H-NS0 T0 Detector Update

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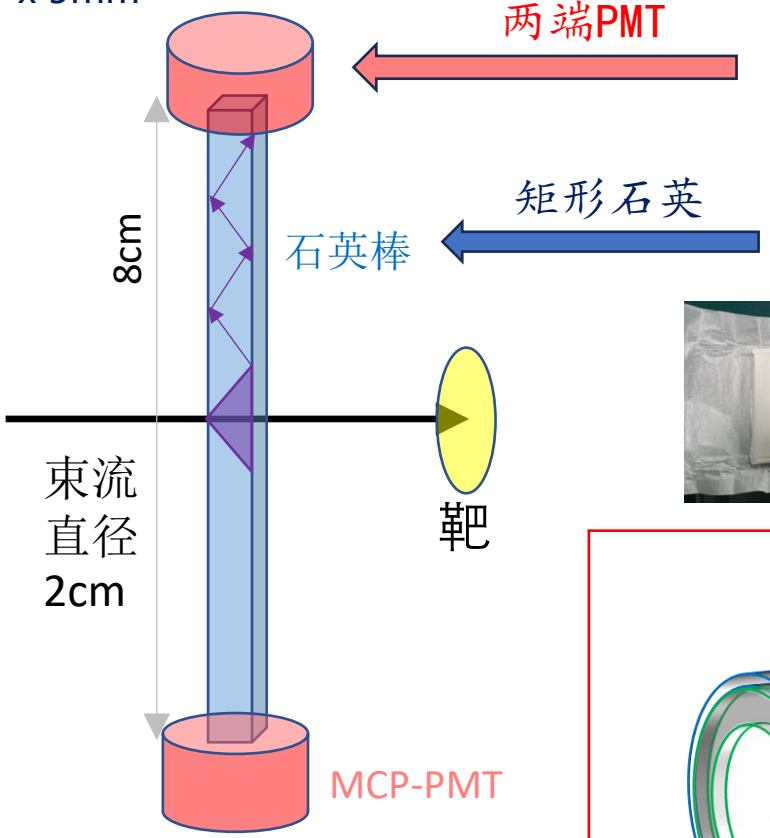
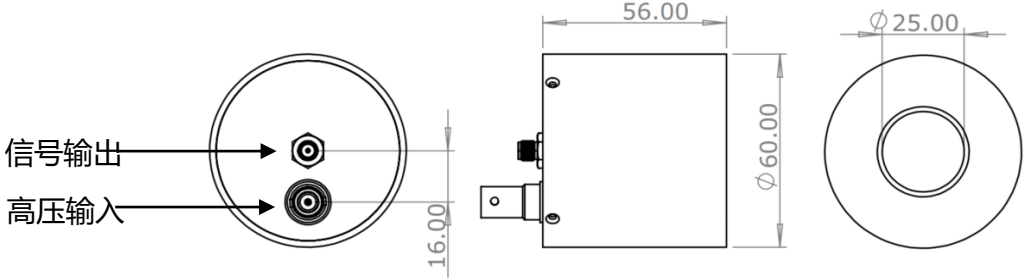
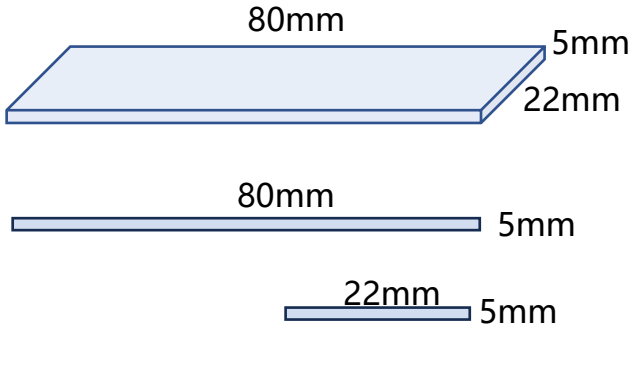
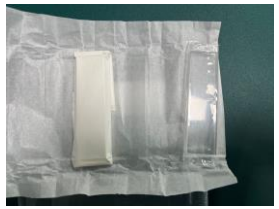
T0定时方案

- 西光所单阳极PMT：单光电子TTS<50ps；电子学时间晃动<20ps，100光电子应可实现<10ps的T0分辨率。满引出10^8粒子持续1s，计数率约100MHz。
- 石英辐射体（Corning/Heraeus): 80mm x 22mm x 5mm

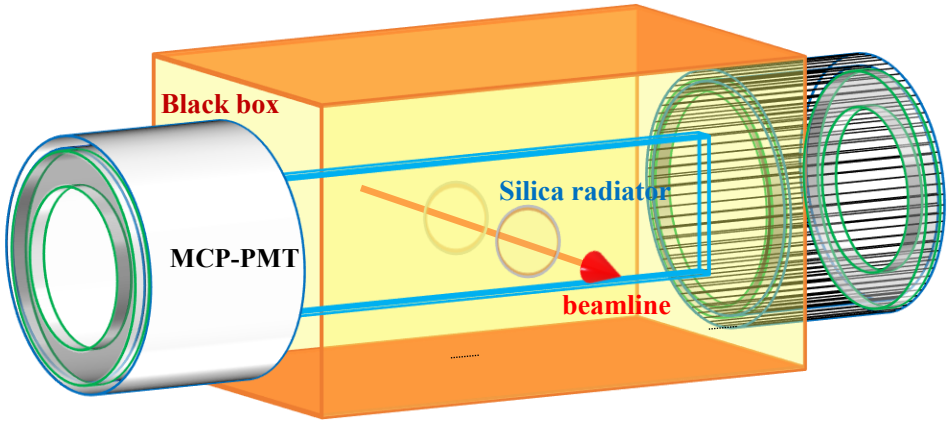






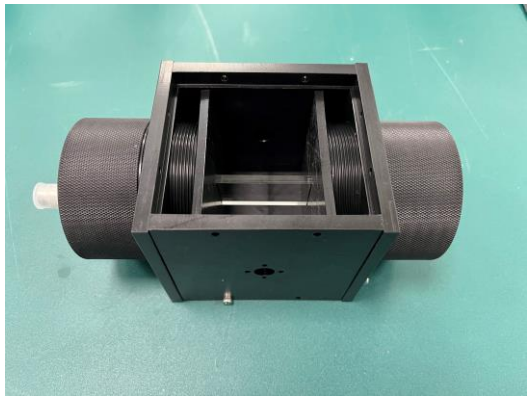


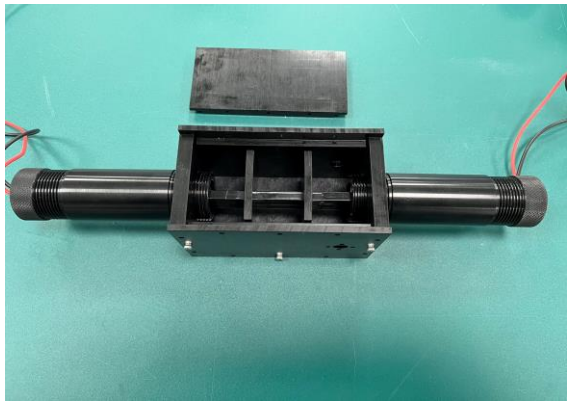
- **封装尺寸：φ60 mm × 56 mm（可定制）**
- **接口：信号 SMA，高压 SHV（负高压）**
- **阴极光谱灵敏度＞100 μA/cm**
- **阴极峰值量子效率：＞20%**

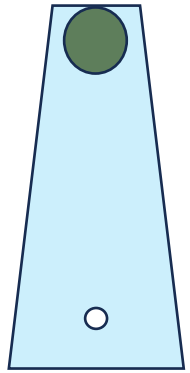


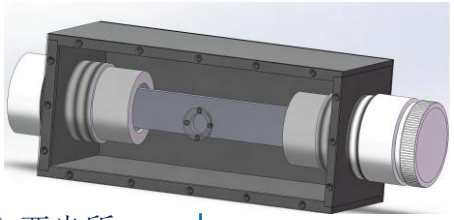
在矩形石英棒两端安装PMT，固定用的两个PMT套筒+一个石英黑盒

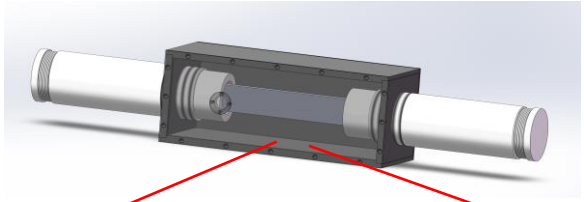
三个闪烁体探测器+切仑科夫T0探测器加工







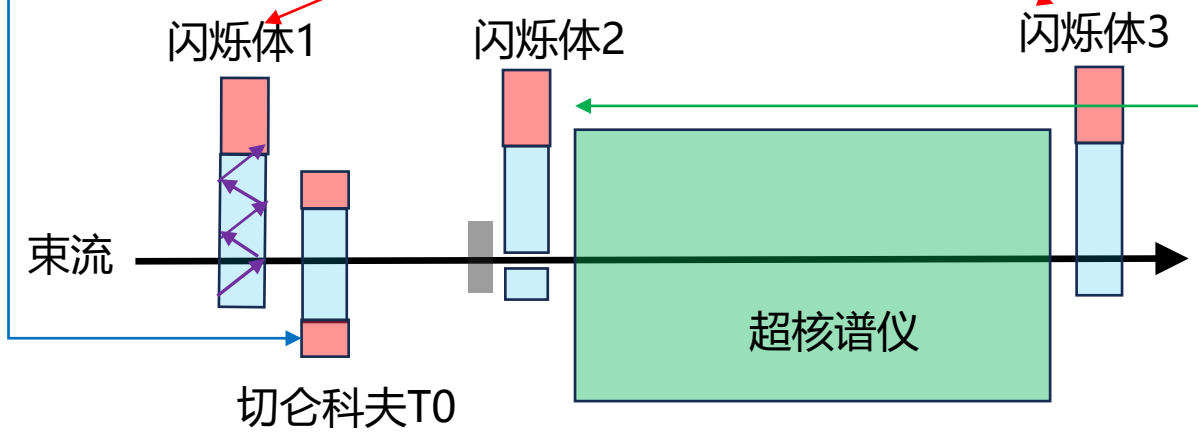




BESIII端盖TOF的
闪烁+PMT模块

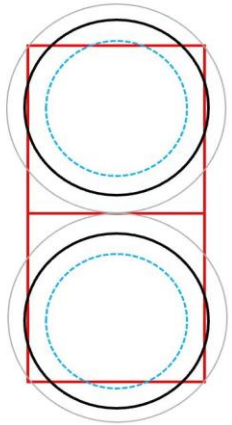
贺利氏石英+西光所PMT

EJ-230+滨松H6533



三个闪烁体探测器筛选：闪烁体1有信号 + 闪烁体2（开孔让束流通过）无信号 +闪烁体3（束流线远端）有信号，三重符合意味着束流过靶但未产生次级粒子，电子学不记录

闪烁体TOF探测器



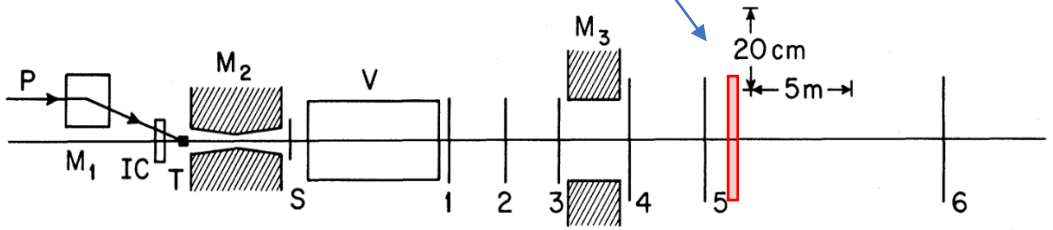
Scintillator: 25 x 25

PMT sensitive area: ϕ20

PMT Tube: ϕ26

PMT Assembly: ϕ31

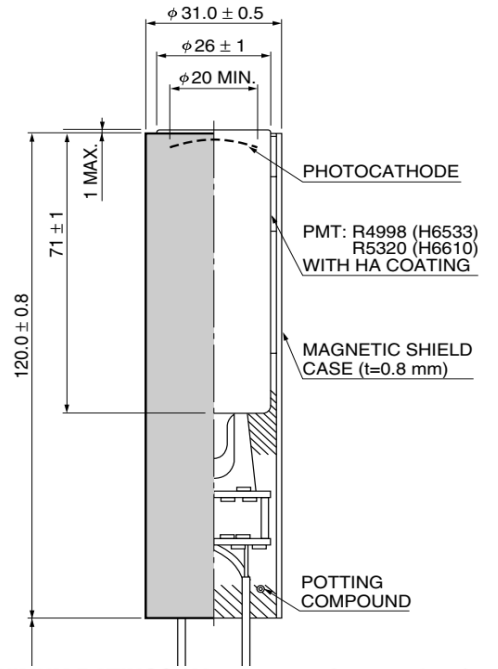
TOF安装在两臂LGAD之后几个cm处



闪烁体：25mm x 25mm x 5mm

PMT：滨松H6533

安装：闪烁体+tyvek纸包装+光学透紫硅油+PMT



MAXIMUM RATINGS (Absolute maximum values)

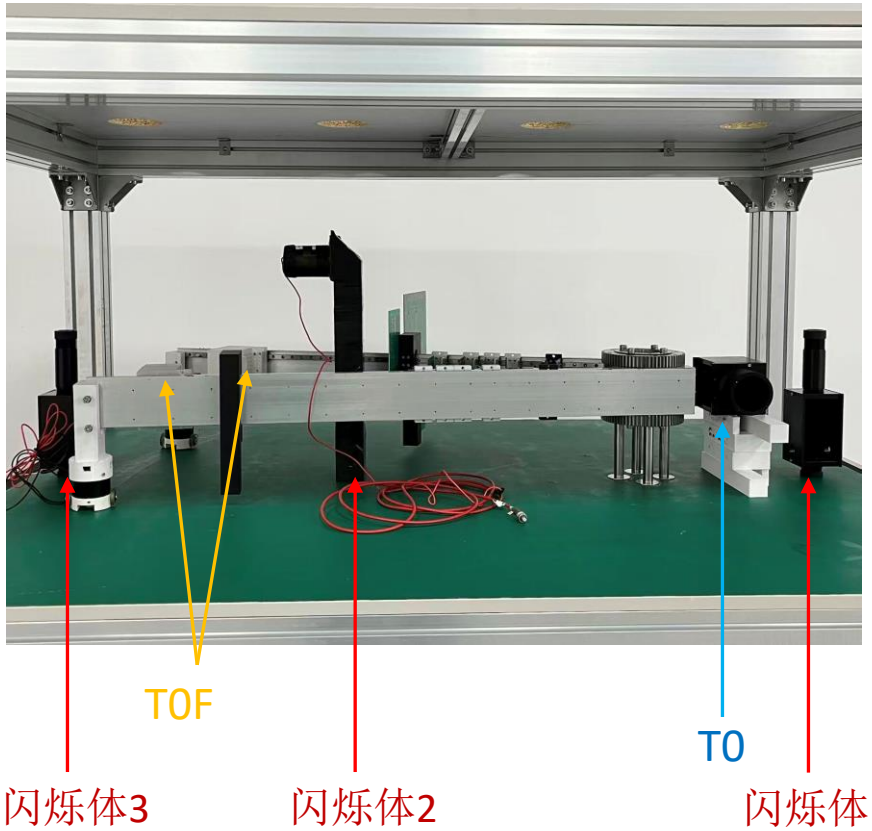
Parameter		Value	Unit
Supply voltage	Between anode and cathode	2500	V
Average anode current		0.1	mA

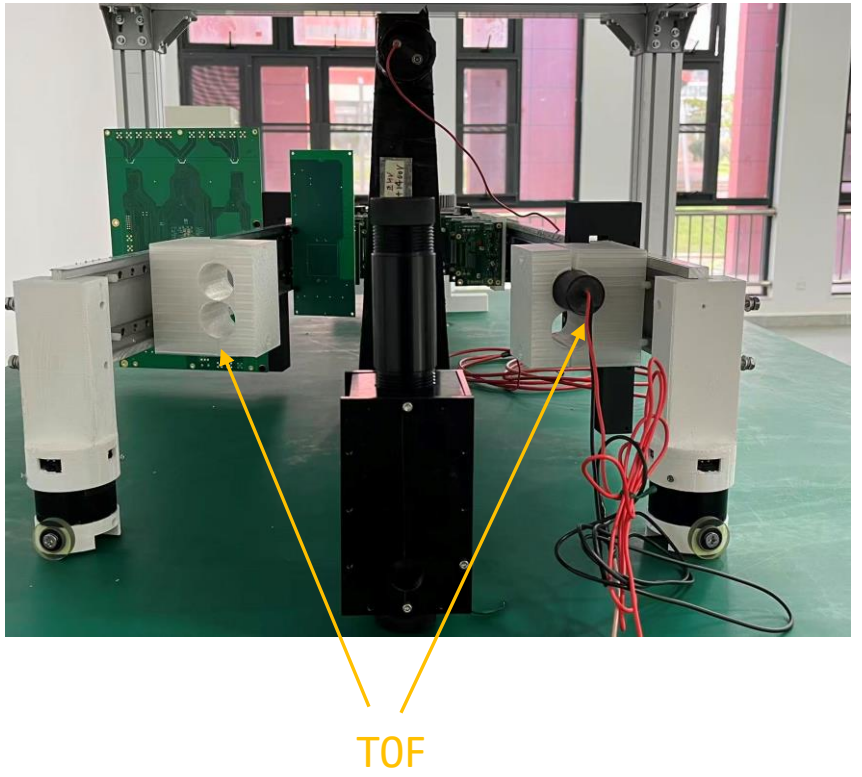
CHARACTERISTICS (at 25 °C)

Parameter		Min.	Typ.	Max.	Unit
Cathode sensitivity	Luminous (2856 K)	60	80	—	μA/lm
	Blue sensitivity index (CS 5-58)	—	9.5	—	—
Anode sensitivity	Luminous (2856 K)	100	400	—	A/lm
Gain		—	5.0×10^6	—	—
Anode dark current (after 30 min storage in darkness)		—	10	200	nA
Time response	Anode pulse rise time	—	0.7	—	ns
	Electron transit time	—	10	—	ns
	Transit time spread (FWHM)	—	160	—	ps

NOTE: Anode characteristics are measured with the voltage distribution ratio shown below.

各个探测器的安装位置



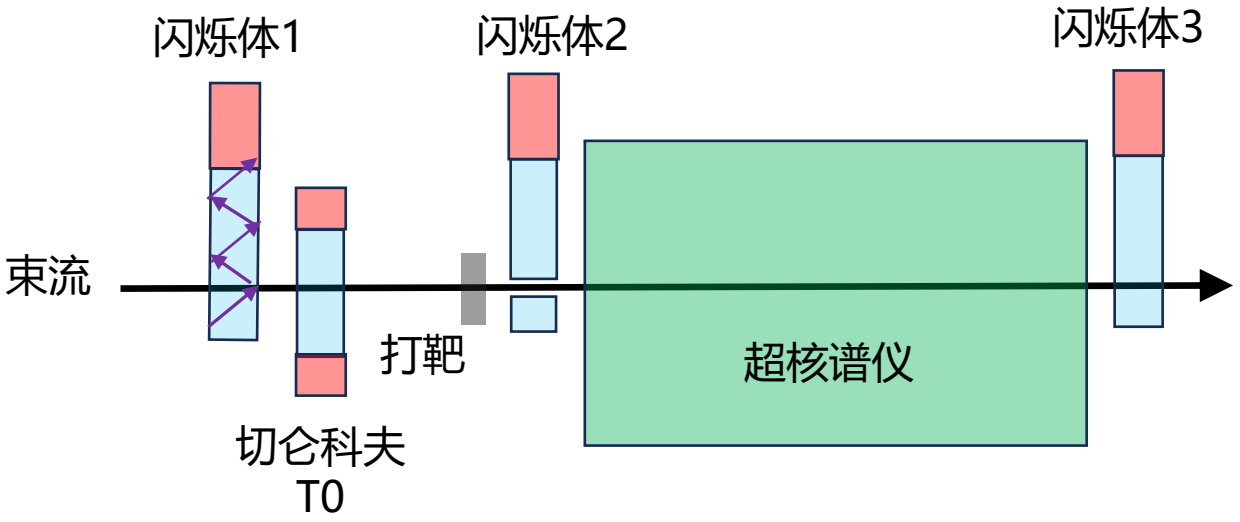


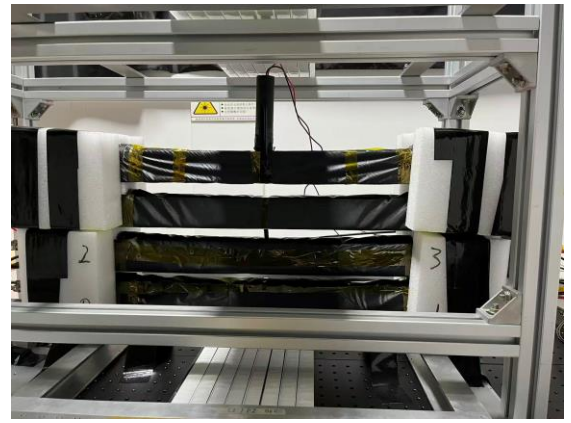
- TO+闪烁体符合探测器需要~11cm高度可调支架，以便2cm直径的黑箱开口对准束流线
- 下层需要~60cm x 50cm x 30cm左右空间安放PMT电源机箱
- 信号线和电源线长度 > 3m

闪烁体探测器符合+切仑科夫T0定时+TOF

目前进度：

- T0探测器：西光所PMT✓，石英 + 黑盒加工✓
- 闪烁体探测器：滨松H6533 PMT✓，闪烁体 + 黑盒加工✓
- TOF探测器：滨松H6533 PMT✓，闪烁体 ✓
- 待完成：安装支架，布线，TOF性能的宇宙线测试，CAEN机箱电源（一个月内到货）





谢谢！