# Time walk correction and THU module PMT test update

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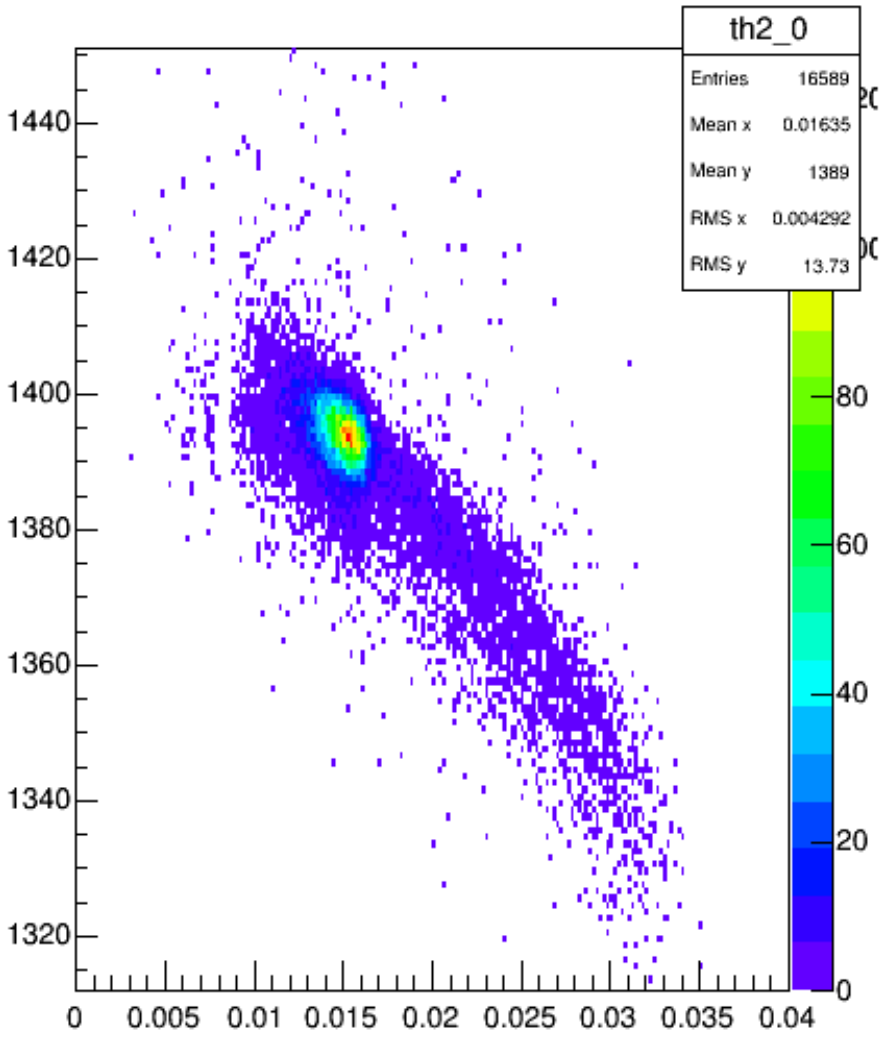
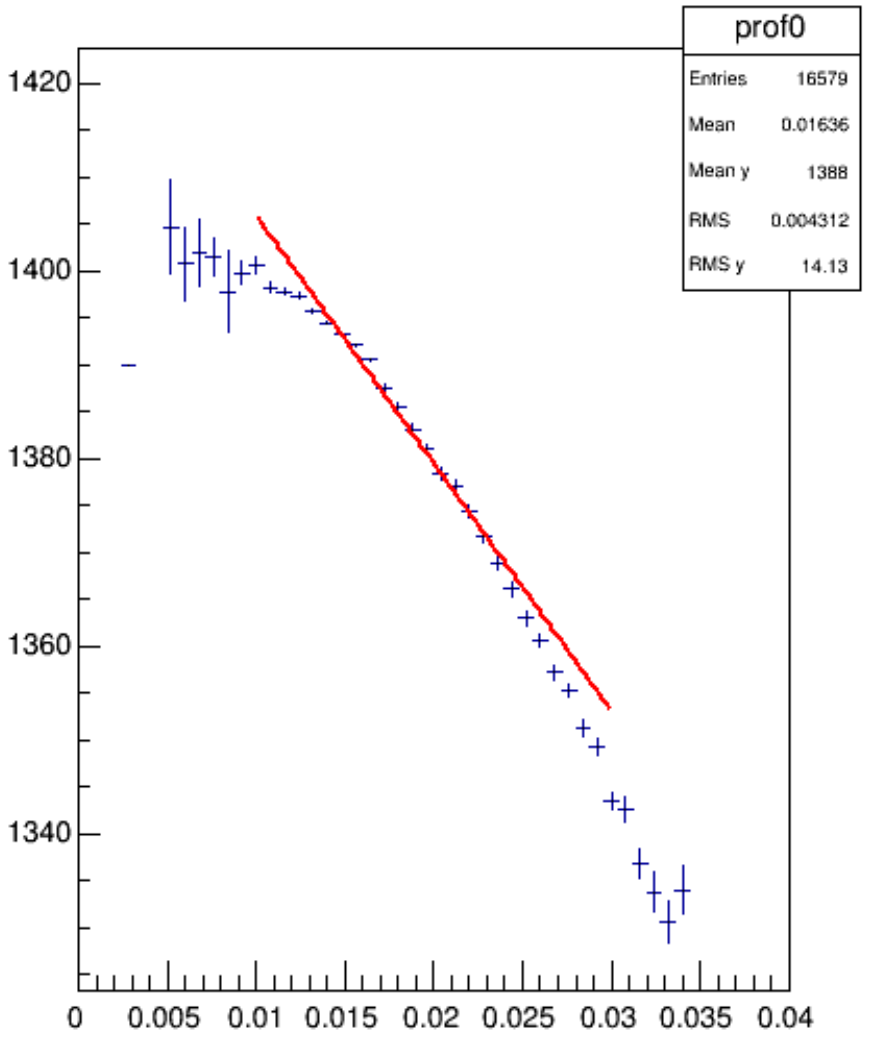
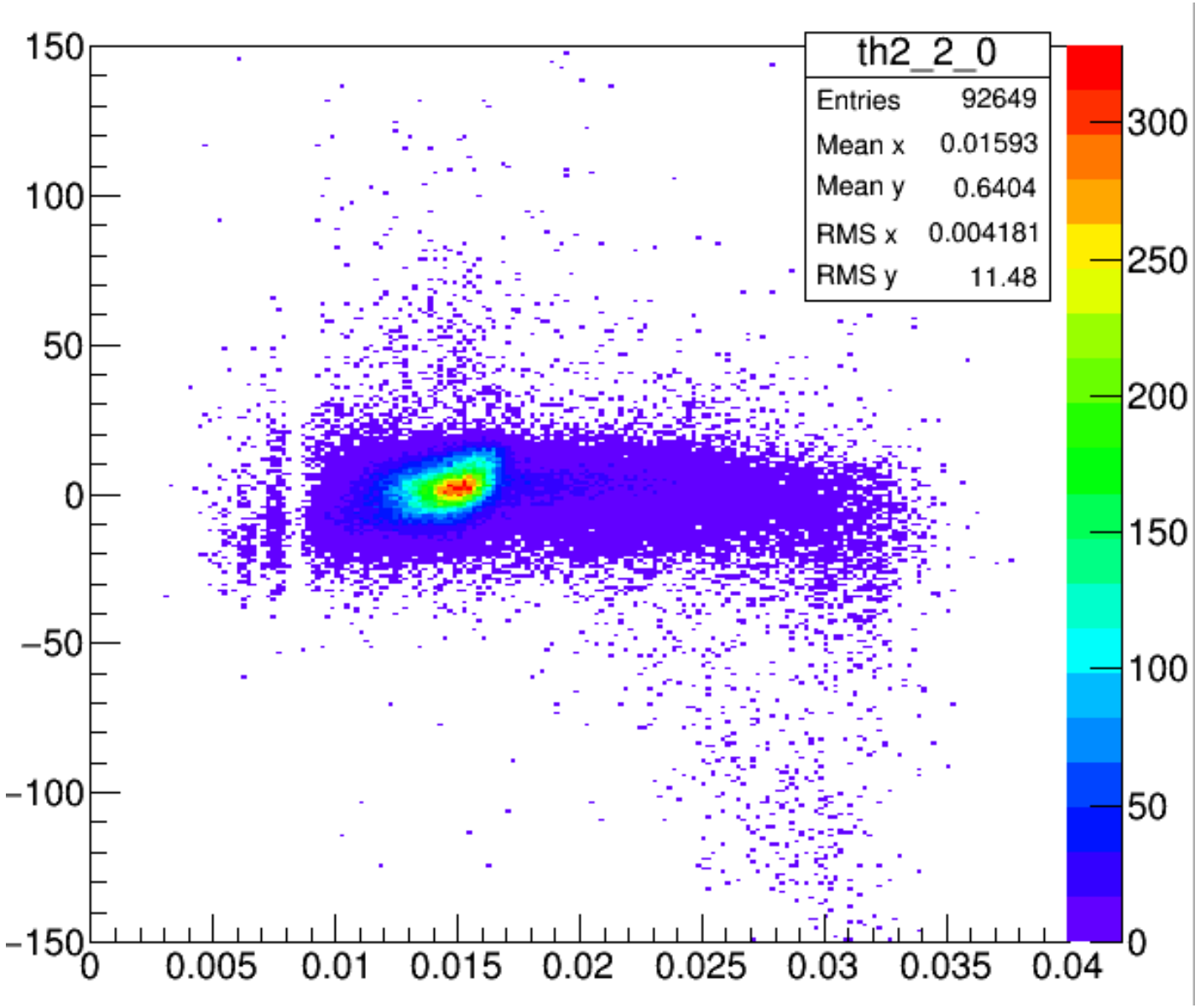
# Typical time walk correction

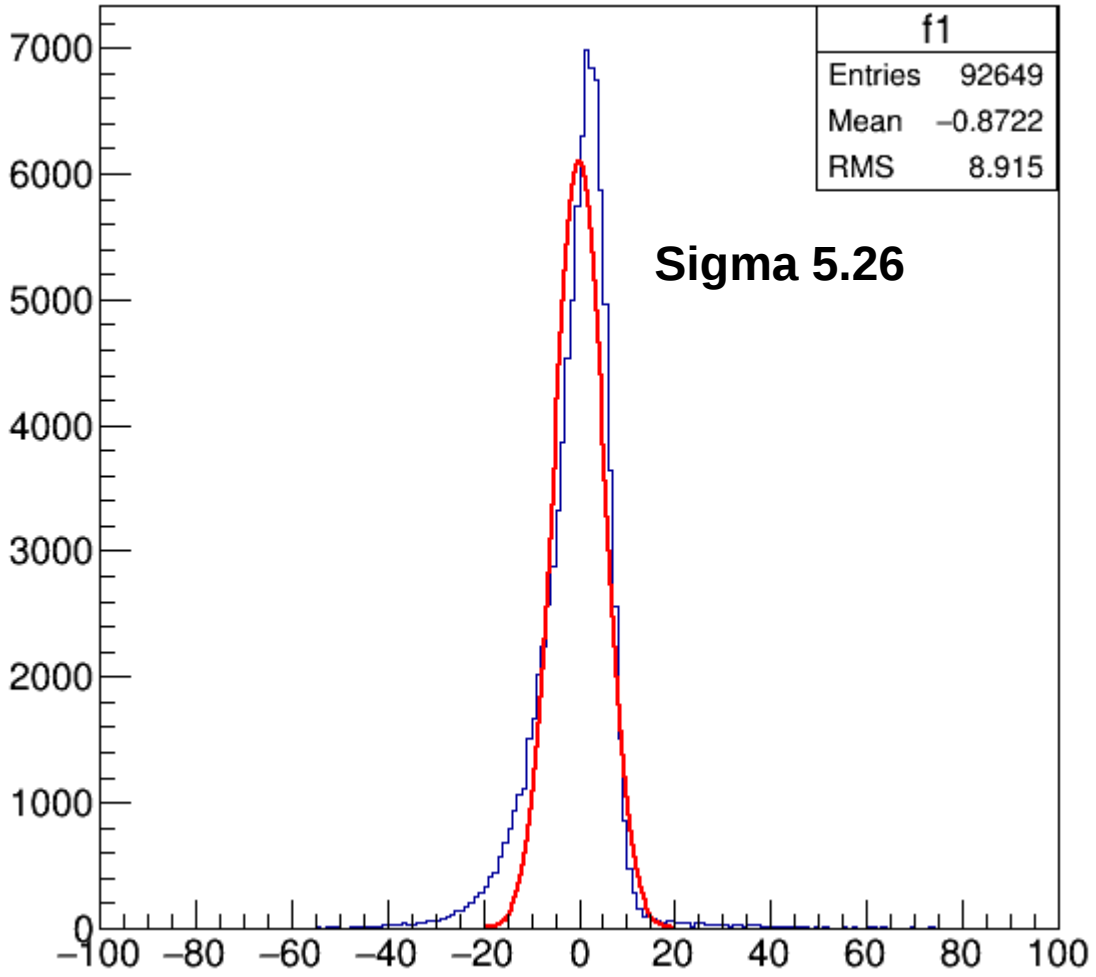


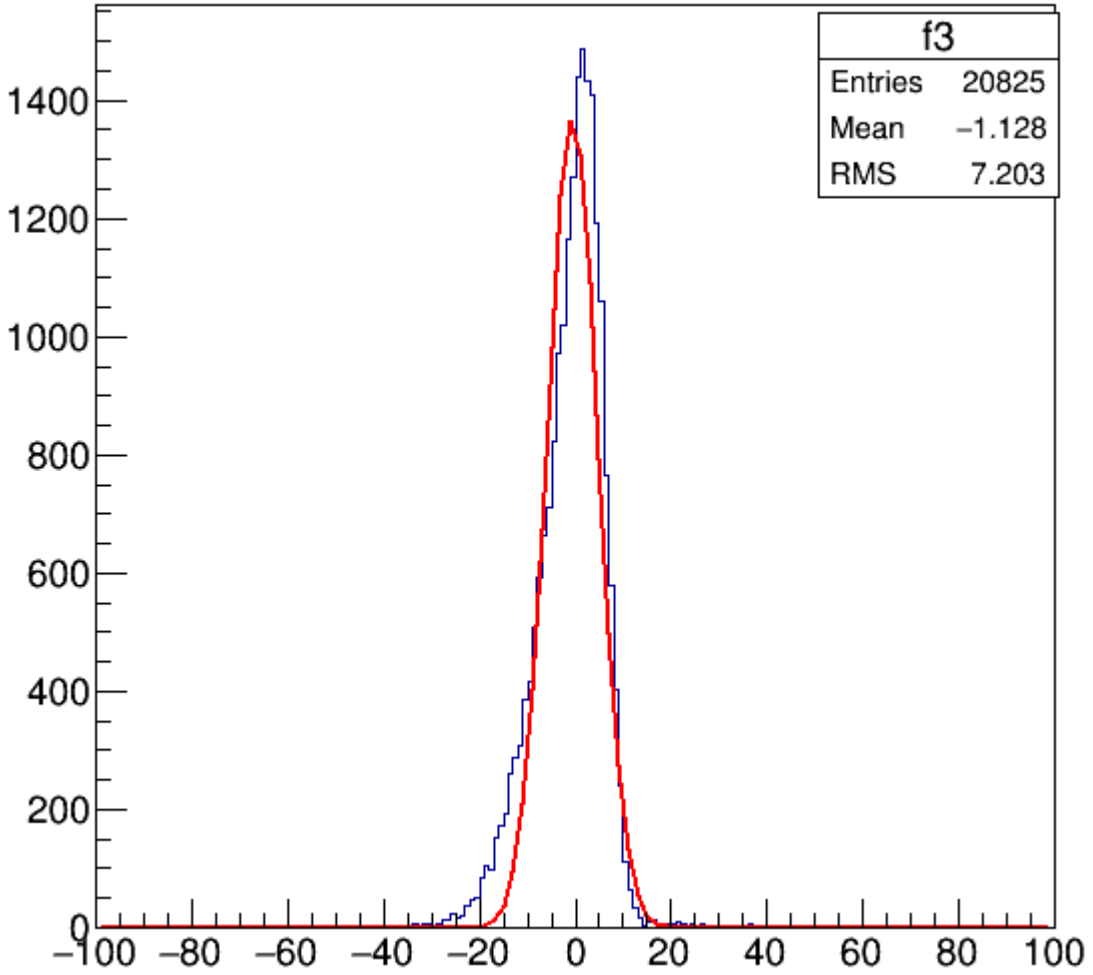
# After correction



# Middle bar time resolution (without any cut)

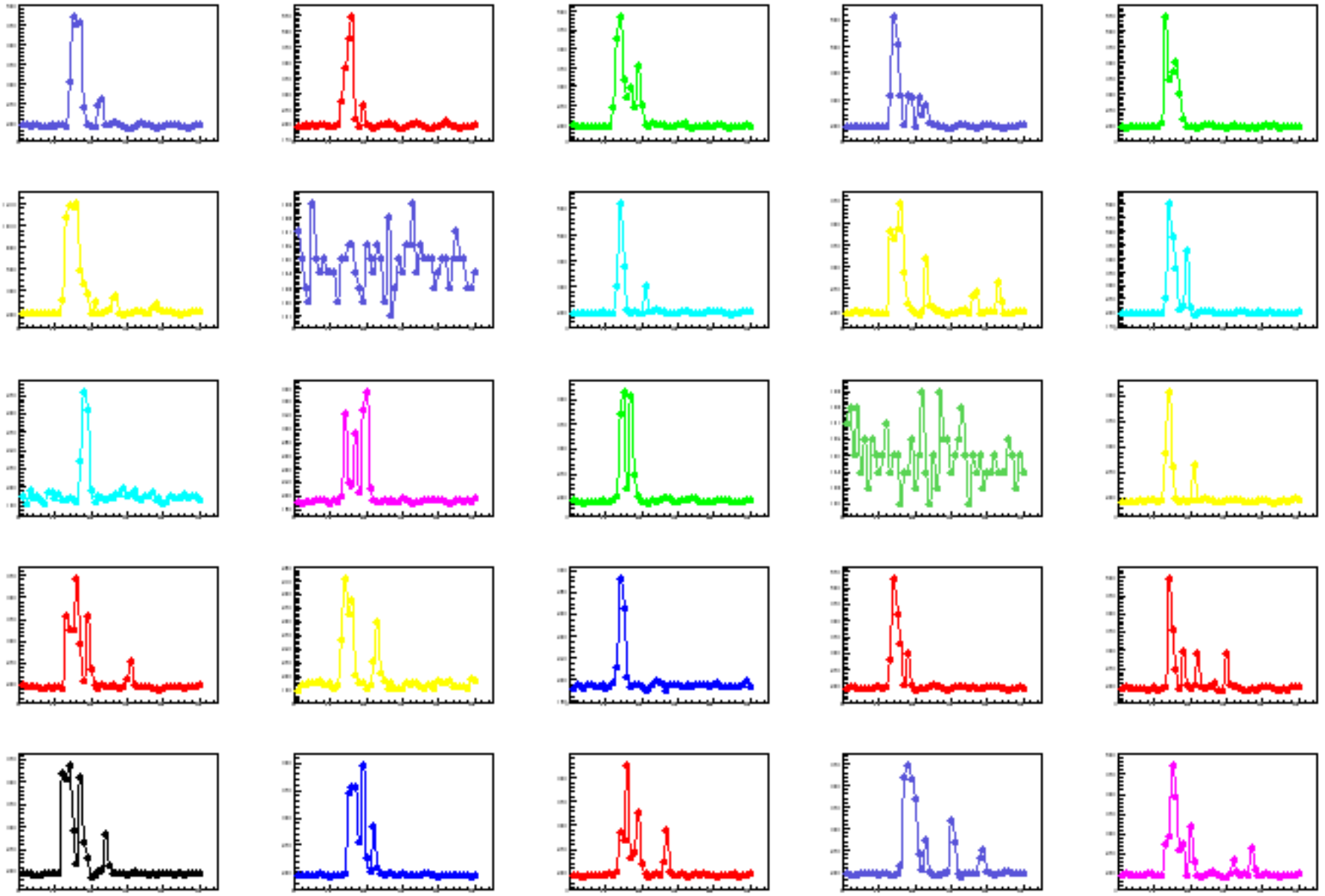


# Middle bar time resolution (add position cut and signal cut)

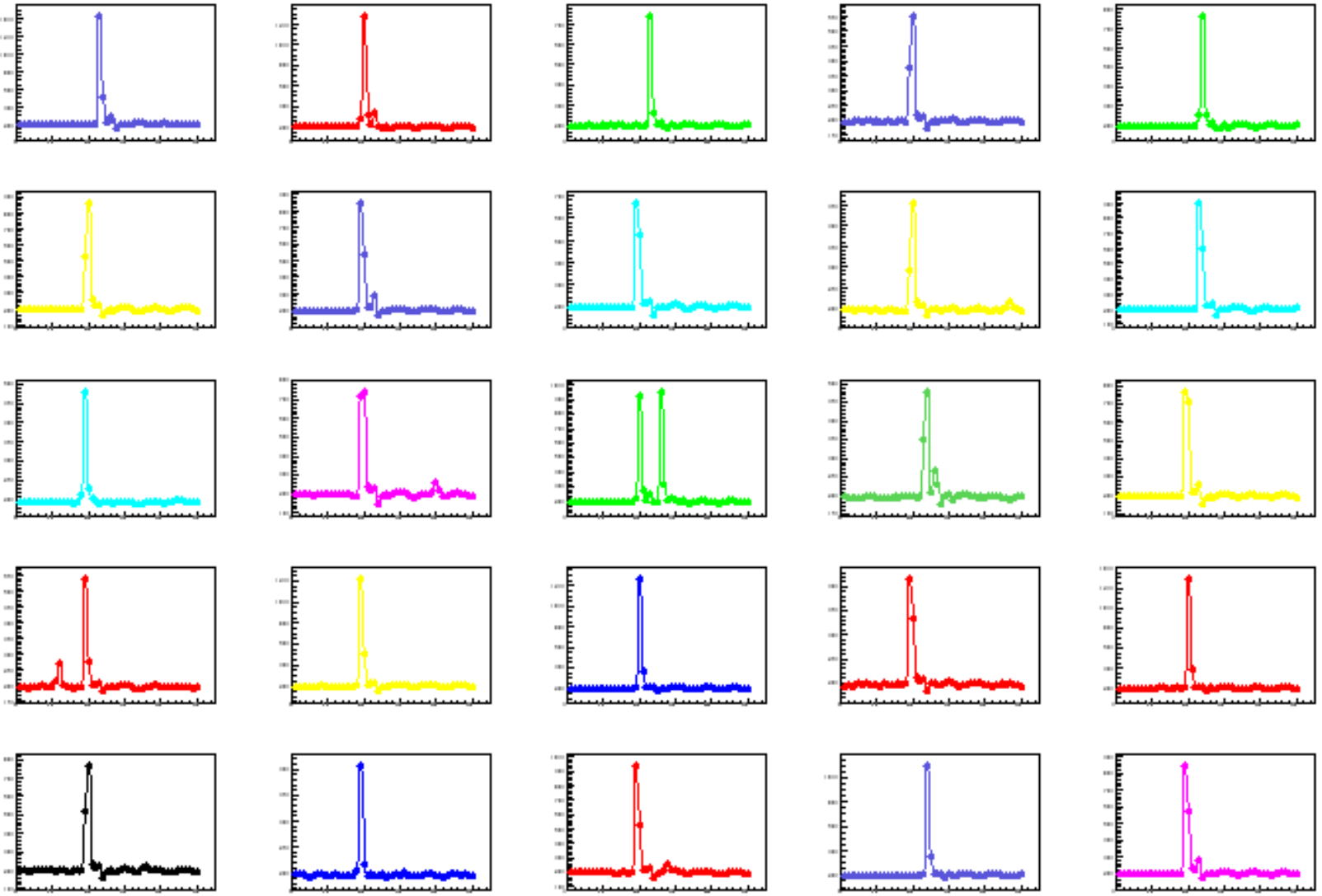



- Fit sigma 5.36 bin
- Each bin 35ps
- Achieve 187.6 ps resolution, much better than than 304 ps result without time walk correction

# THU PMT signal triggered by cosmic ray(passive trigger)

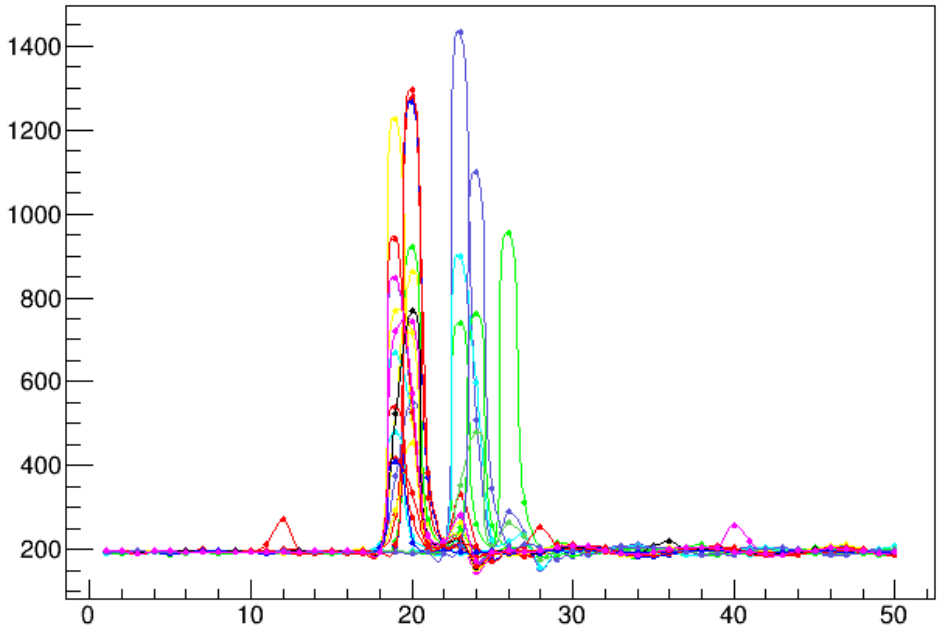


# THU PMT signal triggered by itself(initiative trigger)

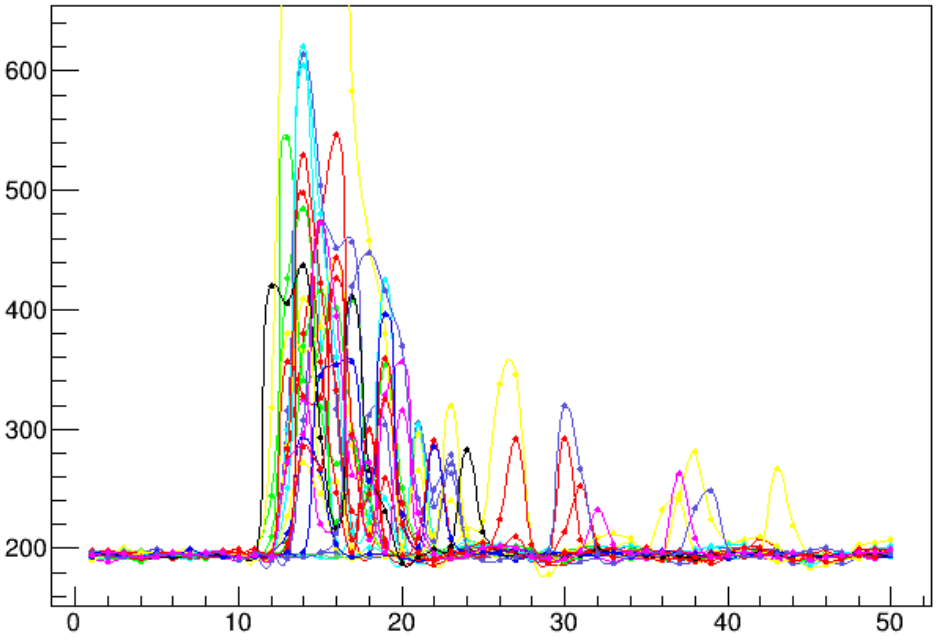


The signal in initiative trigger that triggered by THU module itself, not only include the cosmic ray but also the PMT noise, which the whole rate could reach 10K Hz( record is limited by DAQ), comparing with real cosmic ray about 2 Hz. The amplitude of PMT noise is higher than cosmic ray signal

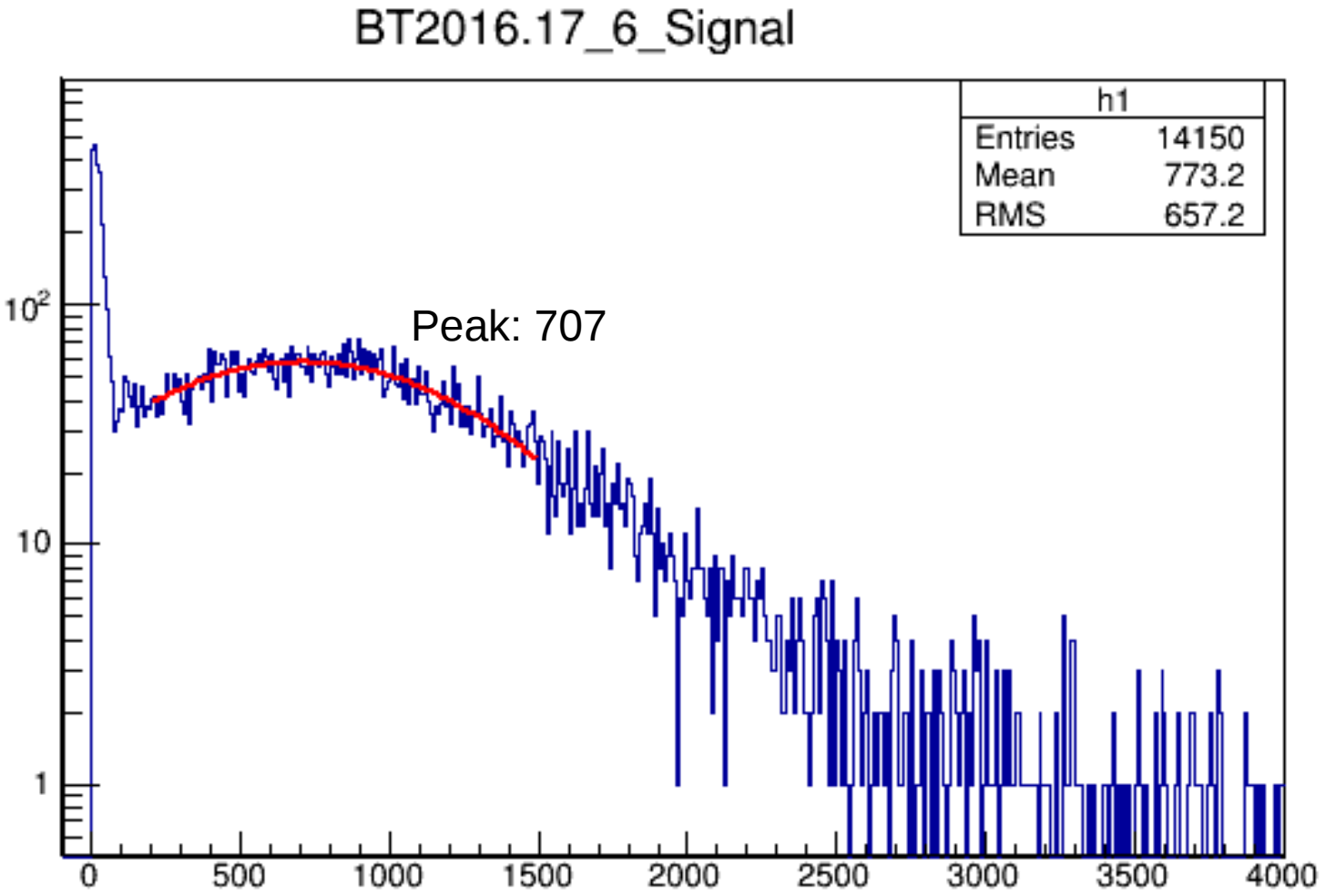
Initiative trigger




Passive trigger(cosmic ray)

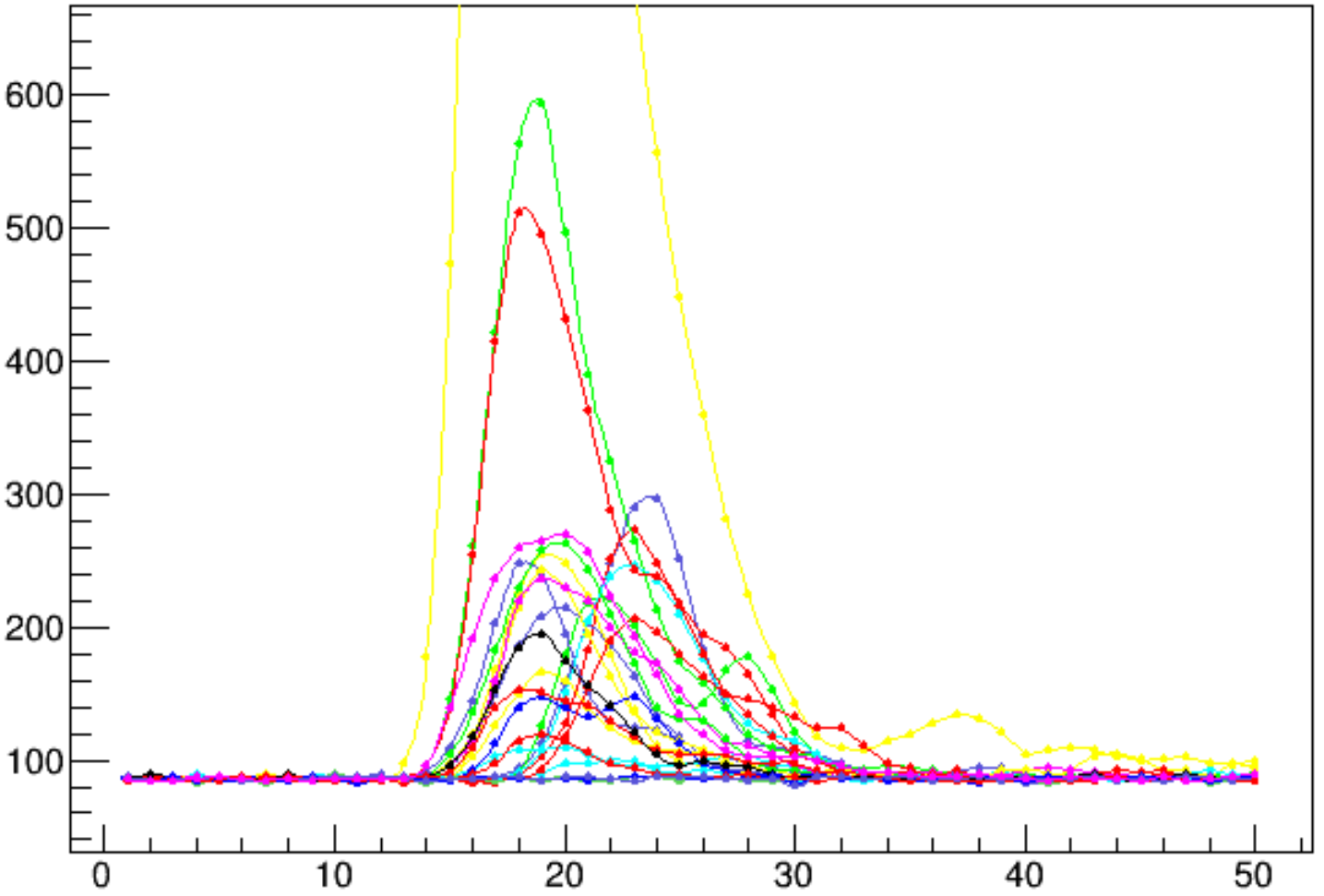


# THU module cosmic ray FADC integral spectrum




Each bin equal to 0.02 pc(1V / 4000(bin) / 50 ohm * 4ns). If consider the gain is 2.5* 10^6(2500V), only 35 NPE collected. (fan in-out have influence on atteuation). Try to replace with PMT in SDU module to test again.

# Replace with SBS PMT



# Replace with another PMT from SDU(cosmic ray test, HV2400V weird...)