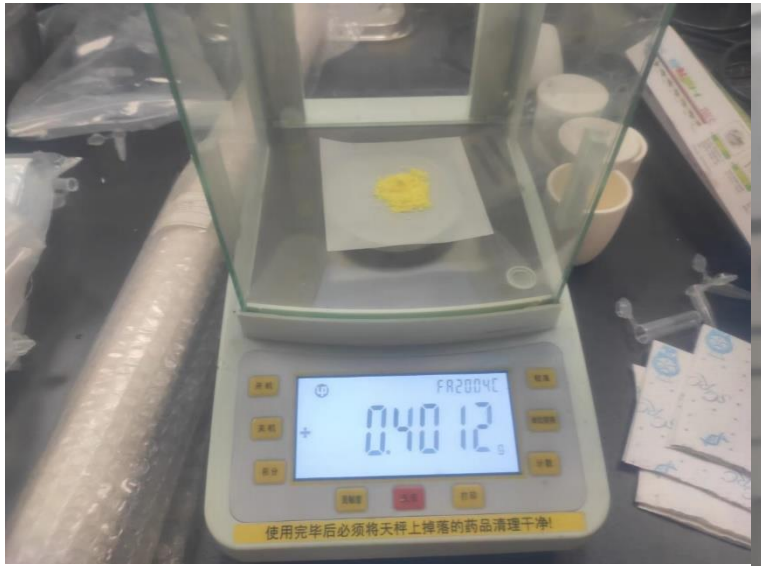
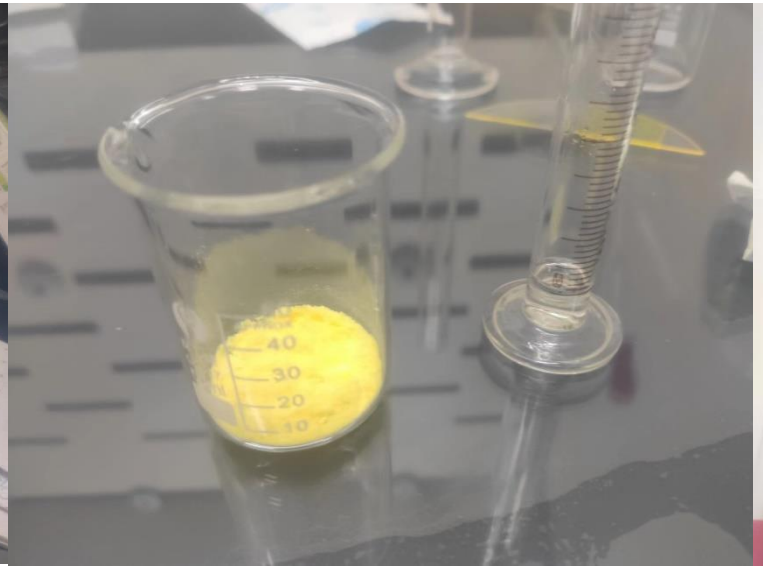
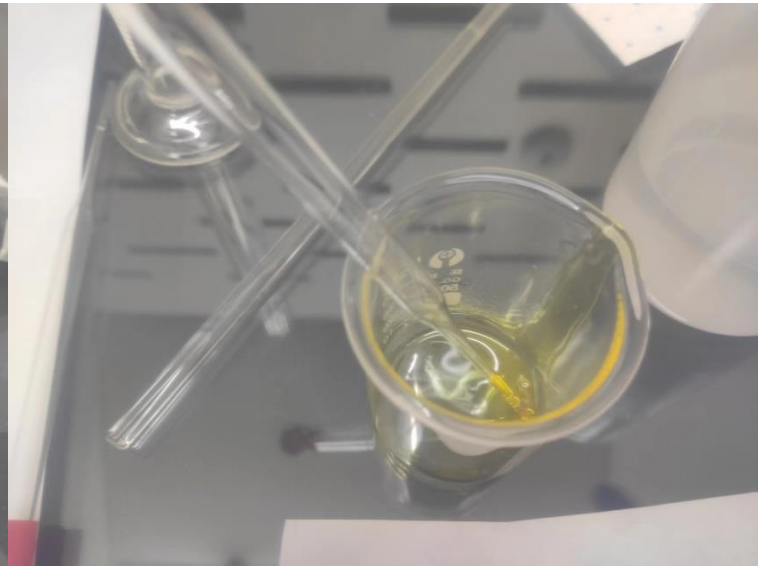
ECAL PROGRESS(220711)

ZEKUN JIA

WLS Film Painting







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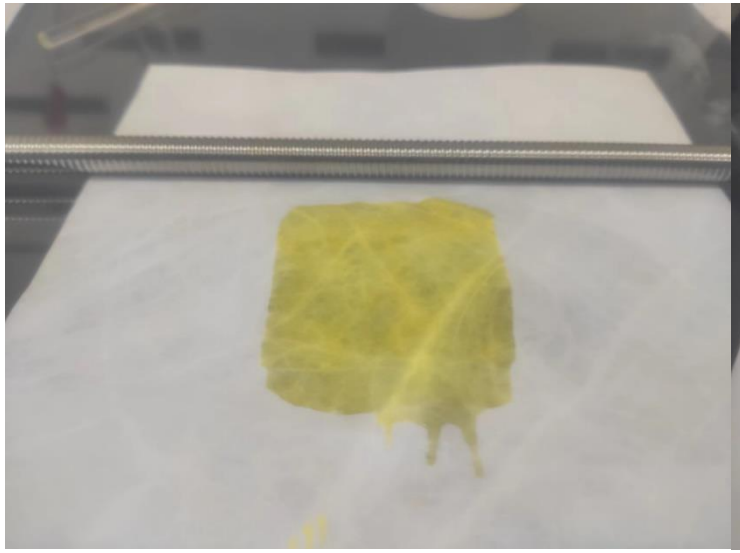
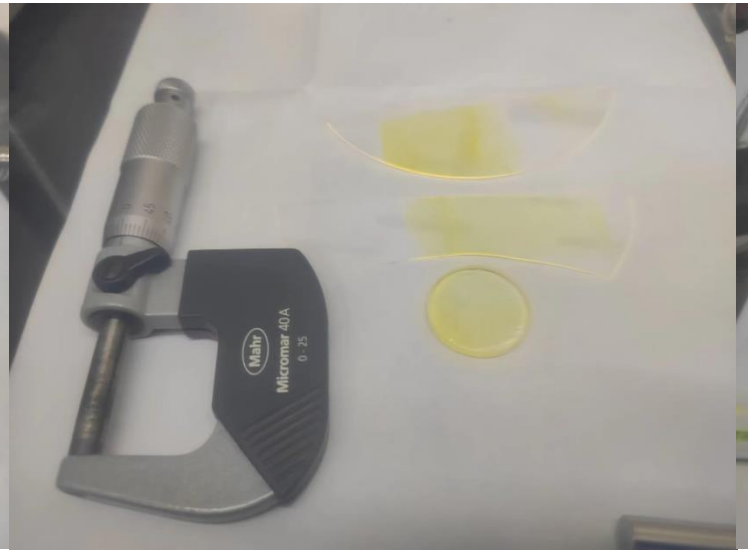


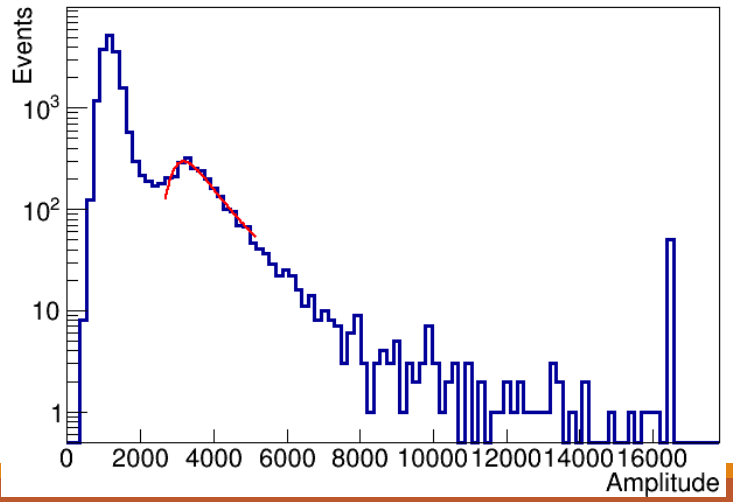


Cosmic ray test result with Tyvek:

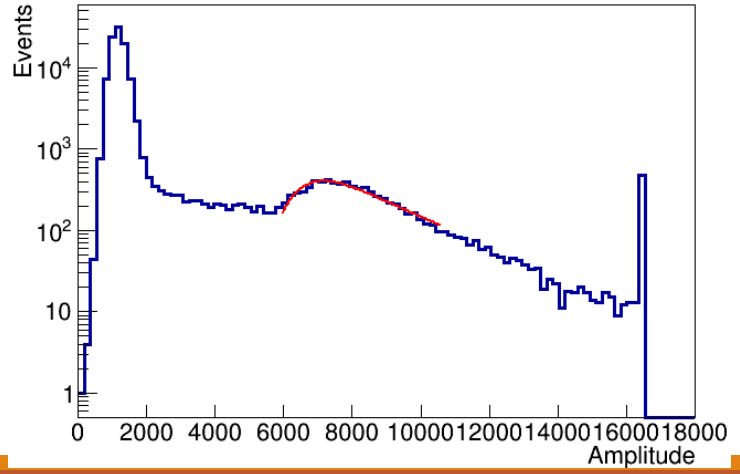
w/o WLS： L.Y.=58 pe/MeV

With WLS： L.Y.=153 pe/MeV

1.6 times improvement



无WLS



有WLS

WLS Film Painting

由于Teflon质地极软，横向收缩十分严重，因此晾干过程需要特殊的处理：

- 四边固定
- 悬空放置防止与垫板粘连

Substrate's Influence on Film Uniformity

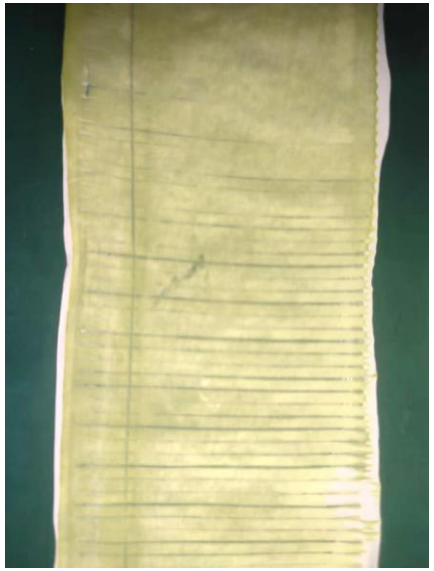
Three substrates with different hardness are tested

The average thickness of the films are all around 80um

The uniformity is visibly different – mainly induced by solution penetration condition and pressure to be applied on film

Aluminum – excellent in flatness, operability and uniformity

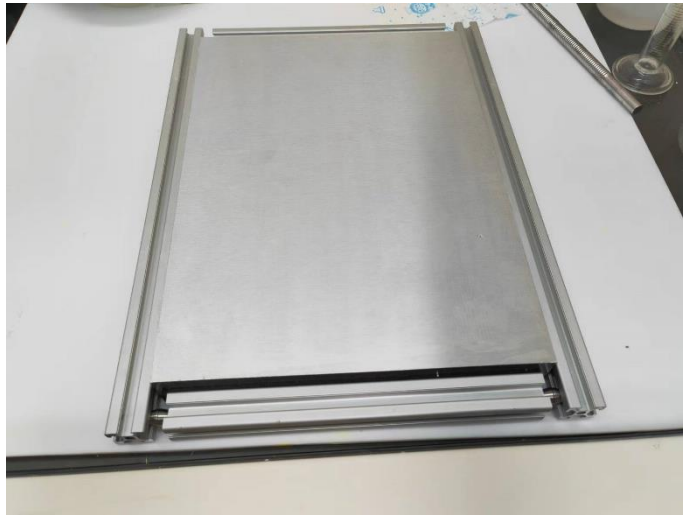
Sponge

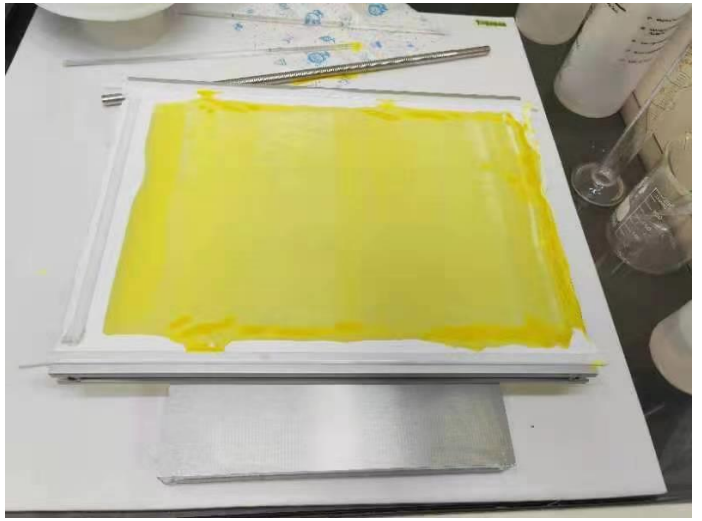


Cardboard

Aluminum

WLS Film Painting





WLS Film Painting

Cosmic ray test result with Teflon to be updated

Preliminary result: L.Y. = 205 pe/MeV

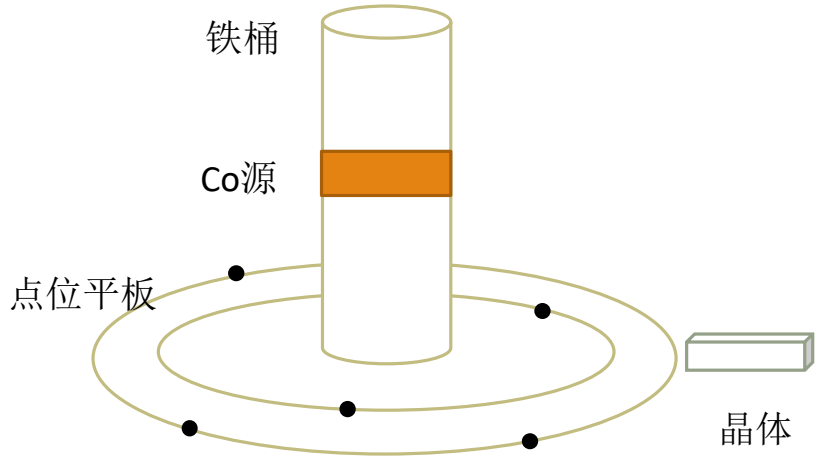
Feasibility of WLS under radiation

The performance of NOL-9 after irradiation not measured before

Propose to perform radiation hardness test at the irradiation station of USTC

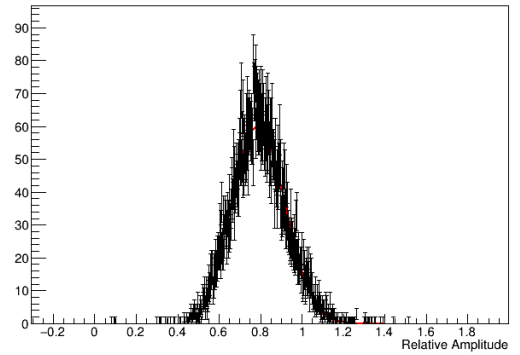
Light collection uniformity & light yield test to monitor the performance of the prototype after irradiation

实验条件(以下数据由光子源负责人提供)	
放射源名称	60Co
单光子能量	~1.25 MeV
放射源强度	7.4E14 Bq
各点位辐照剂量率范围	(138,8410)(rad/min)
剂量率测量仪器	丙氨酸剂量计



图：辐照装置示意图

Light Collection Uniformity

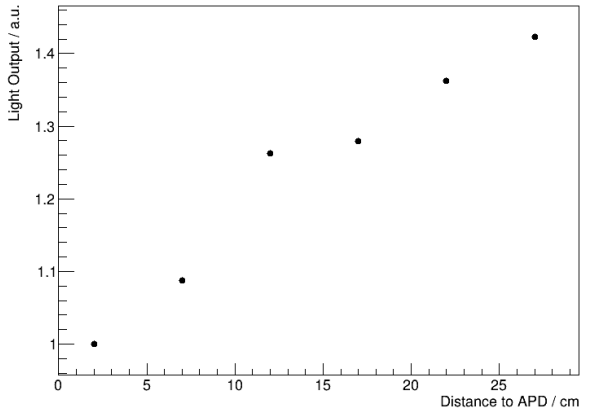


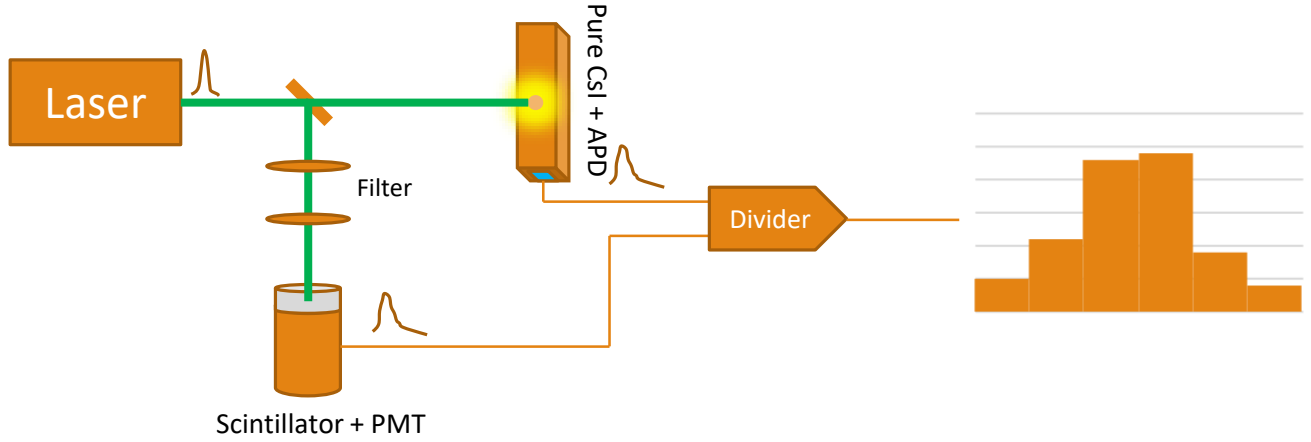
Pulsed UV laser to excite luminescence center of crystal

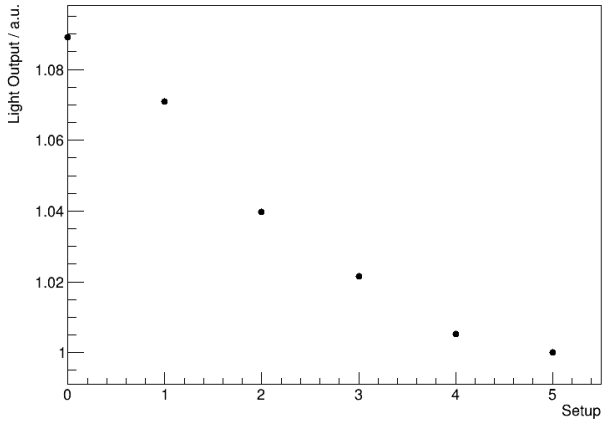
Use the relative amplitude between two detectors to mitigate the influence of laser energy fluctuation

The test result seems good… But

System stability is bad. The result is counterintuitive.







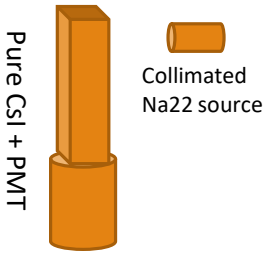
Light Collection Uniformity

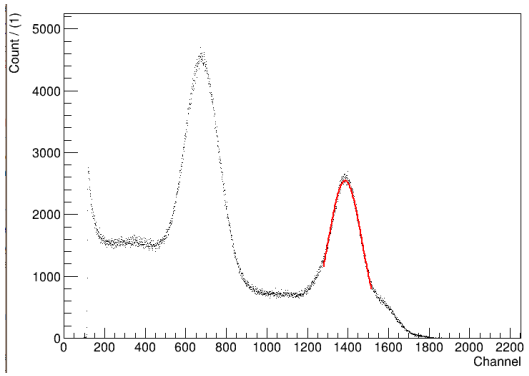
Use radioactive source for cross check

Charactermatic energy: 0.511 MeV, 1.274 MeV

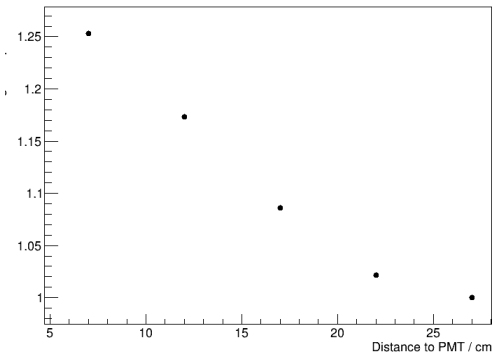
Different energy gets different results of the uniformity

Maybe induced by non-zero pedestal – to be checked

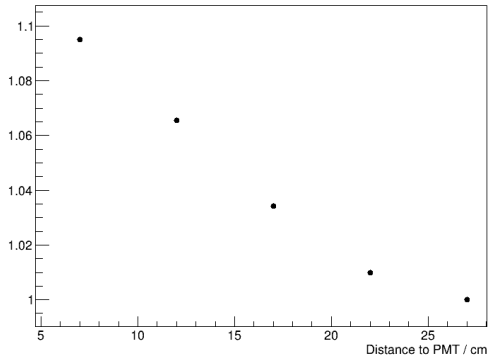




$Amp_{0.511}$



$Amp_{1.274}$



$Amp_{1.274}$-$Amp_{0.511}$