# Parameters at 1.2 V over BDV

Orlando Soto S.

In the next slides differents parameters are shown at 1.20 [V] over breakdown voltage.

There are three slides per each parameter. The first one shows the parameter for each mppc id measured, the second one shows the projection onto the y-axis of the picture on the first slide, the last one shows the dispersion of the 16 cells within each mppc.

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

The formulas used in amplitude are:

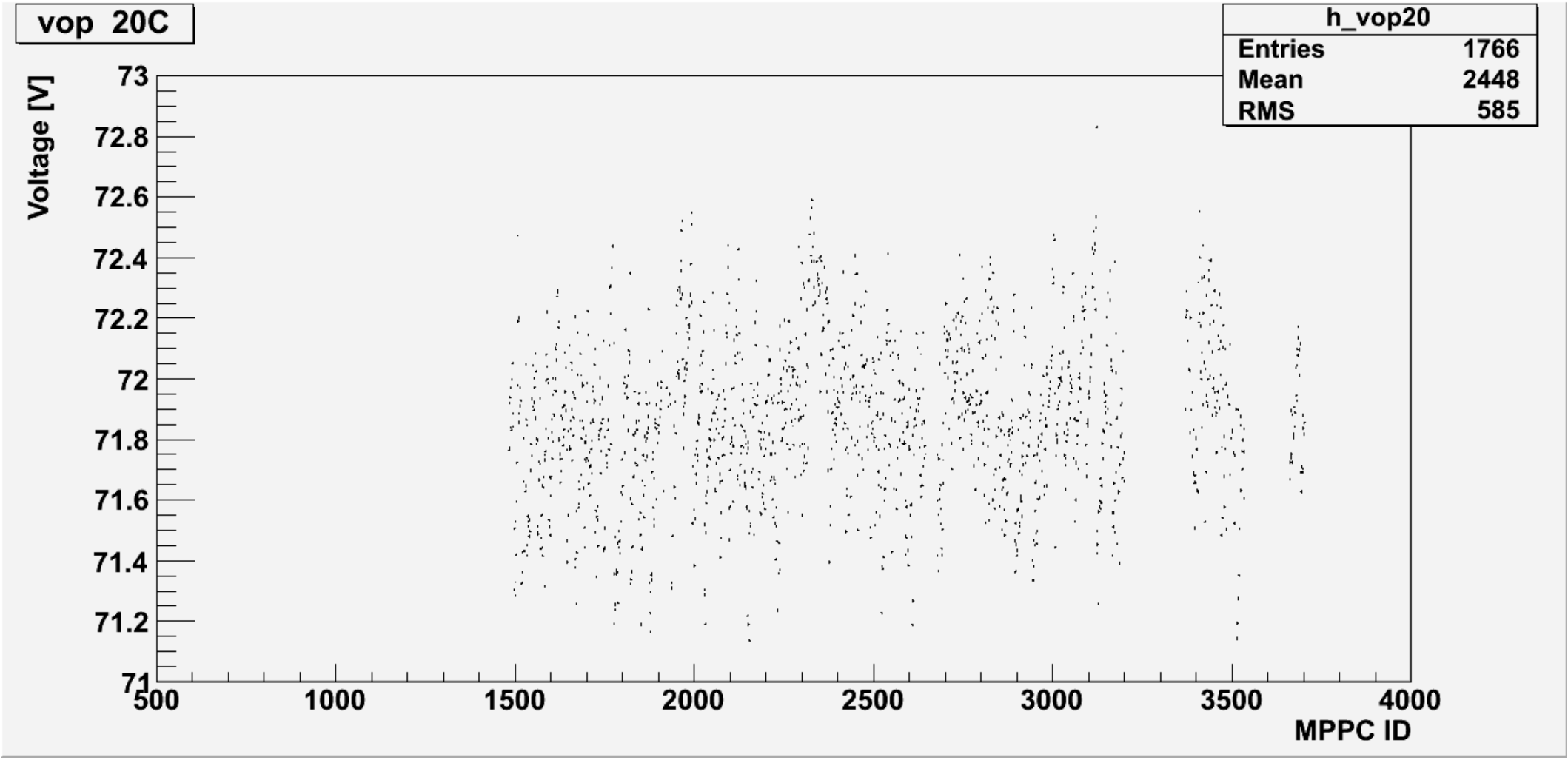
$$Mean_{\mu_i \cdot G_i} = \frac{1}{16} \cdot \sum_{k=1}^{16} \mu_{ik} \cdot G_{ik}; \quad RMS_{\mu_i \cdot G_i} = \sqrt{\frac{1}{16} \cdot \sum_{k=1}^{16} (\mu_{ik} \cdot G_{ik})^2 - Mean^2_{Nphe_i \cdot G_i}}$$

*With $\mu_{ik}$ an $G_{ik}$ Average number of photo−electrons and gain for mppc i and cell k respectively.*

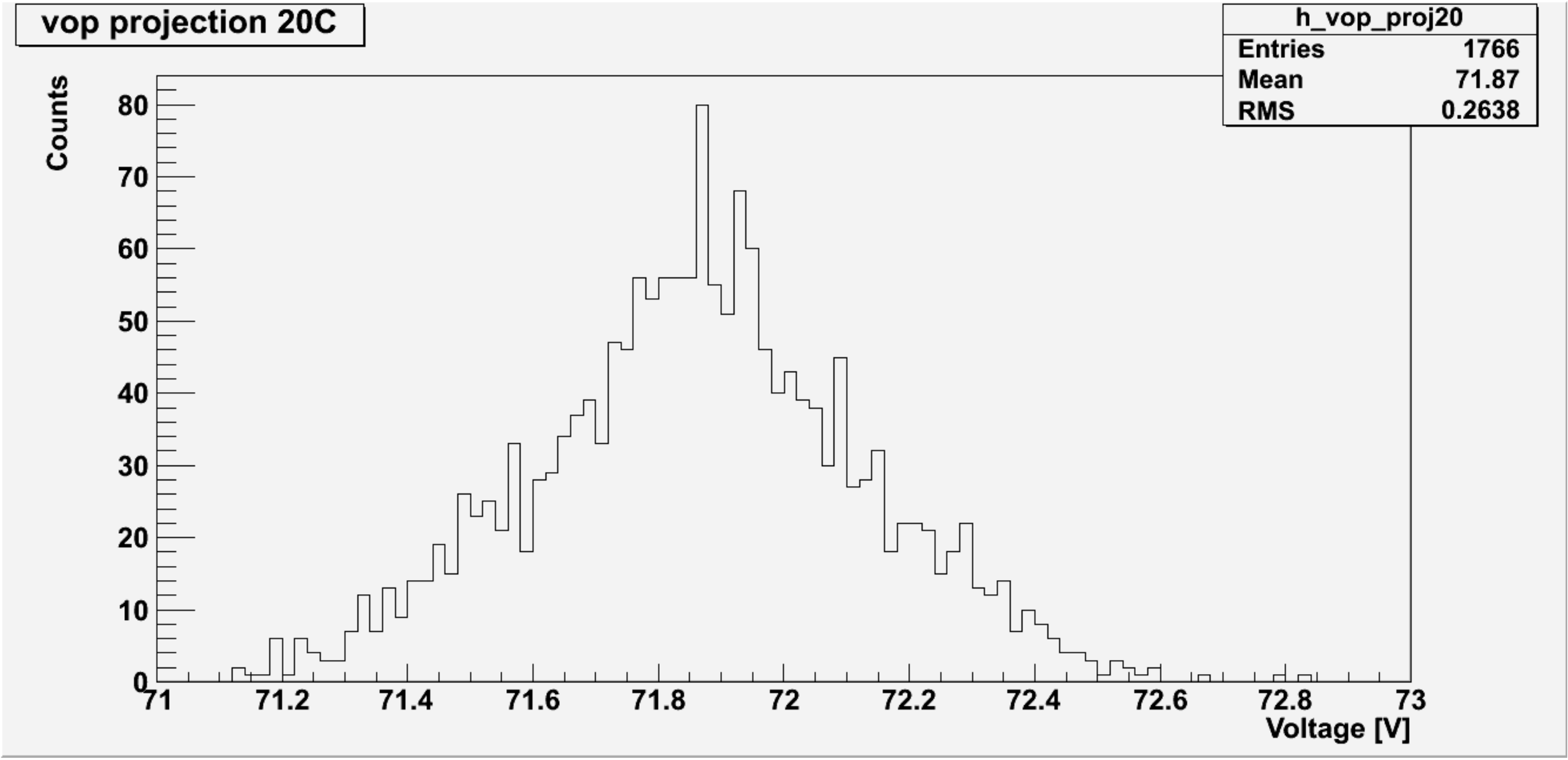
The formulas used in Dark Rate:

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

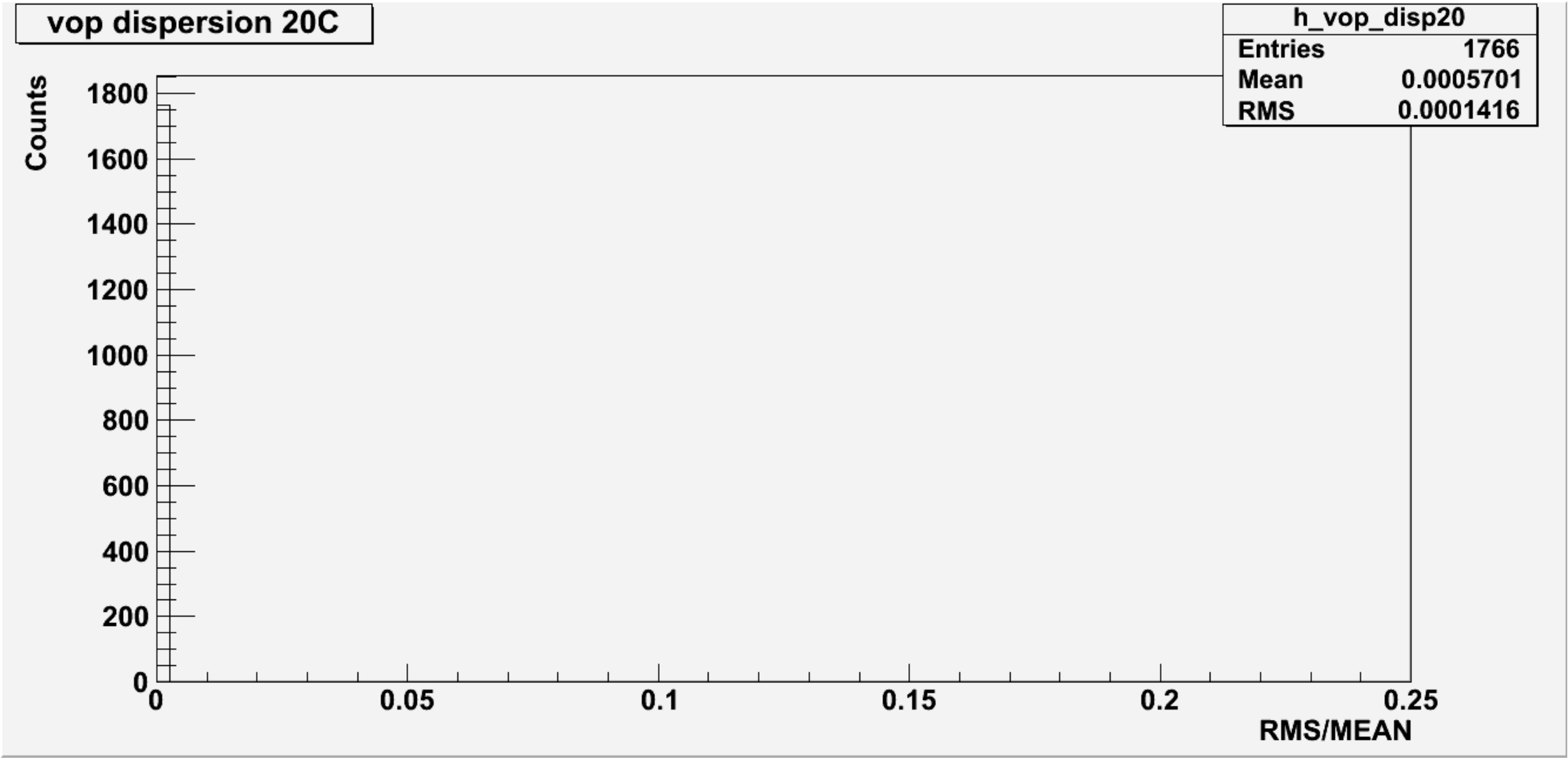
# Vop


vop 20C
h_vop20
Entries 1766
Mean 2448
RMS 585
Voltage [V]
73
72.8
72.6
72.4
72.2
72
71.8
71.6
71.4
71.2
71
500
1000
1500
2000
2500
3000
3500
4000
MPPC ID

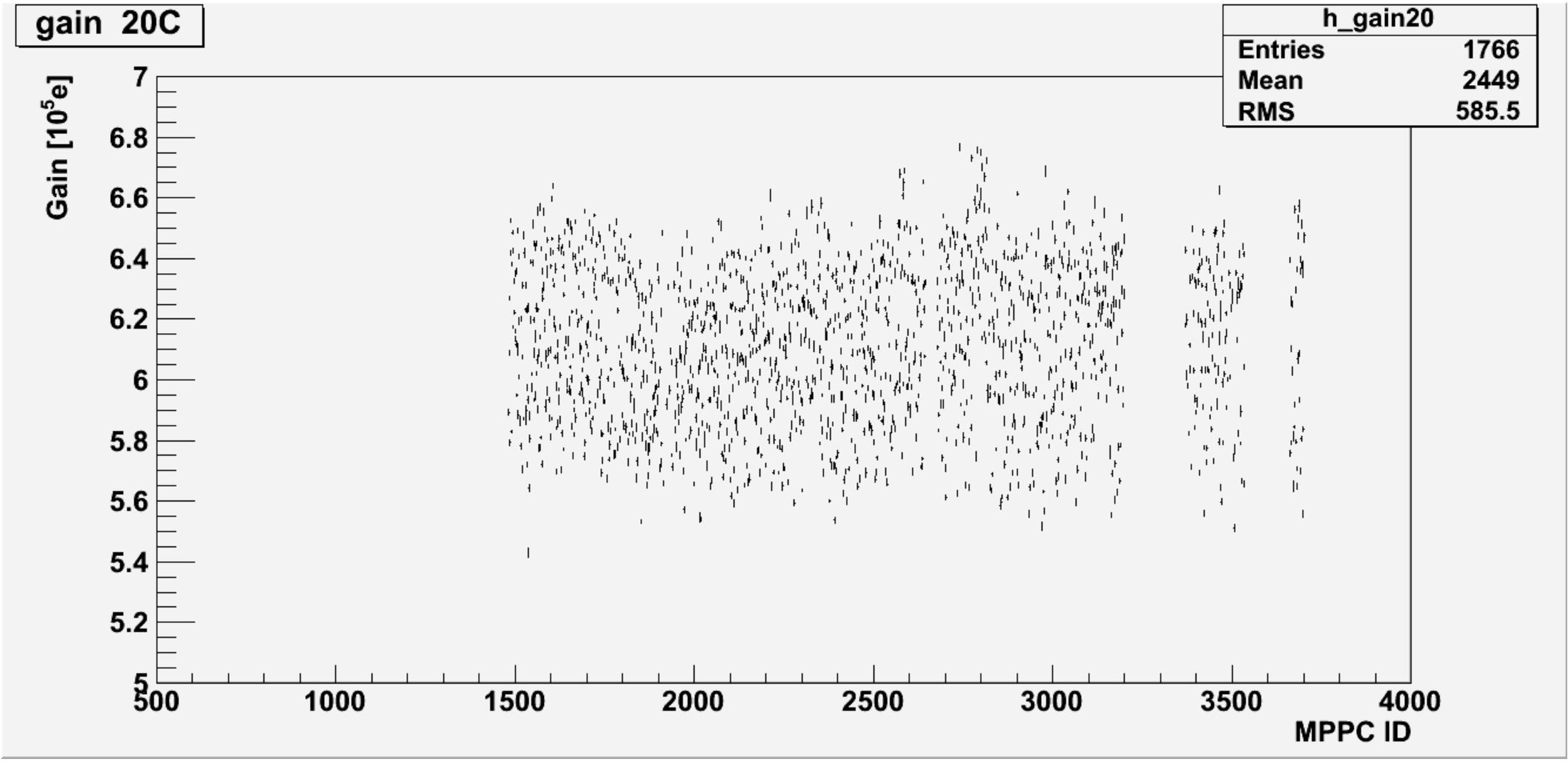
# Vop projection y-axis



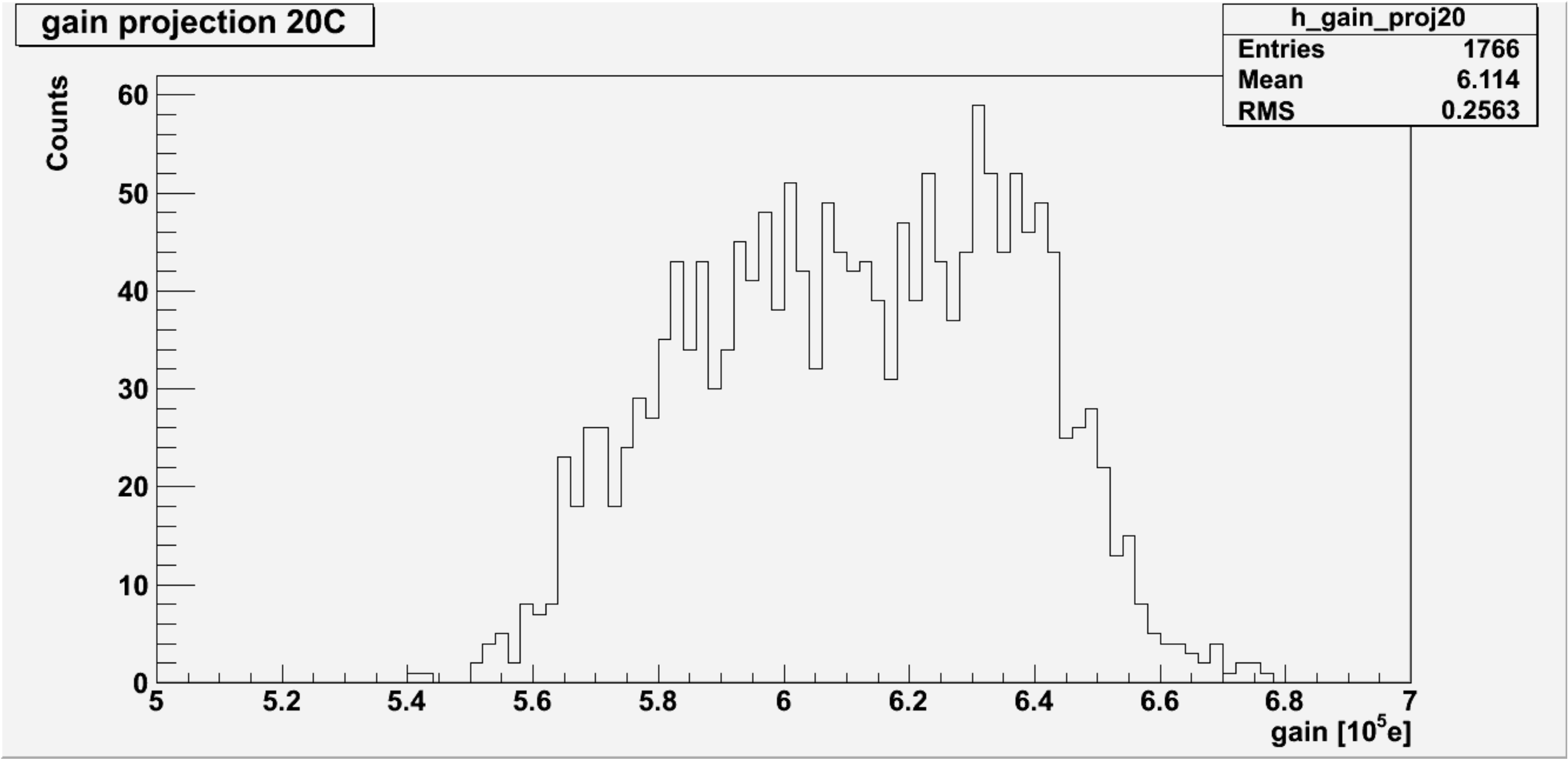
# Vop Dispersion



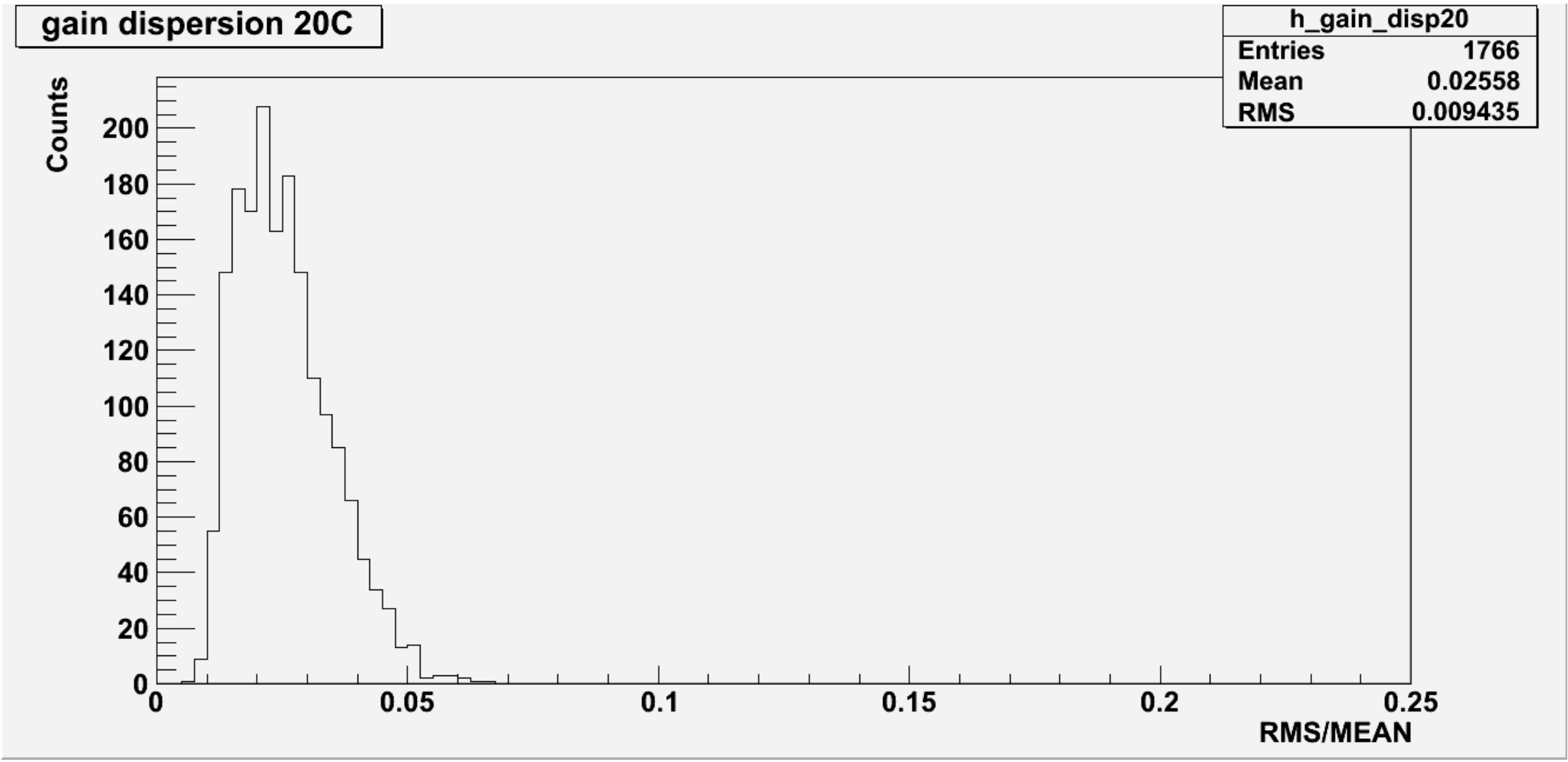
# Gain


gain 20C
h_gain20
Entries 1766
Mean 2449
RMS 585.5
Gain [10^5e]
7
6.8
6.6
6.4
6.2
6
5.8
5.6
5.4
5.2
5
500
1000
1500
2000
2500
3000
3500
4000
MPPC ID

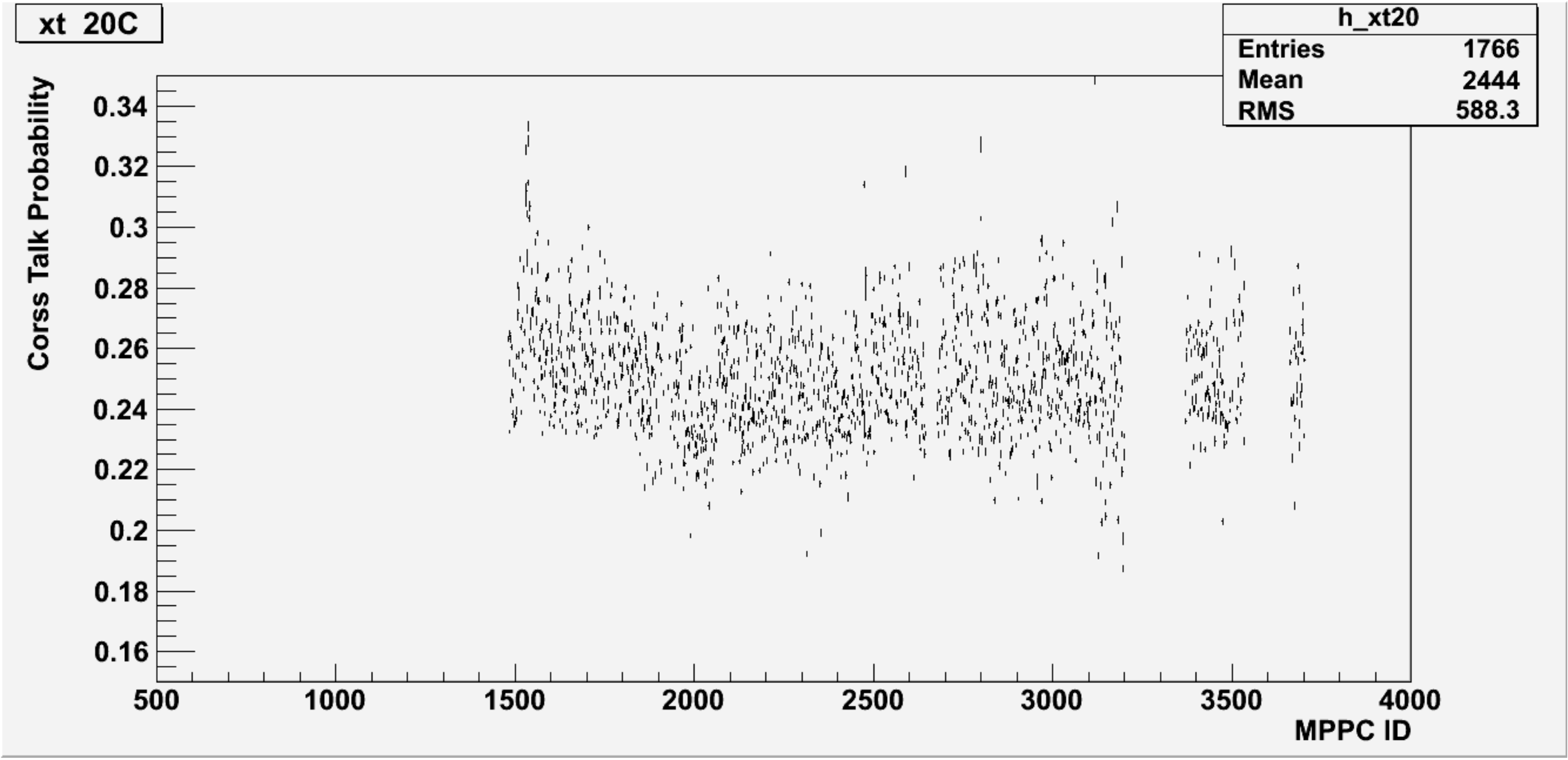
# Gain projection y-axis



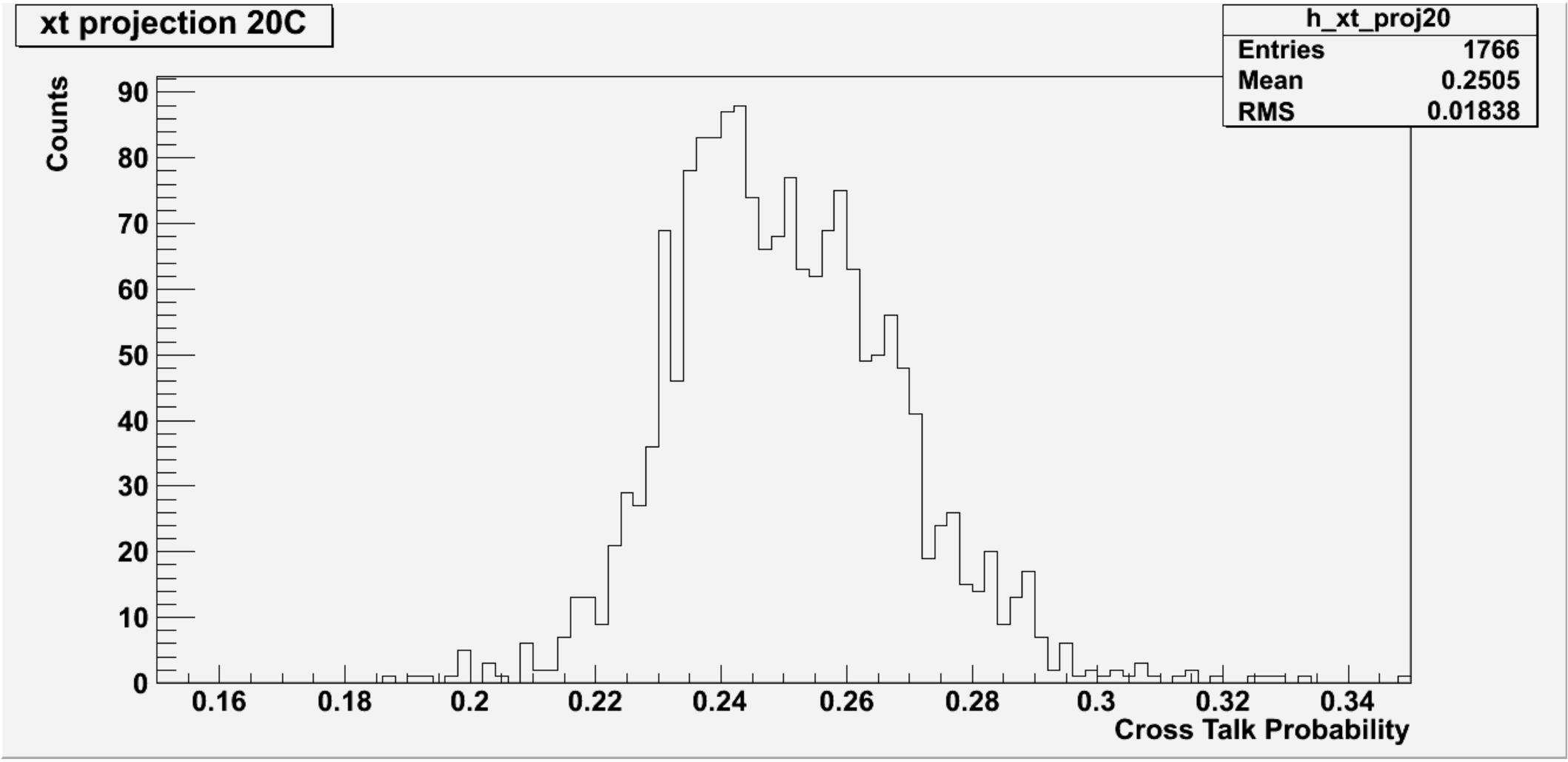
# Gain Dispersion



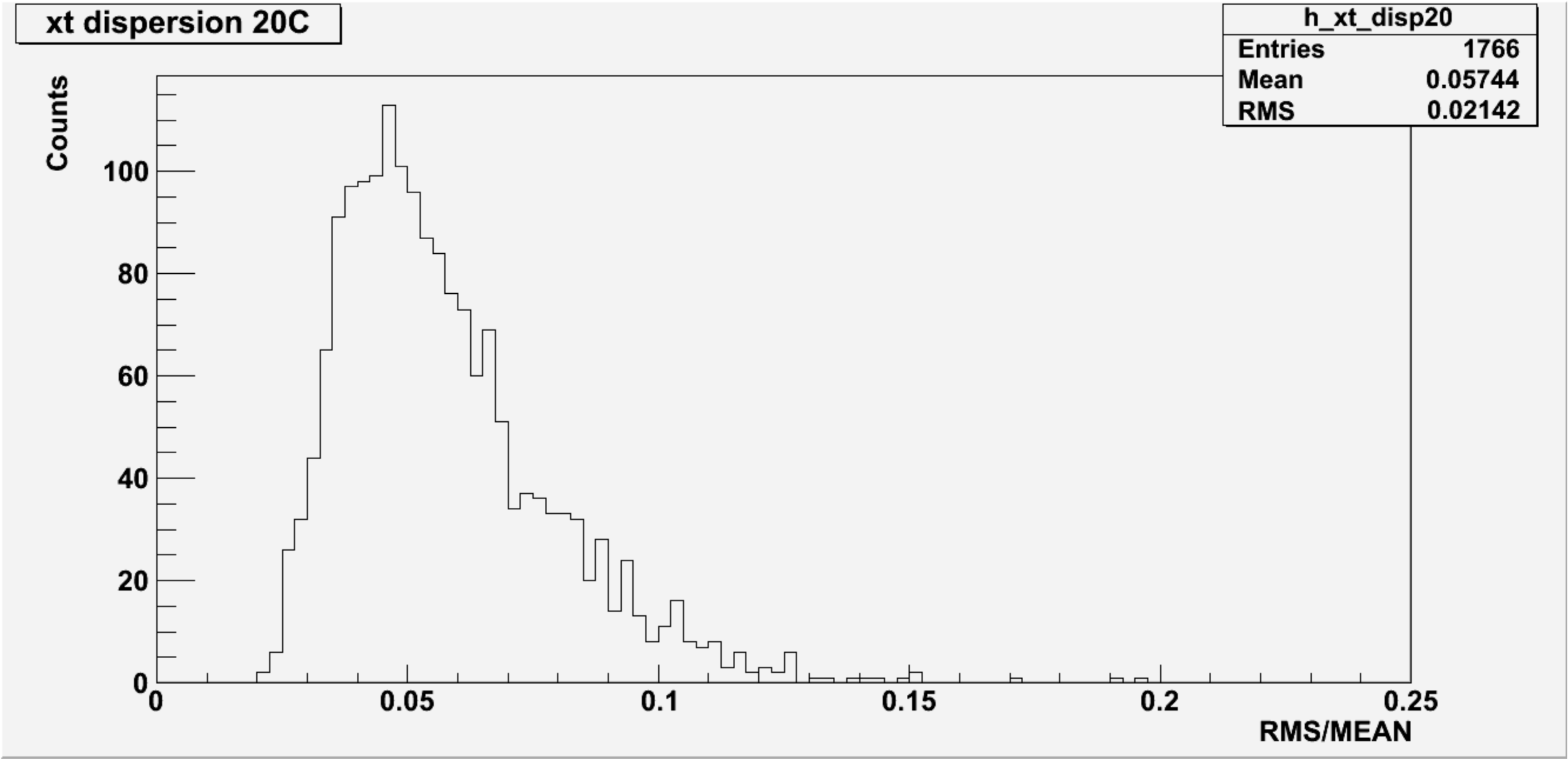
# Cross-Talk


xt 20C
h_xt20
Entries 1766
Mean 2444
RMS 588.3
Corss Talk Probability
0.34
0.32
0.3
0.28
0.26
0.24
0.22
0.2
0.18
0.16
500
1000
1500
2000
2500
3000
3500
4000
MPPC ID

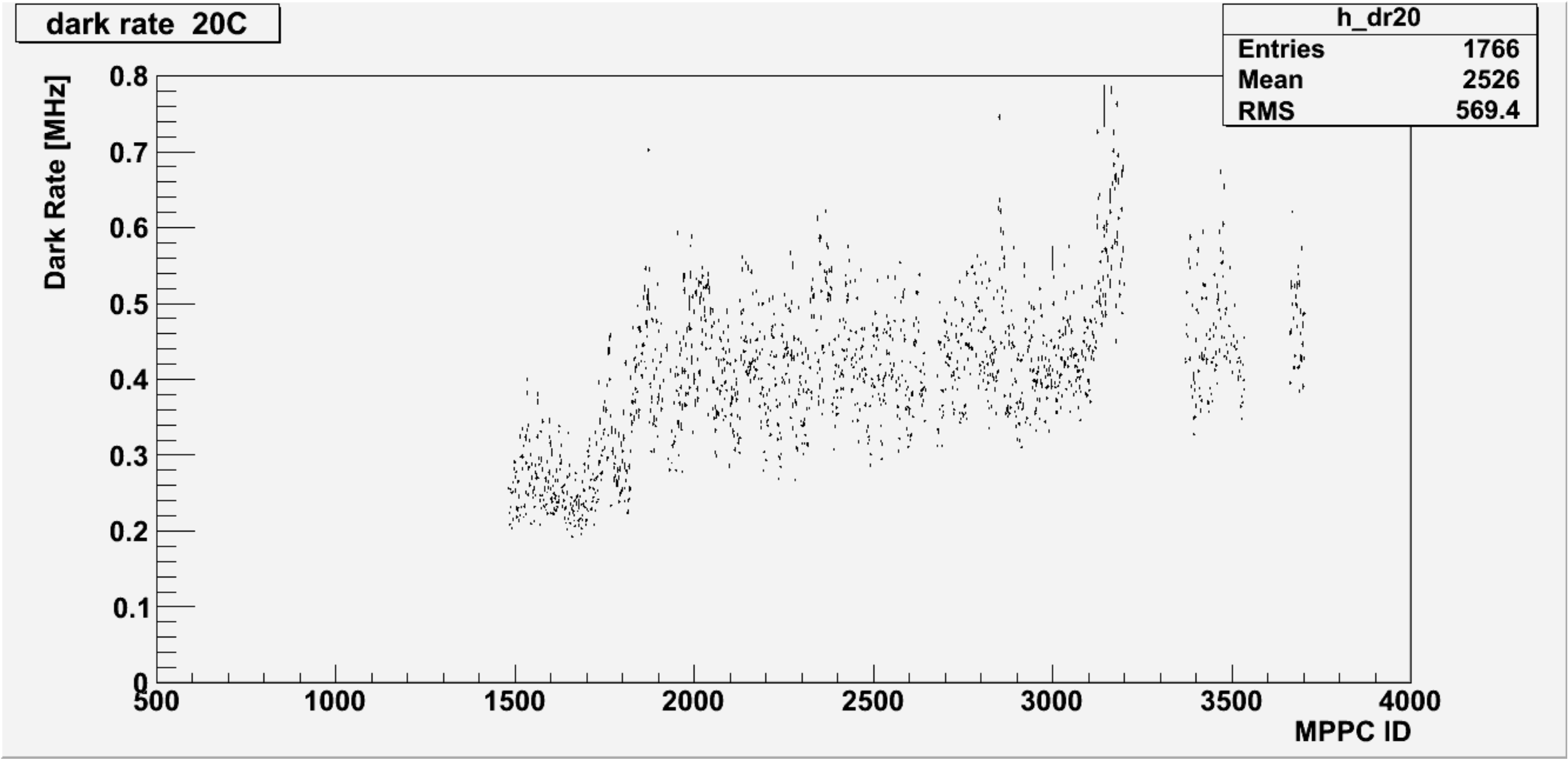
# Cross-Talk projection y-axis



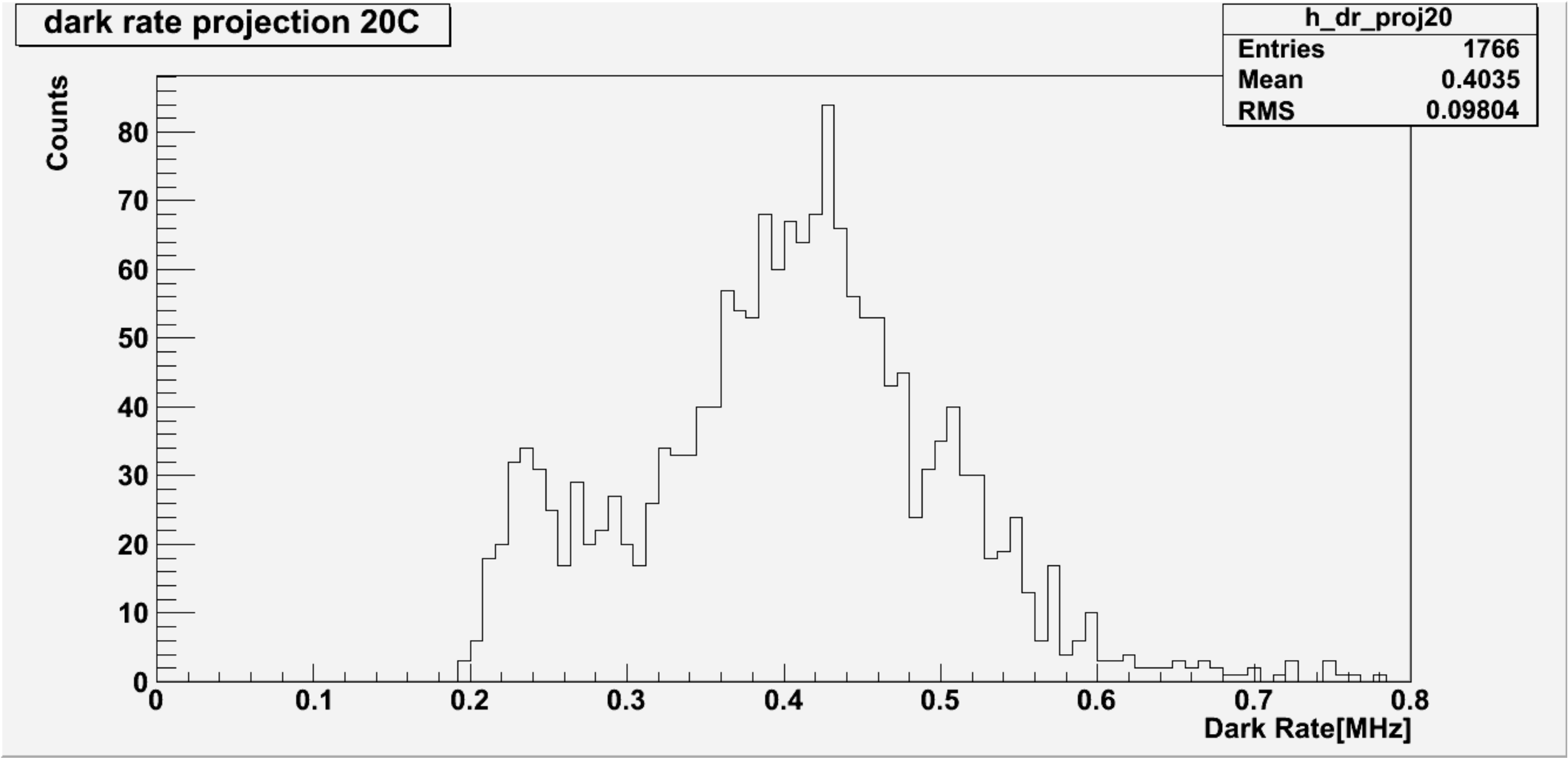
# Cross-Talk Dispersion



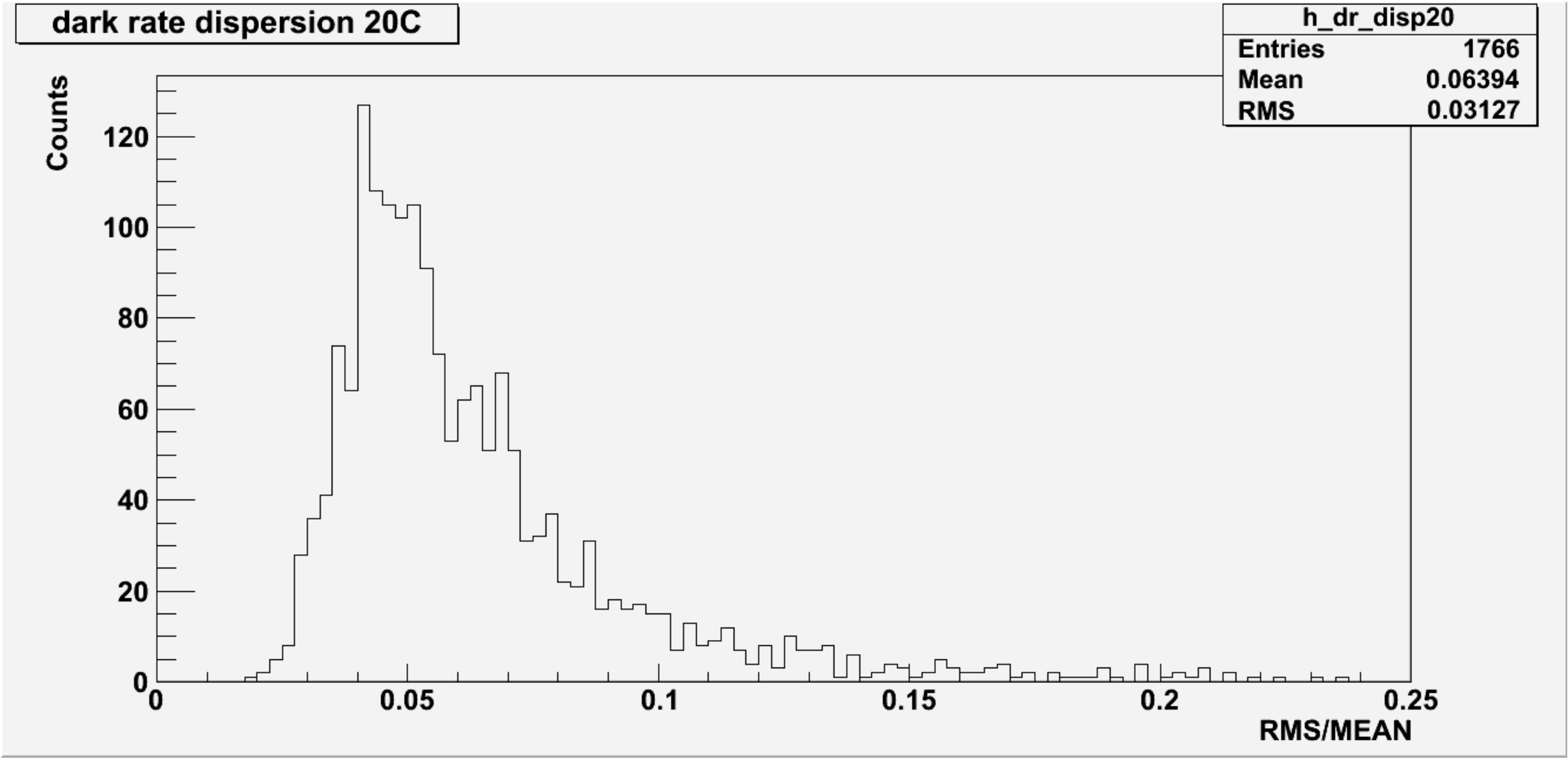
# Dark Rate


dark rate 20C
h_dr20
Entries 1766
Mean 2526
RMS 569.4
Dark Rate [MHz]
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
500
1000
1500
2000
2500
3000
3500
4000
MPPC ID

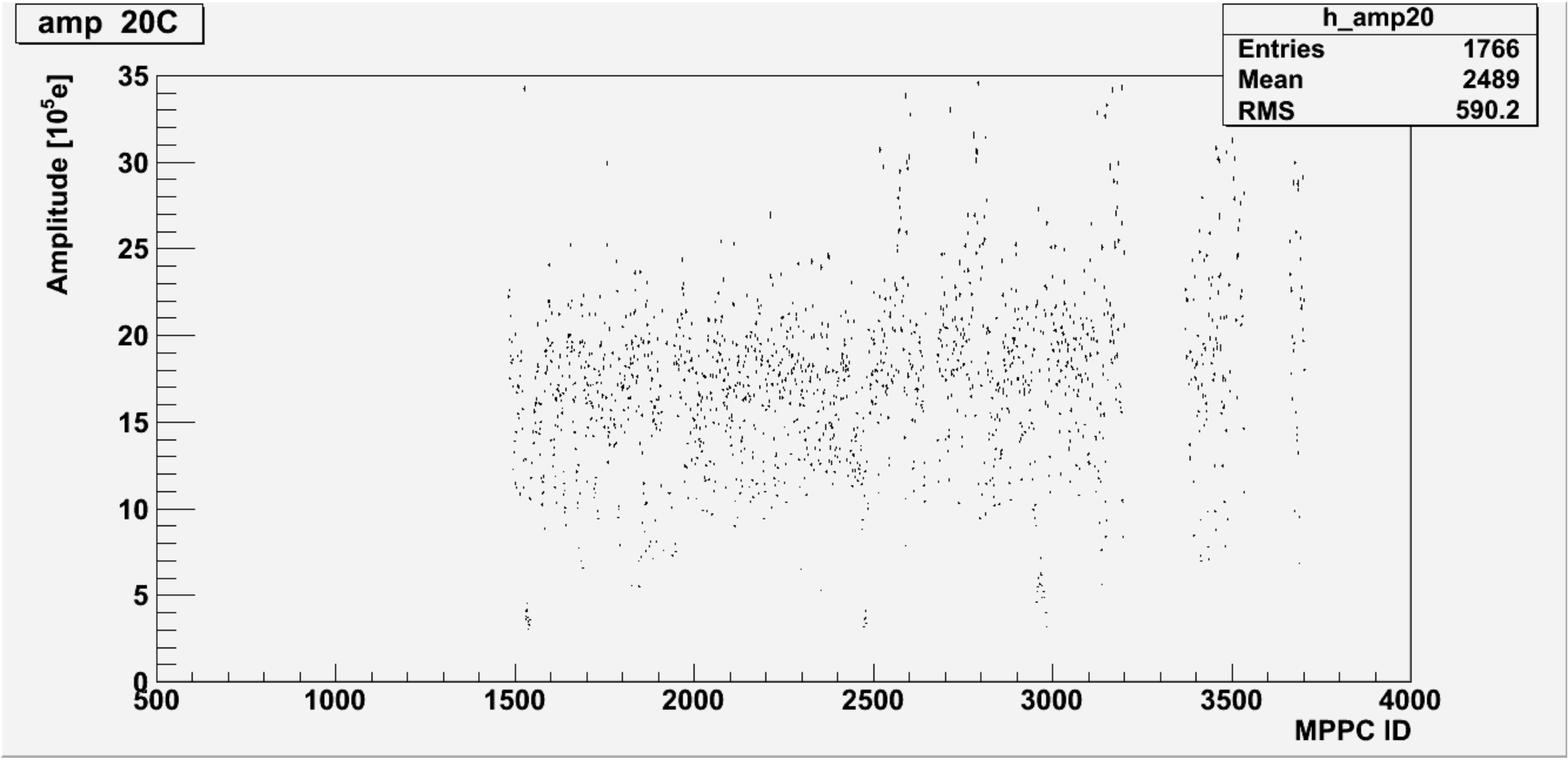
# Dark Rate projection y-axis



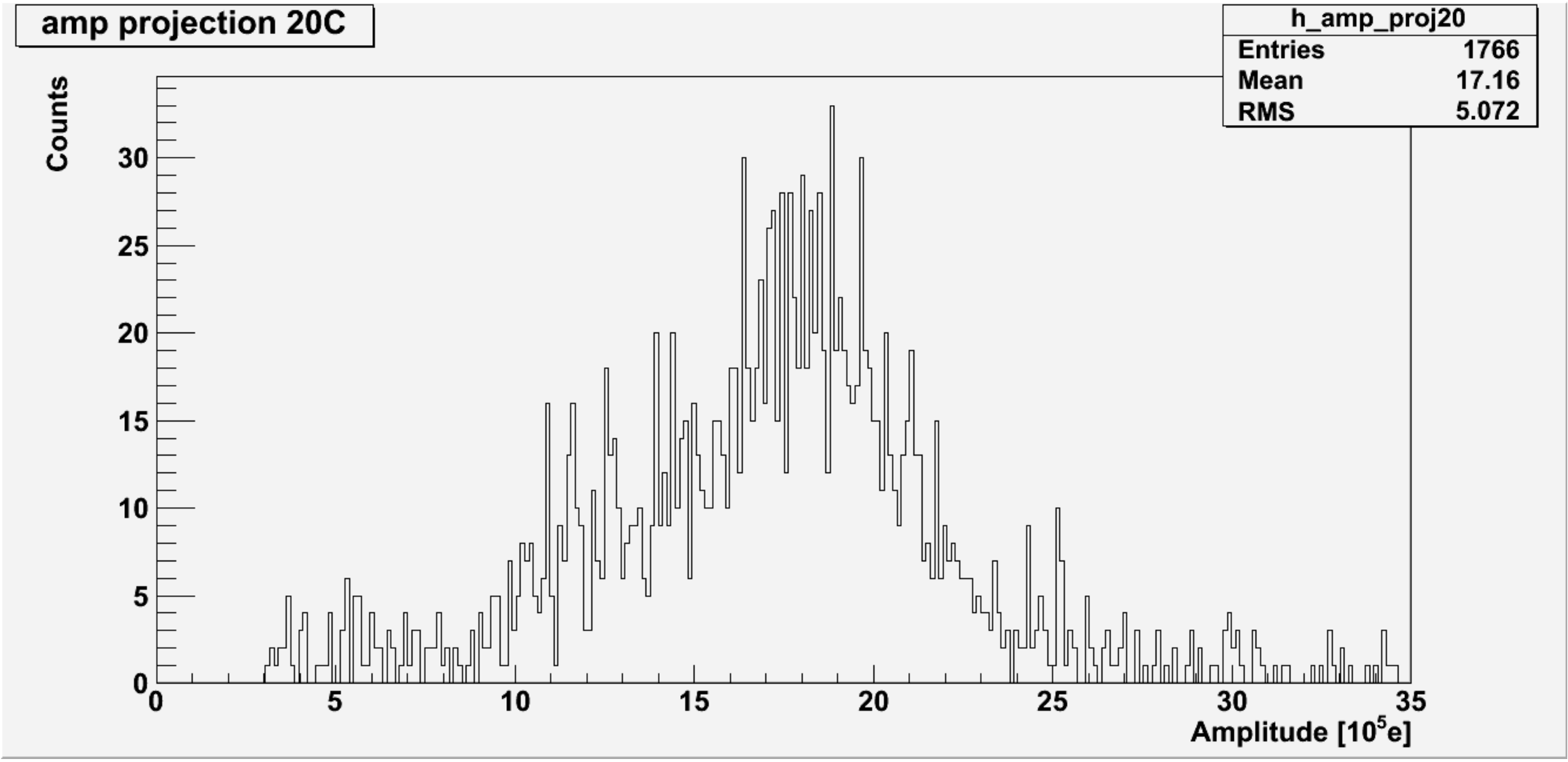
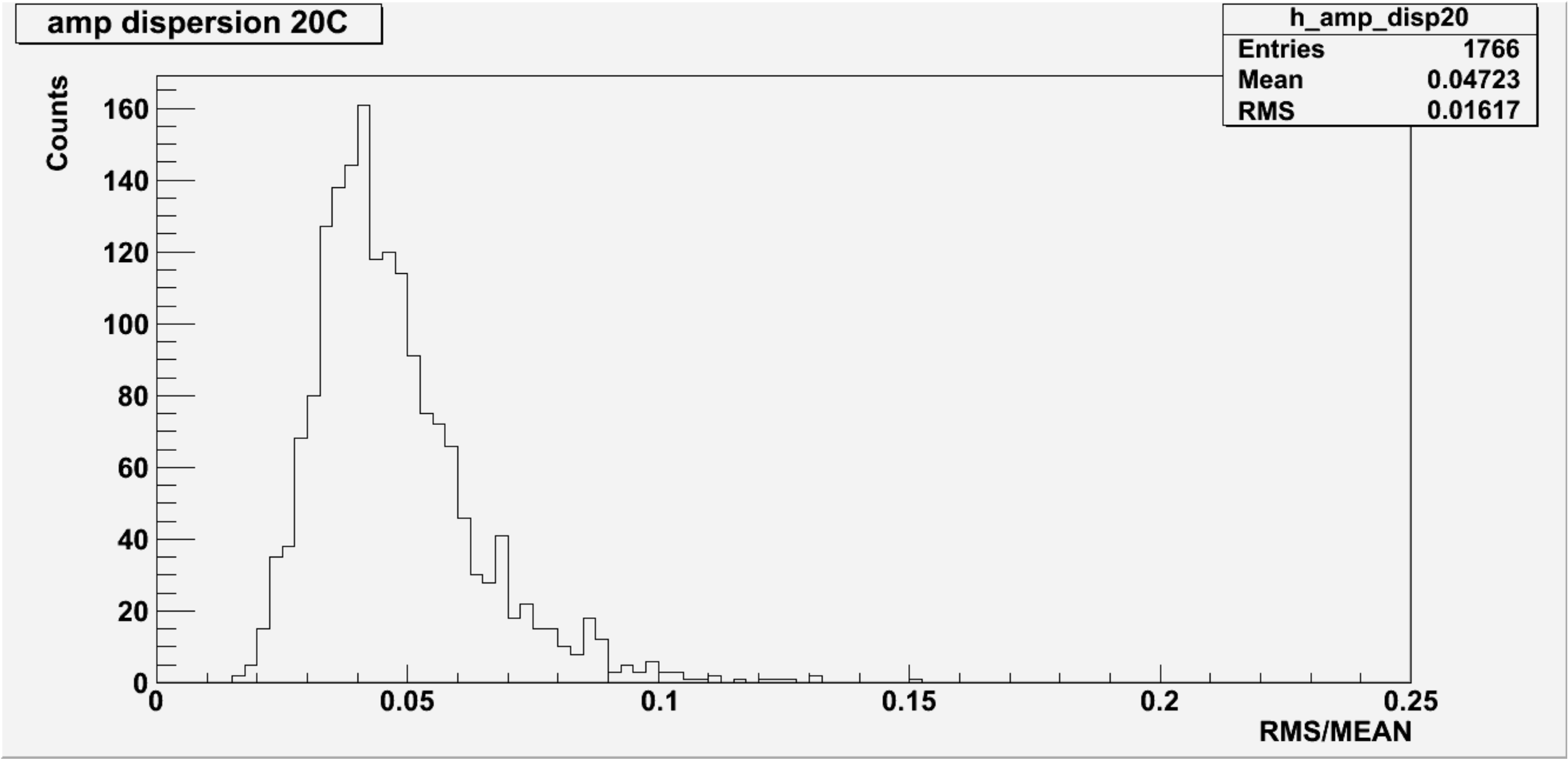
# Dark Rate Dispersion



# Amplitude


amp 20C
h_amp20
Entries 1766
Mean 2489
RMS 590.2
Amplitude [10^5e]
0
5
10
15
20
25
30
35
500
1000
1500
2000
2500
3000
3500
4000
MPPC ID

# Amplitude projection y-axis



# Amplitude Dispersion