SDU #3 cosmic test result

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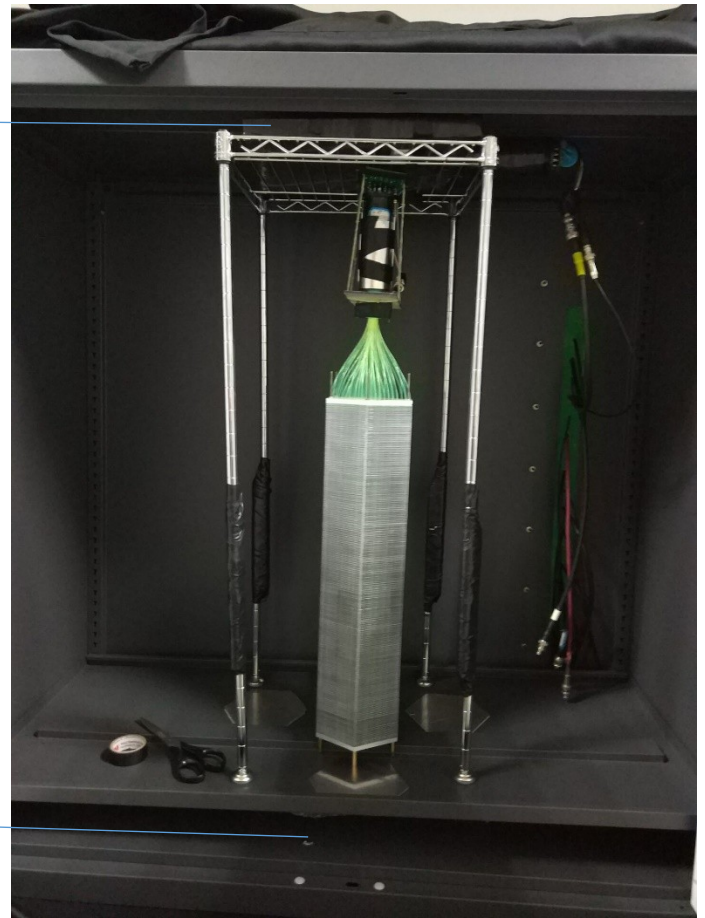
SDU, Jan. 12th, 2017

New SDU #3 module

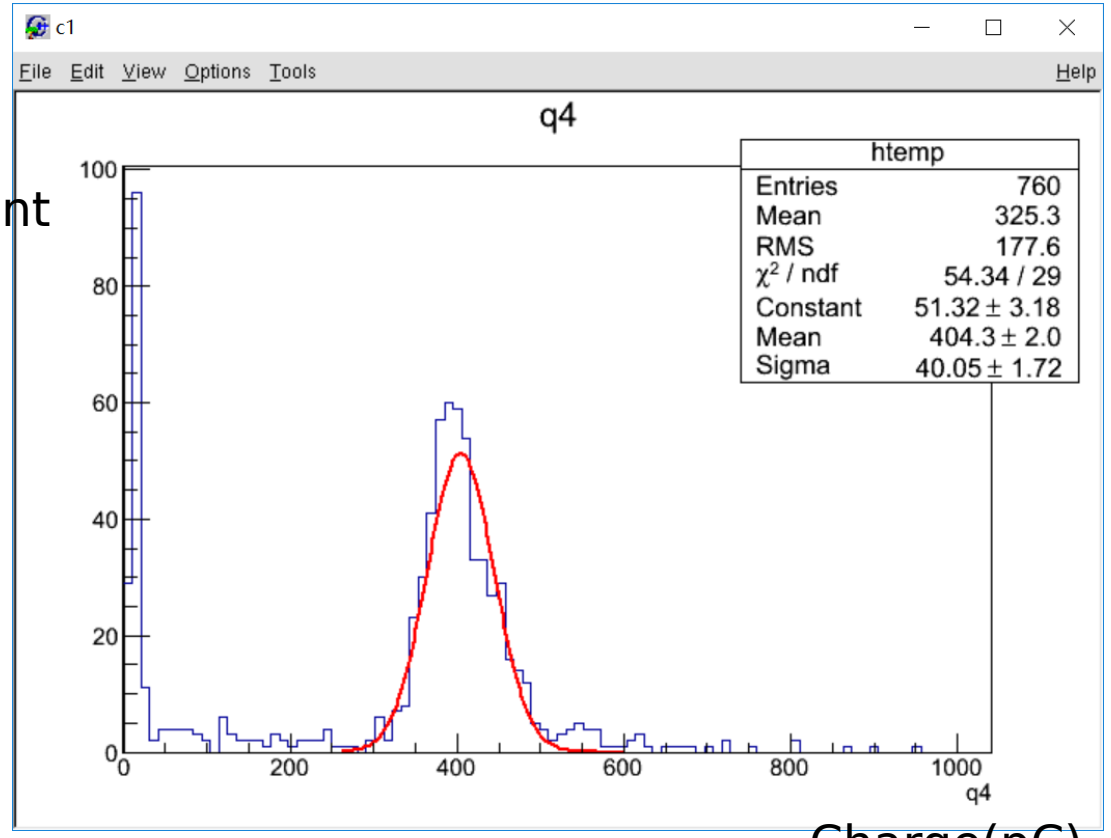
Module No.	WLS fiber	Scintillator	Lead layer	Fiber end	Reflective layer	Front plate	Coating
SDU #3	Y11	Kedi(enhanced)	US company	Silver mirror	Print paper	No holes	TiO2+glue(1:1)

Comparing with SDU #2, the improvement is fiber and use more TiO2 ratio.



Vertical test result

Signal



Pedestal

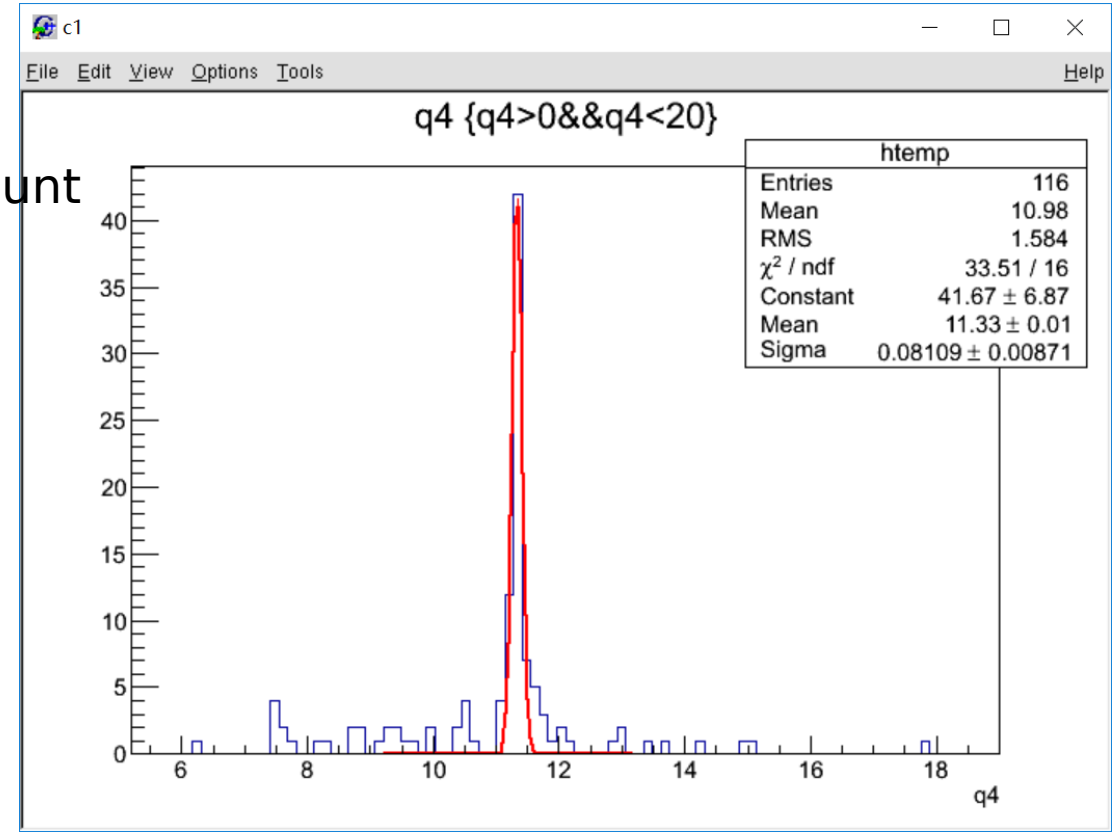
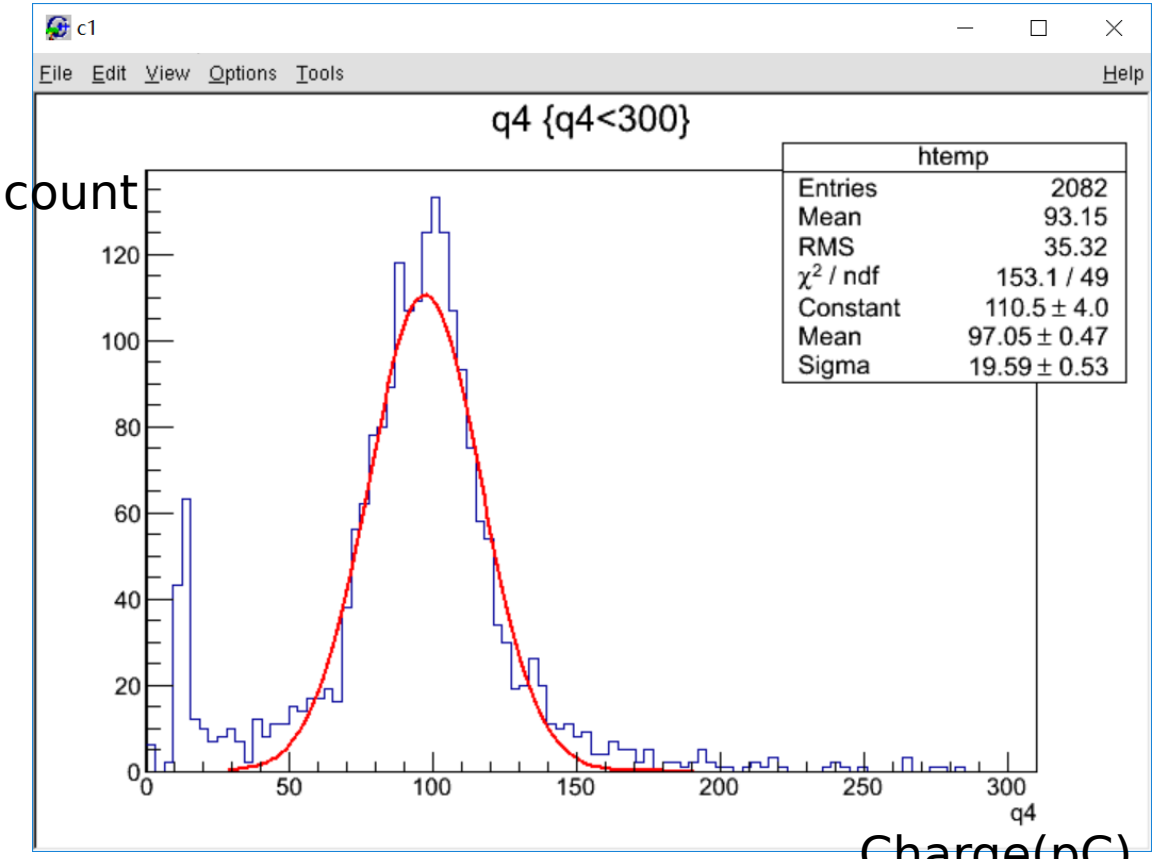


photo-electrons calculated as (MPV-Pedestal)/(e*Gain) = 491.3 p.e. with (Gain=5*10^6)

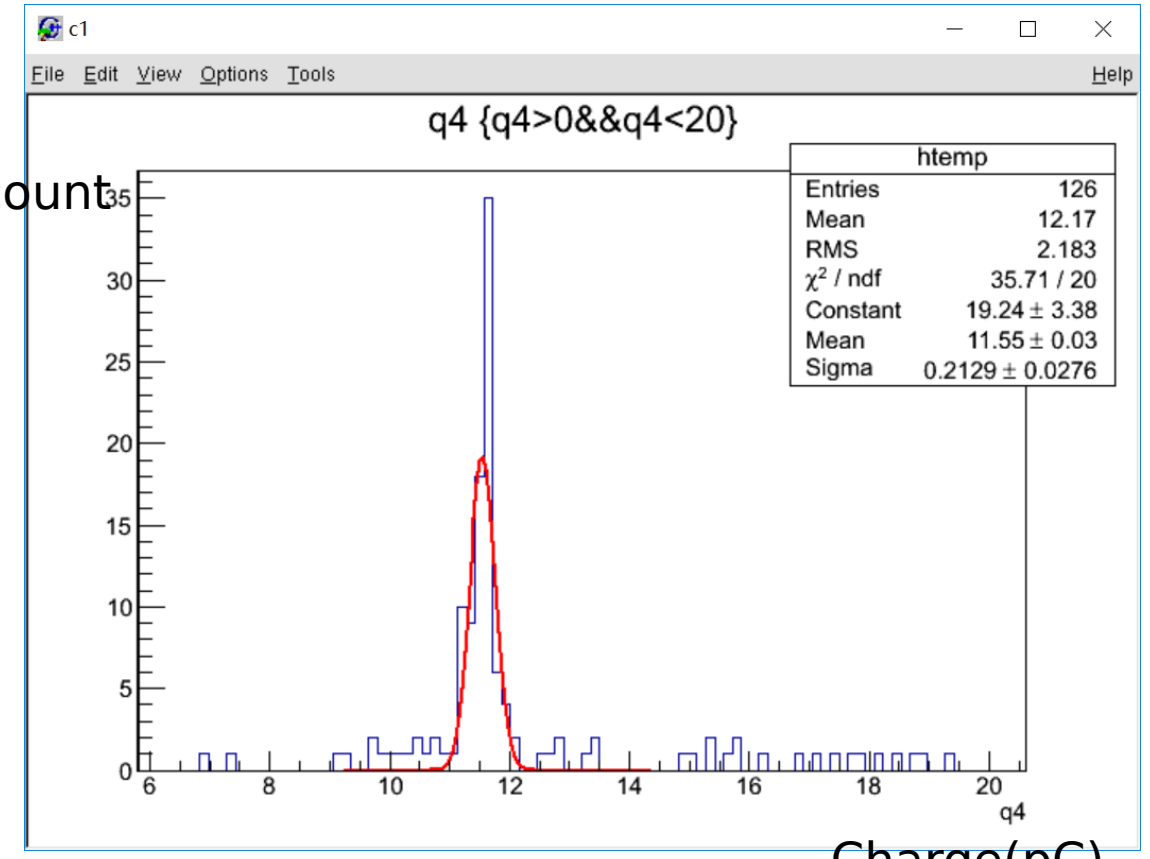
For preshower test at UVa (used IHEP preshower), Y11 light yield is twice of BCF91. Comparing with SDU #2(426.5), our result is only 15% better. (Maybe SDU #3 mirror quality is bad or maybe because the UVa preshower test use IHEP not Kedi scintillator, could the wavelength be different?)

Horizontal test result

Signal



Pedestal

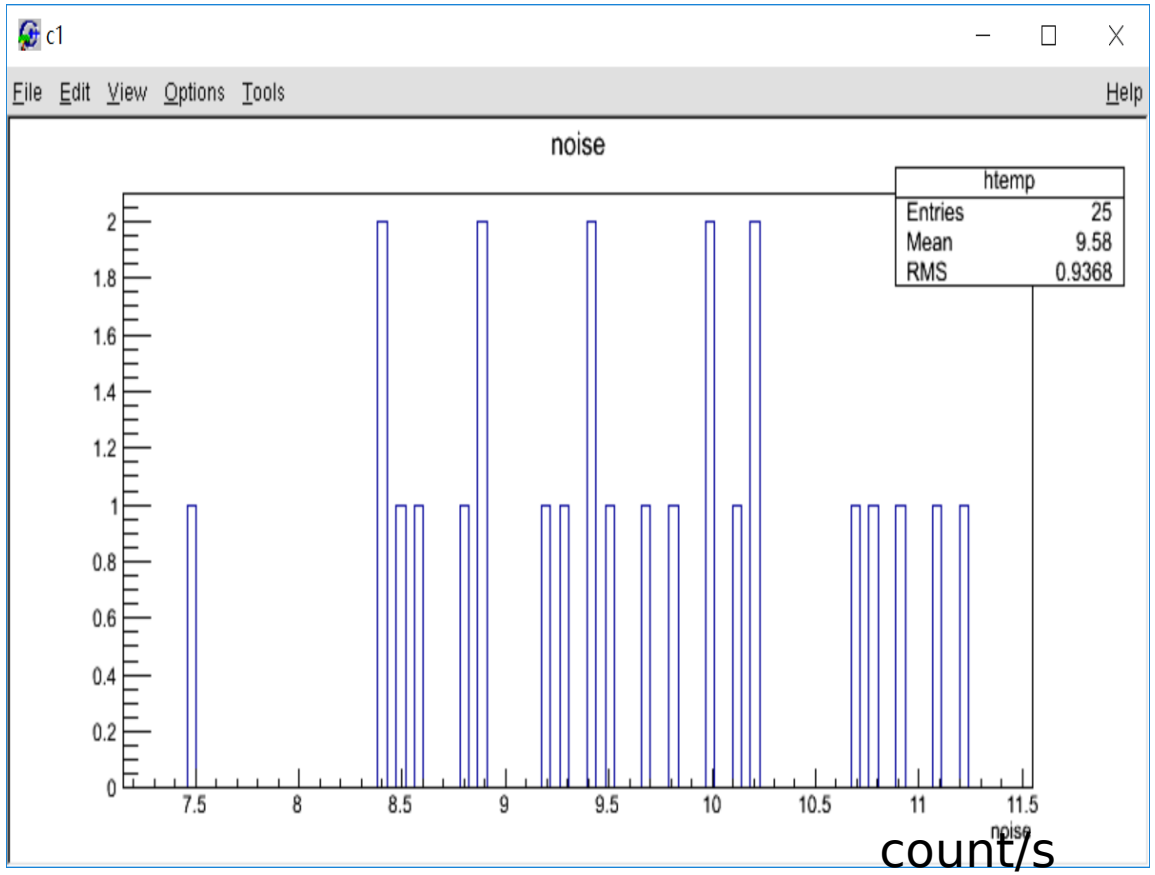


$$\frac{(MPV-Ped)}{e\times Gain} = 106.9 \text{ photo-electrons (Gain=5*10^6)}$$

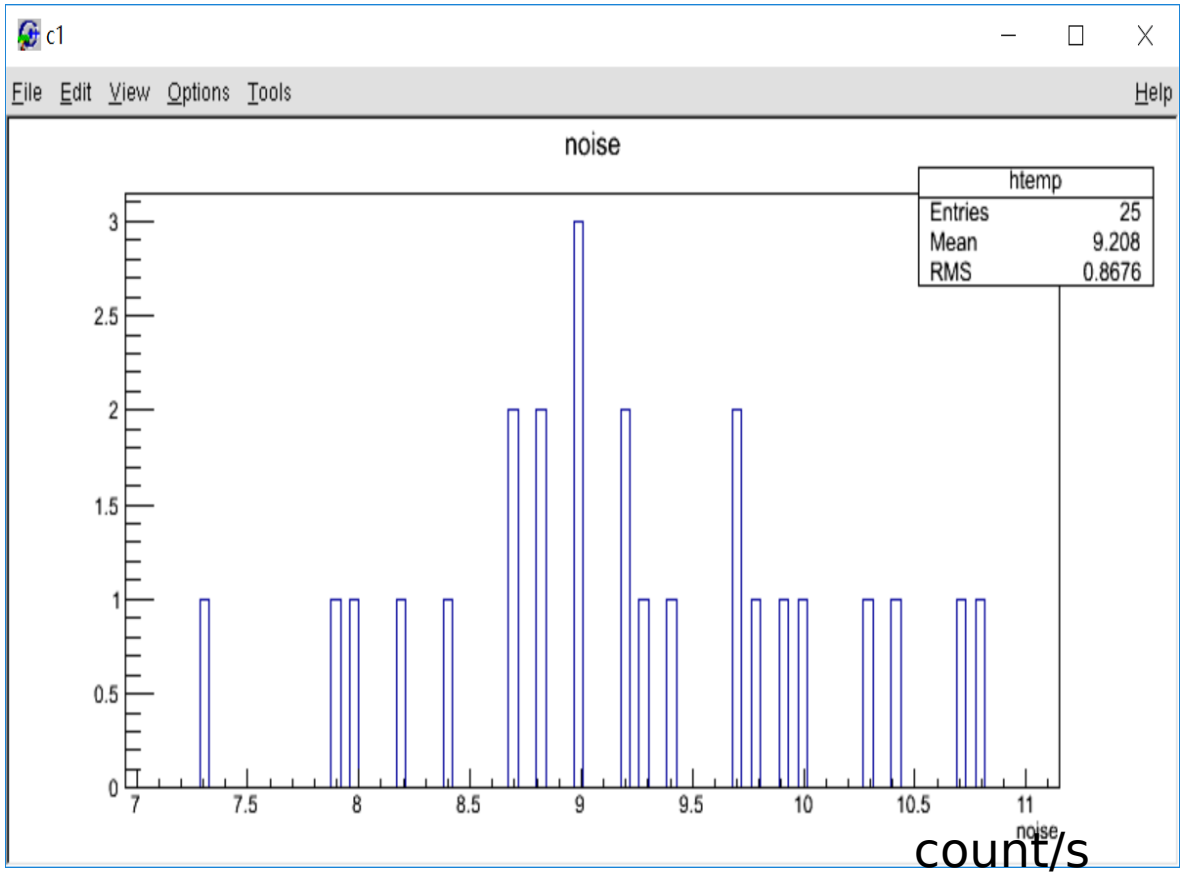
photo-electrons (Gain=5*10^6)

Detector “noise” rate (triggered by itself)

Vertical



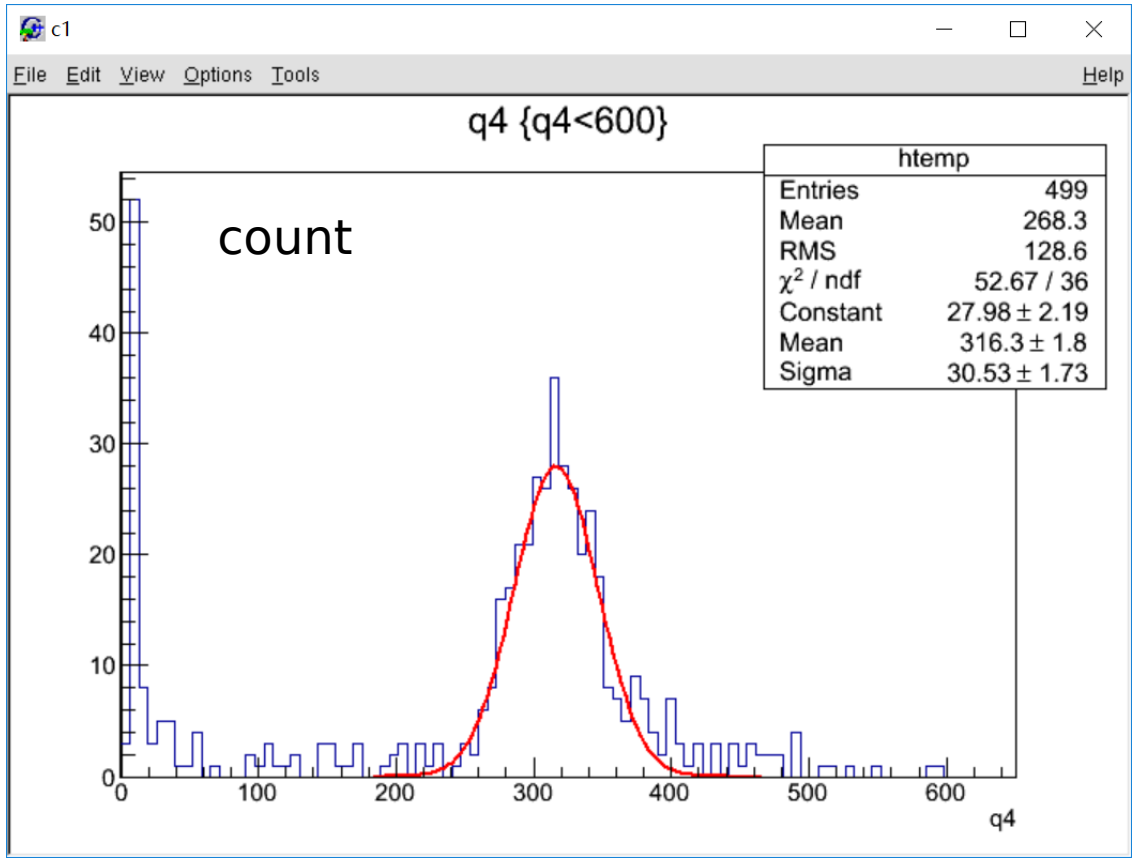
Horizontal



Threshold 100mV (10 SPE)

SDU #3 cosmic test without coating

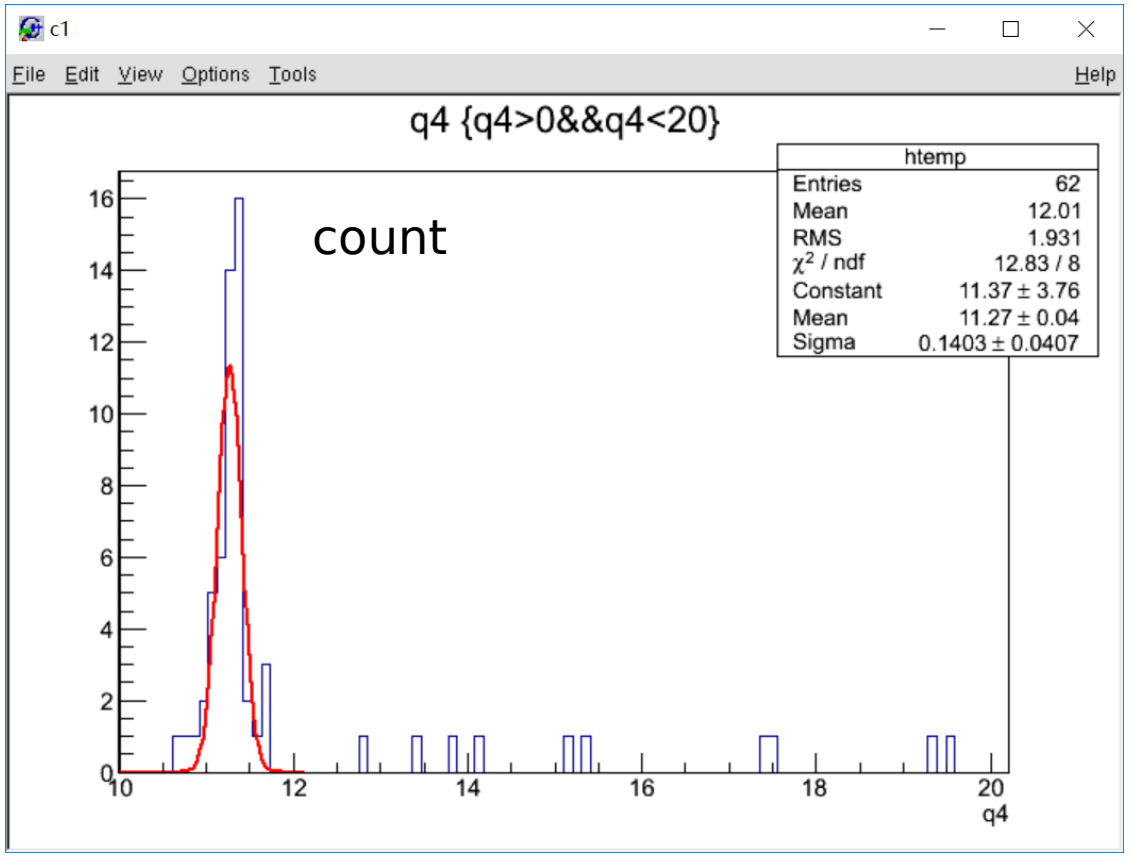
Signal



charge

photo-electrons (Gain=5*10^6)

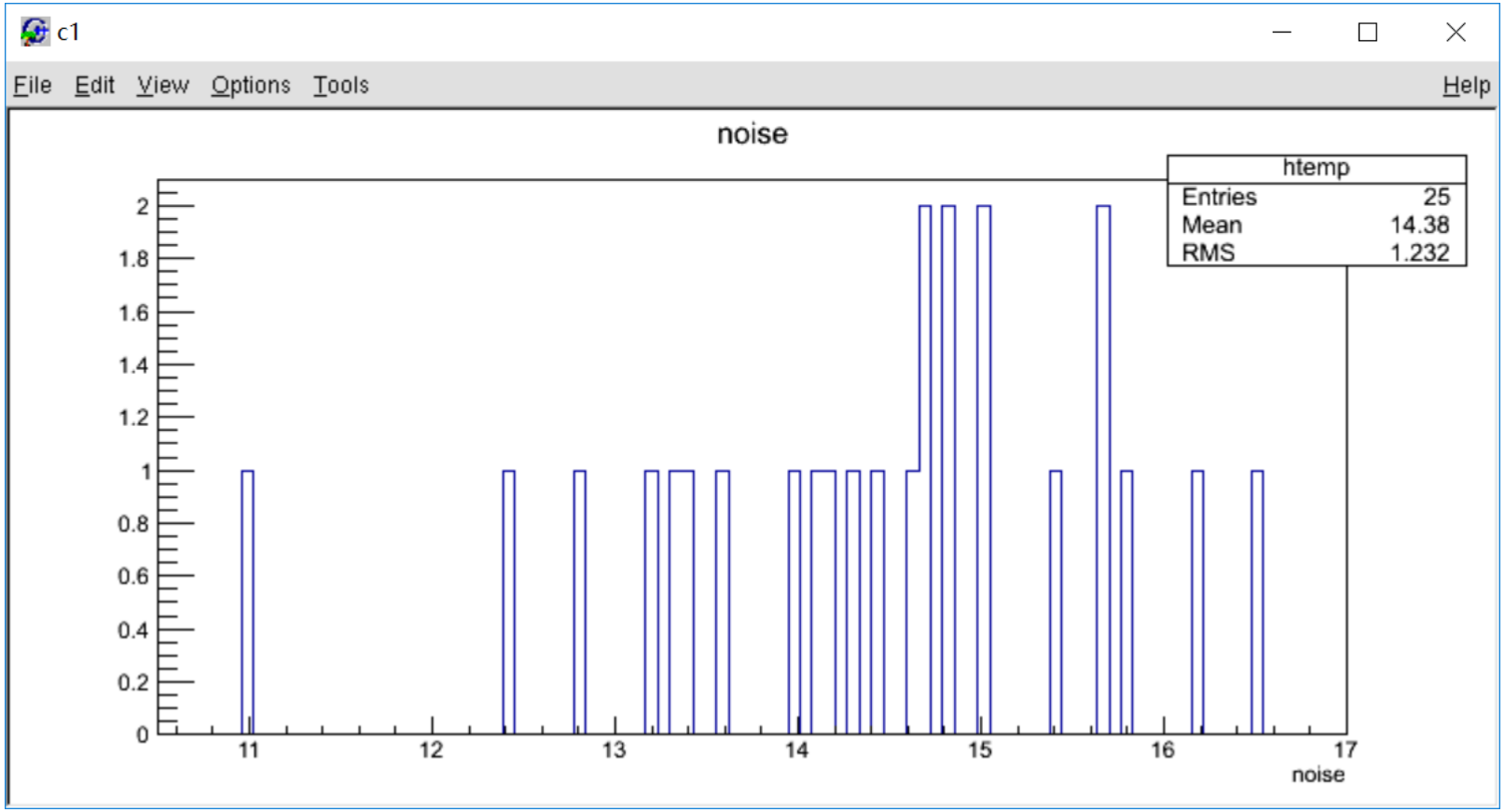
Pedestal



charge

Coating add 29% photo-electron.

“noise” rate without coating



Threshold 100mV (10 SPE)

- Rate is higher compared with coating, but not sure if that indicates problems