

BESIII Inner Tracker Upgrade Meeting

(Sep.9, 2024) 14:00 - 16:00pm (Beijing Time)

Meeting agenda and minutes

- Indico page: <https://indico.ihep.ac.cn/event/23456/>
- Participants:
 1. Present in the meeting room

Junguang LV, Haibo Li, Zheng Wang, Mingyi Dong, Xiaoyan Shen, Tingxuan Zeng, Giulio Mezzadri, Stefano Graminia, Liangchenglong Jin, Jing Dong, Jinyu Fu, Liangliang Wang, Xiaolan Luo, Linghui Wu, Matias Melendi and Nicholas Menegatti.
 2. Online at ZOOM

Gianluigi Cibinetto, Michela Greco, Huirong Qi, Marco Maggiora, Fei Li, Xiaolu Ji, Si Ma, Wenquan Gong, Kejun Zhu, Hongliang Dai, Yunhua Sun, Xinnan Wang

Schedule and Progress last week: Mingyi Dong

- **Summary of the report:** (Slides by Mingyi Dong: [Slides](#))
 1. Progress last week

	Planned tasks last week	Time needed (day)	person in charge	Status
1	Installation of the tools for inner MDC removal	5	Facilities Operation group (Jing Xiaoping)	Almost finished
2	Change MDC operation gas	3	Xiaolan Luo	done
3	Final preparation before pulling out iMDC	3	Mingyi Dong	in progress
4	Final check before pulling out iMDC	1	Mingyi Dong	in progress

2. Plan for the next week

	Tasks	Time needed (day)	person in charge
1	Finished the installation of the tools for inner MDC removal	3	Facilities Operation group (Jing Xiaoping)
3	Finished the preparation before pulling out iMDC	2	Mingyi Dong
4	Final check before pulling out iMDC	1	Mingyi Dong
4	pull out iMDC	1	Mingyi Dong, Facilities Operation group (Jing Xiaoping)
5	Installation of new CF cylinder and gas sealing	2	Mingyi Dong, Facilities Operation group (Jing Xiaoping)

- **Questions during the slides or planning:**

1. The time for pulling out iMDC is better not on Saturday, it is weekend(Haibo) (Mingyi)The Friday or Saturday is as planned, but since we notice the difference between the real detector and prototype, the checking everything is necessary, time is need. Moreover, the cooling ring needs modification due to the small difference between the real detector and the original drawing. The modification of the cooling real will be ready on this Friday.
2. The arriving of the new inner CF cylinder will be on schedule (Zheng Wang)? (Mingyi) The current one is Ok, we have a backup one arriving tomorrow.

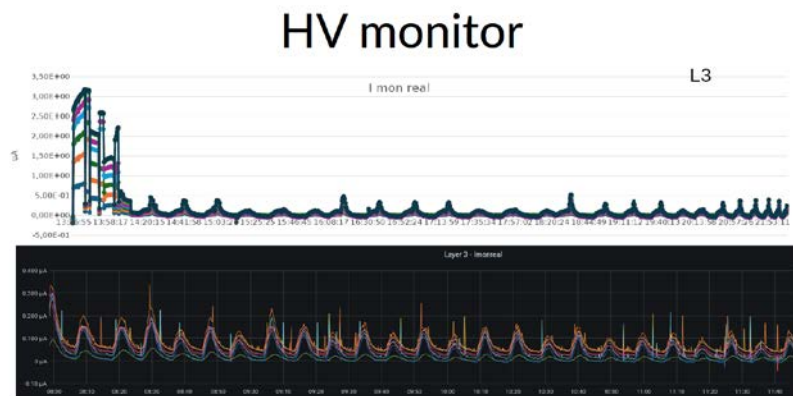
Updated Operation and performance of CGEM: Giulio Mazzadri

- **Summary of the report:** (Slides by Giulio : [Slides](#))

Activities update since last workshop (29, June, 2024)

1. The period of powering on CGEM in the lab 106: (thanks to the dehumidifier or INFN holidays or work schedule or other reasons.)
 - 1) July 15-30 daily power on (with operator)
 - 2) Aug 7-20 daily power on-Few stops to support DAQ, SC tests and due to relatively high humidity
2. The Status of all the sub-branch of the CGEM system:

- 1) HV stability: OK for the first two layers since 2020, but for the layer 3, the discharge numbers around few dozen during 4 hours and the discharge amplitude equal to hundreds of nA have been shown, which didn't prevent the operations or the data taking.
 - 2) LV: Stable FEB temperature, voltages and currents
 - 3) DAQ monitor: During cosmic data taking, typical run integrates few hours of triggers, but we do reconfigure FEBs after 30 minutes (or 30k events), We have taken two runs of 60 (run 1044) and 75 (run 1045) minutes with no reconfiguration (closer to BESIII standard "decay mode" data taking) with no issue.
 - 4) DAQ: the interrupt problem has fixed by Pawel, and data format issue is in progress.
 - 5) SC: Being in progress...
- **Questions during the slides or planning:**
 1. About the HV.
 - 1) Mingyi ask the question about currents, why the behavior is as show as the below figure (negative currents, are they due to the pedestal or something else)?
Zheng Wang ask the polarity and why time axis different?



-Michela explained:

It is the parameter given by the CAEN modules, and it is shown all the numbers from the electrodes, not matter if it is negative or positive. It is also depends on the humidity, in principle the calibration of humidity can be done. However, we already

monitored, no particular happened, also we have lots values given by CAEN modules, and It is OK.

2) Zheng Wang ask the number of the channels.

-Giulio explained: We have 7 electrodes for the triple CGEM. And we know very well the behavior of the macro-sectors. In the monitor we only show the electrodes of one sectors.

3) Mingyi ask the threshold of currents for the CGEM.

-Gigi: this will depend on the beam related background. It should be decided later.

4) (Mingyi) You only show the currents of the electrodes, do you have the corresponding high voltage? is there any fluctuation in the voltages?

-The high voltage is stable. No fluctuation (Giulio)

5) (Mingyi) When was the current figure you presented?

-Michela: On August 10.

2. DAQ/SC

1) Time cost for the configuration (Haibo)? (Giulio): 1-2 second.

2) The slow control system should be ready ASAP, then we take data with the system (haibo). I didn't see the software interface.

-Everything is in preparation, the BESIII system is working by Si Ma, we will keep working, in any case, if it is not ready, we can connect Italian standalone system.

Survey of the Cavity: Stefano Gramigna

- **Summary of the report:** (Slides by Stefano Gramigna: [Slides](#))

Stefano ask some measurements for MDC flange and CF cylinder after installation of CF cylinder if they are possible.

- **Questions during the slides or planning:**

Stefano mentions some points still to be clarified:

1) Inquiry on the Shielding:

Stefano G: Inquiry on the Shielding: (a) Install the shielding plates after positioning the central section of the beam pipe or (b) Make windows for accessing the pusher screws

2) Inquiry on Cabling along the Beam Pipe

Stefano G: a: Reinsert ECAL endcap→Close doors→Reinsert SCQ

b: Reinsert ECAL endcap→Reinsert SCQ→Close doors

Mingyi D: b

3) How to keep cables in place while inserting the SCQ?

Mingyi: As we discussed last week, the preliminary scheme is an additional support structure on the EMC end cap. Jinyu will give a preliminary design

Haibo said we can take data before the closing of door.

Stefano: the cables are not fixed, this is why we need the supporting structure for the cables.

CGEM efficiency check with cosmic-ray after re-assembly: Liang-Liang Wang

- **Summary of the report:** (Slides by LLW: [Slides](#))
 - Liangliang mentioned that CGEM operation information is needed by offline. Timely and correct updates are very important. Please consider this part in future operation, data taking
 - There are three runs (taken on 28 June) shared with offline after the CGEM reassembly.
 - Efficiency ($10 \cdot \sigma$) checked with cosmic-rays reconstructed by 5 half-layers of 6
 - Significant z (V) dependent efficiency observed for bottom parts of layer 2 and 3 with the 3 runs mentioned previously
- **Questions during the slides or planning:**
 - 1). Michela's words before the presentation

The title of this talk is misleading, because we are not as the same condition as the review, difference as below:

 - a) The HV is lower since it's for the DAQ system checking during these runs.
 - b) The mechanical things inside is completely different.

(I'm behalf of the CGEM group since Gigi is connected as before, but now is busy for the INFN financial meeting.)

For the point of our view, the title of the talk is wrong and misleading.

Zheng Wang: I got your points.

-Liangliang: In the talk, all the condition is presented, it will be not misleading.

2).Michela: For the HV sets:

It should be as G1/G2/G3:275/285/290 for L2; G1/G2/G3:275/285/295 for the L3.

Since people are not familiar to the conditions, I would like to report that now has lower HV sets, the Gain has a factor of 5 less.

For the three runs, the HV sets have large difference between each other, the first run has even less HV sets, and have a factor of 10 less gain; as I said, none of them is as the same as review HV set. This is my comments.

Michela: the HV is depending on Humidity, as the humidity is higher, we need to less the HV, and there is no issue.

LiangLiang: this is all the data we have, if there is any issue, it is the inter-meeting, we want to share the results/information to all the people.

CGEM DAQ status: Tingxuan Zeng

- **Summary of the report:**

1. Progress last week

- 1) Test

- a) Pawel updated all 4 DCs' firmware. 2 in Hall 3, 2 in DAQ lab.

- b) Preliminary test FEE configuration code in Hall 3.(with Giulio)

- c) Test with Full Signal in Experiment Hall (with Giulio, Jingzhou, Wenxuan, Sheng)

- 2) SC:

- a) HV procedure is almost finalized, expect for details for handling trips.

- b) For cooling system, we are discussing the issue of logic implementation inside the PLC.

2. Plan for the next week

- 1) data format issues;
- 2) FEE configuration;
- 3) Full Signal issue;
- 4) SC more works...

- **Questions during the slides or planning:**

- a) SC concern (Zheng Wang)-HV procedure: (Michela) we have sent the first information to Si Ma, for saving time, we have some concern after the 'Trip' and since we are in this important INFN financial meeting. We will send another information ASAP.
- b) Giulio: For the DAQ/SC, we will deeply contact with Angelo and Dong Sheng.