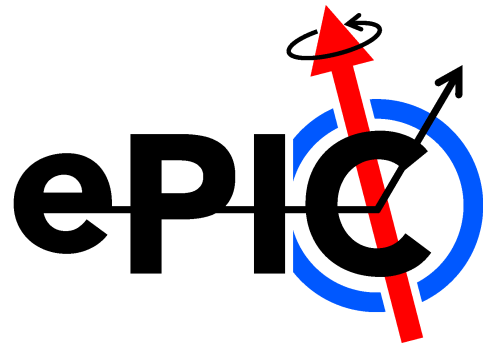


Recent ELC Activities in Taiwan

Chia-Ming Kuo (NCU, Taiwan)
on behalf of the ELC-Taiwan team

EIC Taiwan team



- **Academia Sinica** experimentalist/theorist
 - Wen-Chen Chang, Hsiang-Nan Li, Di-Lun Yang, Suen Hou, Chih-Hsun Lin
- **National Taiwan University**
 - Rong-Shyang Lu, Kai-Feng Jack Chen, Stathes Paganis, Juinn-Wei Chen
- **National Central University**
 - Jen-Chieh Peng (UIUC/NCU), Chia-Ming Kuo
- **Chung Yuan Christian University**
 - Chung-Wen Kao
- **National Tsing Hua University**
 - Pai-Hsien Jennifer Hsu
- **National Yang Ming Chiao Tung University**
 - C.-J. David Lin, Anthony Francis
- **National Cheng Kung University**
 - Yi Yang



Workshops and school



TIDC EIC Workshop

August 18–19, 2022
Department of Physics, NCKU, Tainan, Taiwan

Agenda: <https://indico.phys.sinica.edu.tw/event/52/>

Invited Speakers:
Chung-Wen Kao (CYCU)
Hsiang-nan Li (AS)
Po-Ju Lin (AS)
Jen-Chieh Peng (UIUC)
Zhenyu Ye (UIC)
Rong-Hwei Yeh (Asia Univ.)

Organizers:
Wen-Chen Chang (AS)
Chia Ming Kuo (NCU)
Rong-Shyang Lu (NTU)
Yi Yang (NCKU)

Sponsors
Ministry of Science and Technology (MOST)
Taiwan Instrumentation Detector Consortium (TIDC)
National Cheng Kung University (NCKU)
Department of Physics, NCKU

2022/8 @ NCKU



THE 2ND TIDC EIC WORKSHOP

January 3, 2023
Institute of Physics, Academia Sinica

Registration Deadline **December 15, 2022**

INVITED SPEAKERS
✓ Jiunn-Wei Chen (NTU)
✓ Chia-Yu Hsieh (AS)
✓ David Lin (NYCU)
✓ Po-Ju Lin (AS)
✓ Cheng-Wei Shih (NCU)
✓ Rong-Hwei Yeh (Asia Univ.)

ORGANIZERS
Wen-Chen Chang (AS)
Chia Ming Kuo (NCU)
Rong-Shyang Lu (NTU)
Yi Yang (NCKU)

SPONSORS
Taiwan Instrumentation and Detector Consortium
Institute of Physics, Academia Sinica
Division of Particles and Fields, The Physical Society of Taiwan

Info & Registration
<https://tidc.phys.ntu.edu.tw/WordPress/activities/2023-eic-workshop/>

Contact Us
☎ 02-33668648
chhuang@phys.ntu.edu.tw

January 3, 9 AM to 6 PM
Conference Room 1, 5F, Institute of Physics, Academia Sinica

2023/1 @ IPAS

NCU workshop on EIC physics and detectors

12/9 2022
Fri.

National Central University

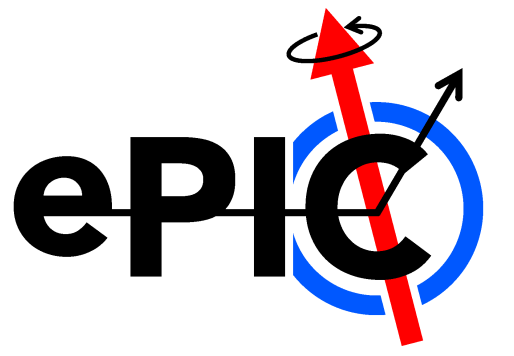
Organization Committee:

Jen-Chieh Peng (UIUC/NCU),
Wen-Chen Chang (AS),
Chia-Ming Kuo (NCU)

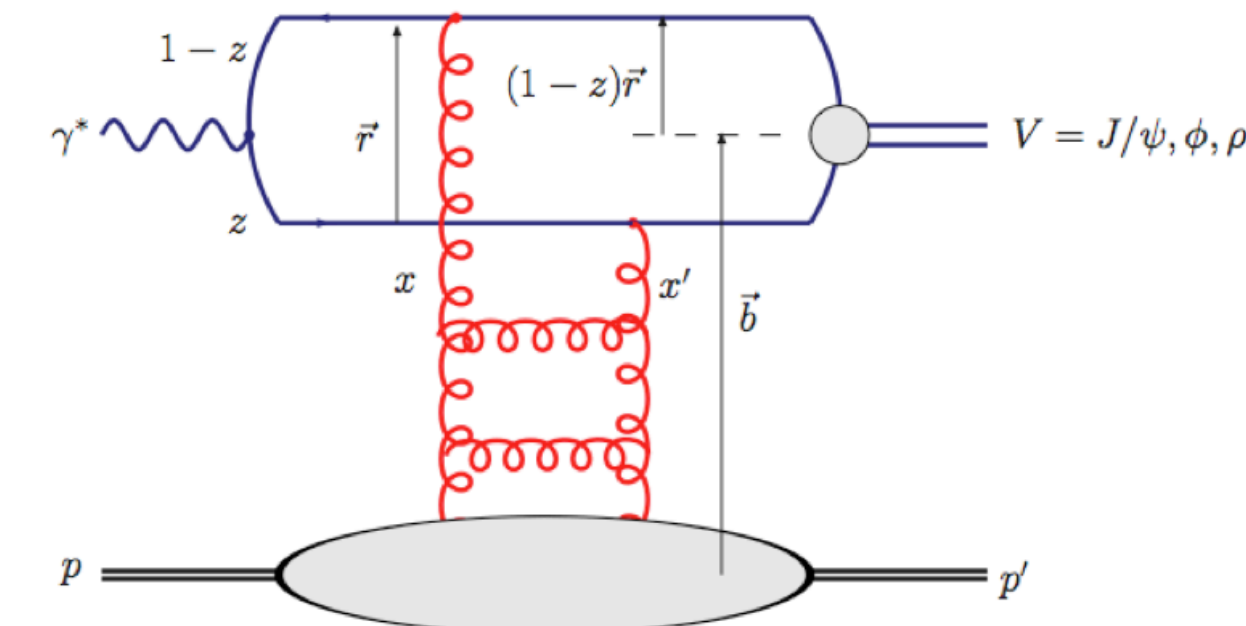
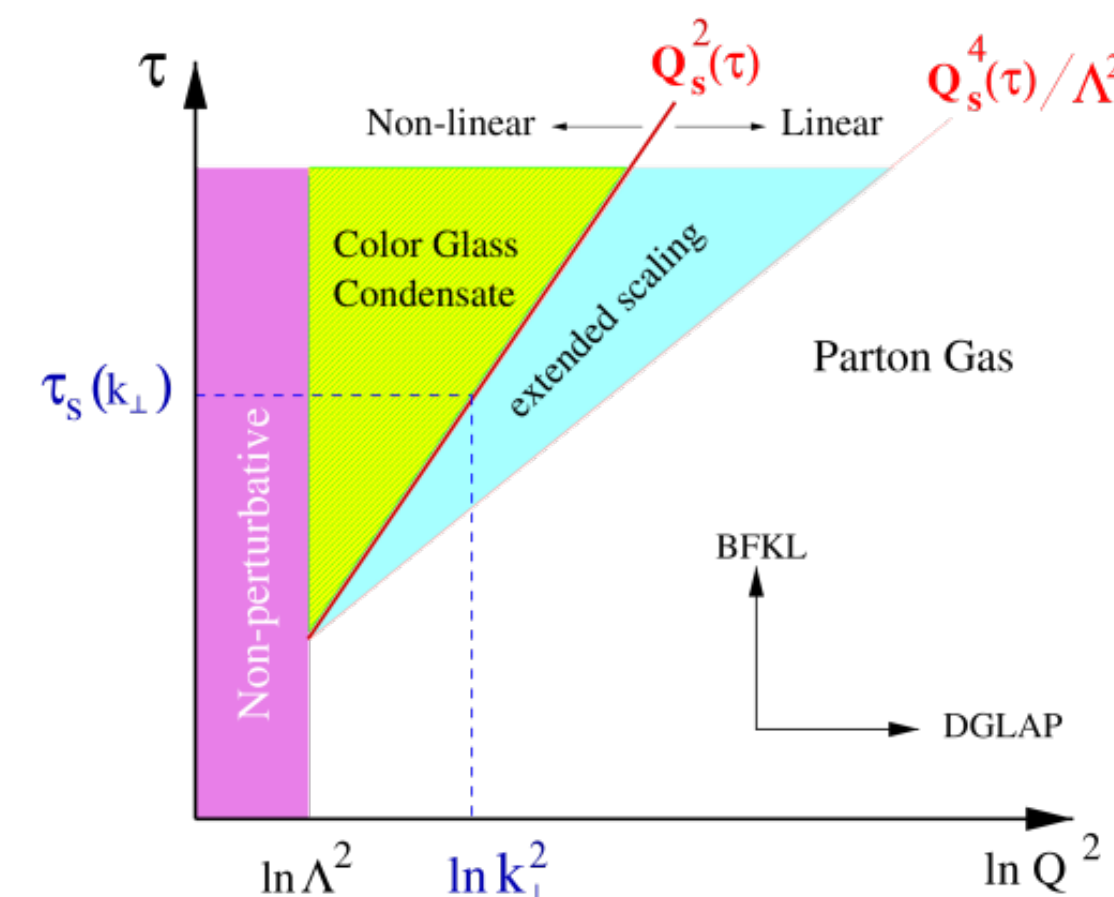
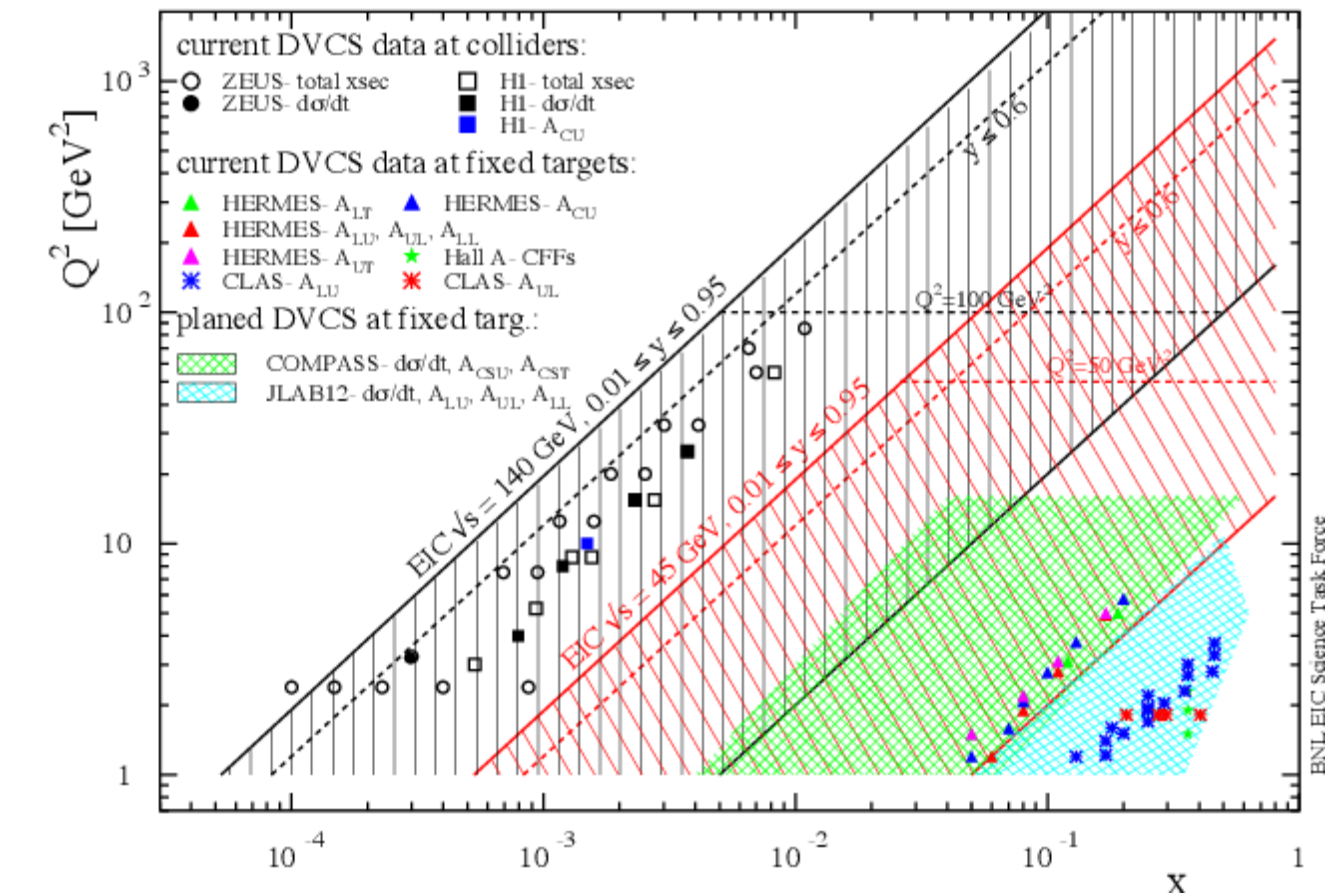
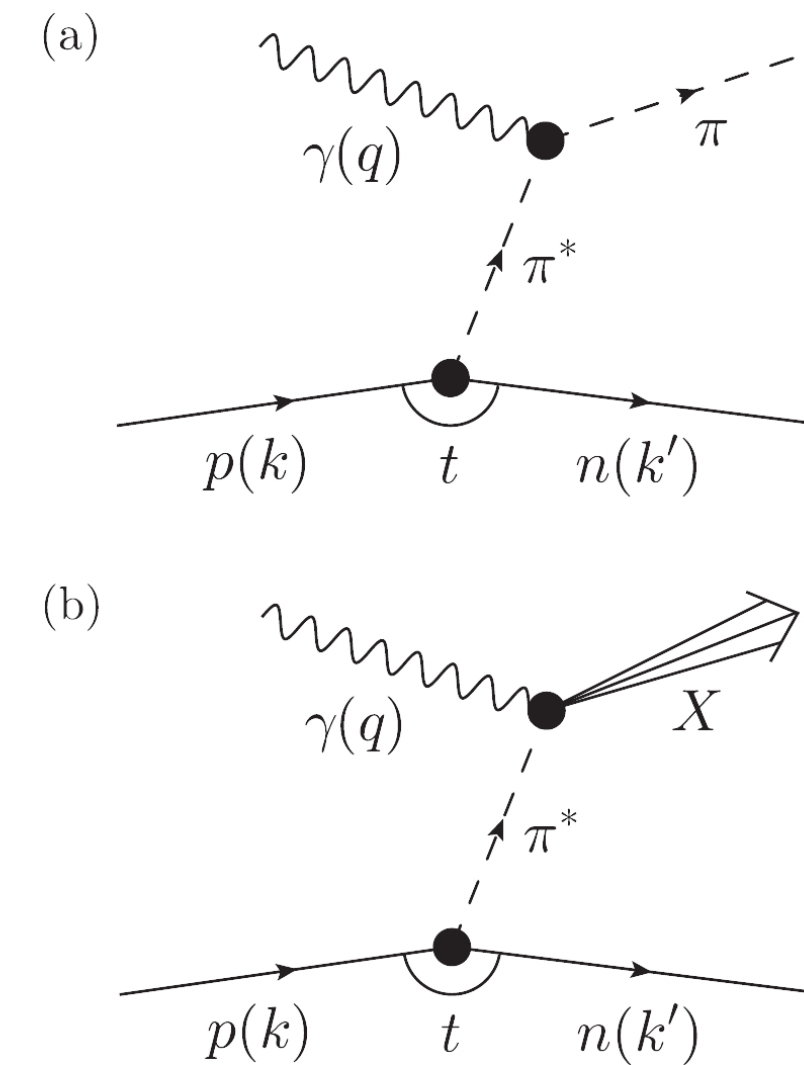


- We will host an EIC summer school from August 28th to 30th 2023 at NTU
- you and your young students are more than welcome to join us
- We would like to host the East-Asia EIC meeting in November 2023

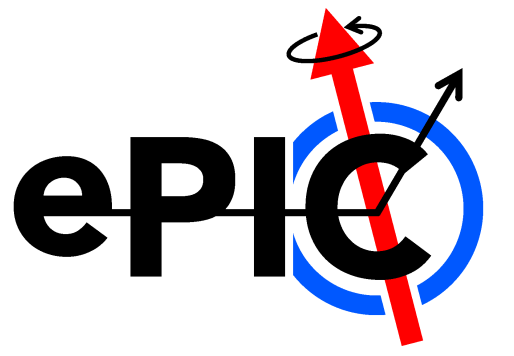
Physics interests



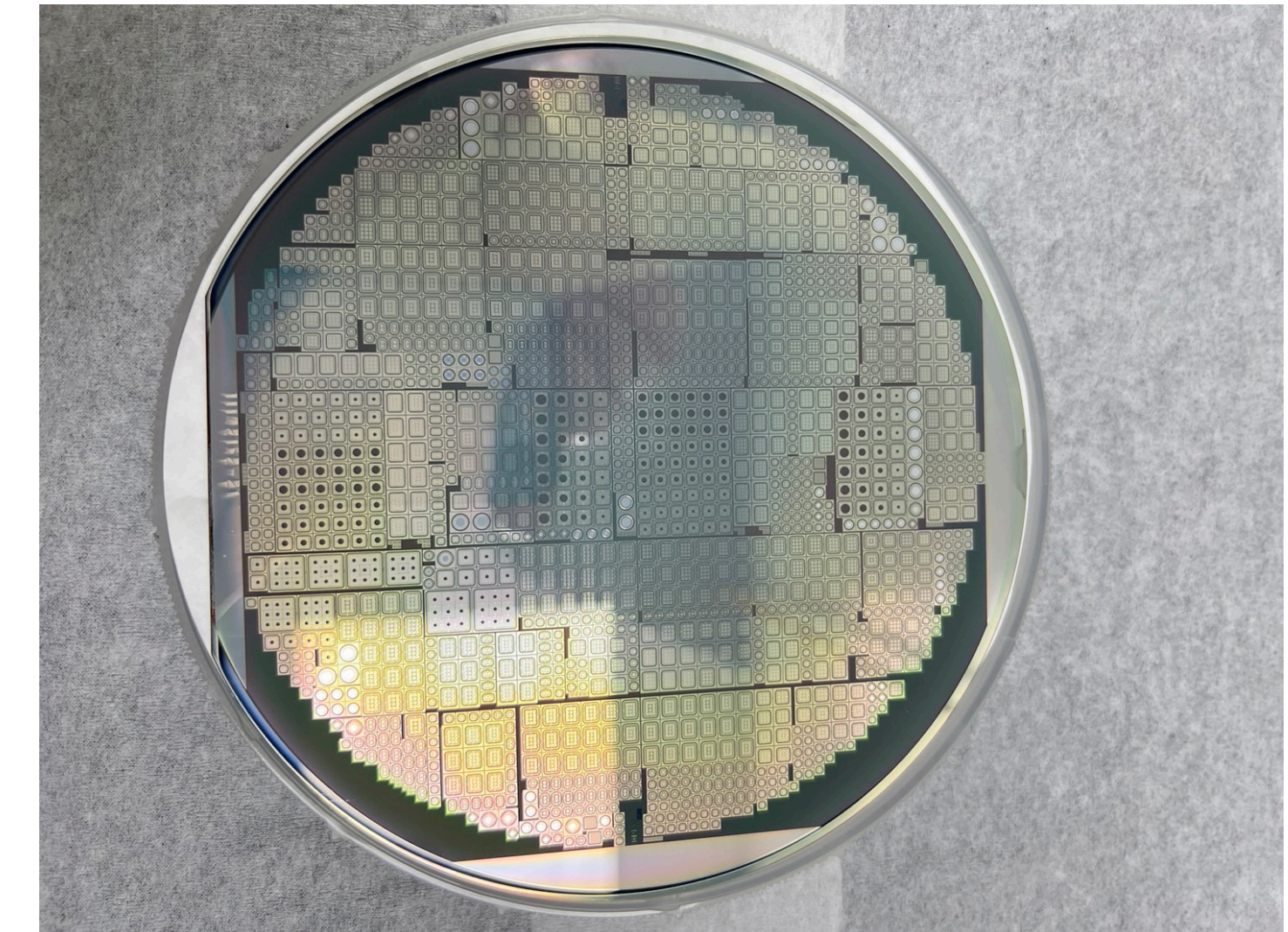
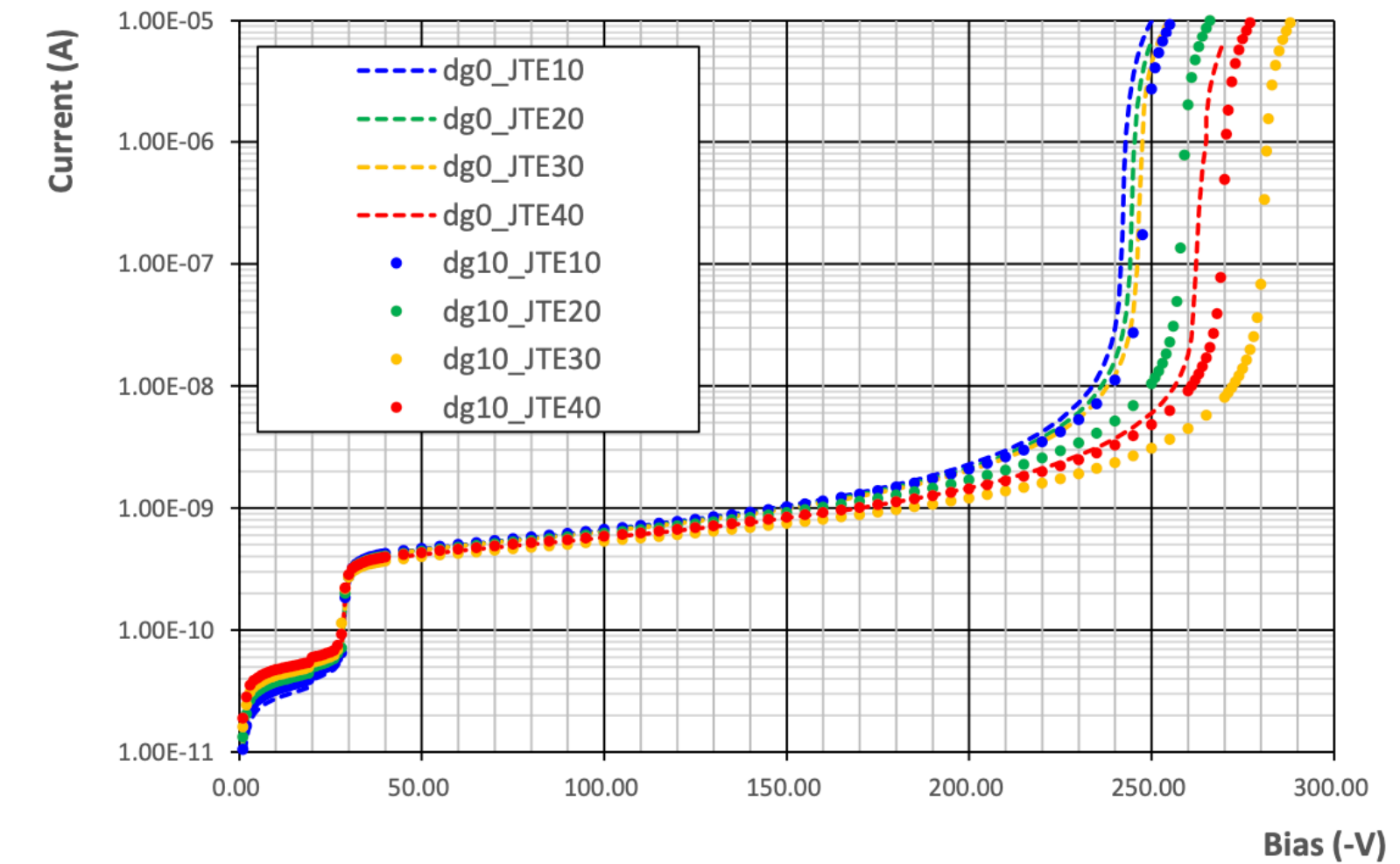
- preliminary ideas
- **pion and kaon PDFs** (tagged-DIS; sec. 7.1.3 of YR)
 - W.C. Chang, J.W.Chen, C.W. Kao, D. Lin
- **GPDs** (DVCS, TCS, DVMP; sec. 7.2.2 of YR)
 - P.J. Lin, J.W. Chen, C.W. Kao
- **CGC** (di-jet, di-hardon DIS, $e+A \rightarrow e'+A'+J/\Psi, \phi, \rho, \dots$; sec. 7.3.1 of YR)
 - C.M. Kuo, H.N. Li
- **hard probes** (jet, heavy quarks; sec. 7.3.9 of YR)
 - Y. Yang



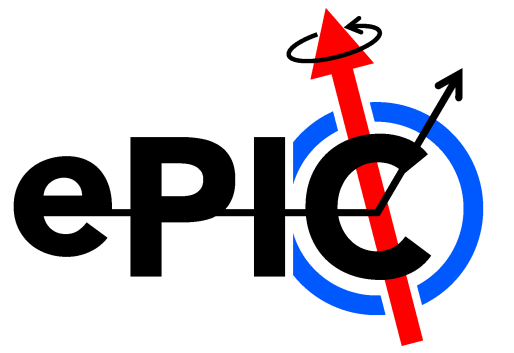
LGAD



- started with DC-LGAD
- TCAD simulation used to decide the LGAD sensor process parameters
- first goal: verify sensor process flow and TCAD simulation
- first batch of production with TSRI finished at the end of 2022
- the electrical performance of sensors is being carried out



Mechanical structure for TOF



- similar concept of STAR IST
- rather long support (1.35m) with minimal deflection
- R&D with carbon fiber composite materials
- NCKU/AS and Purdue University will collaborate
- project engineering and design (PED) will be carried out

Low Mass Support Structure for EPIC

W.-C. Chang¹, A.W. Jung², P.-J. Lin¹, Y. Yang³,

¹ Academia Sinica, Nankang, Taipei 11529, Taiwan

² Purdue University, West Lafayette, IN 47907, USA

³ National Cheng Kung University, Tainan, 70101, Taiwan

September 2022

1 Proposed FY23 Work for Purdue/NCKU/AS

Purdue University (US), National Cheng Kung University (NCKU, Taiwan), and Academia Sinica (AS, Taiwan) will collaborate on the design and manufacture of the mechanical support structure for the TOF detector in EPIC. To meet the required precision and material budget of TOF measurements, carbon fiber composite materials have been proposed for manufacturing the light-weight support due to their high thermal conductivity, strength to mass ratio, and radiation tolerance.

Request for Project Engineering and Design Support for EPIC TOF Detectors

Oskar Hartbrich (ORNL),

Andreas Jung (Purdue),

Po-Ju Lin (AS),

Yi Yang (NCKU),

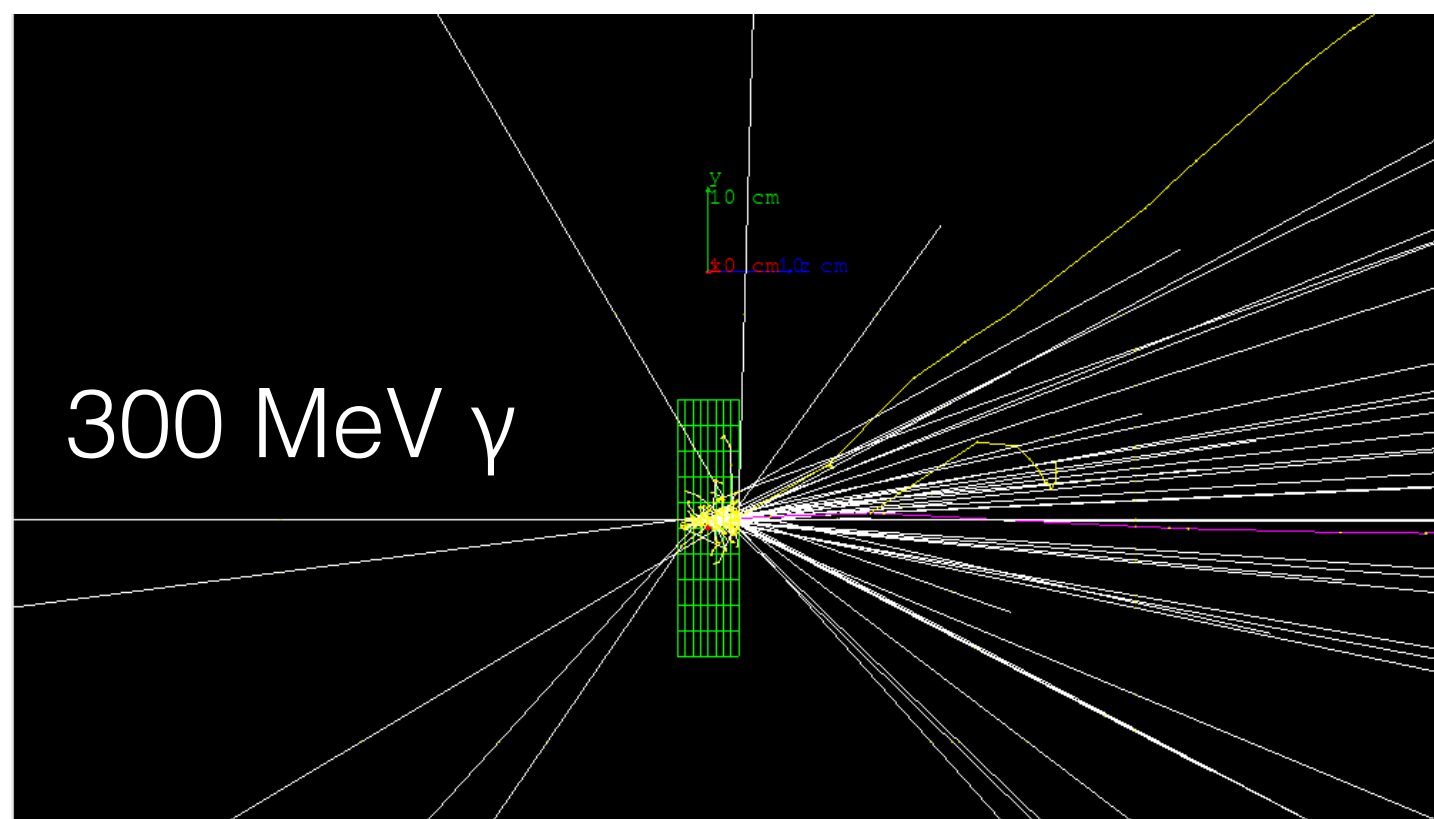
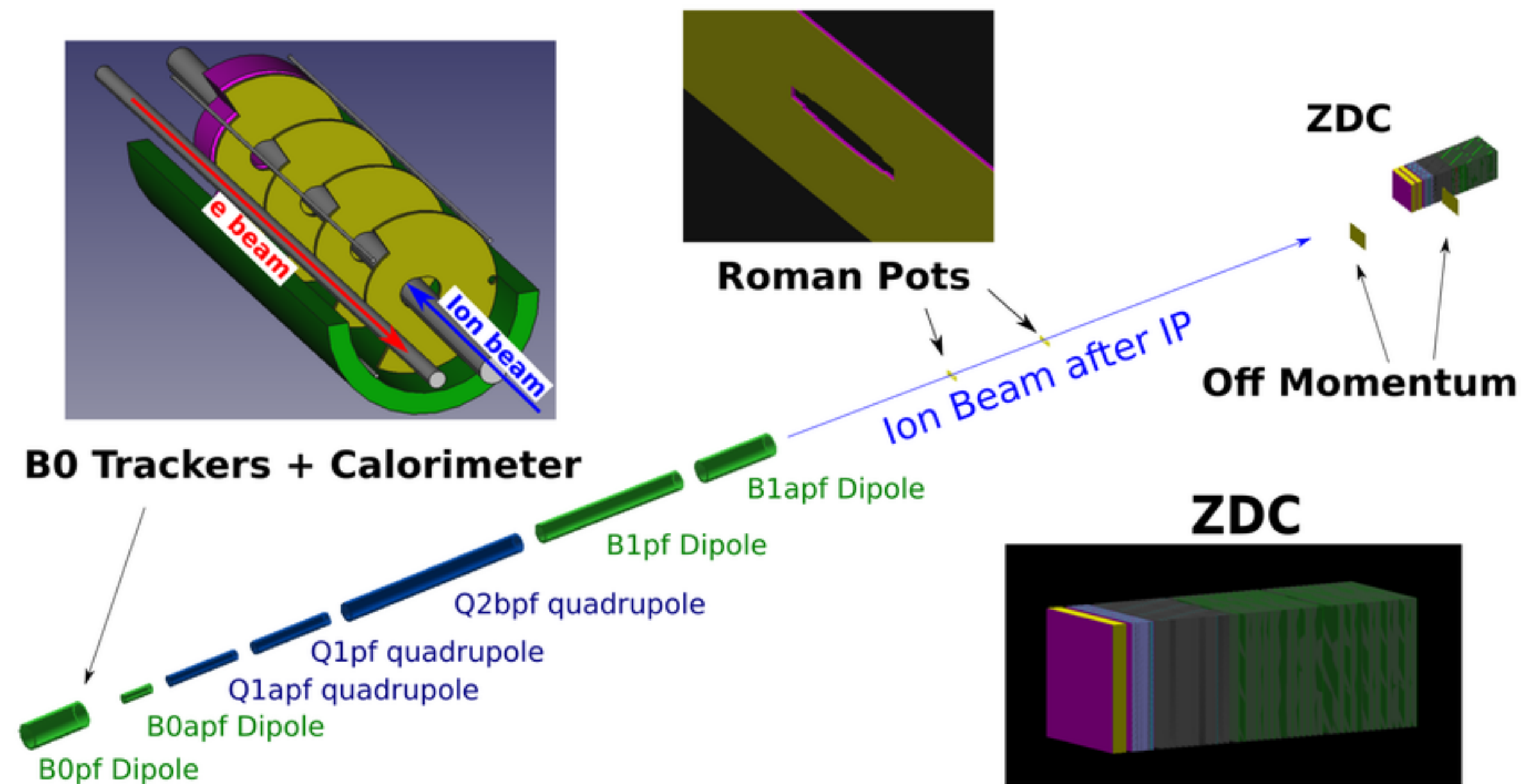
Zhenyu Ye (UIC)

for the EPIC TOF group.

October 2022

1 Introduction

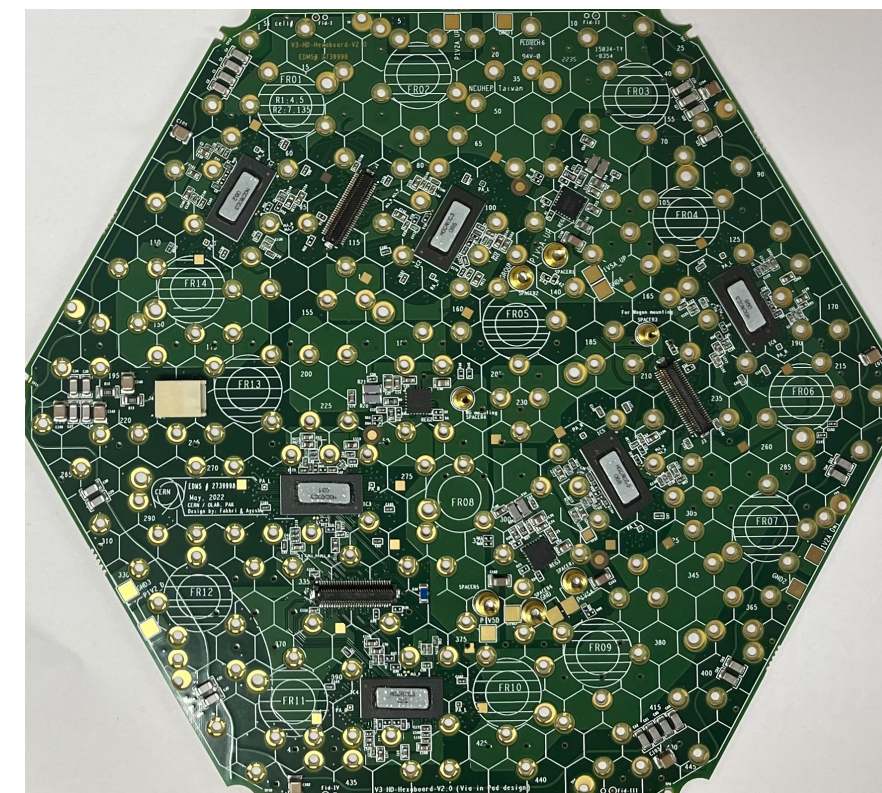
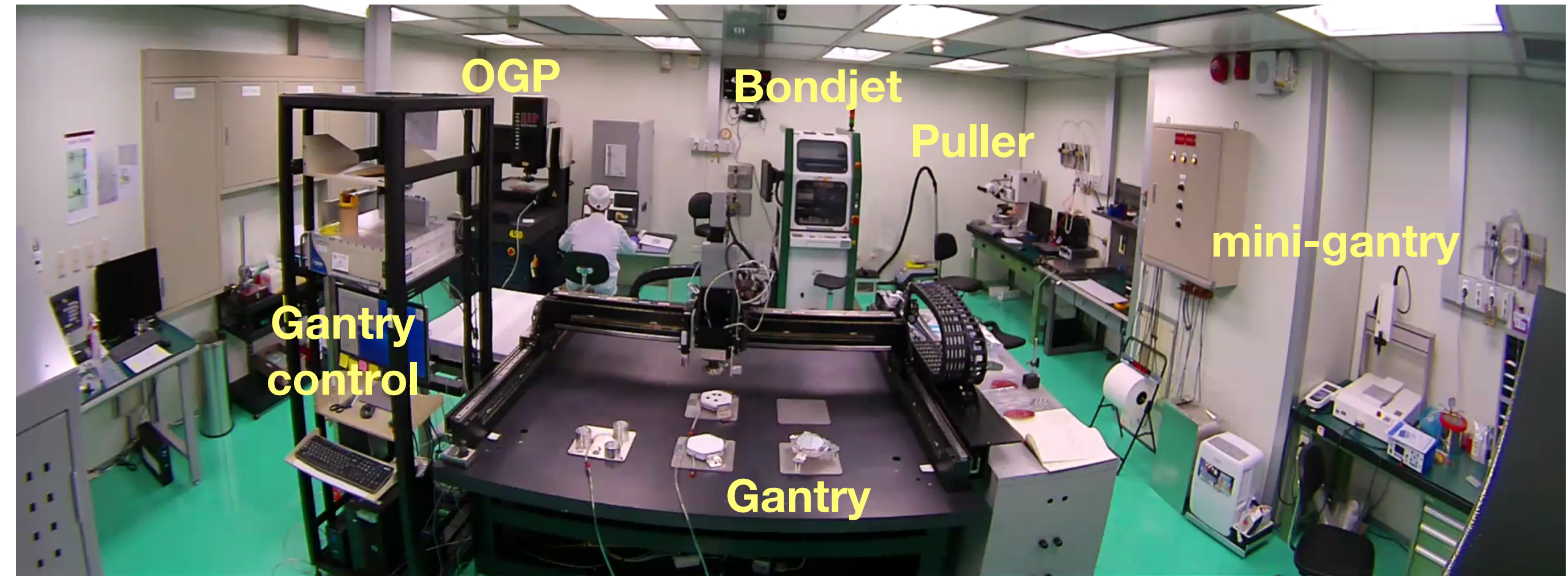
A number of AC-LGAD detector system aspects which constitute project engineering will need to be addressed in time for the CD2/3a review. This includes preliminary mechanical engineering design of the barrel and endcap TOF detector systems to be able to connect all electrical, optical and cooling services and provide a realistic plan of pre-assembling modules and services onto the mechanical structure, so that the assembled detectors can be integrated into EPIC with minimal post-assembly. Prototype mock-up structures will need be constructed to demonstrate the feasibility of production and assembly of individual parts where necessary. A detailed study of an appropriate cooling system will also be needed to quantify potential heating effects of surrounding detector systems, specifically the very temperature sensitive backwards ECAL crystals. The details of the plan and funding requests will be described in this Project Engineering and Design (PED) request.



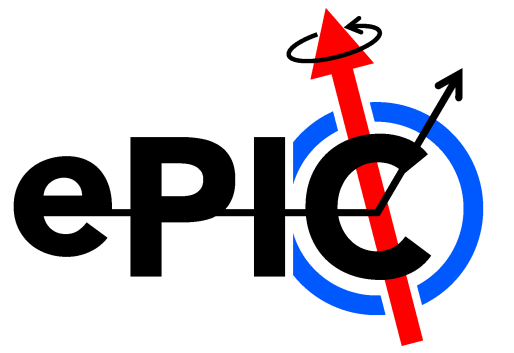
- interested in contributing to ZDC with building an EMCal prototype with LYSO
- physics motivations: meson structure/CGC/...
- LYSO producer: Taiwan Applied Crystal
- NTU has been working on studies with LYSO LY and timing with SiPM
- in contact with CMS experts to understand the use of SiPM up to $2 \times 10^{14} \text{ n/cm}^2$
- funding situation will be clear in April
- Po-Ju Lin is picking up simulation work from Shimizu-san
- started working on standard alone G4 simulation
- experience with PbWO_4 calibration at CMS ECAL

Other possibilities

- silicon detector assembly
- optical readout
- PCB production and assembly
- CMS HGCal HD hexaboards, DC-DC converters
- computing
- ATLAS T1/T2/T3, CMS T1/T2/T3
- ~12K CPU cores/~30TB storage



Summary



- We started to form the EIC Taiwan group, including experimentalists and theorists
- The first 12 DC-LGAD sensors have been produced and their electrical properties are being measured
- Project engineering and design of mechanical support for TOF will be carried out
- We are interested in contributing to ZDC with building an EMCal prototype with LYSO. Some activities have already started.
- We will host an EIC summer school at the end of August and hope to host next East-Asia EIC meeting in November