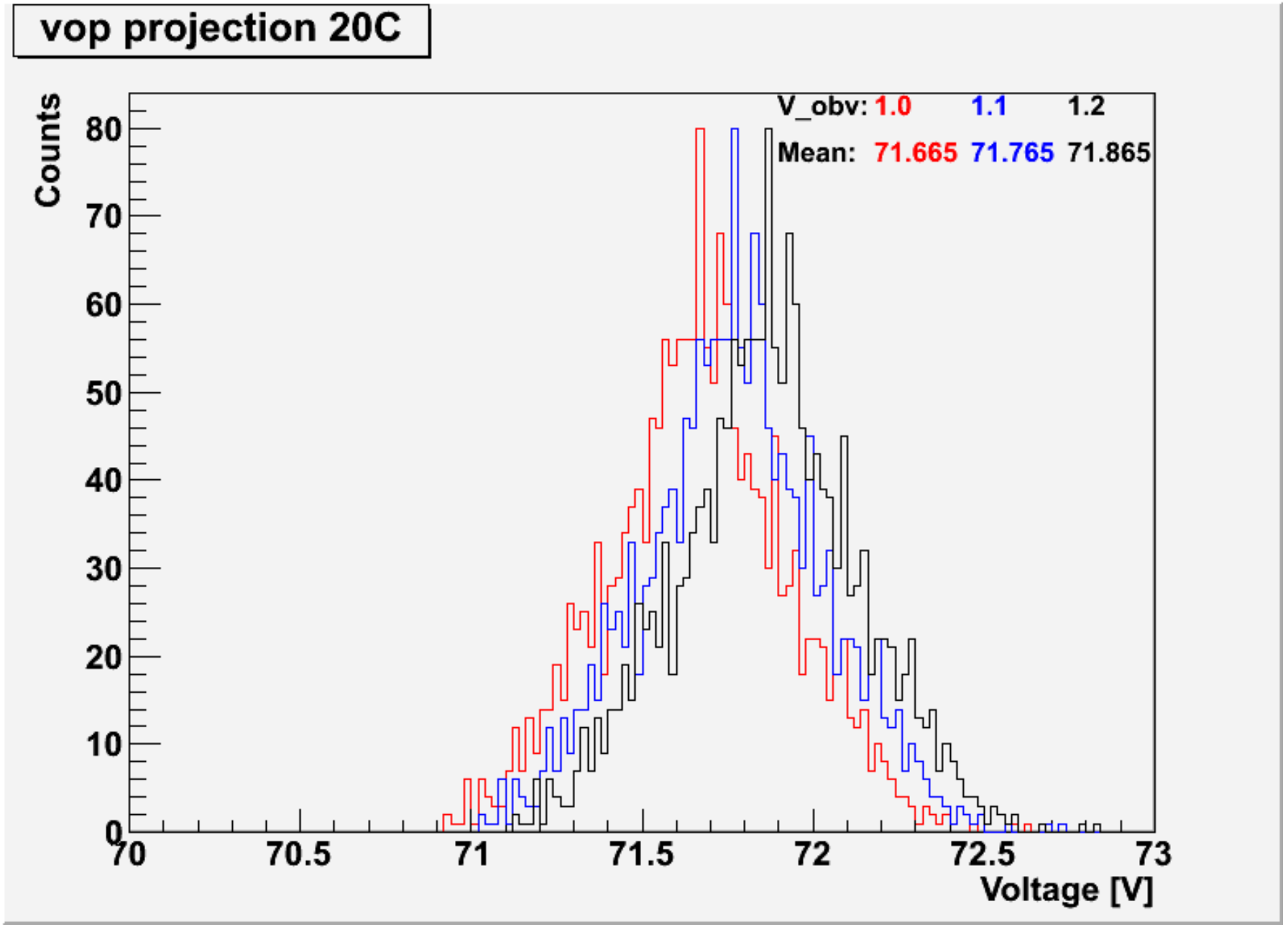
$$Dark\ Rate = \frac{N_{outside\ pedestal}}{N_{insisde\ pedestal} \cdot gate \cdot 10^{6}}$$

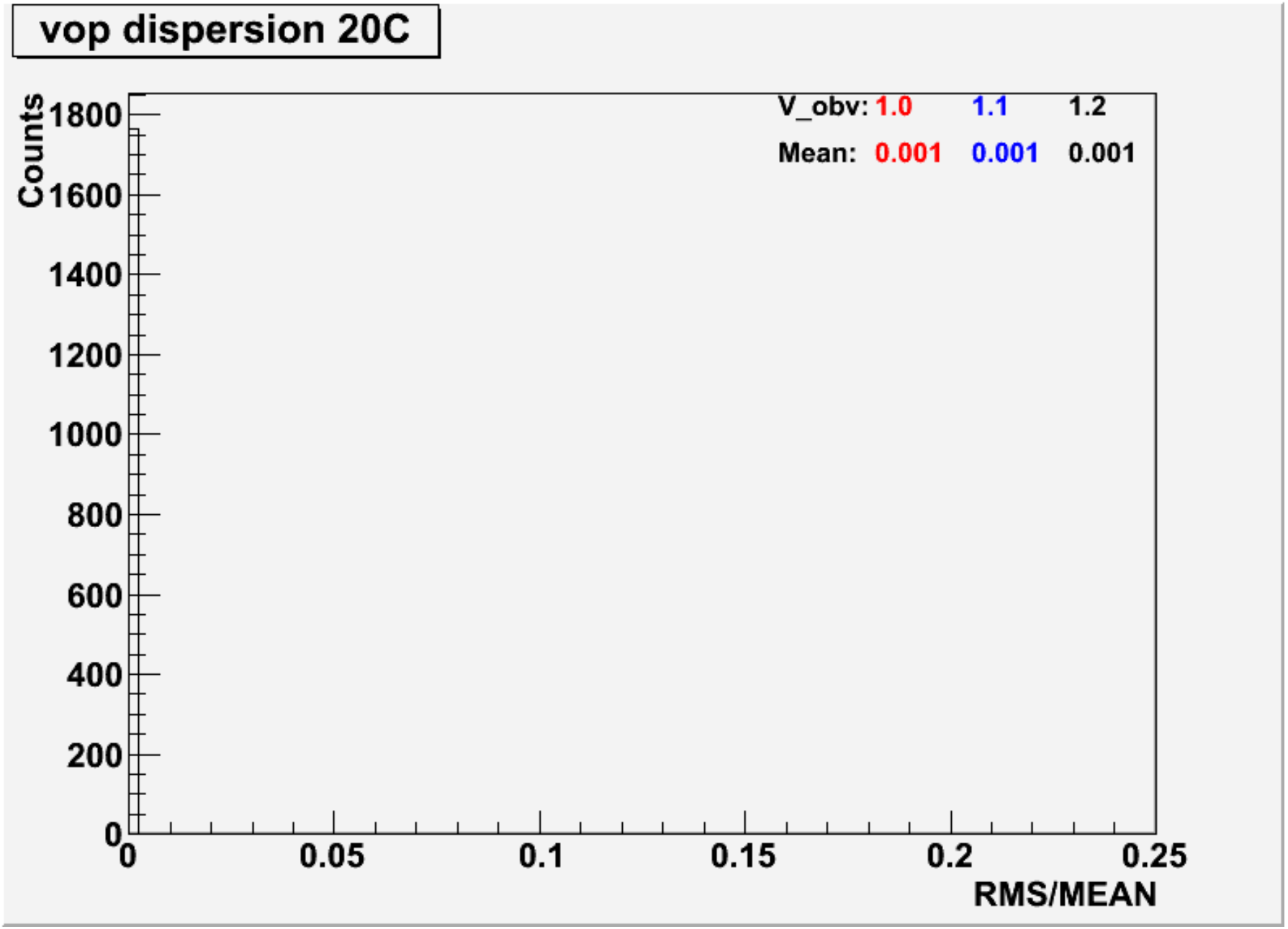

vop projection 5C
V_obv: 1.0 1.1 1.2
Mean: 70.872 70.972 71.072
60
50
40
30
20
10
0
70
70.5
71
71.5
72
72.5
73

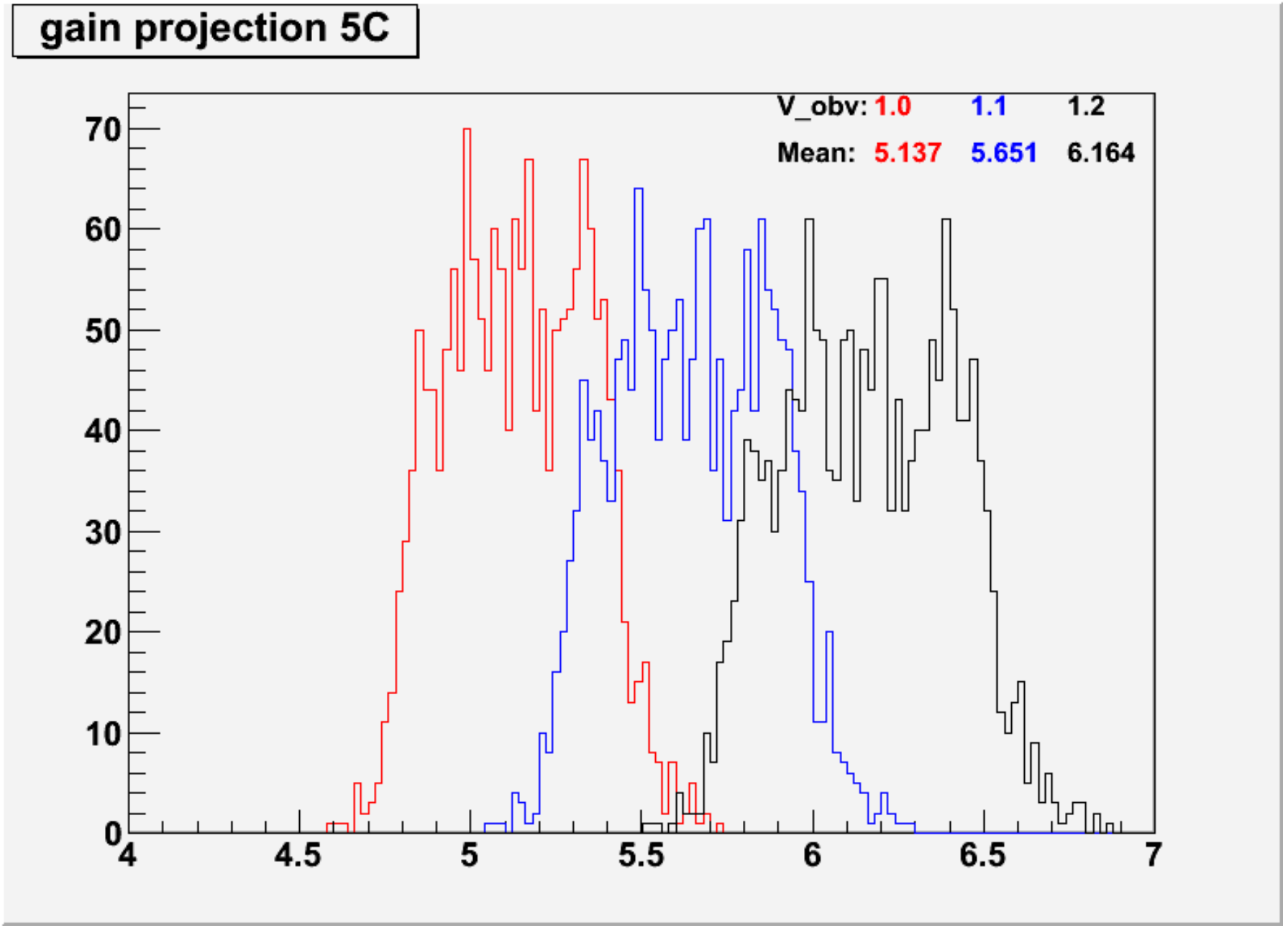

vop dispersion 5C
V_obv: 1.0 1.1 1.2
Mean: 0.001 0.001 0.001
1800
1600
1400
1200
1000
800
600
400
200
0
0 0.02 0.04 0.06 0.08 0.1 0.12 0.14 0.16 0.18 0.2

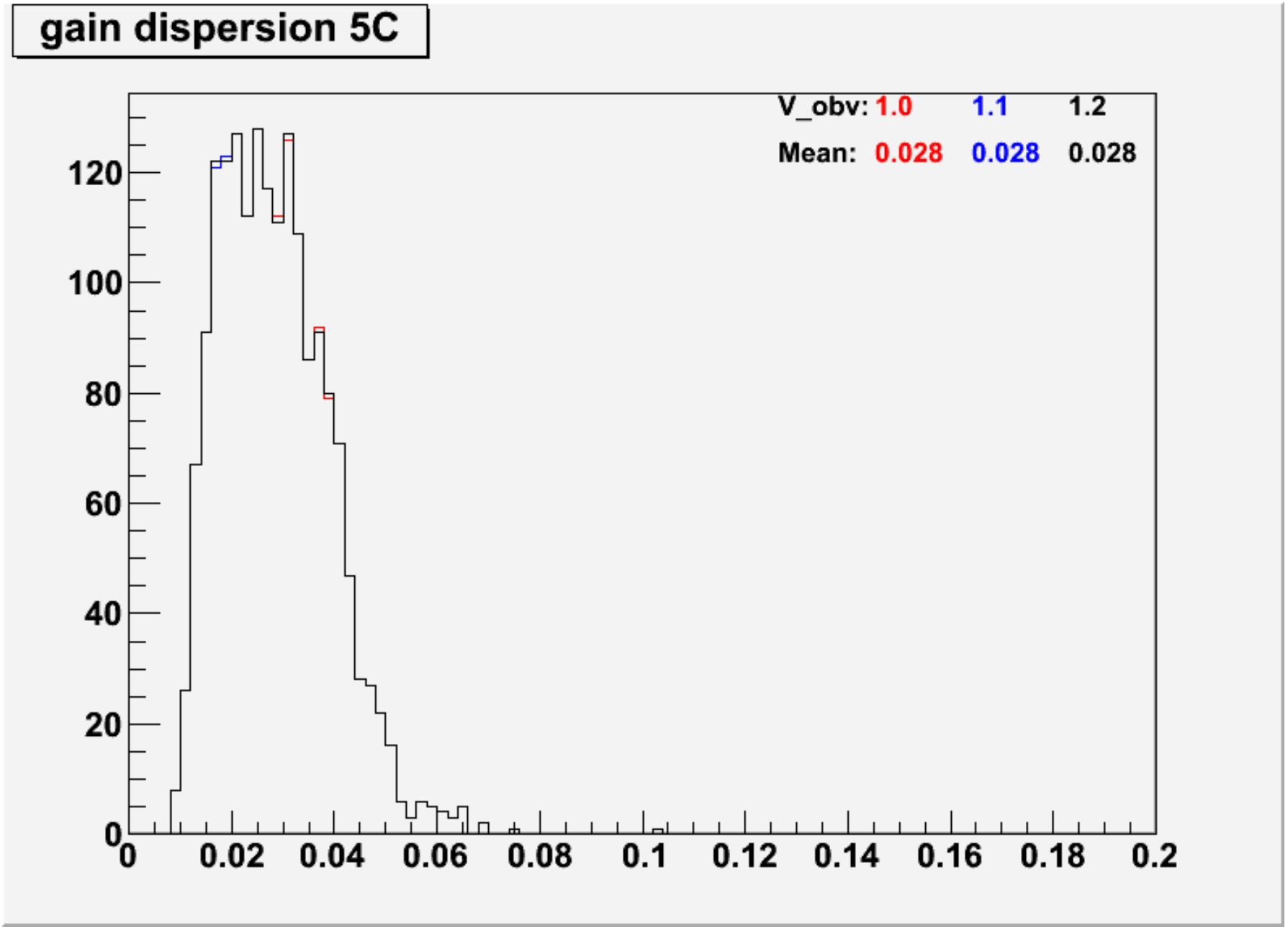

vop projection 7C
V_obv: 1.0 1.1 1.2
Mean: 71.011 71.111 71.211
60
50
40
30
20
10
0
70
70.5
71
71.5
72
72.5
73

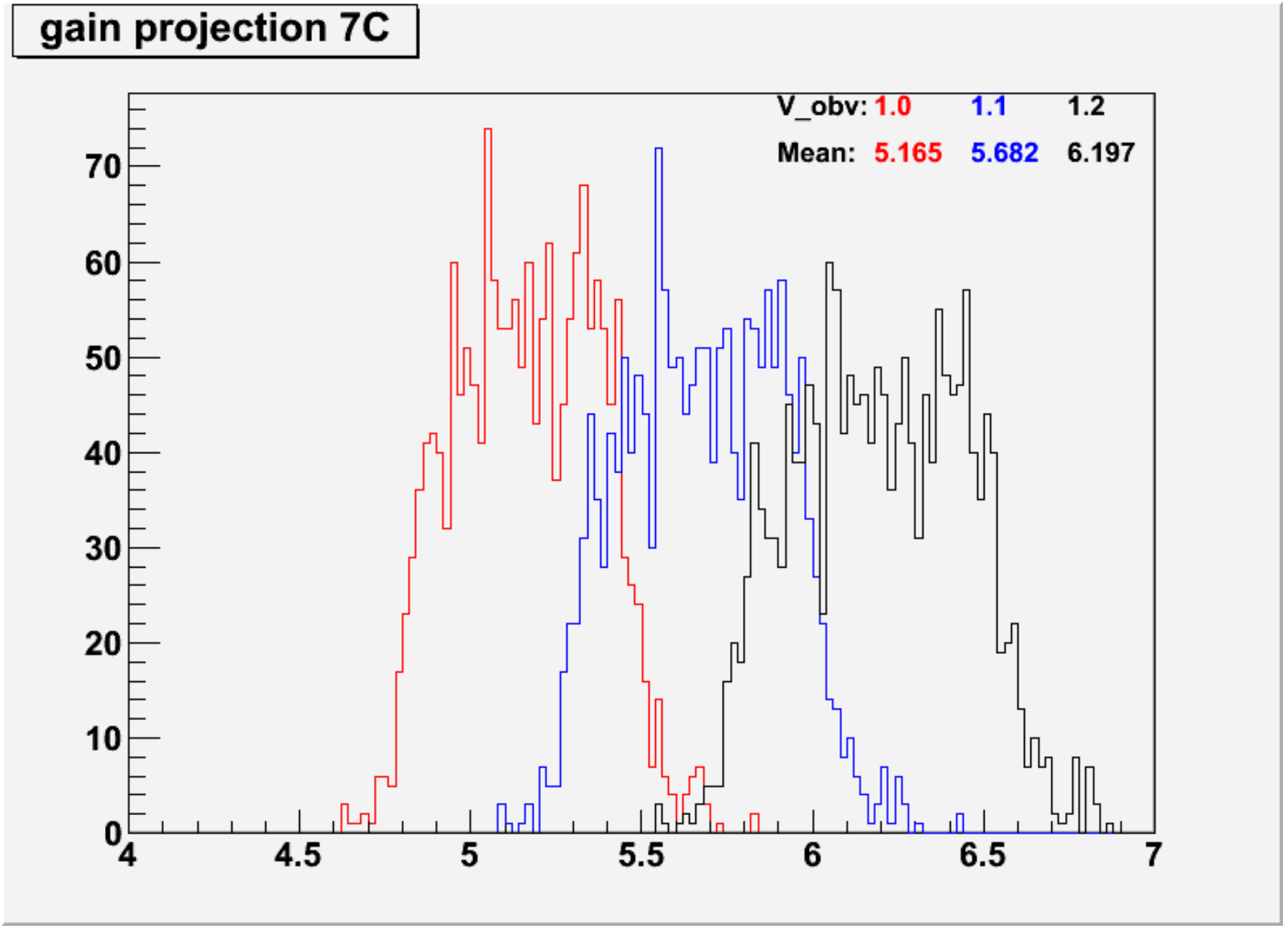

vop dispersion 7C
V_obv: 1.0 1.1 1.2
Mean: 0.001 0.001 0.001
1800
1600
1400
1200
1000
800
600
400
200
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

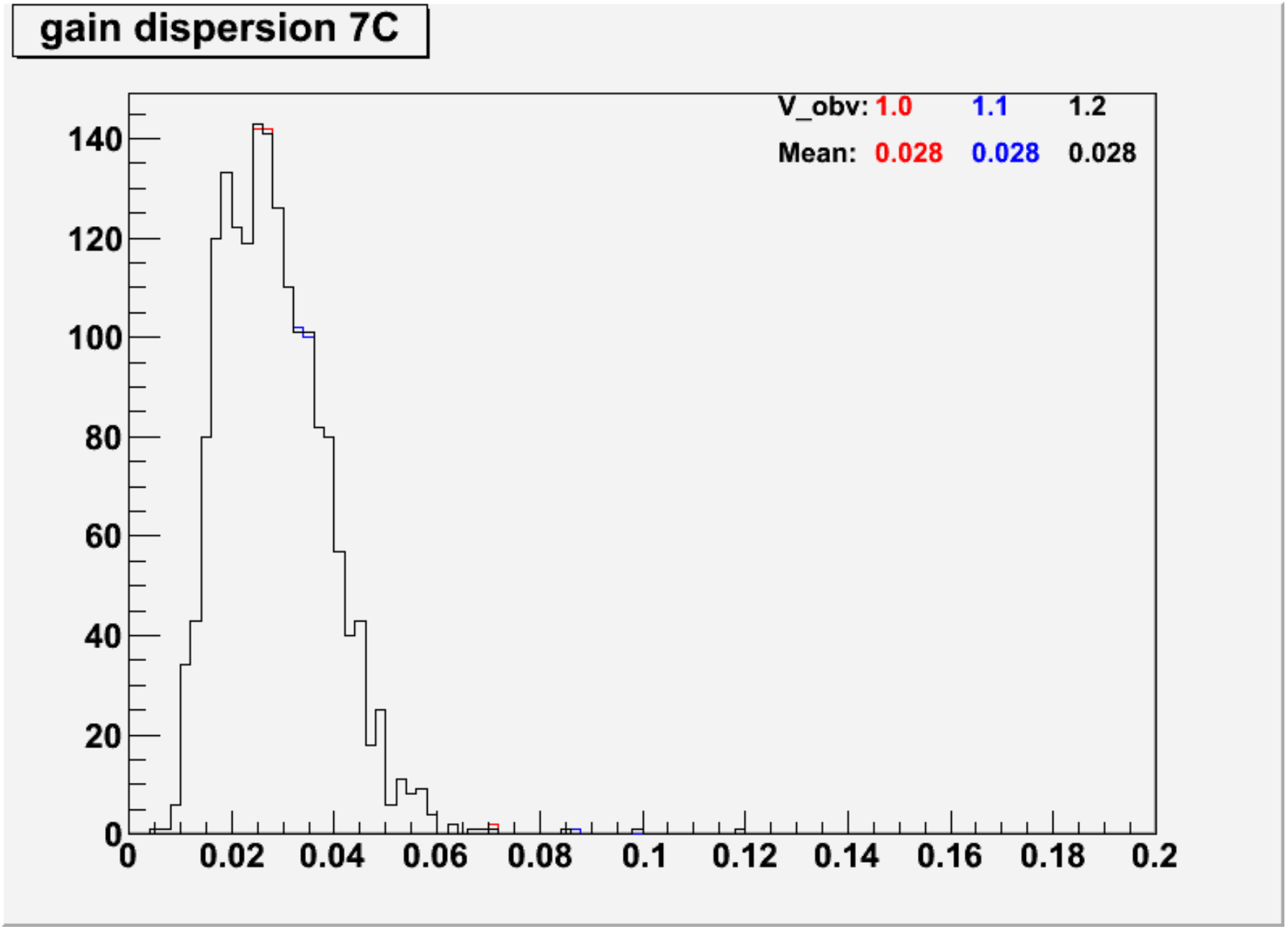

vop projection 20C
V_obv: 1.0 1.1 1.2
Mean: 71.665 71.765 71.865
Counts
0
10
20
30
40
50
60
70
80
70
70.5
71
71.5
72
72.5
73
Voltage [V]

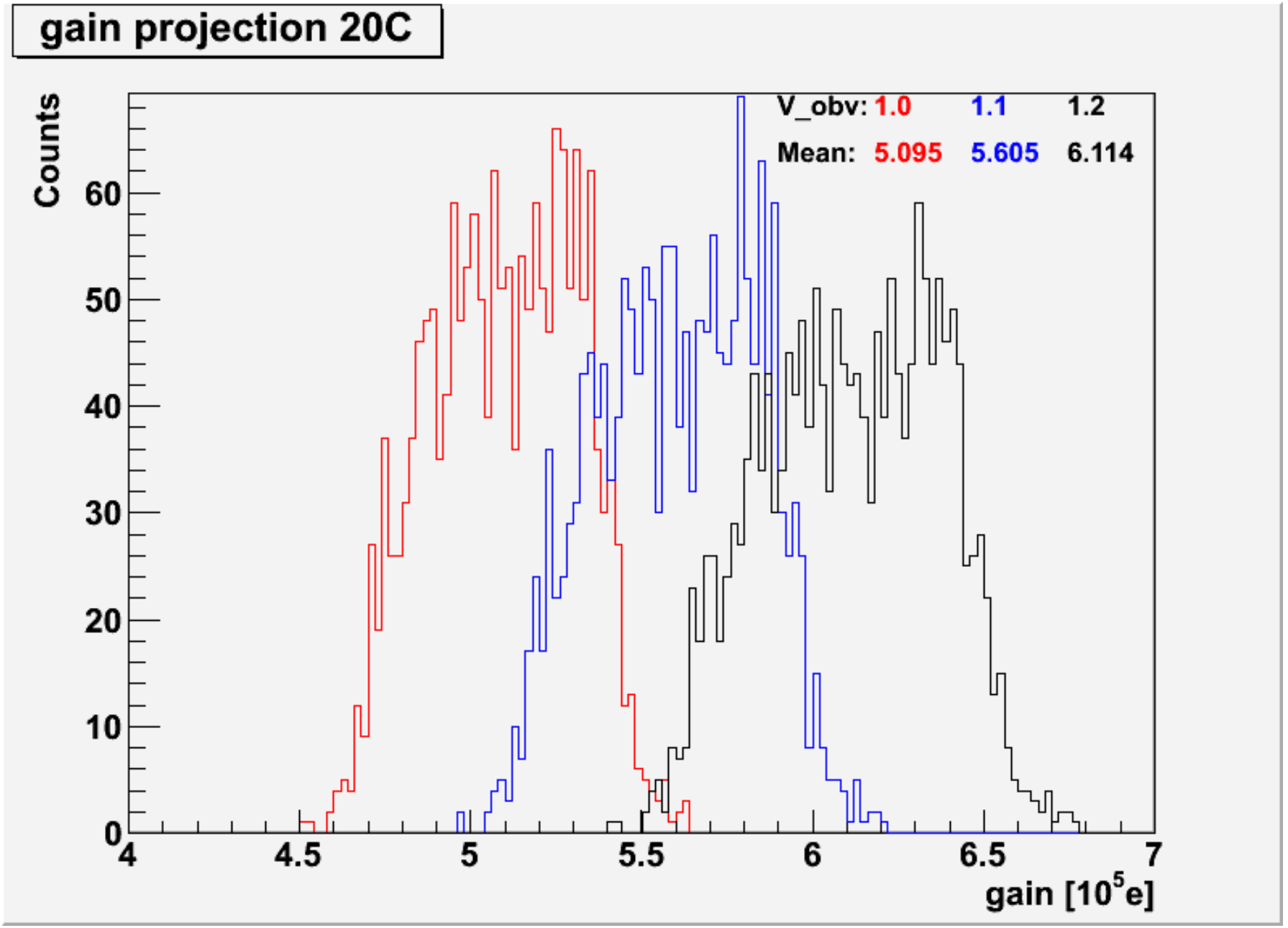

vop dispersion 20C
V_obv: 1.0 1.1 1.2
Mean: 0.001 0.001 0.001
Counts
1800
1600
1400
1200
1000
800
600
400
200
0
0
0.05
0.1
0.15
0.2
0.25
RMS/MEAN

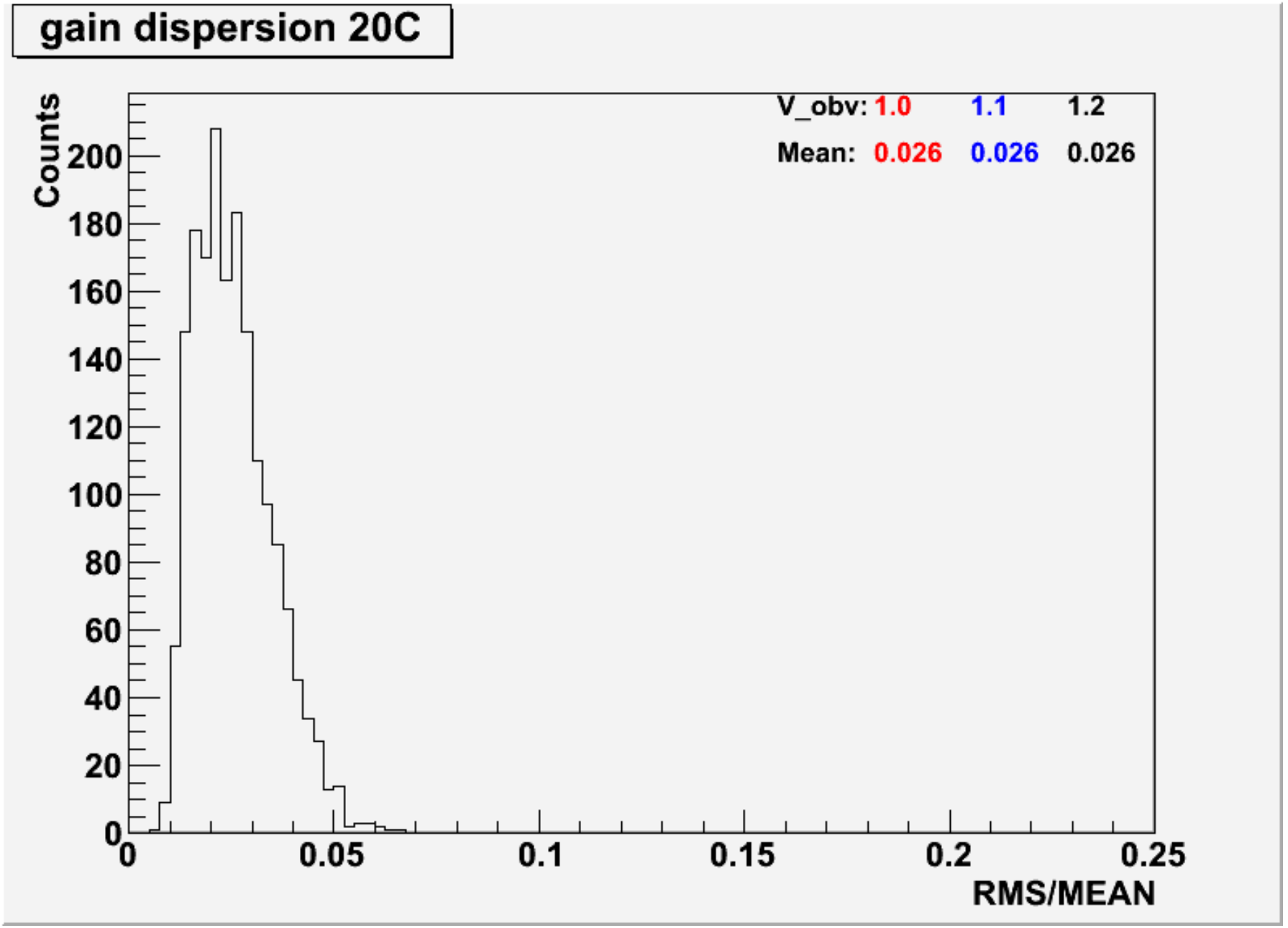

gain projection 5C
V_obv: 1.0 1.1 1.2
Mean: 5.137 5.651 6.164
70
60
50
40
30
20
10
0
4
4.5
5
5.5
6
6.5
7

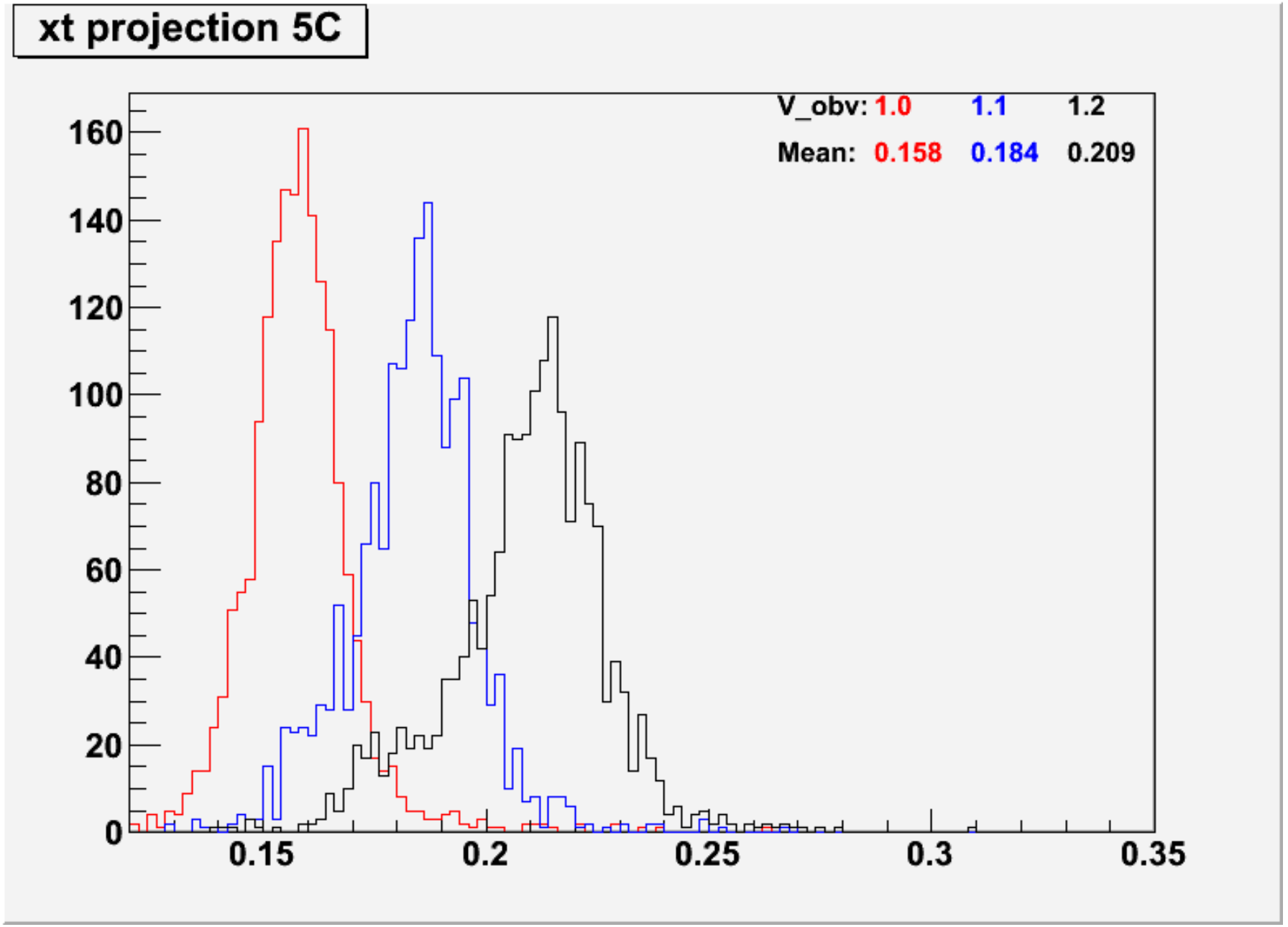

gain dispersion 5C
V_obv: 1.0 1.1 1.2
Mean: 0.028 0.028 0.028
120
100
80
60
40
20
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

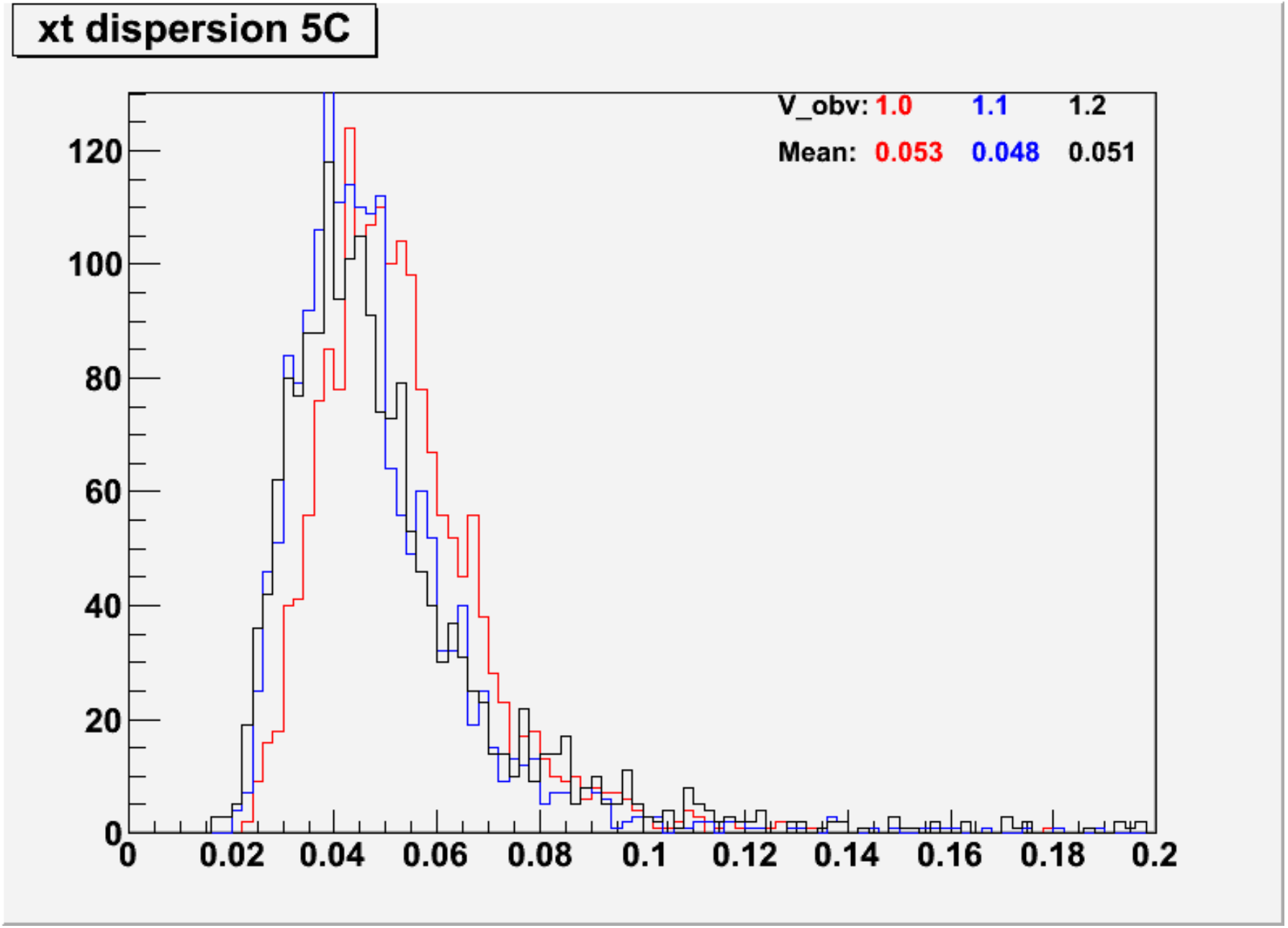

gain projection 7C
V_obv: 1.0 1.1 1.2
Mean: 5.165 5.682 6.197
70
60
50
40
30
20
10
0
4
4.5
5
5.5
6
6.5
7

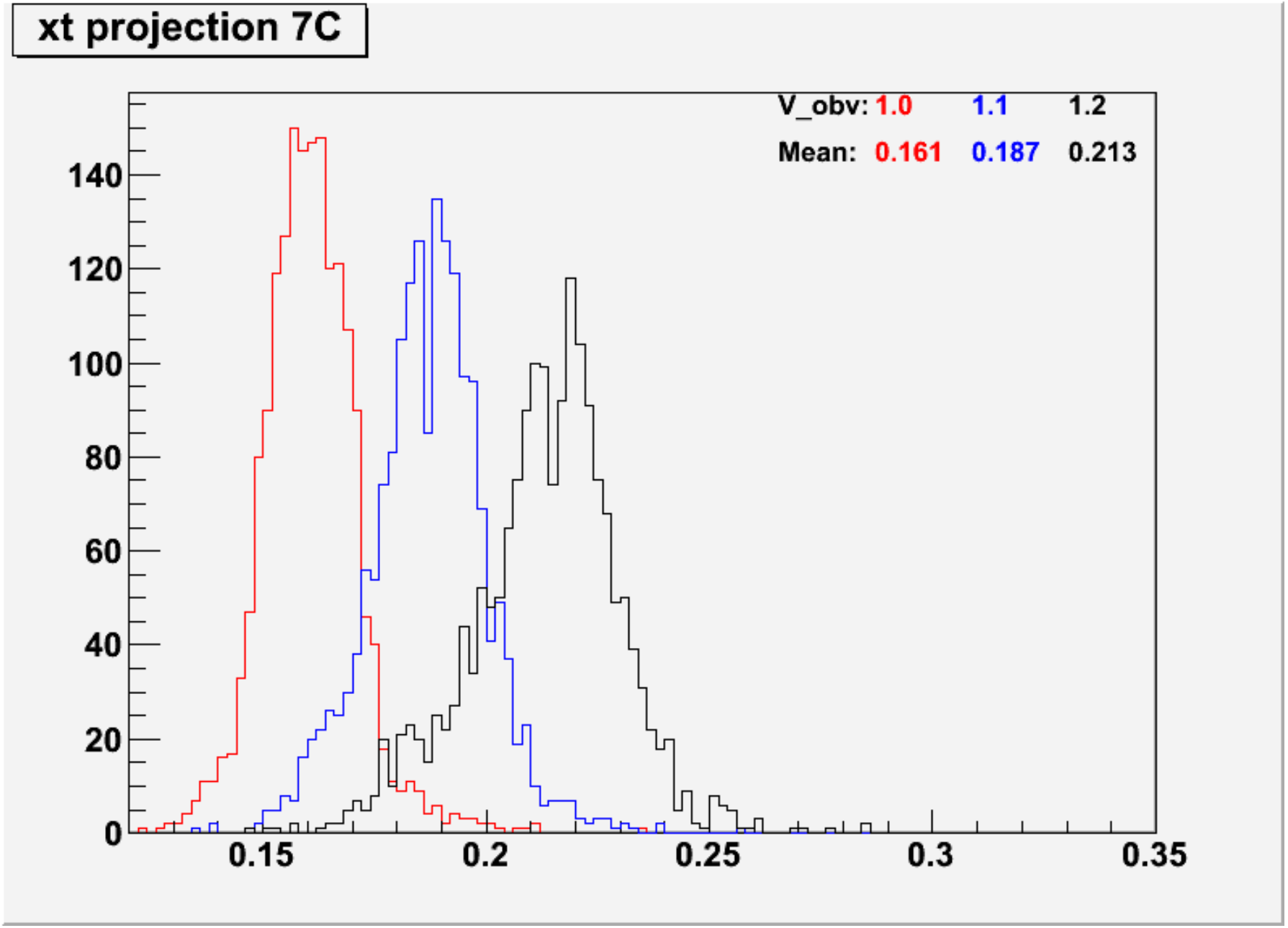

gain dispersion 7C
V_obv: 1.0 1.1 1.2
Mean: 0.028 0.028 0.028
140
120
100
80
60
40
20
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

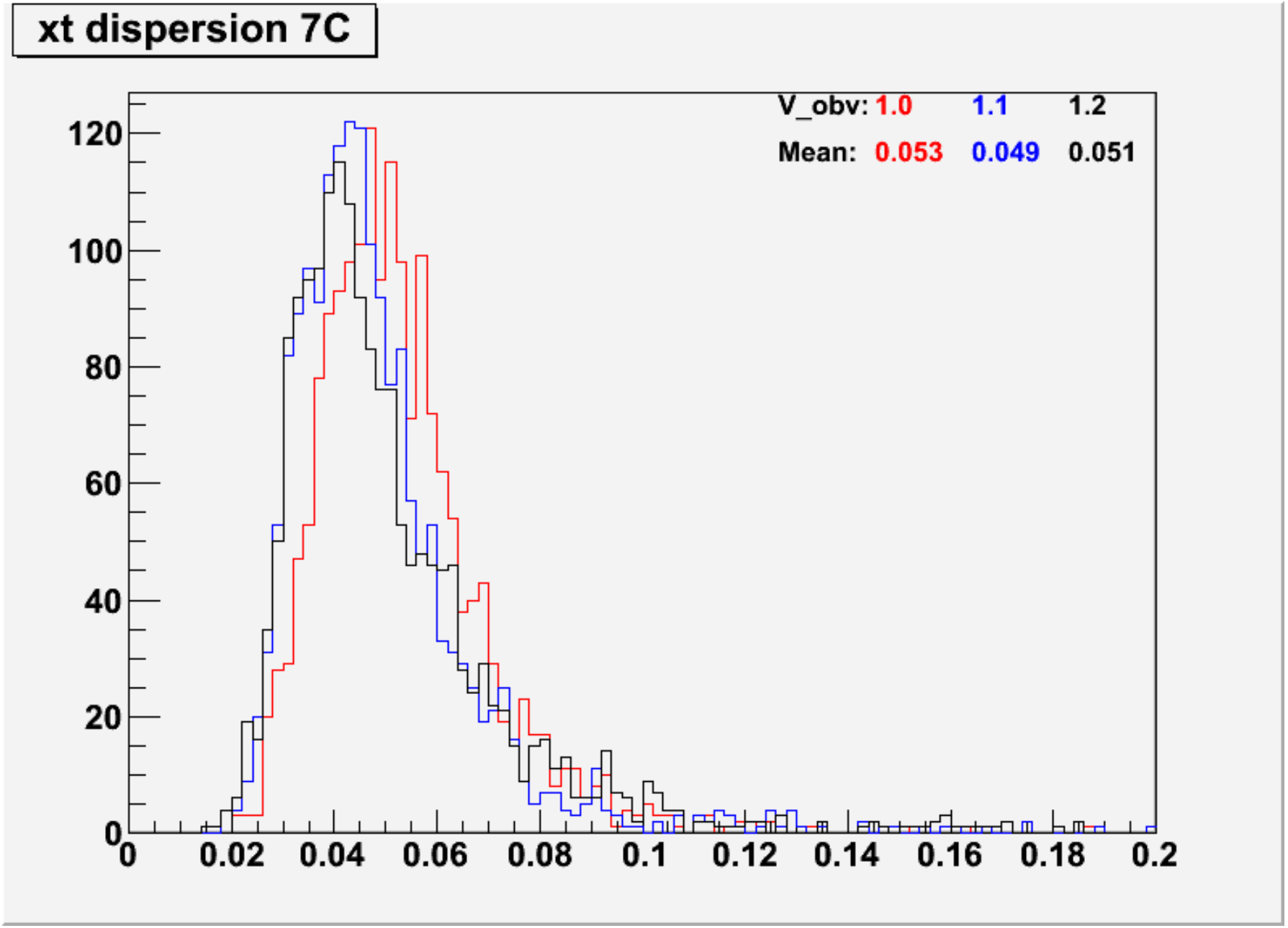

gain projection 20C
V_obv: 1.0 1.1 1.2
Mean: 5.095 5.605 6.114
Counts
0
10
20
30
40
50
60
4
4.5
5
5.5
6
6.5
7
gain [10^5e]

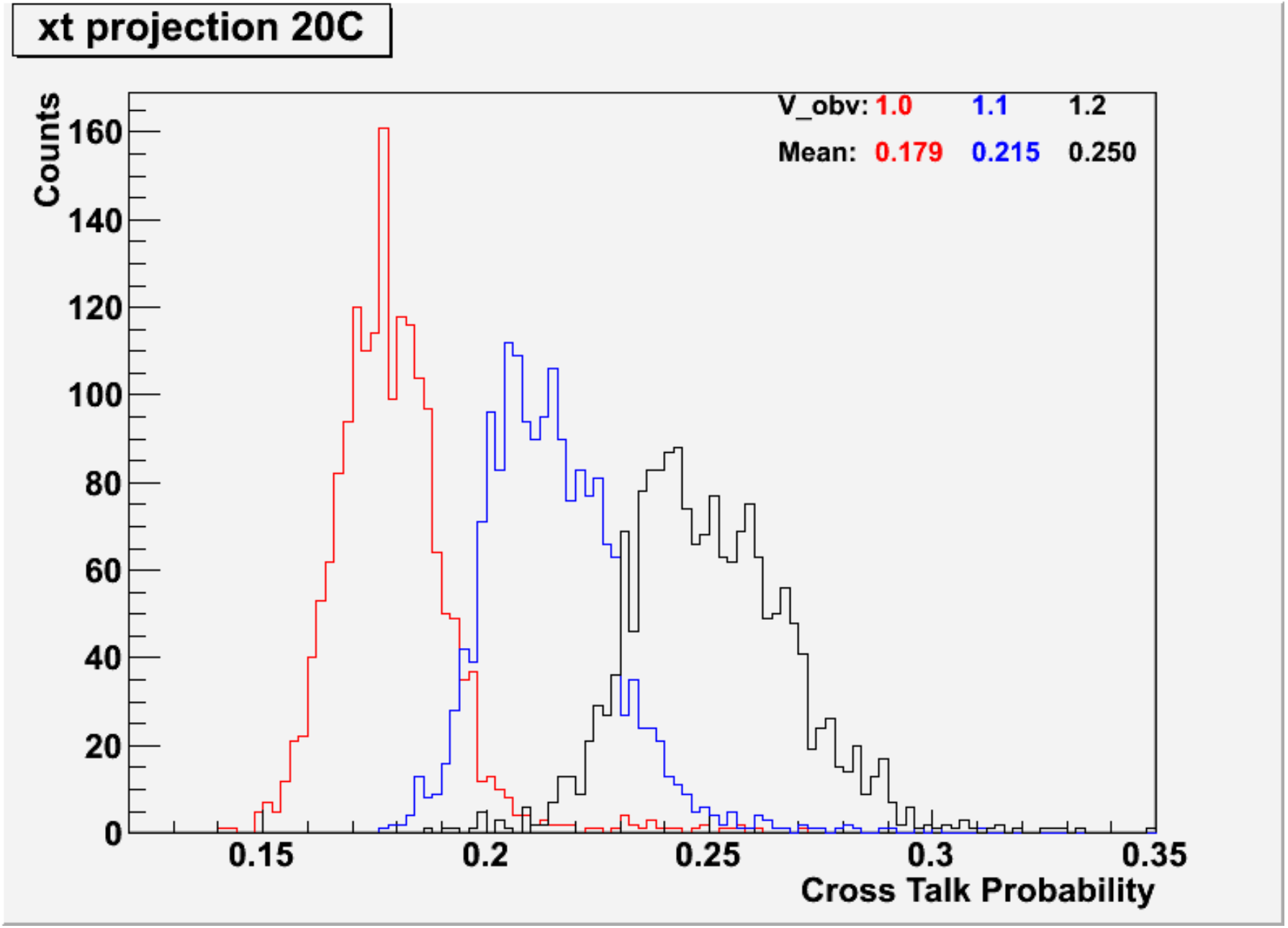

gain dispersion 20C
V_obv: 1.0 1.1 1.2
Mean: 0.026 0.026 0.026
Counts
0
20
40
60
80
100
120
140
160
180
200
0
0.05
0.1
0.15
0.2
0.25
RMS/MEAN

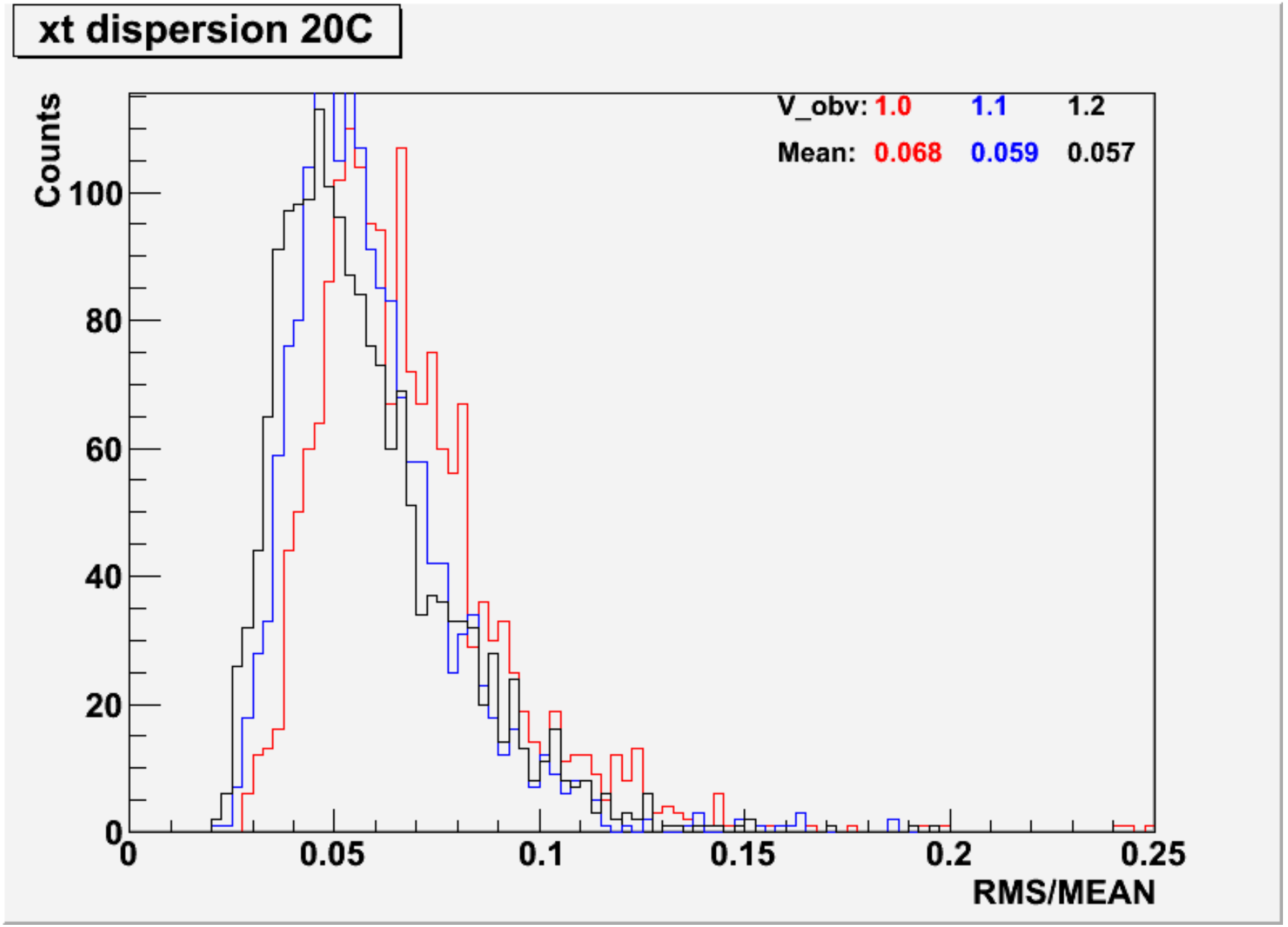

xt projection 5C
V_obv: 1.0 1.1 1.2
Mean: 0.158 0.184 0.209
160
140
120
100
80
60
40
20
0
0.15
0.2
0.25
0.3
0.35

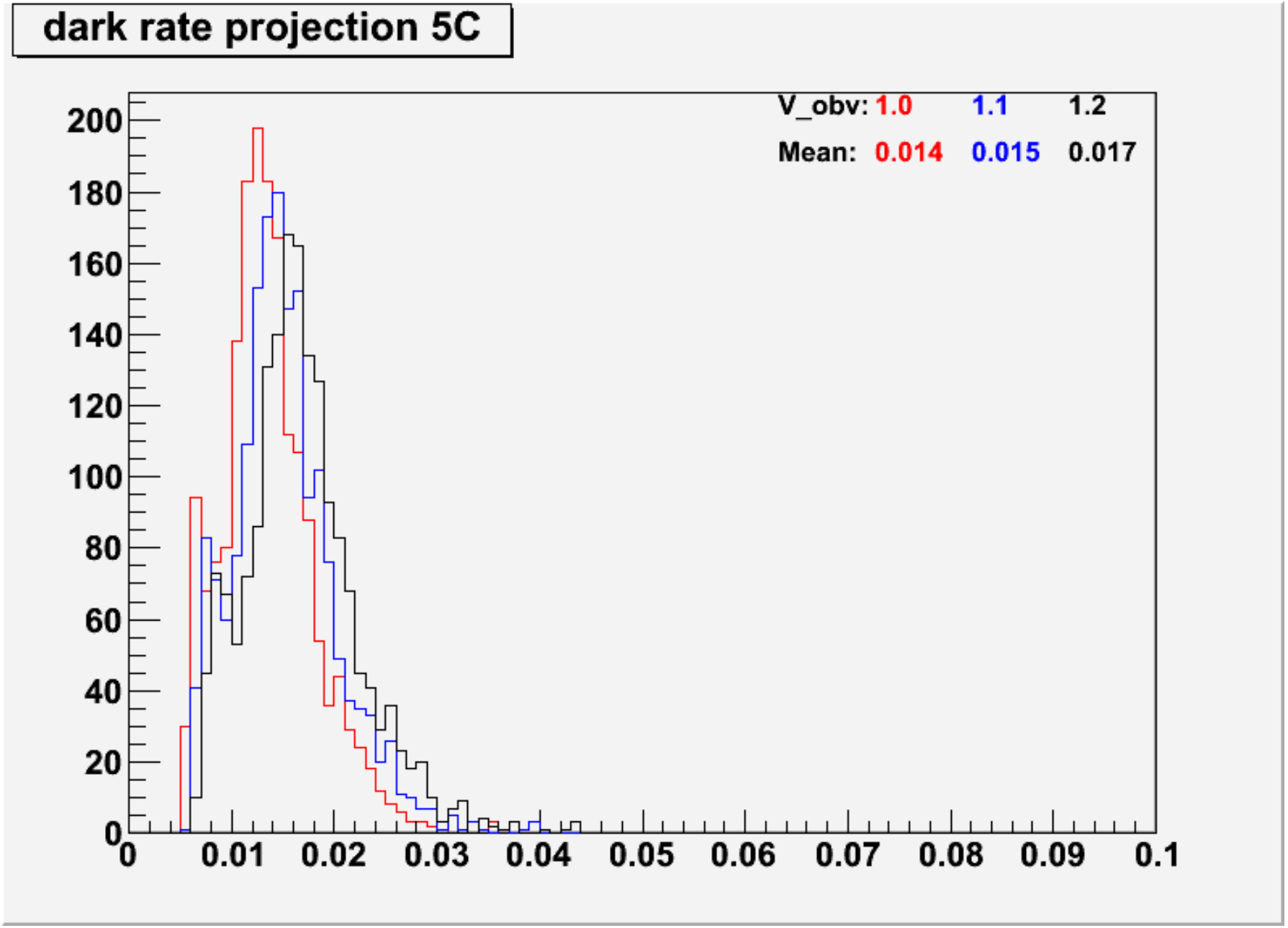

xt dispersion 5C
V_obv: 1.0 1.1 1.2
Mean: 0.053 0.048 0.051
120
100
80
60
40
20
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

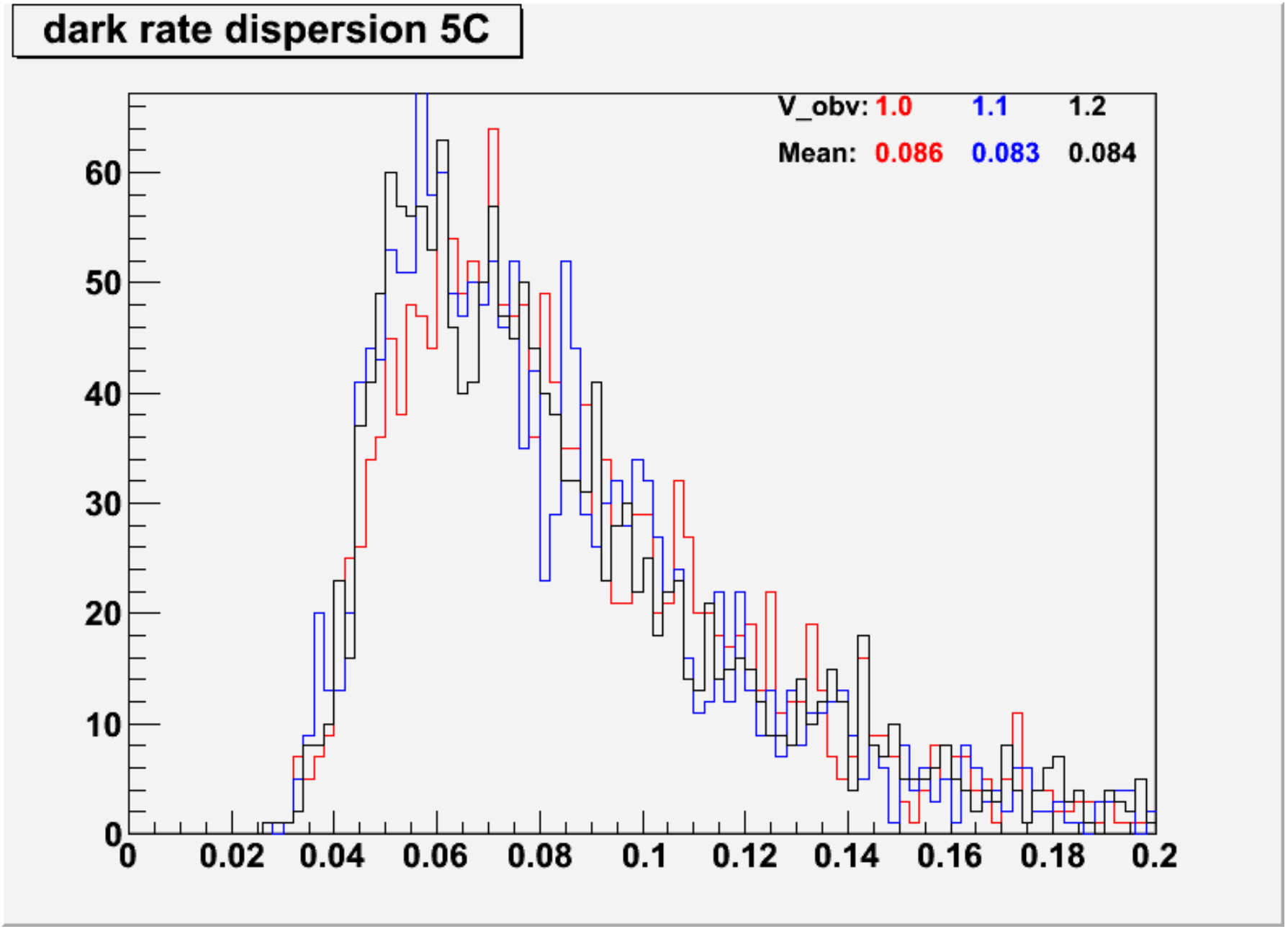

xt projection 7C
V_obv: 1.0 1.1 1.2
Mean: 0.161 0.187 0.213
140
120
100
80
60
40
20
0
0.15
0.2
0.25
0.3
0.35

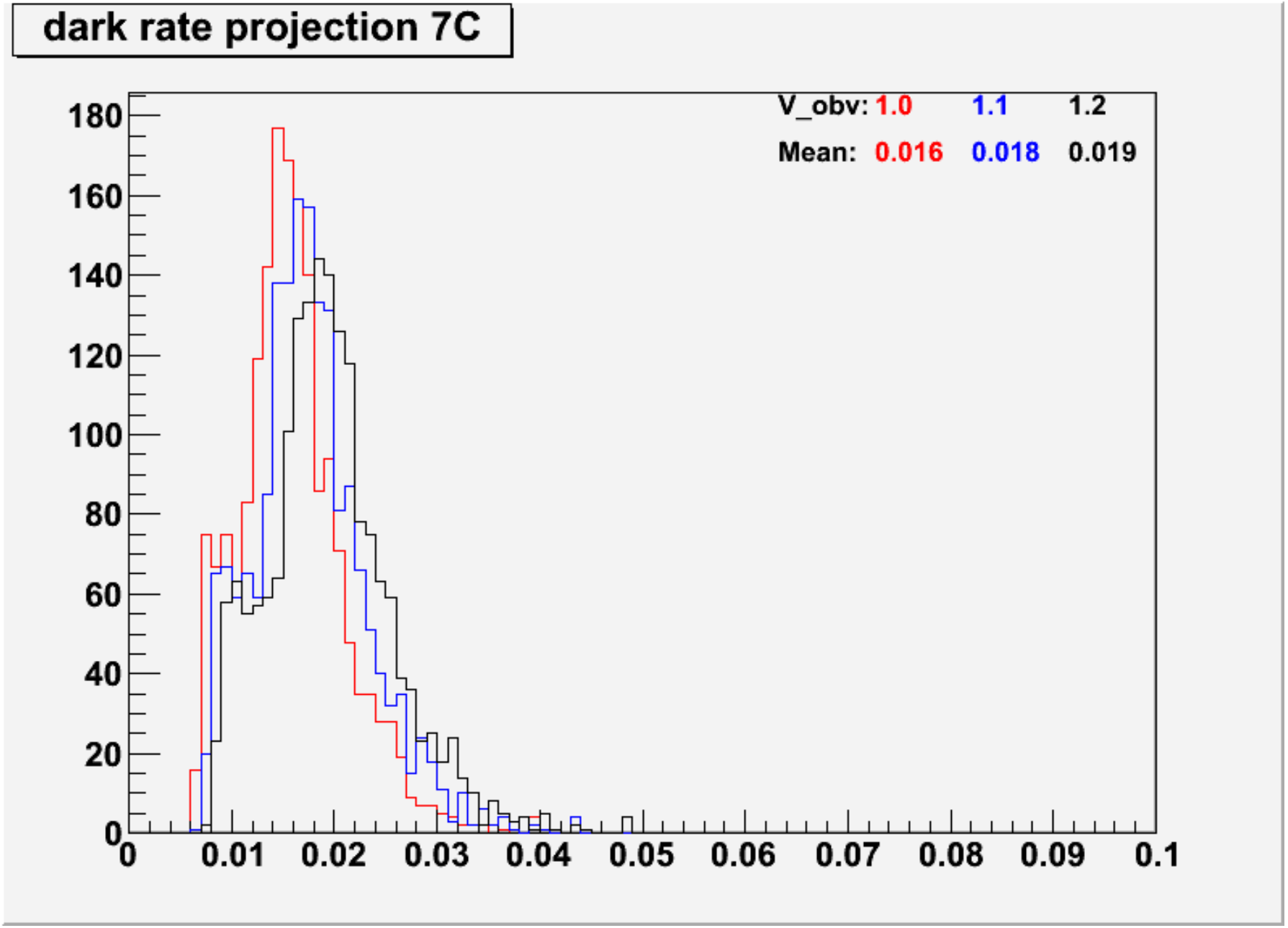

xt dispersion 7C
V_obv: 1.0 1.1 1.2
Mean: 0.053 0.049 0.051
120
100
80
60
40
20
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

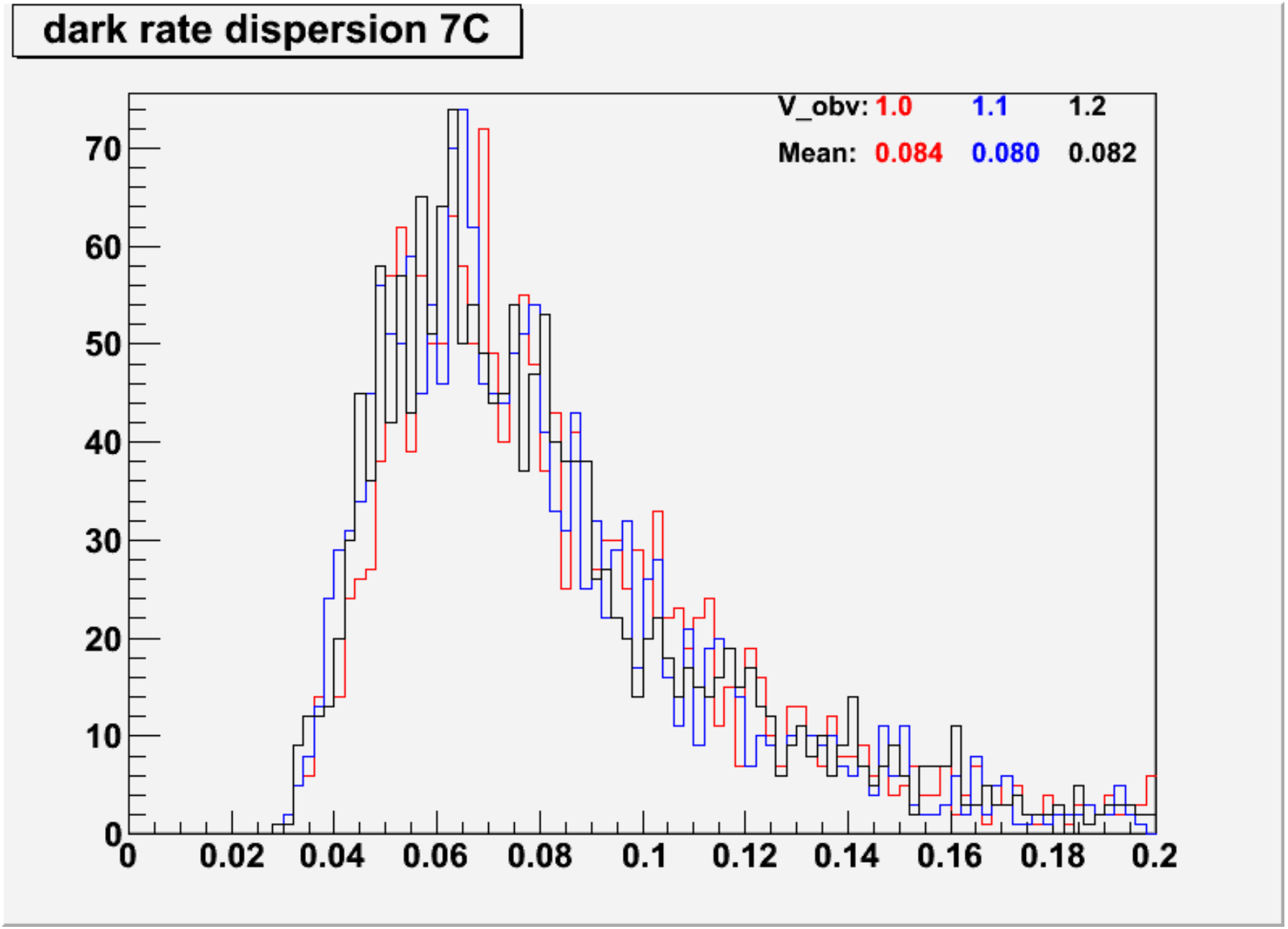

xt projection 20C
V_obv: 1.0 1.1 1.2
Mean: 0.179 0.215 0.250
Counts
160
140
120
100
80
60
40
20
0
0.15
0.2
0.25
0.3
0.35
Cross Talk Probability

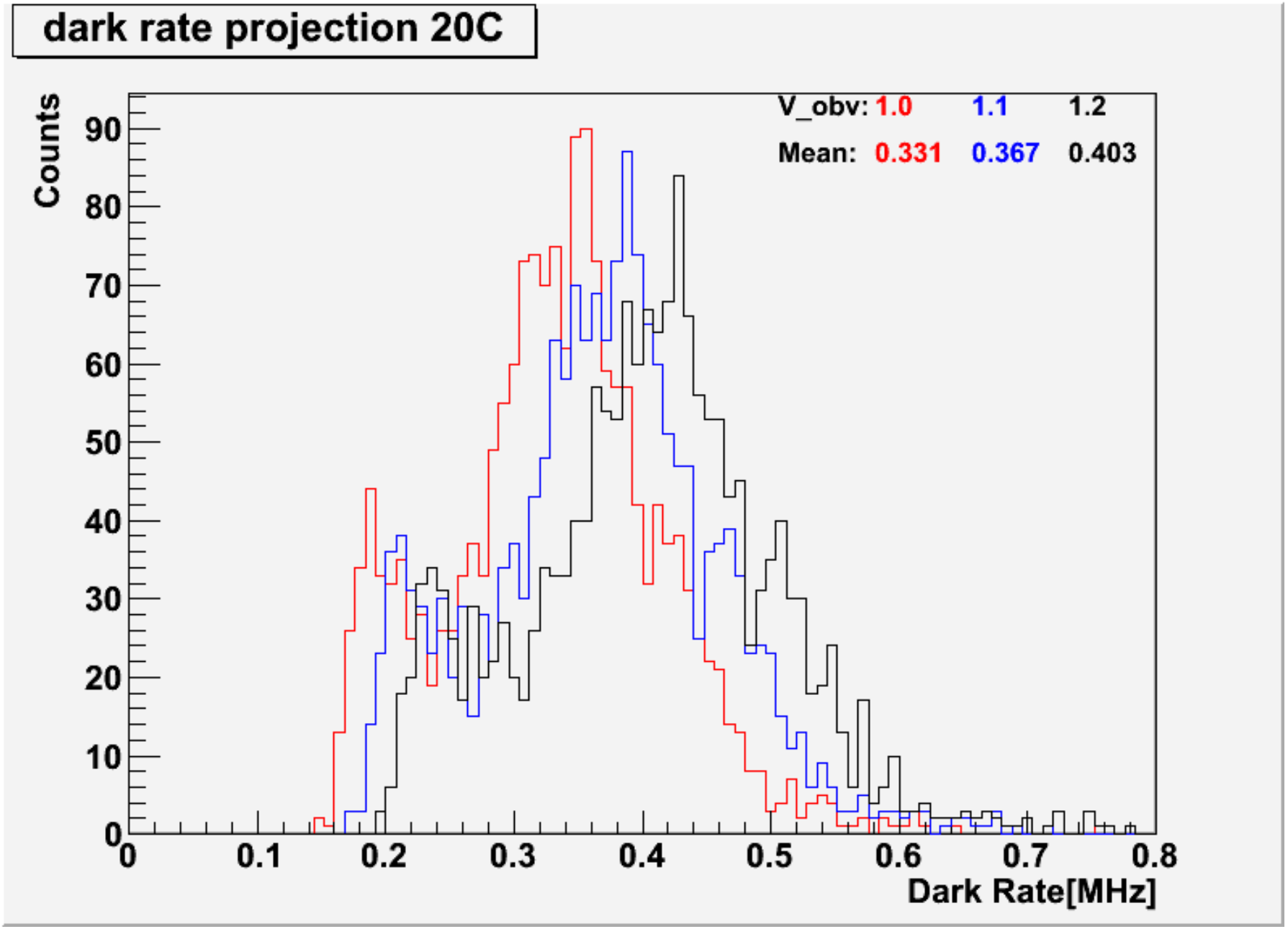

xt dispersion 20C
V_obv: 1.0 1.1 1.2
Mean: 0.068 0.059 0.057
Counts
0
20
40
60
80
100
0
0.05
0.1
0.15
0.2
0.25
RMS/MEAN

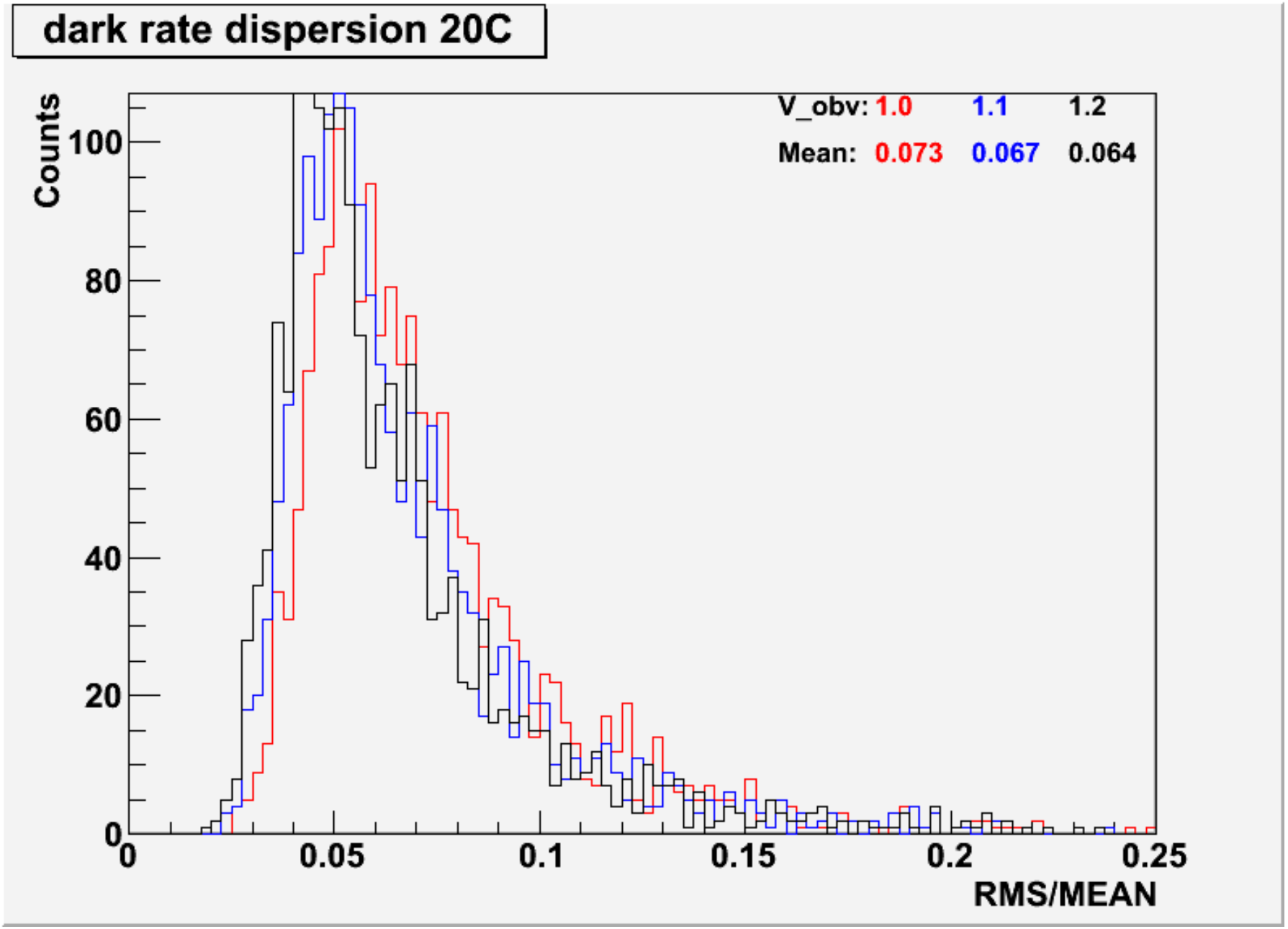

dark rate projection 5C
V_obv: 1.0 1.1 1.2
Mean: 0.014 0.015 0.017
200
180
160
140
120
100
80
60
40
20
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1


dark rate dispersion 5C
V_obv: 1.0 1.1 1.2
Mean: 0.086 0.083 0.084
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2


dark rate projection 7C
V_obv: 1.0 1.1 1.2
Mean: 0.016 0.018 0.019
180
160
140
120
100
80
60
40
20
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1


dark rate dispersion 7C
V_obv: 1.0 1.1 1.2
Mean: 0.084 0.080 0.082
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2


dark rate projection 20C
V_obv: 1.0 1.1 1.2
Mean: 0.331 0.367 0.403
Counts
0
10
20
30
40
50
60
70
80
90
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Dark Rate[MHz]


dark rate dispersion 20C
V_obv: 1.0 1.1 1.2
Mean: 0.073 0.067 0.064
Counts
100
80
60
40
20
0
0
0.05
0.1
0.15
0.2
0.25
RMS/MEAN