The Status of the HCAL

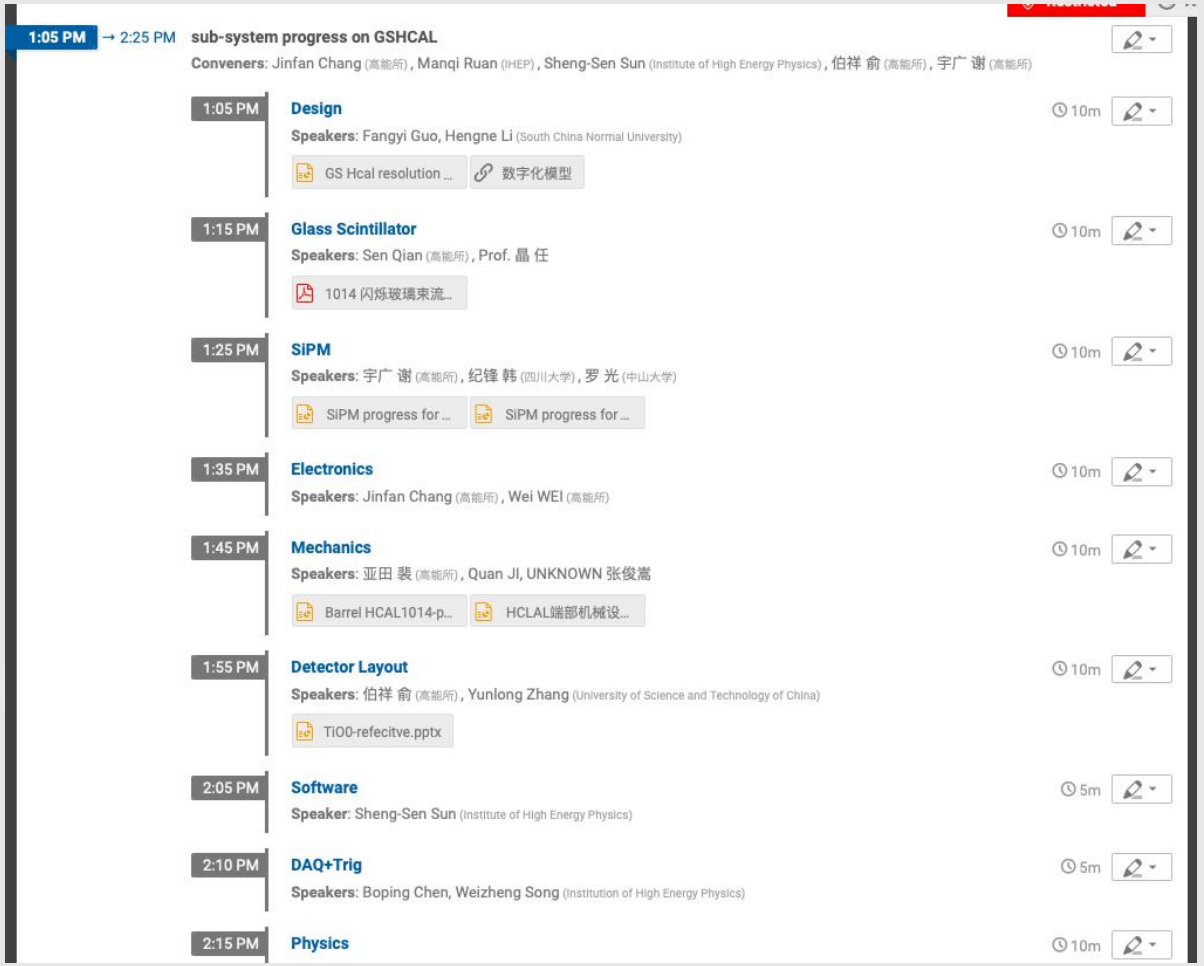
2024-10-15

Qian Sen, on behalf of the HCAL Group

qians@ihep.ac.cn

The Weekly Meeting of HCAL

The Indico Page



1:05 PM → 2:25 PM **sub-system progress on GSHCAL**

Conveners: Jinfan Chang (高能所), Manqi Ruan (IHEP), Sheng-Sen Sun (Institute of High Energy Physics), 伯祥 俞 (高能所), 宇广 谢 (高能所)

1:05 PM **Design** 10m
Speakers: Fangyi Guo, Hengne Li (South China Normal University)
GS Hcal resolution ... | 数字化模型

1:15 PM **Glass Scintillator** 10m
Speakers: Sen Qian (高能所), Prof. 晶 任
1014 闪烁玻璃束流...

1:25 PM **SiPM** 10m
Speakers: 宇广 谢 (高能所), 纪锋 韩 (四川大学), 罗 光 (中山大学)
SiPM progress for ... | SiPM progress for ...

1:35 PM **Electronics** 10m
Speakers: Jinfan Chang (高能所), Wei WEI (高能所)

1:45 PM **Mechanics** 10m
Speakers: 亚田 裴 (高能所), Quan JI, UNKNOWN 张俊嵩
Barrel HCAL1014-p... | HCLAL端部机械设...

1:55 PM **Detector Layout** 10m
Speakers: 伯祥 俞 (高能所), Yunlong Zhang (University of Science and Technology of China)
TiO0-refecitve.pptx

2:05 PM **Software** 5m
Speaker: Sheng-Sen Sun (Institute of High Energy Physics)

2:10 PM **DAQ+Trig** 5m
Speakers: Boping Chen, Weizheng Song (Institution of High Energy Physics)

2:15 PM **Physics** 10m

HCAL：例会机制成型，可以正常运行！

周一例会正常进行。

20240930，国庆放假前一天，第二天没有Ref-TDR会议；

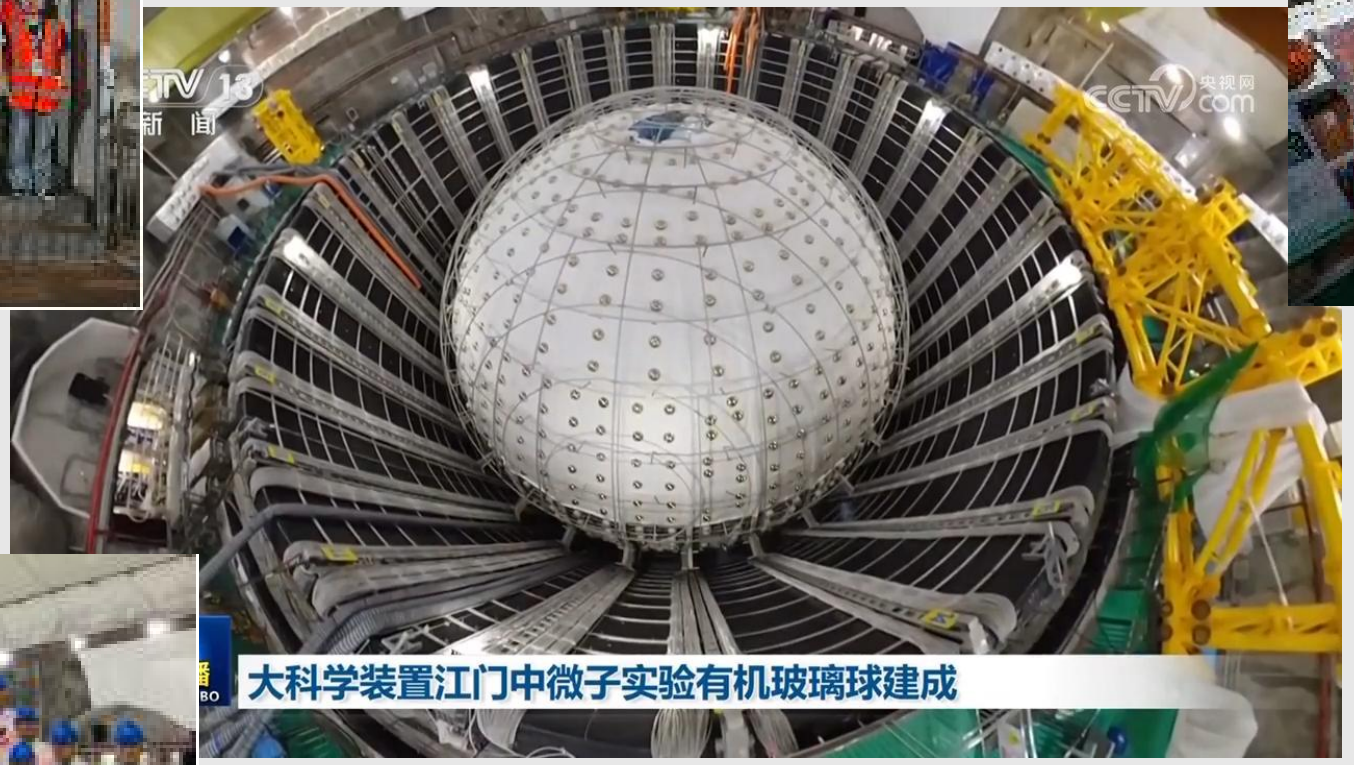
20241007，放假期间开会，准备第二天Ref-TDR报告；

20241014，钱森请假，会议正常召开。

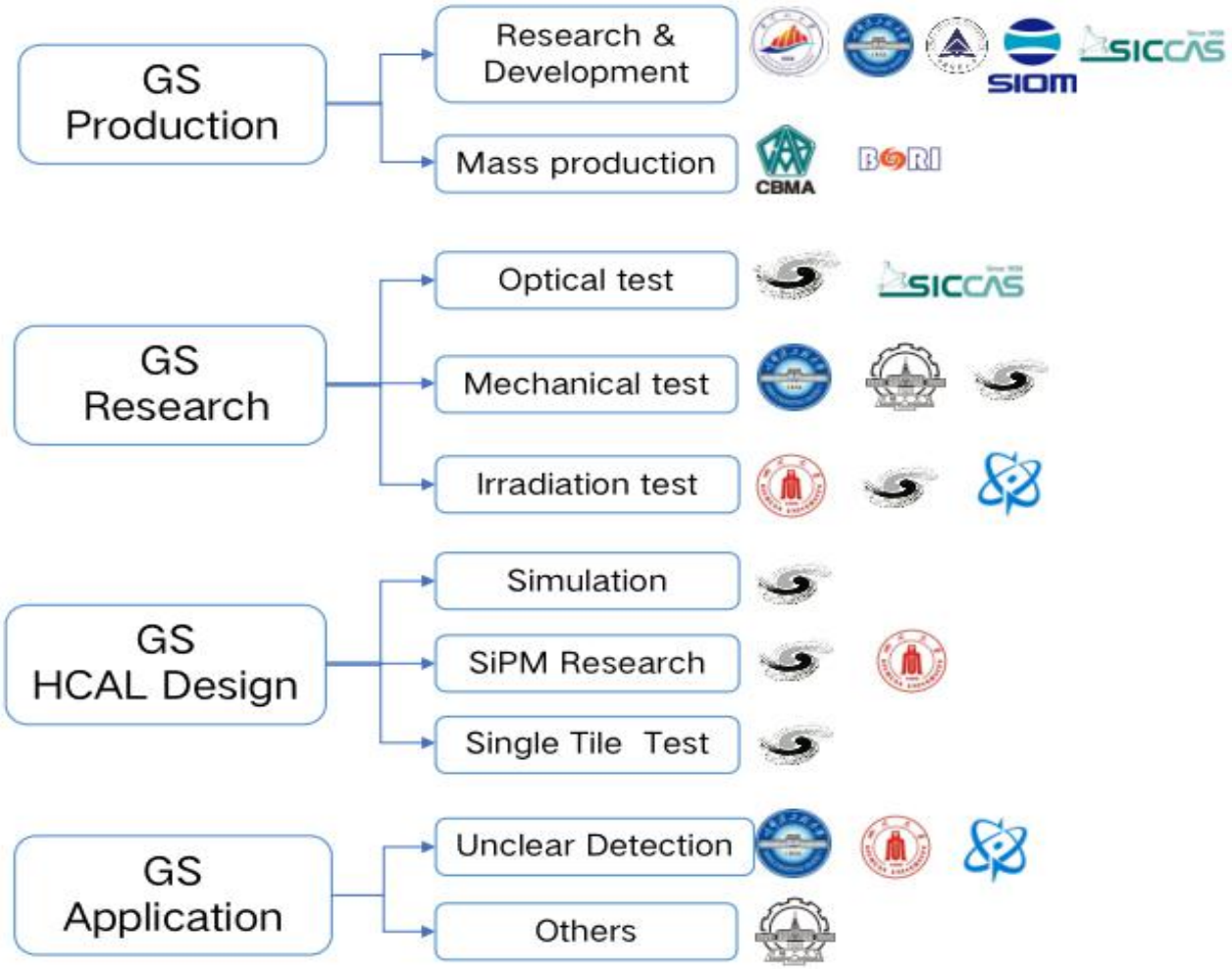
----会议继续为HCAL 报告增加素材和理清一些疑问，
同时有部分进展。将在下次周会汇报。

A new mail list will be done:
cepc_det_ref_tdr_HCAL@maillist.ihep.ac.cn

The 8th GS Collaboration Meeting


CCTV 13
新 闻
央视网 cctv.com
大科学装置江门中微子实验有机玻璃球建成

The GS collaboration Group 20240528



Institute of High Energy Physics, CAS
中国科学院高能物理研究所

Jinggangshan University
井冈山大学

Beijing Glass Research Institute
北京玻璃研究院

China Building Materials Academy
中国建筑材料研究院

China Jiliang University
中国计量大学

Harbin Engineering University
哈尔滨工程大学

Harbin Institute of Technology
哈尔滨工业大学

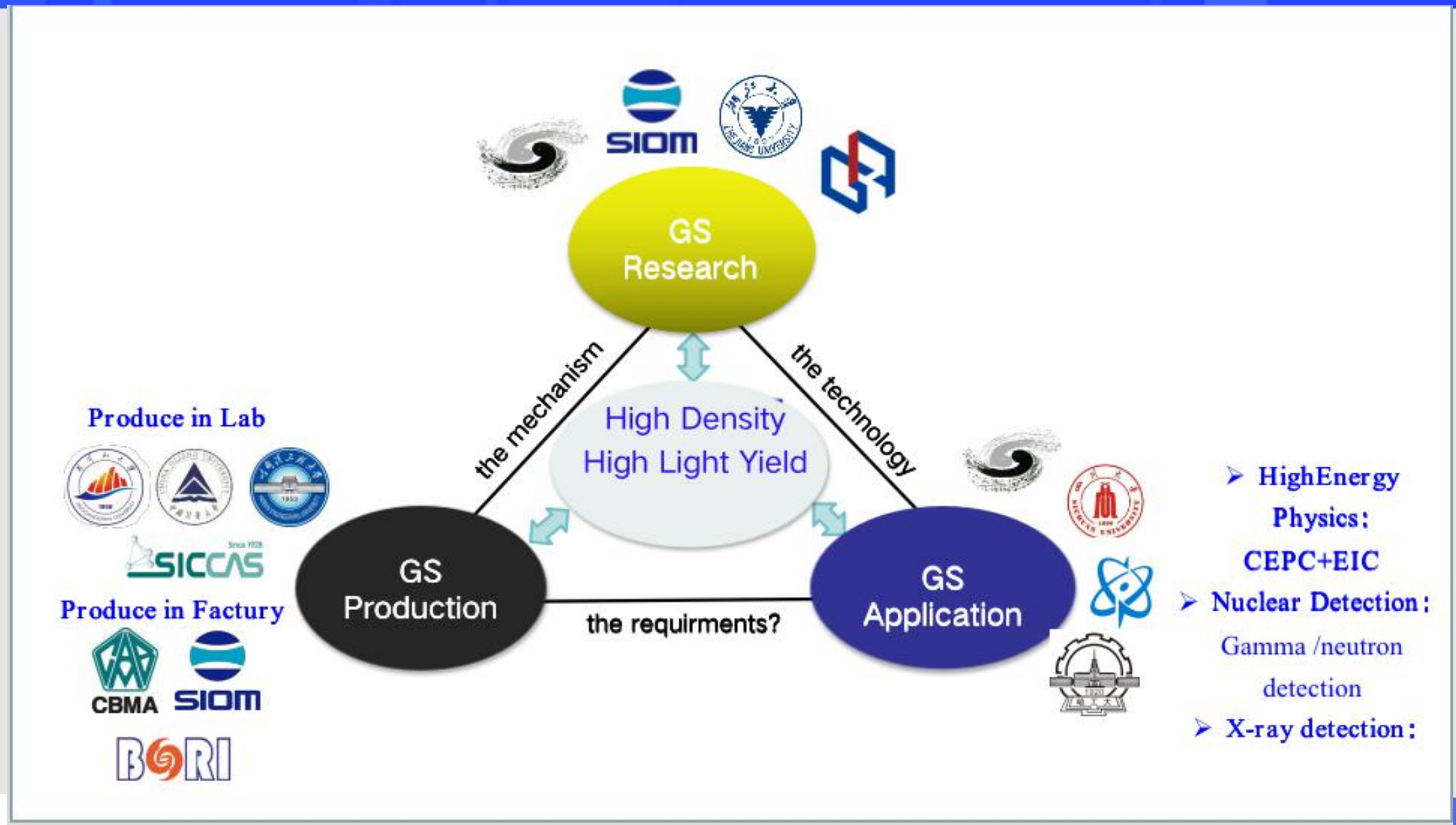
Sichuan University
四川大学

Shanghai Institute of Ceramics, CAS
中国科学院上海硅酸盐研究所

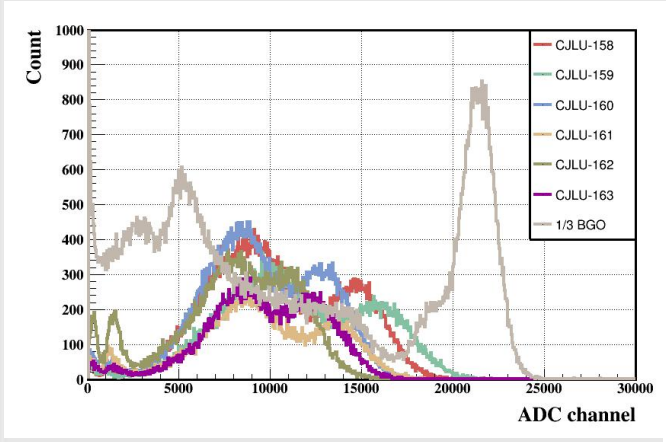
Shanghai Institute of Optics and Fine Mechanics,
中国科学院上海光学精密机械研究所

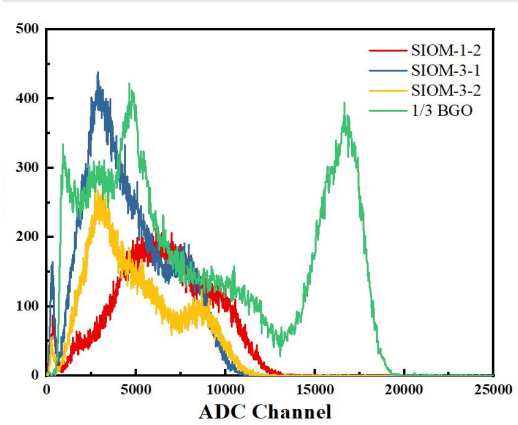
CNNC Beijing Unclear Instrument Factory
中核（北京）核仪器有限责任公司

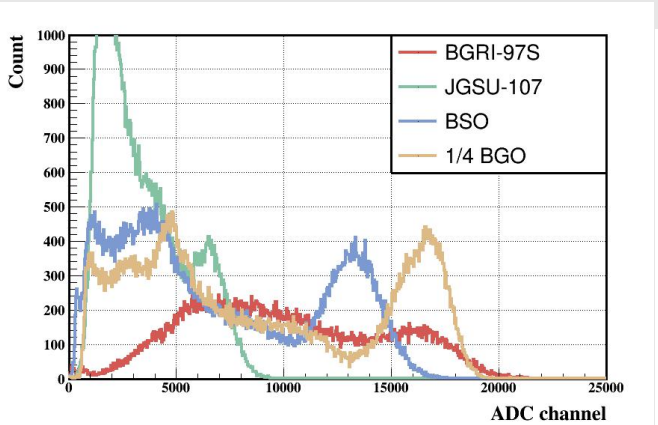
The GS collaboration Group 20241014

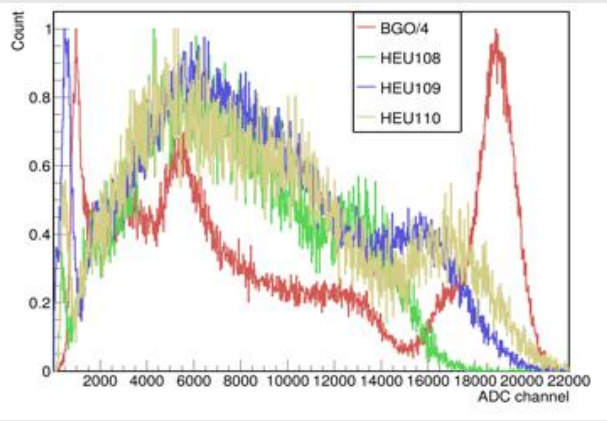


The small samples with LY>2000ph/MeV









202404 CJLU：

- Density~5.6 g/cm^3
- LY=2202 ph/MeV
- ER=27.7%
- Decay=129 (6%), 2466 ns

202406 SIOM：

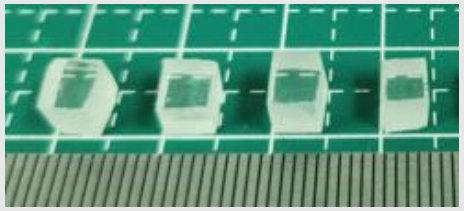
- Density~6.0 g/cm^3
- LY=2005 ph/MeV
- ER=37.6%
- Decay=111 (5%), 1063 ns

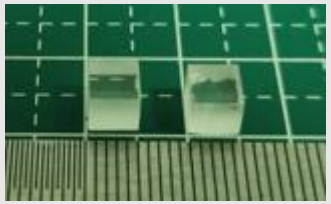
202406 BGRI：

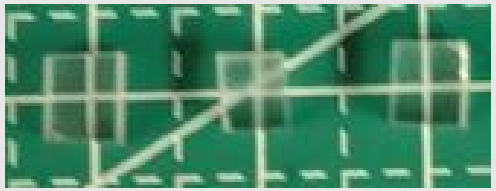
- Density~6.0 g/cm^3
- LY=2455 ph/MeV
- ER=25.8%
- Decay=101 (2%), 1456 ns

202408 HEU：

- Density~5.5 g/cm^3
- LY=2066 ph/MeV
- ER=30.2%
- Decay=125 (4%), 1782 ns







The GS collaboration Group 20241014

① **The performance of the best glass sample approach our initial goals,** 6 g/cm^3 & 1000 ph/MeV & ~100 ns

for the mass production about 10000 pics with the size of 4cm X 4cm X 1cm for the GS-HCAL module in the next two years.

② **To produce the sample with** 6 g/cm^3 & 2000 ph/MeV & ~300 ns,

For better performance GS-HCAL:

For cheaper GS-ECAL: save more money for better GS-ECAL&HCAL：

③ **To produce difference types of GS for CEPC,EIC,Nucler Detection and X-ray detection.**

R&D, Mass Production, Internation Business Mode, Funding, ……

HCAL Research Group

- CEPC-HCAL team：IHEP, USTC, SJTU, HNNU
  - Detector for RPC-DHCAL： Staff(2) + Student(1)
  - Detector for PS/GS-AHCAL： Staff(9) + Student(5)
  - Electronics: Staff(5)
  - Mechanics: Staff(3)
- The Glass Scintillator Collaboration
  - **Institute (13) + Staff (26)+ Student (10)**
- Join the DRD6 - WP1 for the GS study and HCAL study

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The comments from the IDRC Chair

- 1. The man power of the HCAL and ECAL should be fixed on the name of the person.
  - The group is divided into two parts: ECAL and HCAL;
  - The people of the HCAL Group have fixed them one by one with functions and contributions.
  - The HCAL Group will setup samll group:

    Physics; Software; Design； Scintillator Detector; SiPM; Electronics; Mechanics; DAQ; Detector.
  - Sub-system: 2 Conveners（1 from IHEP, 1 from University） + others
- 2, The R&D of the GS, the mass producetion?
  - There is the GS collaboration Group could do the R&D work;
  - The mass production of the GS will be discuss after the R&D work by the GS Collaboration Meeting;
  - Beijing Qiu-Shi High Energy Tech-Developing Company will on behalf of the GS group for the sample supply and post.
- 3, The R&D of the SiPM, the mass producetion?
  - There are some small company try to produce the SiPM in China;

The Manpower of the HCAL

- 1. The PS-HCAL
  - **Jianbei Liu,** Haijun Yang, Boxiang Yu，Yunlong Zhang，……，
- 2. The GS-HCAL： Sen Qian （IHEP）
  - Sub-system: 2 Conveners + others
  - Physics：**Manqi Ruan(IHEP)，Haijun Yang(SJU)，**
  - Software: Sengsen Sun(IHEP)；
  - Design: **Fangyi Guo(IHEP), Hengne Li(SCNU)，**
  - Glass Scintillator: **Sen Qian(IHEP), Jing Ren(HEU)，** the GS collaboration Group
  - SiPM: **Yuguang Xie(IHEP), Jifeng Han(SCU)，**
  - Electronics: **Jingfan Chang(IHEP)，**
  - DAQ：**Chen Boping(IHEP),**
  - Mechanics: **Yatian Pei(IHEP), Junsong Zhang**
  - Detector：**Boxiang Yu(IHEP), Yunlong Zhang (USTC)，**

The Manpower of the subsystem of GSHCAL

Physics：Manqi Ruan(IHEP)，Haijun Yang（SJTU），

Software: Sengsen Sun(IHEP)；

Design: Fangyi Guo(IHEP), Hengne Li(SCNU), Qingming Zhang(XJTU), Weizheng Song(IHEP), Peng Hu(261) Dejing Du(IHEP), Hongbing Diao(SUTC), Jiyuan Chen(SJTU), ……

--to design the GS-HCAL detector based on the CEPCSW;

Glass Scintillator: Sen Qian(IHEP), Jing Ren(HEU)， the GS collaboration Group;

--R&D of the GS for CEPC-HCAL, a special group independent of CEPC;

SiPM: Yuguang Xie(IHEP), Jifeng Han(SCU), Guang Luo(SYSU),

--to do the research of SiPM for CEPC-HCAL, the electronics of SiPM for the GS performance test;

Electronics: Jingfan Chang(IHEP),

--to design the ASIC and FEE for CEPC-HCAL; the power supply, the cables and so on;

DAQ: Chen Boping(IHEP),

Mechanics: Yatian Pei(IHEP), Junsong Zhang(IHEP), Shang Bofeng(ZZU)

--to design the Mechanics of the GS-CEPC-HCAL; also the cell, the module, the cooling system;

Detector：Boxiang Yu(IHEP), Yunlong Zhang (USTC)

--to study the module of the GS-HCAL with GS and SiPM, the cosmic ray test, the beam test;