

Updates on GEM noises with MPD readout system

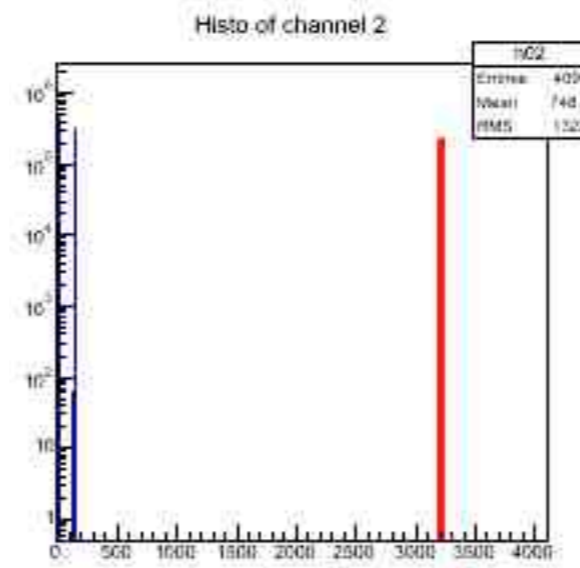
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Status

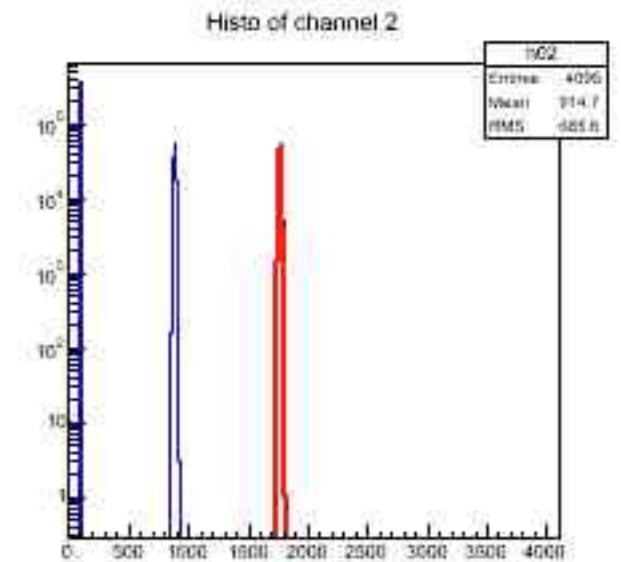
- Issues found in UVa:
 - 2 readout system: SRS and MPD (see Kondo's talk in Nov 7th 2012's weekly meeting for details)
 - Noise in ADC counts is 3 times bigger for MPD (~20 ADC channels) than SRS (~7 ADC channels)
- Updates:
 - The MPD readout system has been transferred from UVa back to JLab
 - Setup the MPD system here with a new 40x50 prototype chamber
 - Calibrated the clock phase
 - Took noise level with different ADC gain

Clock Phase

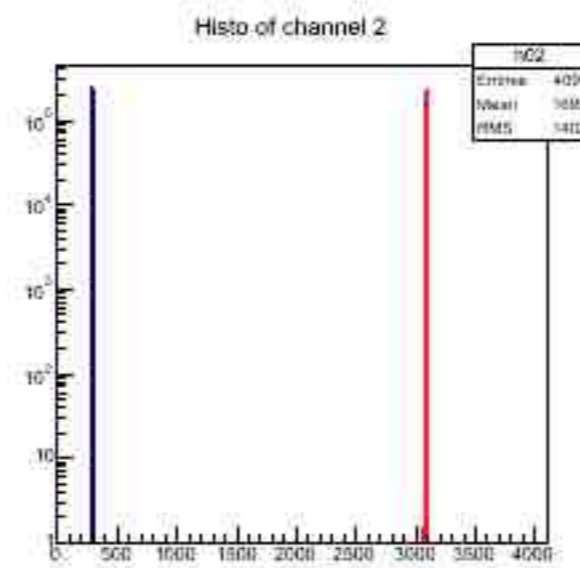
- Clock phase: reduce the influence of the delay in the signal cables
- To read the plots: there should be 2 groups of peaks in each histogram, which represents the digital level 0 and 1, the distance of these 2 groups of peaks should be maximized when the clock phase is optimized (here 1 stands by 0.5ns)
- We got that the clockphase = 47 is the best value
- We were using 45 in the previous test in UVa



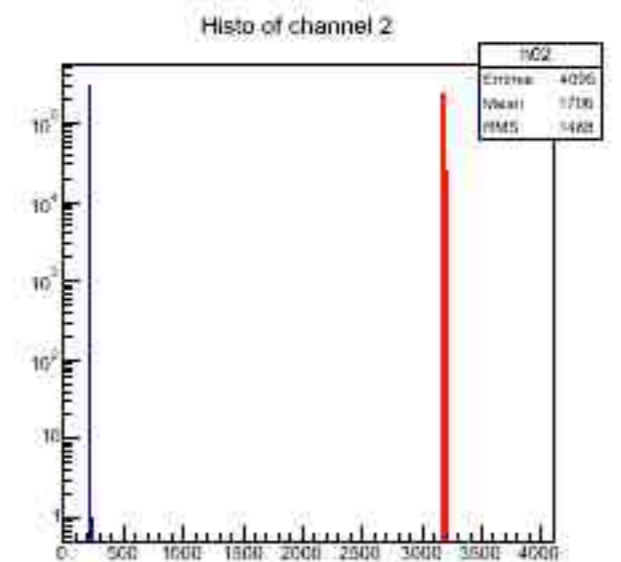
Clockphase=10



Clockphase=20



Clockphase=40

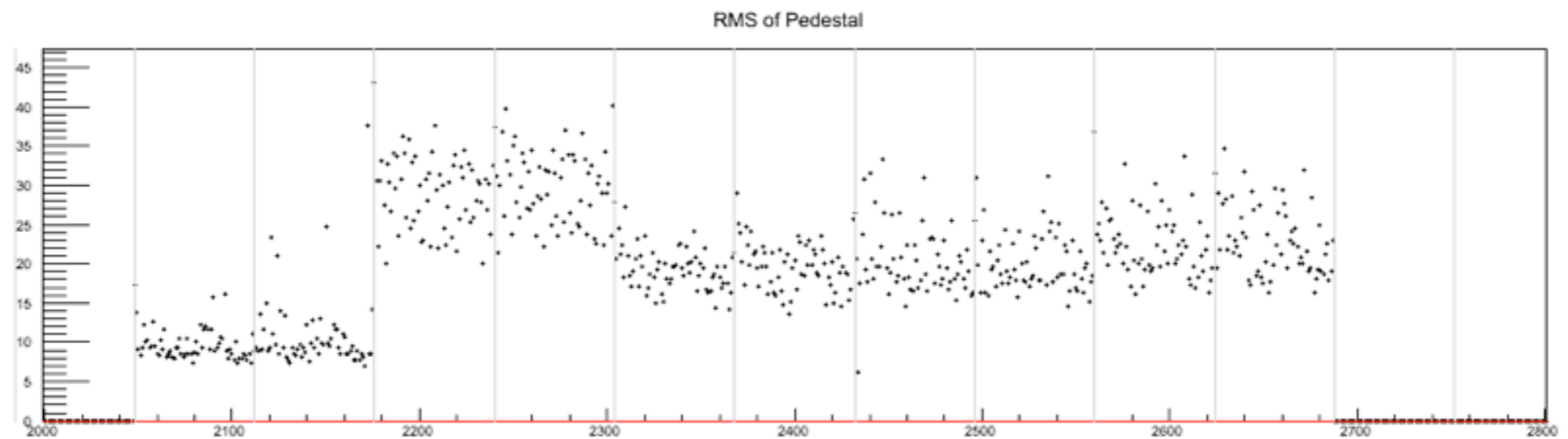
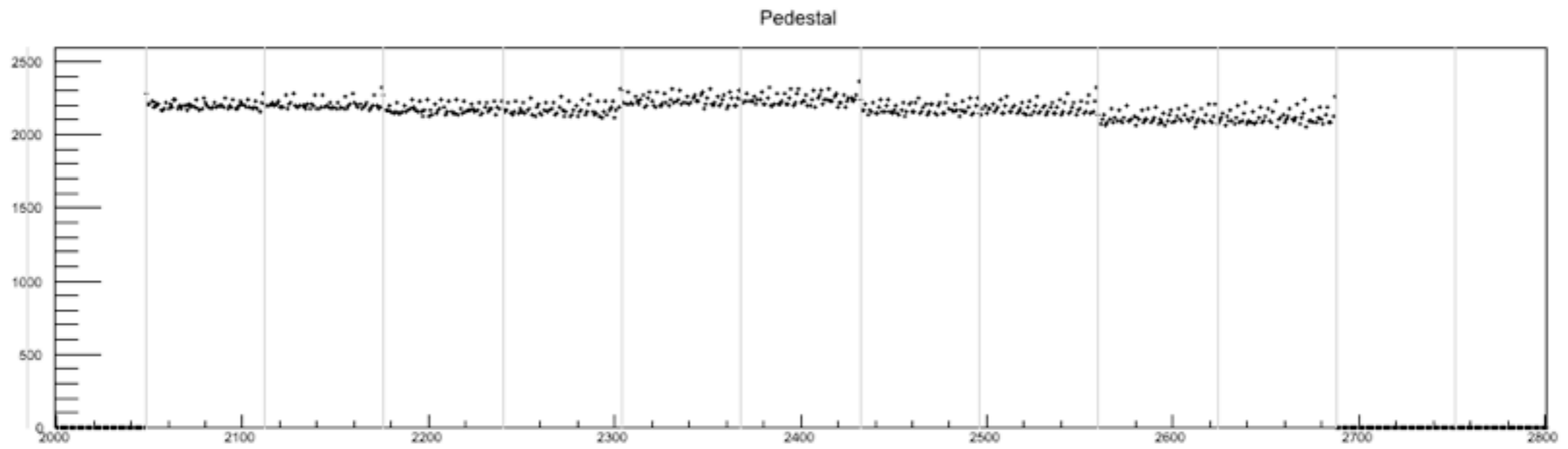


Clockphase=47

Noise level with different ADC gain

- We took the noise level with different ADC gain
- Setup: APV1 is not connected to the chamber for compare, the other four are connected to the chamber
- Comments from Evaristo this morning:
 - ~11 ADC unit with `adc.gain=5dB` if the APV is not connected
 - ~20 ADC

ADC gain	APV1	APV2	APV3	APV4	APV5
4dB	10.3	29.4	19.5	20.3	22.8
5dB	10.4	29.7	21.1	22.4	24.4
6dB	14.4	34.4	23.8	17.2	29.1
8dB	15.6	44.9	31.5	34.9	36.2
10dB	20.1	57.0	36.9	41.3	45.4
12dB	26.8	68.1	48.1	51.9	57.0



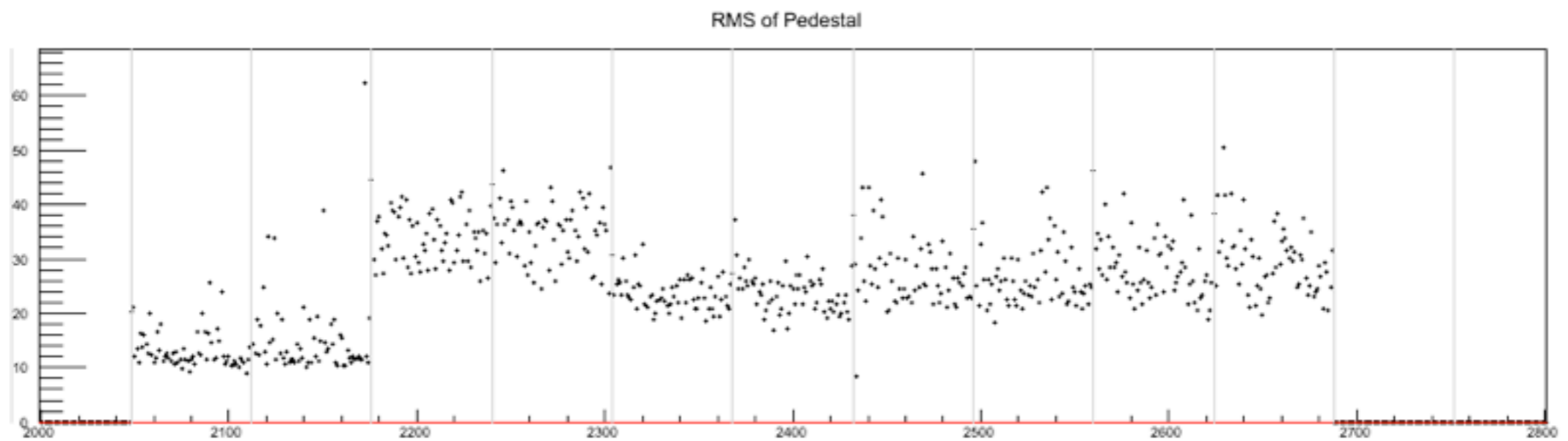
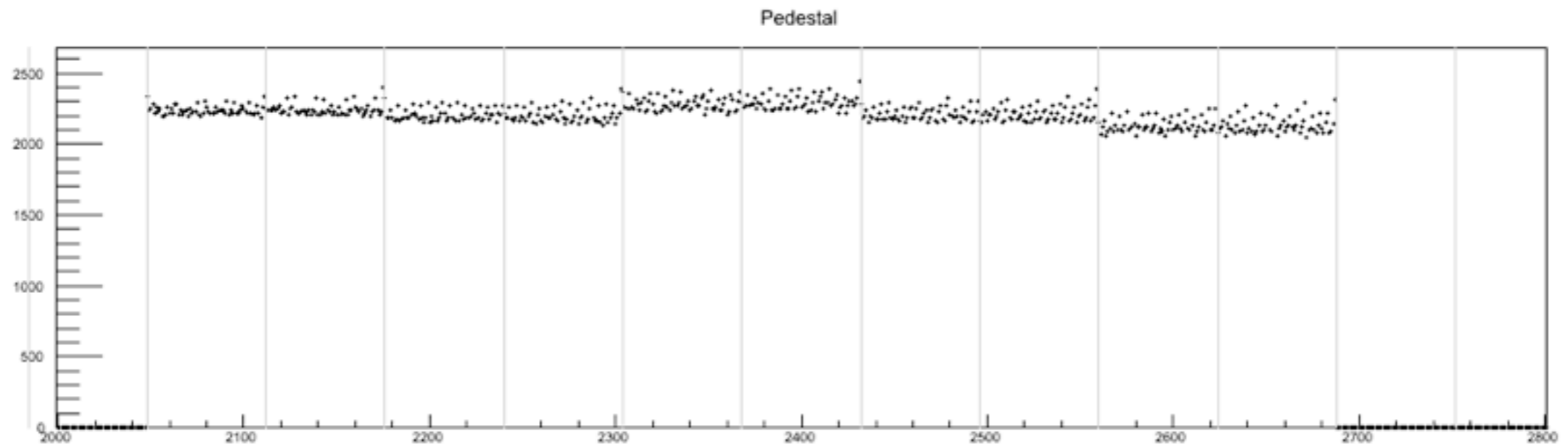
ADC gain = 4dB

Pedestal RMS = 10.3 (not connected to chamber)

22.8 (connected to chamber)

(in ADC channel)

Backups

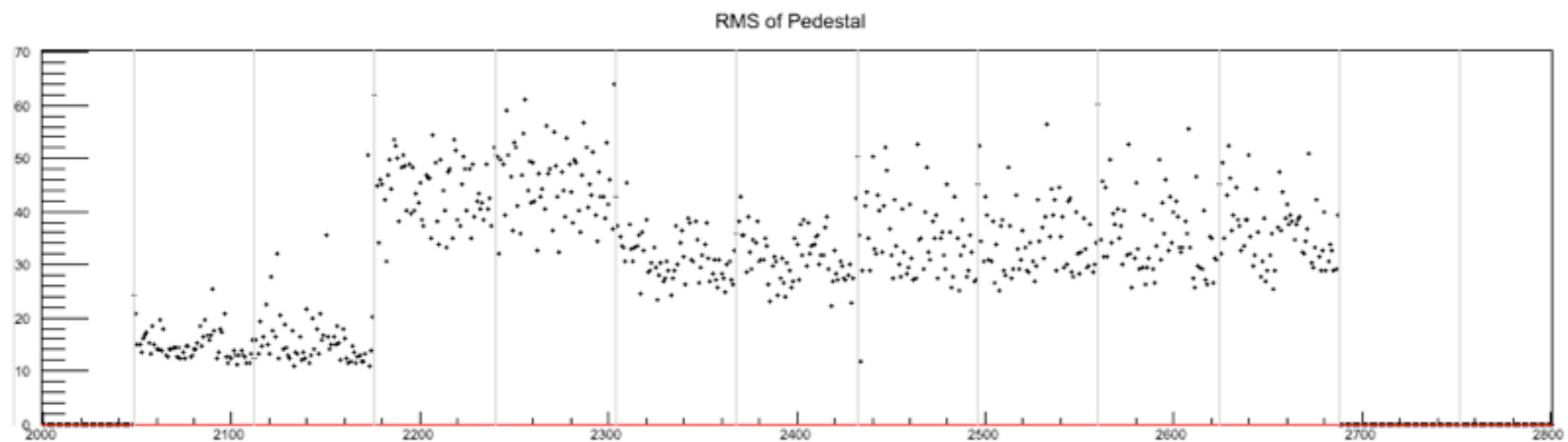
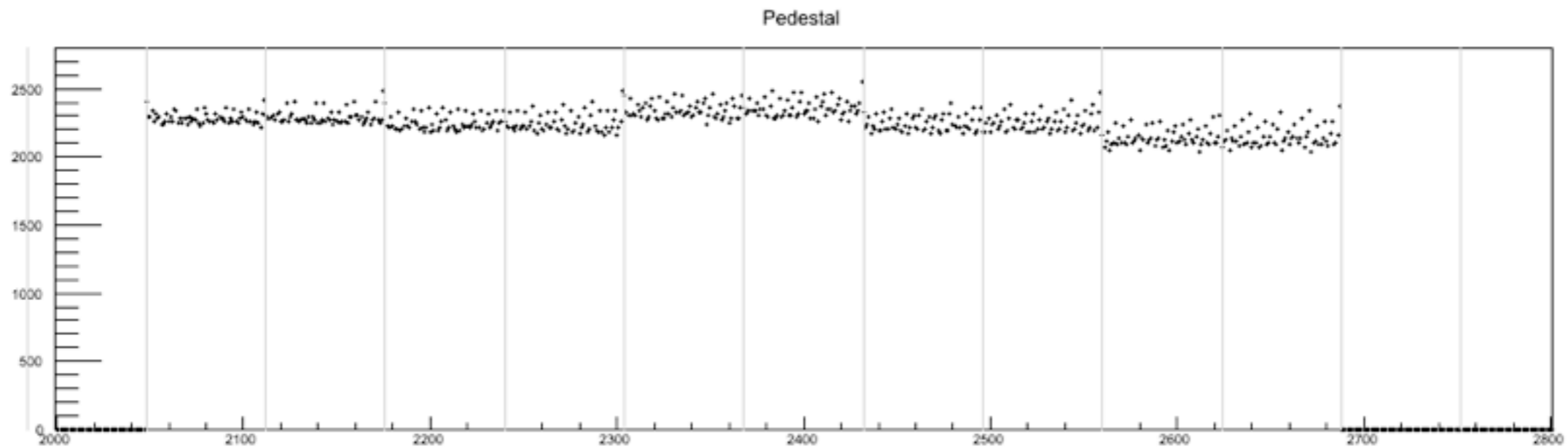


ADC gain = 6dB

Pedestal RMS = 14.4 (not connected to chamber)

29.1 (connected to chamber)

(in ADC channel)

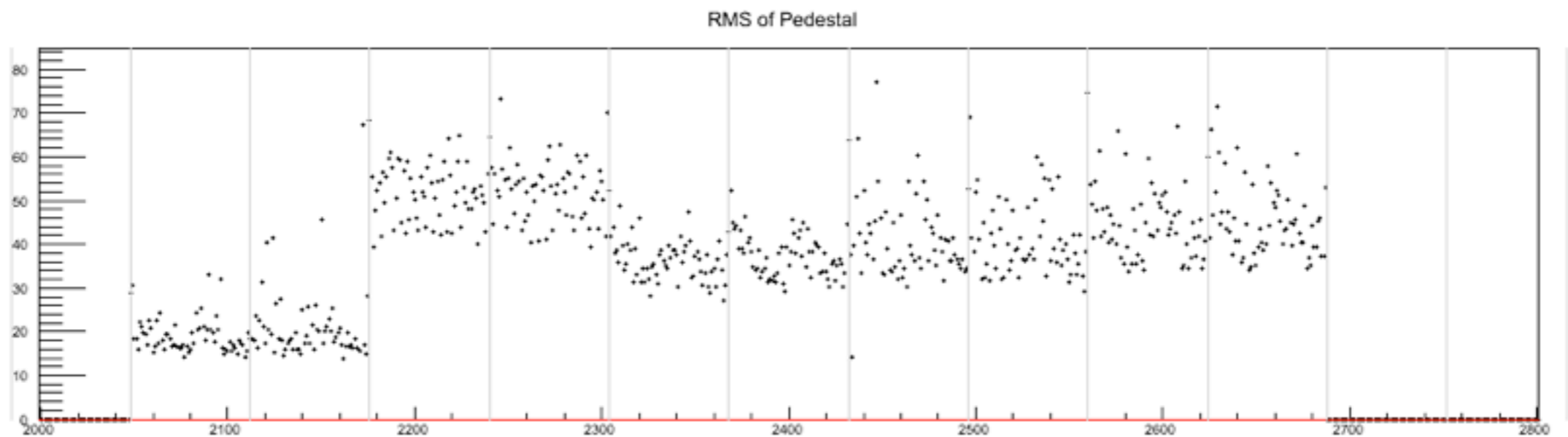
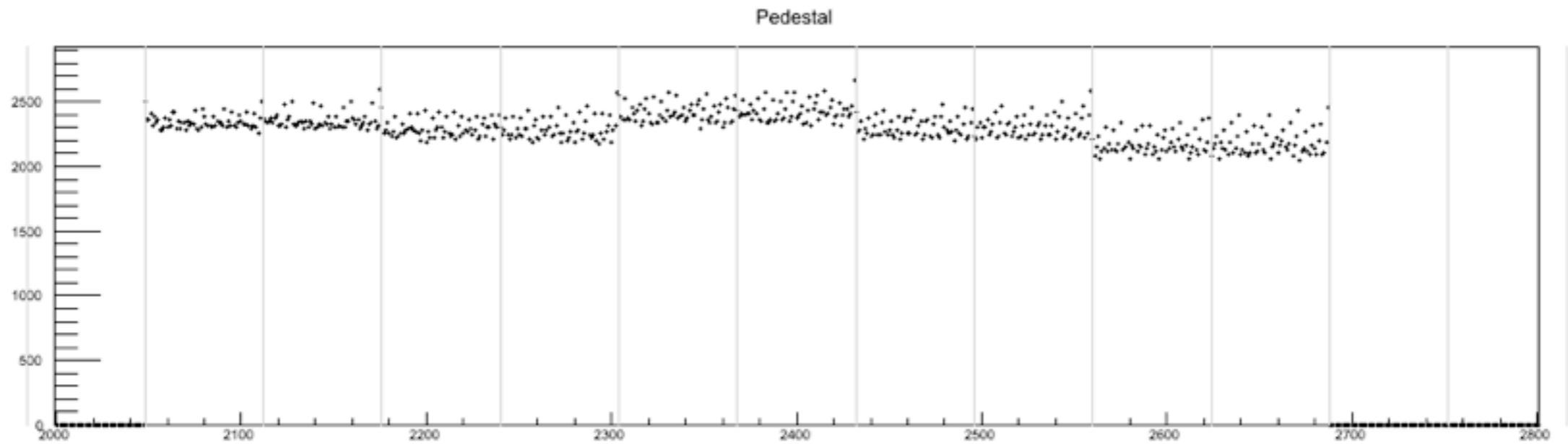


ADC gain = 8dB

Pedestal RMS = 15.6 (not connected to chamber)

36.2 (connected to chamber)

(in ADC channel)

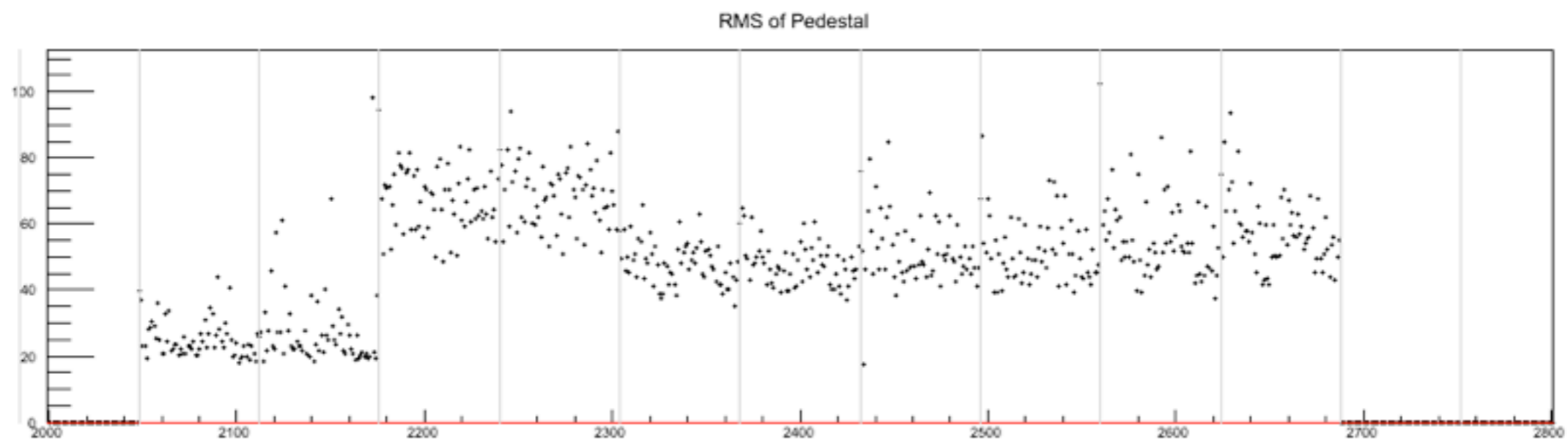
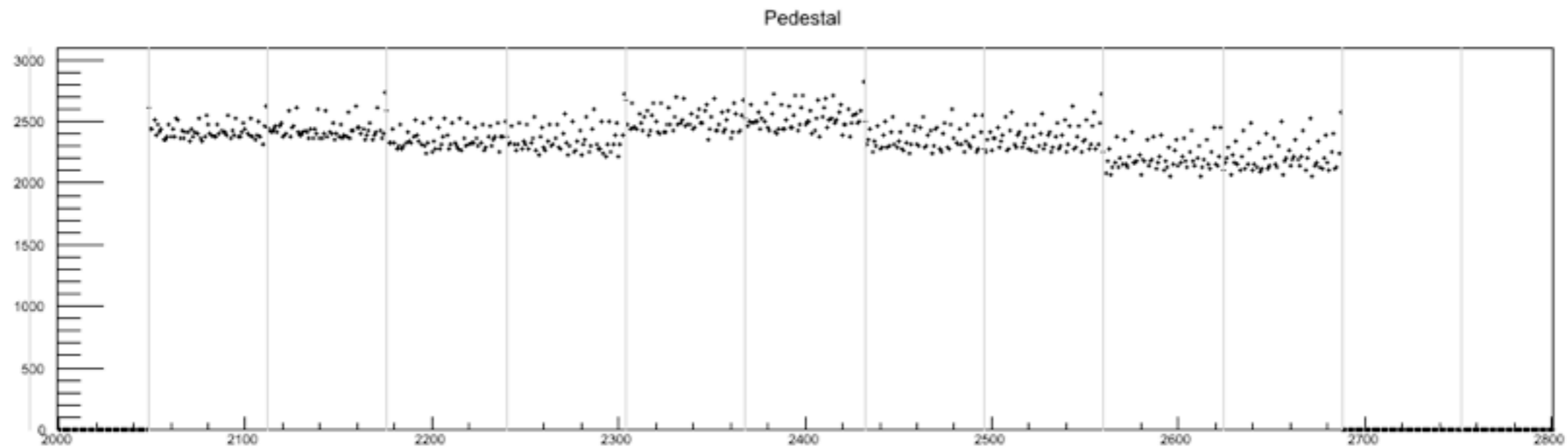


ADC gain = 10dB

Pedestal RMS = 20.1 (not connected to chamber)

45.4 (connected to chamber)

(in ADC channel)



ADC gain = 12dB

Pedestal RMS = 26.8 (not connected to chamber)

57.0 (connected to chamber)

(in ADC channel)