

# MPT2321 readout electronics

Ming-Kuan Yuan  
Fudan University

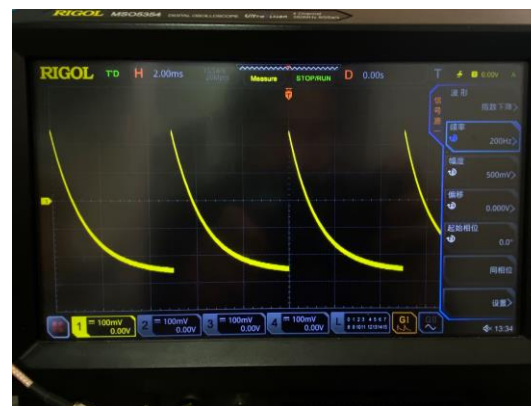
2025.2.17

CEPC MUON RefTDR weekly report

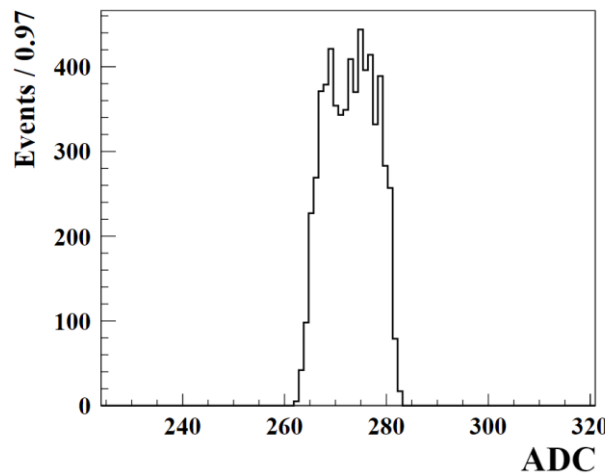
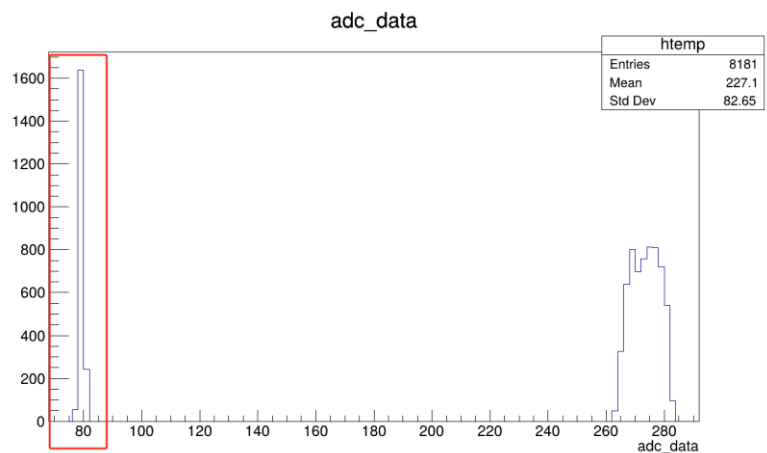
[yuanmk@mail2.sysu.edu.cn](mailto:yuanmk@mail2.sysu.edu.cn) / [MPT2321\\_readout](#) · [GitLab](#)

# 电荷线性度测量

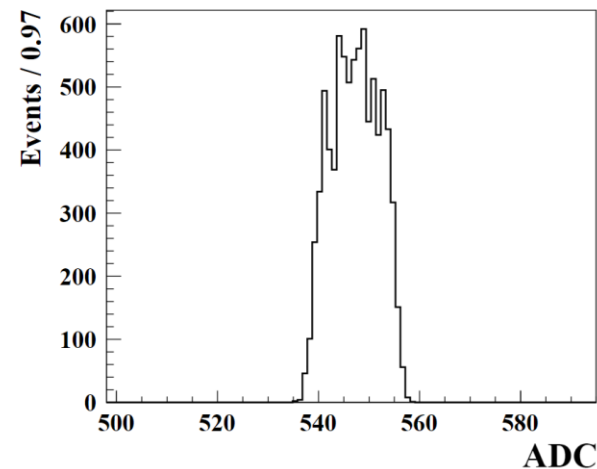
- 注入波形为指数下降
  - 在下降沿不会产生额外的触发
- 低增益测量
  - 在ADC=80附近有一个峰，分析中去除。



指数下降波形



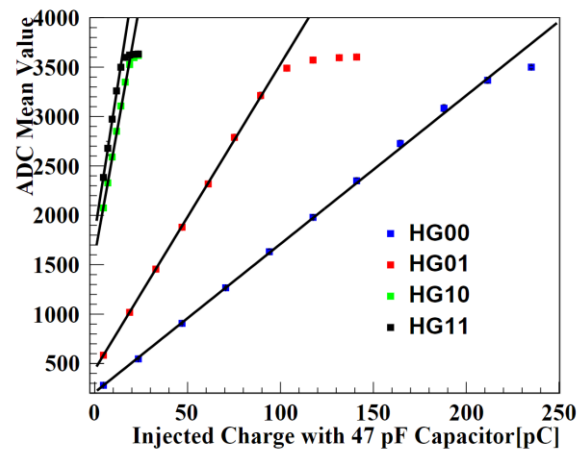
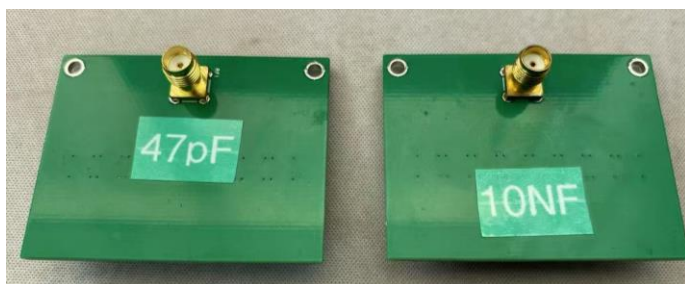
ULG00 1nF 2000mV  
测试条件下ADC分布



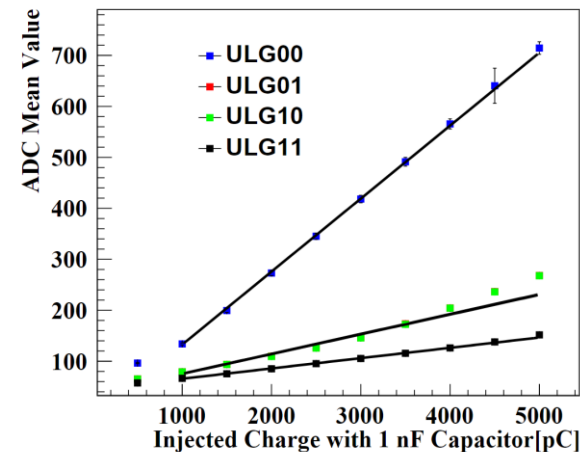
HG00 47pF 500mV  
测试条件下ADC分布

# 电荷线性度测量

- 低增益模式
  - 注入电荷板电容为1nF
- 高增益模式
  - 注入电荷板电容为47pF



High-Gain mode



Low-Gain mode

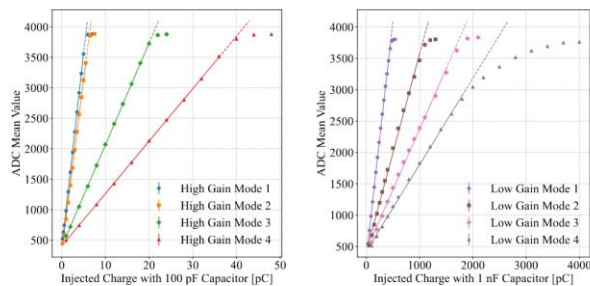


Figure 2. Response linearity under high-gain (left) and low-gain (right) modes. Charges were injected using 100 pF and 1 nF capacitors for high-gain and low-gain modes, respectively.

Table 1. Parameters for the fitting of response linearity curves.

Gain Configuration	Fitting Range [pC]	Fitted Slope [ADC/pC]
High Gain Mode 1	0.2 to 4.5	637.07
High Gain Mode 2	0.2 to 5	565.03
High Gain Mode 3	1 to 18	167.25
High Gain Mode 4	1 to 36	86.10
Low Gain Mode 1	30 to 450	7.53
Low Gain Mode 2	50 to 1000	3.16
Low Gain Mode 3	100 to 1500	1.93
Low Gain Mode 4	100 to 1600	1.38

Gain mode	Fitted slope(ADC/pC)	Fitting chi2
ULG00	$0.1432 \pm 0.0018$	3.22
ULG01	$0.0390 \pm 0.0006$	151.26
ULG10	$0.0388 \pm 0.0006$	155.20
ULG11	$0.0202 \pm 0.0003$	8.46
HG00	$15.03 \pm 0.07$	14.17
HG01	$30.92 \pm 0.20$	1.43
HG10	$104.9 \pm 1.01$	17.56
HG11	$120.2 \pm 1.8$	5.10

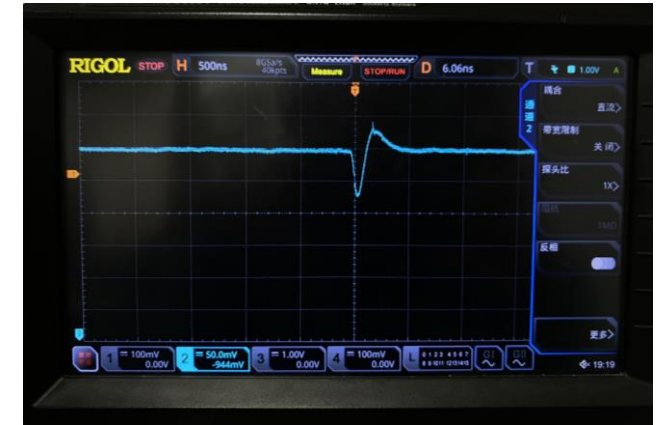
arXiv:2411.18927

● 配置信息:

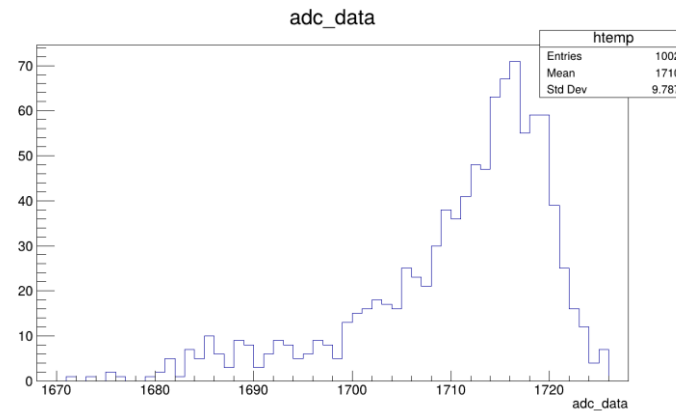
- 只打开channel0
- 从TestIn端口输入宇宙线信号
- 增益模式: HG00



宇宙线模块



经过增益后模拟监控输出波形



Distribution of ADC



单光子波形谱