

*EIC EOI*の議論

2020年10月1日(木)

後藤雄二 (理研)

EOI – EIC-Japan

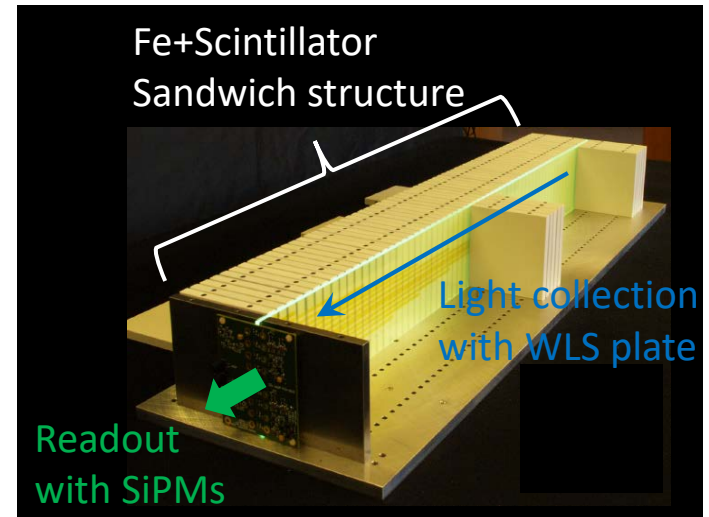
- Please indicate the name of the contact person for this submission:
 - <name> <institution> <e-mail>
- Please indicate all institutions collectively involved in this submission of interest:
 - Yamagata Univ., RIKEN, Kobe Univ., Shinshu Univ., Tsukuba Univ., Tsukuba Tech., JAEA, Nihon Univ., KEK
- Please indicate the items of interest for potential equipment cooperation:
 - Forward hadron calorimeter
 - Zero-degree calorimeter (EM + hadron)
 - Silicon detector

EOI – EIC-Japan

- Opportunities for engagement of other groups
 - Collaboration with high-energy group (mainly working at LHC-ATLAS): Kyushu Univ.
 - Collaboration with cosmic-ray group (mainly working at LHCf & RHICf): ICRR, Nagoya Univ.
 - Collaboration with EIC-Korea group: Korea Univ., Sejong Univ., Pusan Univ., ...
- Additional information you think may be useful for the community to know about your expression of interest.
 - KEK detector R&D platform
 - Silicon detector platform: Kyushu Univ., KEK
 - US-Japan cooperation (high-energy & hadron)

Forward hadron calorimeter

- Cooperation with UCLA/STAR/eRD1
 - Fe/Sci calorimeter
 - 38 layers for STAR FCS
 - 10cm x 10cm x 90 cm tower
 - 4.5 interaction length
 - WLS light collection
 - SiPM readout
 - Expected energy resolution
 - $\sigma_E/E = 70\%/\sqrt{E(\text{GeV})}$
 - Constant/noise terms?
- Possible cooperation with Korea group
 - Dual readout calorimeter
 - (cooperation with eRD1 or UC EIC consortium)

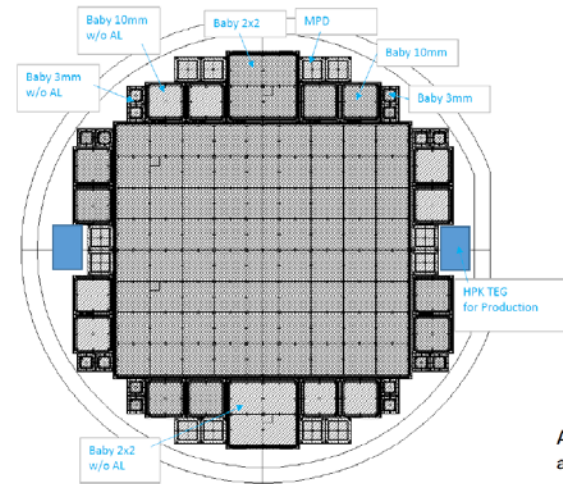


Zero-degree calorimeter

• ALICE FoCal

- W/Si calorimeter (-E)
- Cu/Sci calorimeter (-H)

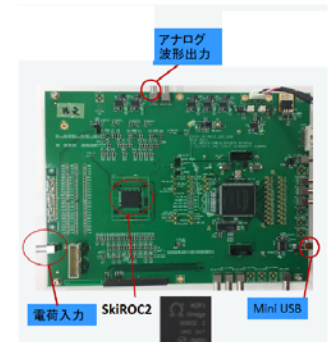
1. New silicon pad sensor for final FoCal



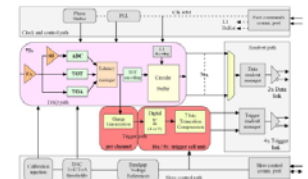
Almost final version
as of Aug. 19, 2020

2. Readout chip: HGCROC (SkiROC-CMS)

- In 2019-2020, we started to use SkiROC (for CALICE, ILC-ECAL), with help by Kyushu U. group (T. Suehara)
- Right now, we are using SkiROC2-CMS (w/ TOT, time-over-threshold) from Kyushu G.
- **[Plan]** test pulse injection to SkiROC, monitor PD readout, beta source test, and laser test, check the linearity in TOT etc.
- At Grenoble, there is a HGCROC(ver.2) evaluation board.
- **[Plan]** shipping this HGCROC(ver.2) evaluation board to Japan, and tested with silicon sensor, in Oct/Nov?



SkiROC2a board from Kyushu U.



Zero-degree calorimeter

- EIC detector R&D eRD27
 - Photon detector (full absorption)
 - Cooperation with eRD1
 - Crystal scintillator: PWG, LYSO, ...
 - Glass scintillator
 - Cooperation with Kansas Univ.
 - hadron calorimeter (LHC-ZDC)
 - Fused Silica
- Radiation hardness / tolerance

Silicon detector

- SOI – 新井グループ
- ANL/BNLグループ？
- 奈良女（蜂谷）、九州大（東城&ILC）、東工大？
- KEKシリコン検出器プラットフォーム

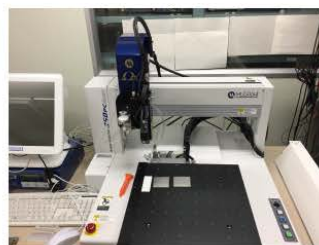
16 モジュールR&D, 製作: KEK シリコンプラットフォーム

Silicon detector platform at KEK: BELLE, ATLAS Itk, J-PARC g-2 experiments

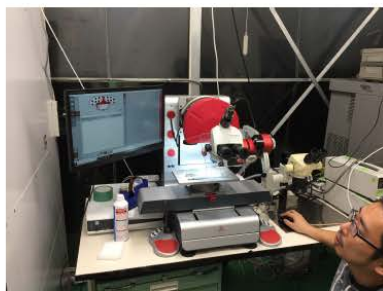
- ・筑波大と KEK との地の利を活用
- ・R&D でプラットフォームの活用合意済、プロダクションについても議論を続けることで合意



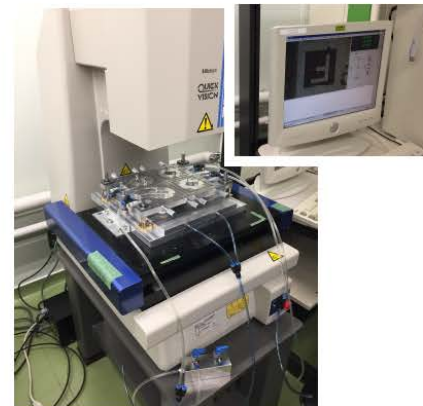
Automatic wire bonder (Belle-2, g-2)



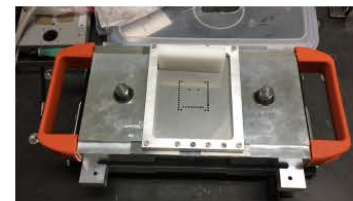
Automatic dispenser (ATLAS)



Wire pull test (ATLAS)



3D measurement (Belle-2, g-2)



Stencil jig for glue (ATLAS)

参考：

- 3rd EIC Yellow Report Workshop “at CUA”
 - <https://indico.bnl.gov/event/9080/>
 - EOI information session

Eoi session: Wednesday, September 16, 2020

#	Presenter	Title
1	Matt Posik	MPGD Trackers
2	Xuan Li	LANL
3	Ken Read	Precision silicon tracking and calorimetry with integrated parallel and continuous readout for an EIC detector
4	Sylvester Joosten	Ultrafast Silicon
5	Tanja Horn	EEEmCal
6	Or Hen	EIC detector
7	Silvia Dalla Torre	INFN
8	Carlos Munoz Camacho	IN2P3 / France
9	Francesco Bossu	CEA Saclay
10	Anselm Vossen	PID
11	Dave Gaskell	Lepton Polarimetry
12	Markus Diefentahler	SWG
13	Ciprian Gal	Stony Brook University
14	Leo Greiner	EIC Silicon Consortium