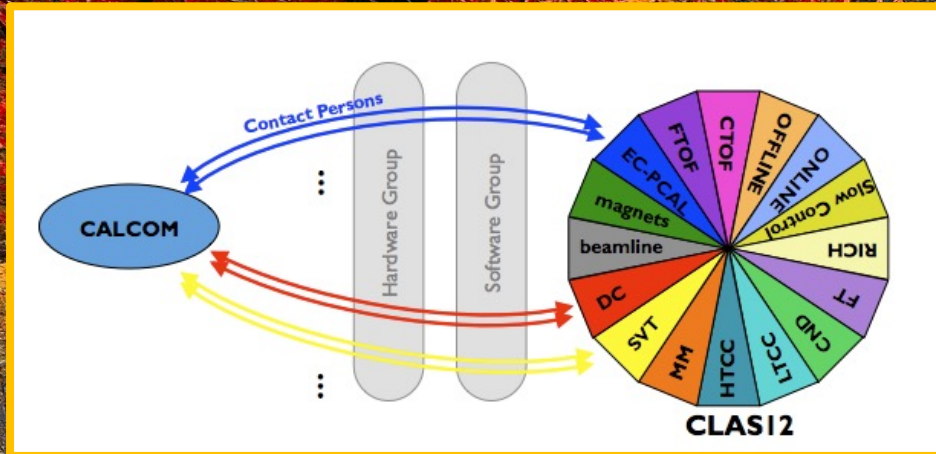


CALCOM Status and Plans



Topics:

- Pass-2 calibration activities: RG-A, RG-B, RG-K
- Pass-1 calibration activities: RG-C
- "Online" calibrations: RG-D
- Work plans and next datasets

Active Run Groups in Calibration Mode - November 2023

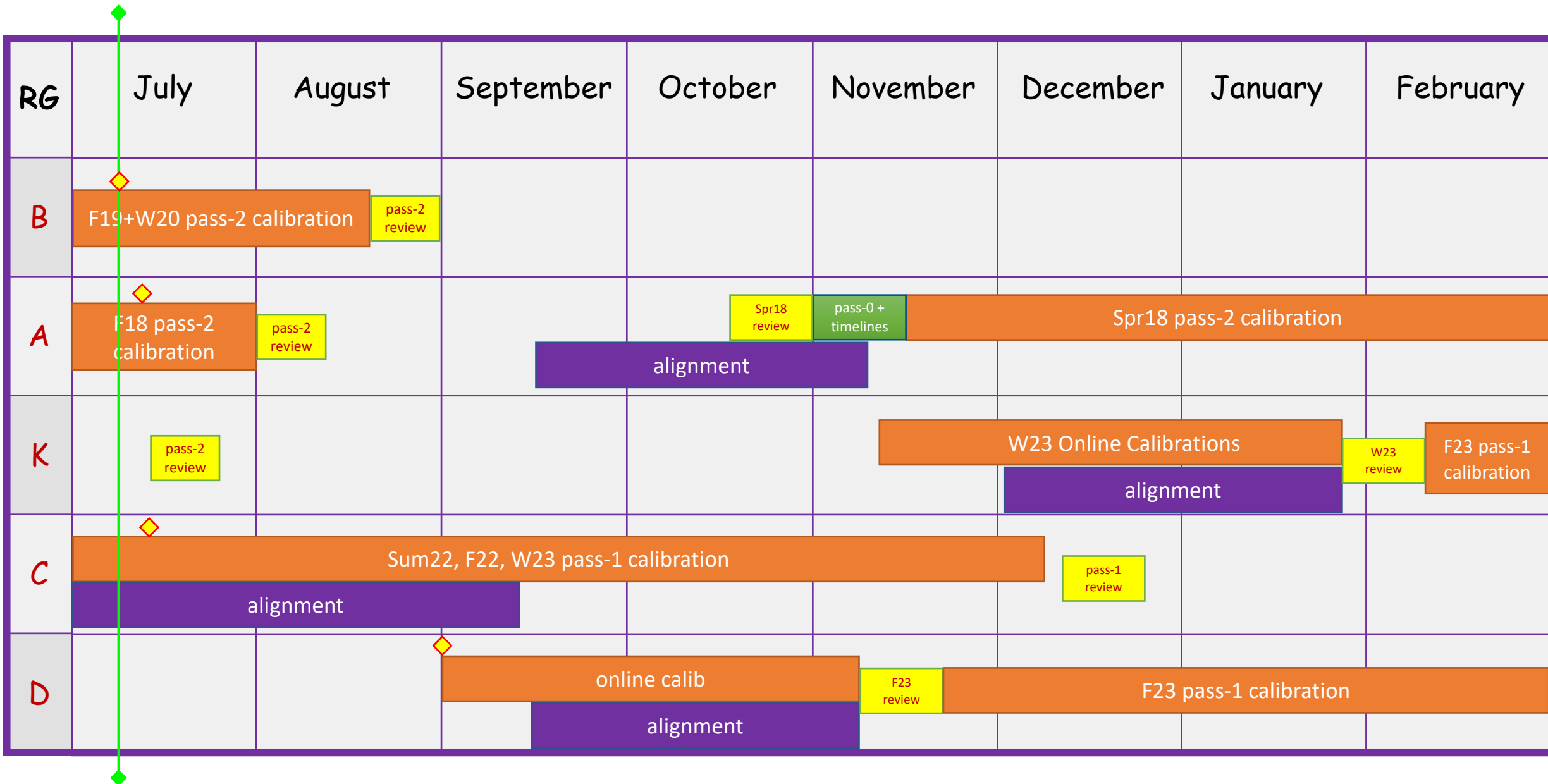
| # | Run Group | Dataset | Conditions | Run Range | Stage |
|---|-----------|----------------|-------------------------------------------------------------------------------------|---------------|----------------------|
| 1 | RG-A | Spr18 | LH2 6.4, 10.6 GeV, inbending+outbending (+ 2.2 GeV zero-field from engineering run) | 3029 - 4325 | Pass-1 |
| 2 | RG-B | F19/W20 | LD2 4.2, 10.2/10.5 GeV inbending+outbending | 11093 - 11571 | Pass-2 |
| 3 | RG-C | Sum22/F22 /W23 | Polarized NH3, ND3, 10.5 GeV, inbending; FT-On/FT-Off | 16128 - 17811 | Pass-1 |
| 4 | RG-D | F23 | LD2, C, Cu, Sn, 10.6 GeV inbending+outbending | 18329 - TBD | "Online" calibration |

Four different datasets are being calibrated in parallel

| | Analysis Coordinator | Chef |
|------|------------------------------------|----------------|
| RG-A | Latifa Elouadrhiri/Timothy Hayward | Nick Trotta |
| RG-B | Silvia Niccolai | Zhiwen Zhao |
| RG-C | Silvia Niccolai | Kayleigh Gates |
| RG-D | Lamiaa El Fassi | Mikhail Yurov |

Calibration Timeline: July 2023 - February 2024

July 7, 2023



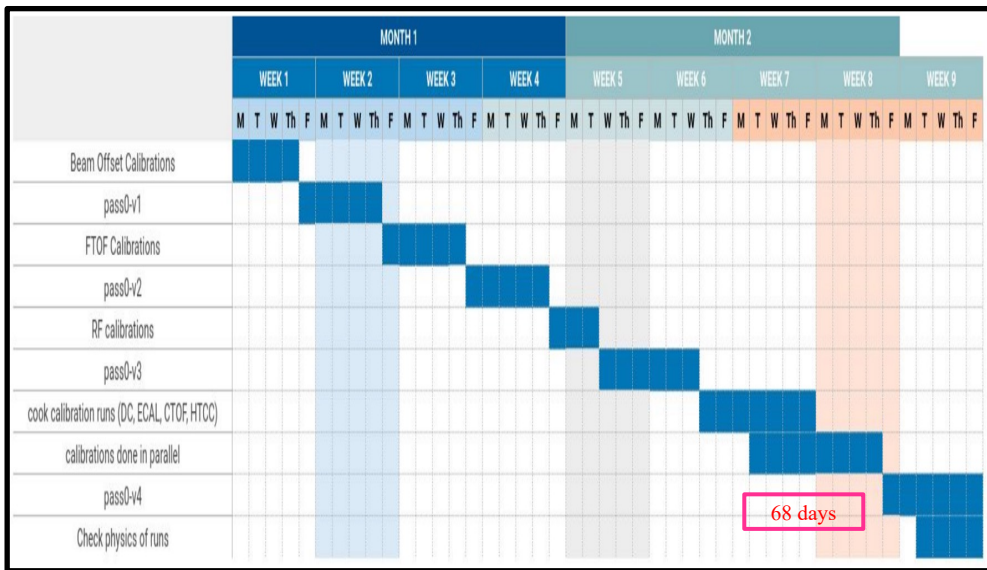
DONE

Calibration Status I

DONE

[1] RG-M W21 - Pass-1 calibration review Aug. 19, 2022

[2] RG-K W18 - Pass-2 calibration review Apr. 8, 2022



| | | |
|------------|----------------------------------------------------------------------------------------|-------------|
| Day 1 | Cook runs 5703 & 5983 for 7.5 and 6.5 runs DC calibration | |
| Days 2-4 | Beam-offset & initial DC calibrations | |
| Days 5-8 | Pass 0-v1 cooking with beam-offset | |
| Day 9 | Pass 0-v1 Timelines | Milestone 1 |
| Days 10-11 | Cook 11 calibration runs for FTOF calibration | |
| Days 12-20 | TOF calibration (possible iteration needed) | |
| Days 21-24 | Pass 0-v2 cooking with FTOF ST and DC calibrations done | |
| Day 25 | Pass 0-v2 Timelines | Milestone 2 |
| Days 26 | RF calibration using pass 0 v2 | |
| Days 27-30 | Pass 0-v3 cooking with RF calibration | |
| Day 31 | Pass 0-v3 Timelines | Milestone 3 |
| Days 32-33 | Cook 11 calibration runs for subsystems calibration(DC, ECAL, FT, HTCC,...) | |
| Days 34-44 | Subsystem calibration (done in parallel), test of high-level QA on fully cooked runs | |
| Days 45-48 | Pass 0-v4 with subsystem calibrations, cook of ~4 full runs to check high-leve physics | |
| Days 49-53 | Pass 0-v4 timelines, final check of specs, investigation of full runs | Milestone 4 |

Timeline:

- Original calibration window:
 - Sep. 1 - Nov. 7, 2022
 - CVT alignment investigation (1.5 months)
 - end of year shutdown (3 weeks)
 - DC calibration work (3.5 months)
- Pass-1 review: May 23, 2023
- Cooking: Jun. 27, 2023 - July 27, 2023

Timeline:

- Original calibration window:
 - Dec. 1, 2022 - Feb. 14, 2023
 - beam offset calibration (2 months)
 - subsystem calibrations (1 month)
 - AI training/validation (2 months)
- Pass-2 review: Aug. 16, 2023
- Cooking: Aug. 28, 2023 - Sep. 25, 2023

Calibration Status II

[3] RG-A F18 - Pass-2 calibration review Dec. 16, 2022

1. Day -1: Initial pass-0 (can run over holiday break)
2. Day 1-2: Beam-offset (forward and central; maybe over holiday break)
3. Day 3-7: Pass 0-v1 cooking with beam-offset
4. Day 7: Pass 0-v1 timelines *Milestone 1*

5. Day 8-19: Cook ~15 full runs for TOF calibration
6. Day 20-31: TOF calibration, begin DC calibrations
7. Day 32-36: Pass 0-v2 with TOF calibration
8. Day 37: Pass 0-v2 timelines *Milestone 2*

9. Day 38-40: RF calibration using pass 0 v2
10. Day 41-44: Pass 0-v3 with RF calibration
11. Day 45: Pass 0-v3 timelines *Milestone 3*

12. Day 46-57: Cooking of ~15 full runs for subsystem calibration (DC, ECAL, FT, HTCC, LTCC, RICH, ...)
13. Day 58-69: Subsystem calibration (done in parallel)
14. Day 70-73: Pass 0-v4 with subsystem calibrations, cook of ~4 full runs to check high-level physics
15. Day 74-75: Pass 0-v4 timelines, final check of specs, investigation of full runs *Milestone 4*

Timeline:

- Original calibration window:
 - Jan. 16 - Mar. 31, 2023
 - beam offset calibration (1 month)
 - DC calibrations (1.5 months)
 - subsystem calibrations (1 month)
 - AI validation (2 months)
- Pass-2 review: Sep. 22, 2023
- Cooking: Oct. 2, 2023 - XXX (@83%)

[4] RG-B F19/W20 - Pass-2 calibration review Nov. 18, 2022

Calibrations sequence:

- 1) DC and beam-offset calibrations + pass-0 cooking → monitors & timelines to establish runs to process
- 2) FTOF calibration
- 3) RF calibration: run-by-run calibration after FTOF calibrations using pass-0 files + pass-0 cooking → monitors & timelines to make sure FTOF is OK before moving to the next step
- 4) CLAS12 subsystem calibration: DC, CND, CTOF, ECAL, FT (Hodo, Cal), HTCC, RICH?
- 5) Pass-0 cooking → monitors & timelines; check of calibration quality vs run – AI training in parallel
- 6) Reiterate, if necessary (for specific run ranges and/or detector subsystems)

Calibration timeline (conservative estimates):

- For 1) cooking needs: ~2 runs → 1 day
- For 1) duration of DC calibration: ~2 days
- For 1) beam offset calibration: 1 day
- For 1) pass-0 cooking & timelines: ~3 days (MILESTONE 1)
- For 2) and 4) ~15 runs should be cooked for calibration → ~5 days
- For 2) FTOF calibration of ~15 runs → ~10 days
- For 3) RF calibration requires a pass0 cooking: ~2 days + ~1 day for the calibration itself → 3 days
- For 3) pass-0 cooking & timelines: ~3 days (MILESTONE 2)
- For 4) Recooking of the ~10 runs → ~4 days
- For the calibrations 4) of ~10 runs → ~10 days (done in parallel)
- For 5) 3 days – ideally the monitoring part will be included in the cooking workflow (MILESTONE 3)
- For 6) ~10 days including cookings, recalibrations, and further monitoring passes (MILESTONE 4)
- + 2 weeks to account for delays in cooking due to resource limitations.

→ TOTAL: ~69 days

Timeline:

- Original calibration window:
 - Jan. 1 - Mar. 17, 2023
 - beam offset calibration and CVT alignment (3.5 months)
 - DC calibrations (3 months)
- Pass-2 review: Nov. 1, 2023
- Cooking: TBD (to be started soon)

[5] RG-C Sum22 - Pass-1 calibration review Jun. 23, 2023

Calibrations sequence:

- 1) Complete beam-offset calibrations, DC calibration + pass-0 cooking → monitors & timelines to establish runs to process
- 2) FTOF calibration
- 3) RF calibration: run-by-run calibration after FTOF calibrations using pass-0 files + pass-0 cooking → monitors & timelines to make sure FTOF is OK before moving to the next step
- 4) CLAS12 subsystem calibration: DC, CND, CTOF, ECAL, FT (Hodo, Cal), HTCC (timing), RICH?
- 5) Pass-0 cooking → monitors & timelines; check of calibration quality vs run – AI training in parallel
- 6) Reiterate, if necessary (for specific run ranges and/or detector subsystems)

Calibration timeline (tentative estimates):

- For 1) cooking needs: ~2 runs → 1 day
- For 1) duration of DC calibration: ~2 days
- For 1) beam offset calibration: 1 day
- For 1) pass-0 cooking & timelines: ~3 days (MILESTONE 1)
- For 2) and 4) ~7 runs should be cooked for calibration → ~3 days
- For 2) FTOF calibration of ~7 runs → ~7 days
- For 3) RF calibration requires a pass0 cooking: ~2 days + ~1 day for the calibration itself → 3 days
- For 3) pass-0 cooking & timelines: ~3 days (MILESTONE 2)
- For 4) Recooking of the ~7 runs → ~3 days
- For the calibrations 4) of ~7 runs → ~7 days (done in parallel)
- For 5) 3 days – ideally the monitoring part will be included in the cooking workflow (MILESTONE 3)
- For 6) ~10 days including cookings, recalibrations, and further monitoring passes (MILESTONE 4)
- + 2 weeks to account for delays in cooking due to resource limitations.

→ TOTAL: ~57 days

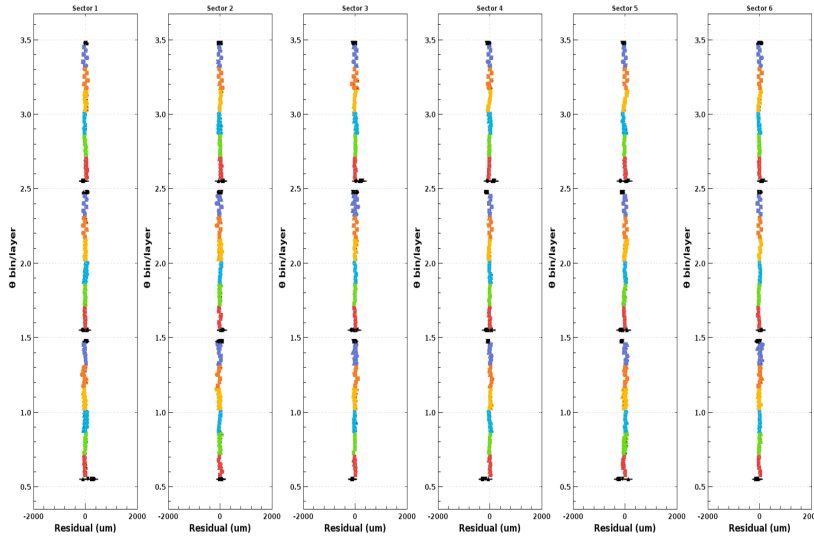
Timeline:

- Original calibration window:
 - Jul. 1 - Aug. 31, 2023 (FT-On Sum22)
 - alignment (3 months)
 - beam offset calibration (1 month)
 - calibration now in progress
- Pass-1 review: TBD
- Cooking: TBD

Note: Upcoming review to schedule work for FT-Off (F22), FT-On (W23)

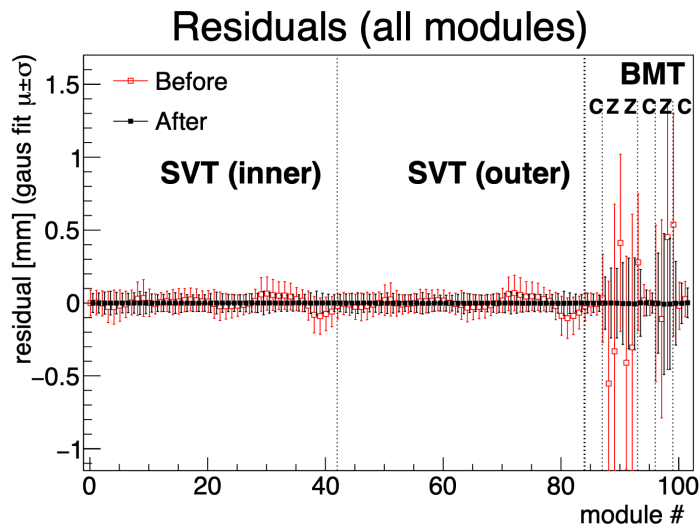
RG-C Sum22 - Tracker Alignment

Forward Detector - DC



Noémie Pilleux

Central Detector - CVT



Taya Chetry

- RG-C DC and CVT alignments for Sum22 were reported as complete at the last CLAS Collaboration meeting. However, it was discovered that zero field runs before and after the target system disassembly could not be combined.
- The Sum22 DC alignment and beam offset calibration had to be redone. This work has just been completed and the calibration work has resumed.
- While the Sum22 alignment was being redone, the F22 and W23 alignments were paused. They have recently been restarted.



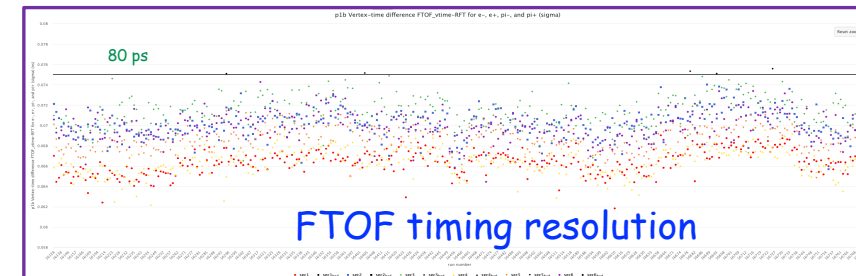
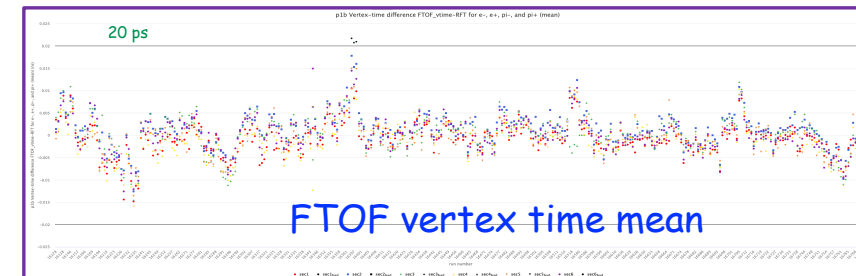
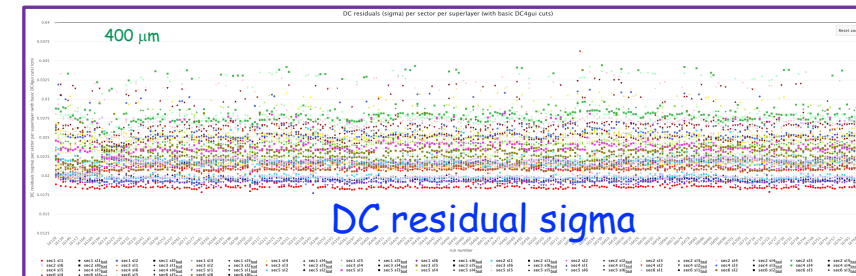
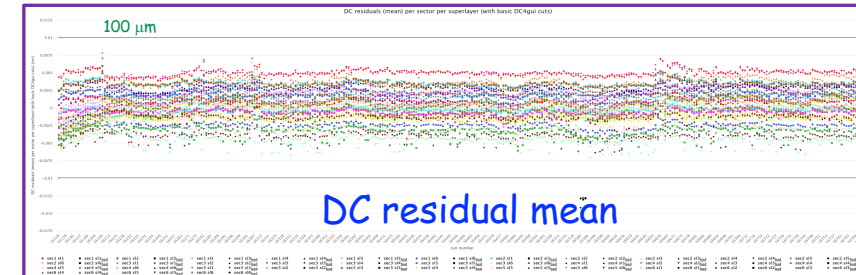
This has resulted in a significant delay in calibrating RG-C

- all of RG-C dataset was supposed to be calibrated by the end of 2023!

RG-C - Calibration Status

Where do things stand?

- Calibration focus has been solely on the Sum22 (FT-On) dataset
 - DC and CVT alignment ✓
 - Raster calibration ✓
 - Beam offset calibration ✓
 - DC-CVT offset calibration ✓
 - Subsystem calibrations: DC, FTOF ✓
 - Next steps (Sum22):
 - RF calibration
 - ECAL, LTCC, HTCC, RICH, CND, CTOF, BAND, FT-Cal/FT-Hodo
 - HW status tables (run-by-run version?)
 - DC AI/denoising network training & validation
 - Monte Carlo vs. data efficiency comparison
 - Pass-1 ready for cooking review
- Next steps for F22/W23:
 - CVT alignment for F22 and W23 complete
 - DC alignment for F22 in progress (W23 work will follow)
 - Beam offset calibrations
 - CALCOM "ready for calibration" review (archaeology + timeline)
 - Subsystem calibrations to begin within the next month



Calibration Status III

[6] RG-A Spr18 - Pass-1 calibration

| | Run range | Beam | Torus | Solenoid |
|----|-----------|----------|-------|----------|
| 1 | 3000-3069 | 6.4 GeV | -100% | -100% |
| 2 | 3070-3087 | 6.4 GeV | -75% | -100% |
| 3 | 3097-3105 | 6.4 GeV | 75% | -100% |
| 4 | 3131-3293 | 10.6 GeV | 100% | -100% |
| 5 | 3304-3551 | 10.6 GeV | -100% | -100% |
| 6 | 3698-3817 | 10.6 GeV | -100% | -100% |
| 7 | 3819-3834 | 6.4 GeV | 75% | -100% |
| 8 | 3839-3853 | 6.4 GeV | 100% | -100% |
| 9 | 3855-3857 | 6.4 GeV | 100% | -50% |
| 10 | 3862-3987 | 10.6 GeV | 100% | -100% |
| 11 | 4001-4325 | 10.6 GeV | -100% | -100% |

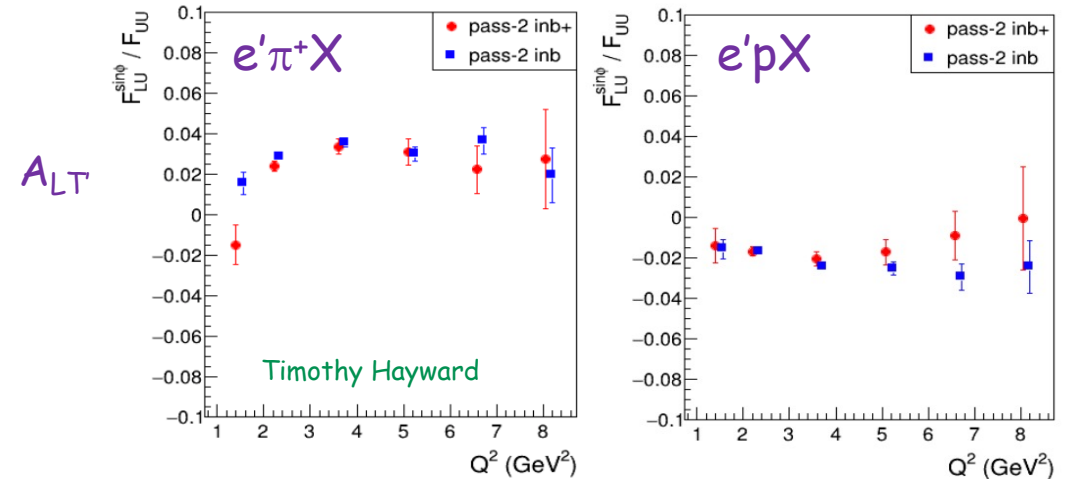
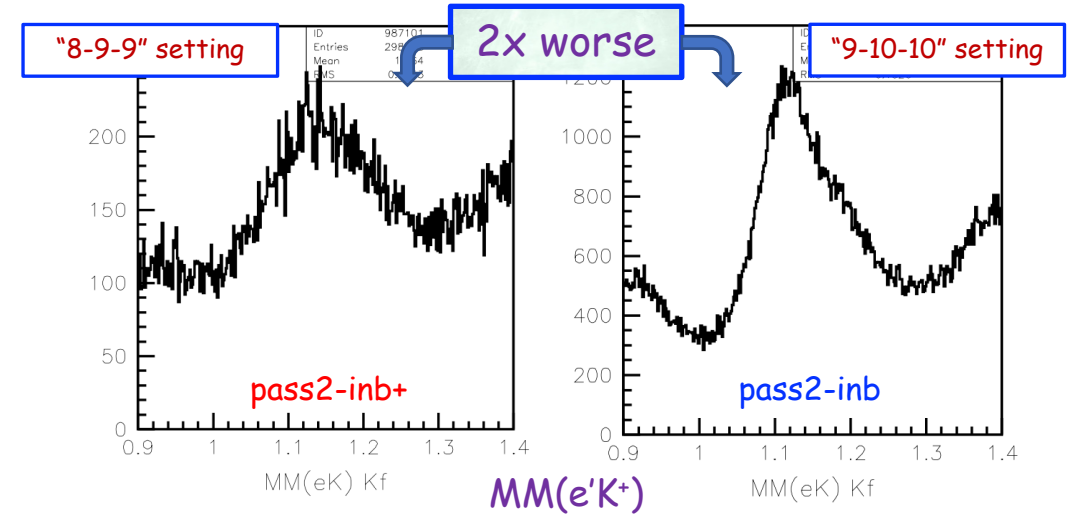
| | |
|-------|--------|
| Spr18 | 126 mC |
| F18 | 99 mC |
| Spr19 | 58 mC |

Questions about dataset usefulness



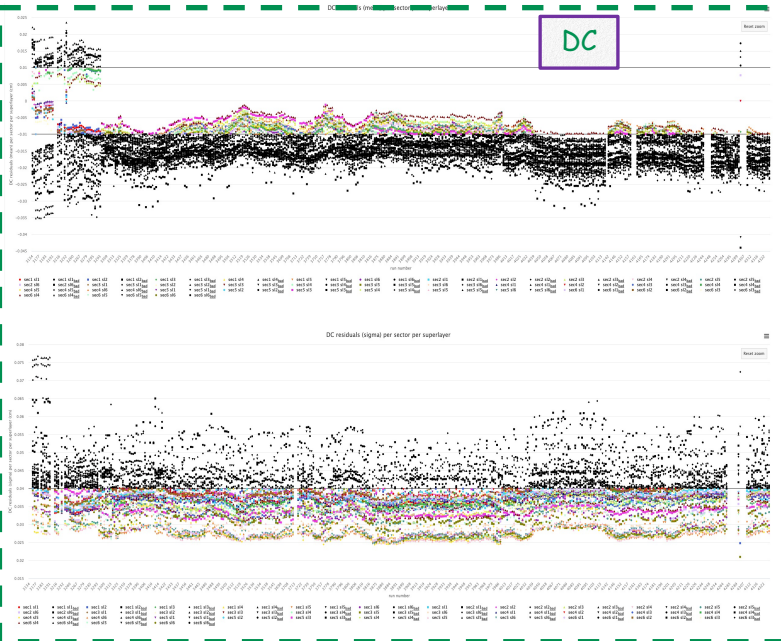
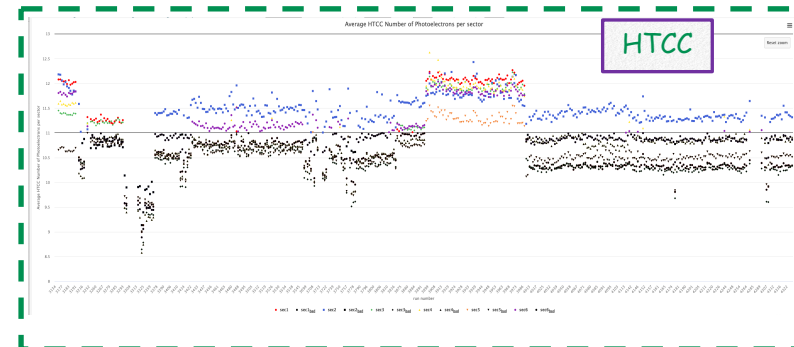
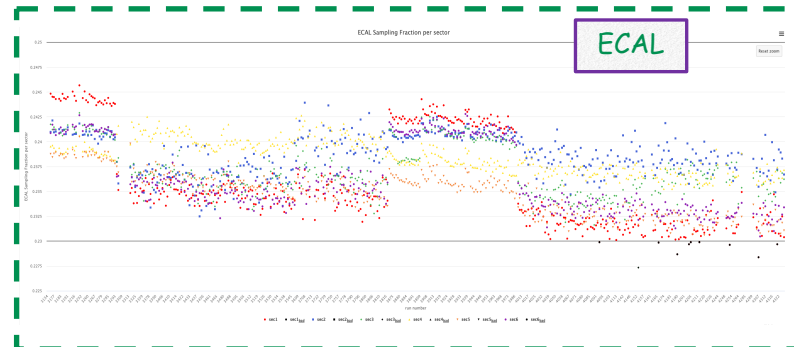
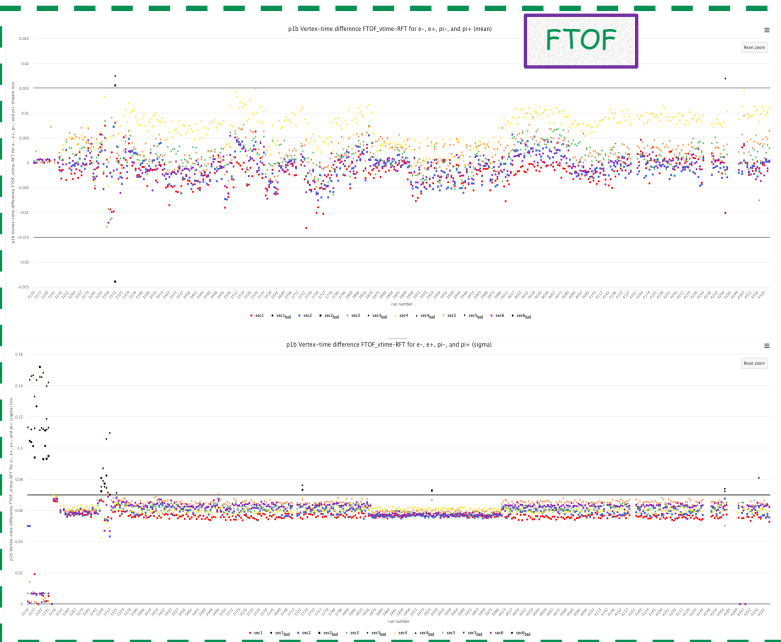
Note: DC HV was reduced for this run compared to F18 settings; "Massive" version of FMT installed

RG-A F18 Early Inbending vs. Nominal Inbending



While not useful for all RG-A analyses, several of the experiments can make good use of these data

Calibration Status III



Next step: Complete “ready for calibration” review at CALCOM (Dec. 1) to detail the runs for calibration and the schedule for work tracking.

Calibration Status IV

[7] RG-D F23 - Online calibration

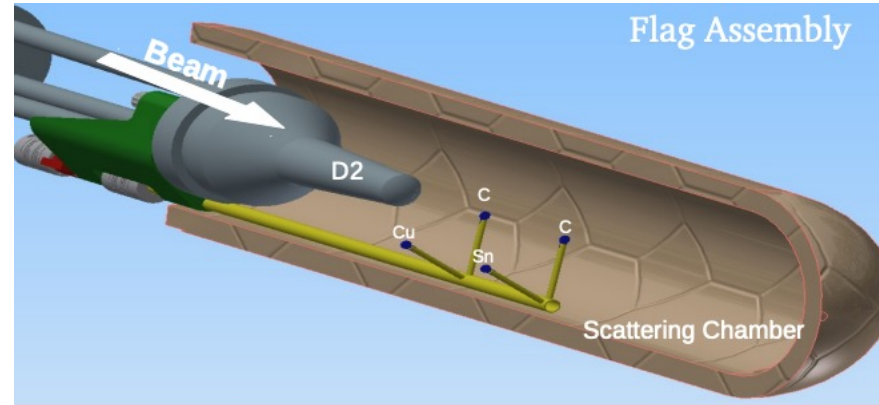
Color transparency, nuclear TMDs

RG-D is the third Run Group for which we are using the "online" calibration approach

- Calibrate runs during data taking to monitor detector and probe physics
- Complete tracker alignment runs @ B=0 early and analyze in order to move to final detector calibrations
- Run online pass-0 cooking and update calibration timelines daily to track calibrations and detector stability

Note: Online calibration mode proven critical for the success of both RG-M ($^{40}\text{Ca}/^{48}\text{Ca}$ target issue) and RG-C (track target polarization)

first experiment with new CLAS12 cryotarget



RG-D: Oct. 3 - Dec. 15, 2023

| Target | Schedule |
|----------------------------------|----------|
| LD ₂ | 3 |
| $^{63}\text{Cu}/^{118}\text{Sn}$ | 8 |
| LD ₂ | 3 |
| $^{12}\text{C}/^{12}\text{C}$ | 7 |
| LD ₂ | 2 |
| $^{63}\text{Cu}/^{118}\text{Sn}$ | 9 |
| LD ₂ | 3 |
| $^{12}\text{C}/^{12}\text{C}$ | 7 |
| LD ₂ | 3 |
| $^{63}\text{Cu}/^{118}\text{Sn}$ | 11 |

Status:

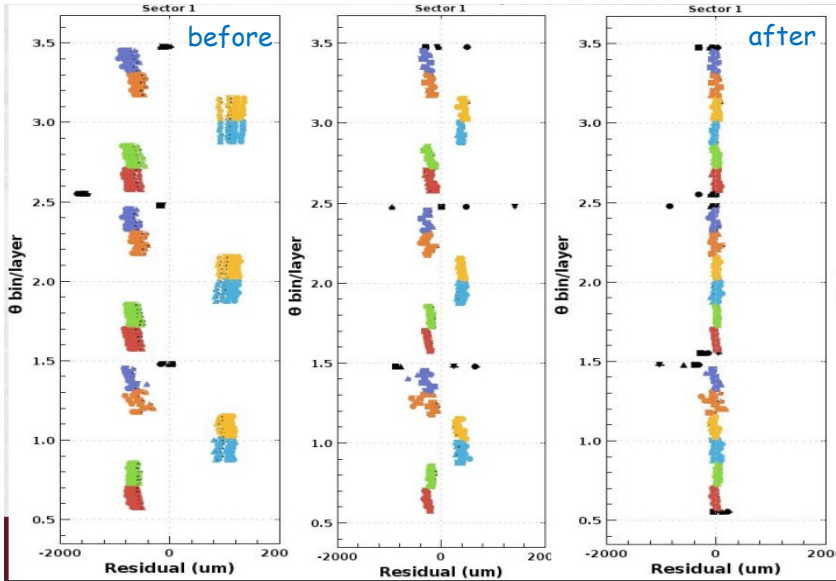
- Online pass-0 running (<https://clas12mon.jlab.org/timelines/?rg=rgd>)
- Alignment (zero field) run taken
 - DC and CVT alignment completed
- Initial reference run calibrations in progress

Goal:

- Complete calibrations within 6 months of beam off ⇒ pass-1 review by June 2024

RG-D - Tracking System Alignment

DC

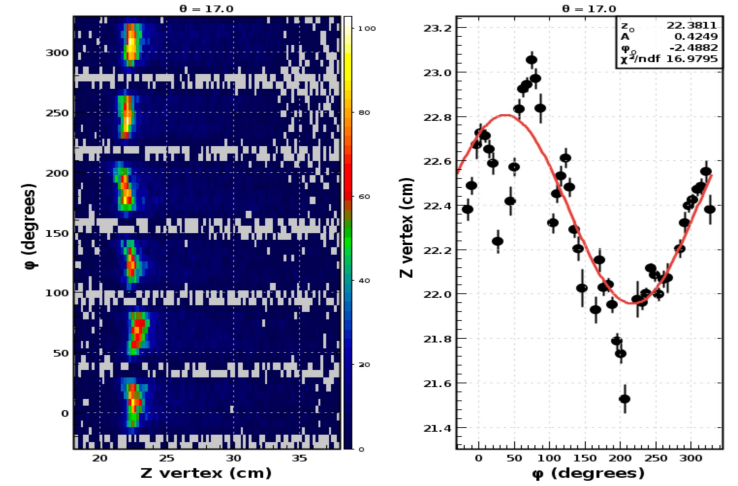


Matthew Maynes

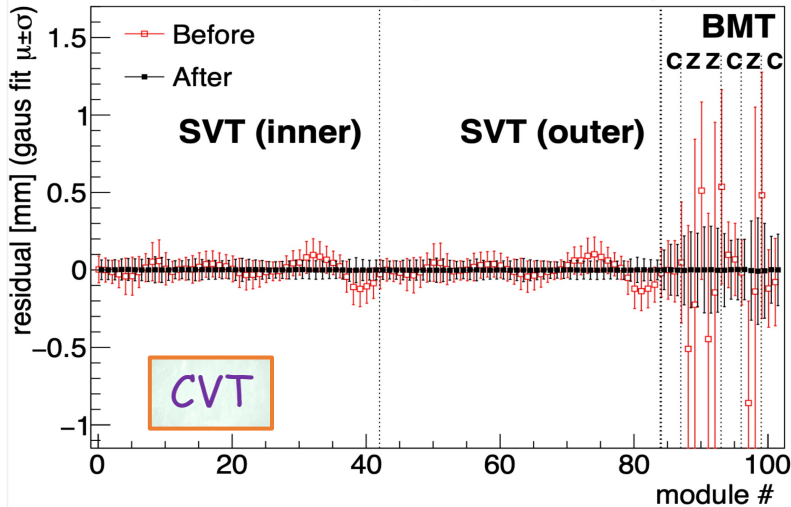
Alignment complete for the first time during data taking (3 weeks turn-around)

- Final DC iteration needed after DC calibration
- DC-CVT z-offset to be fixed

beam offset



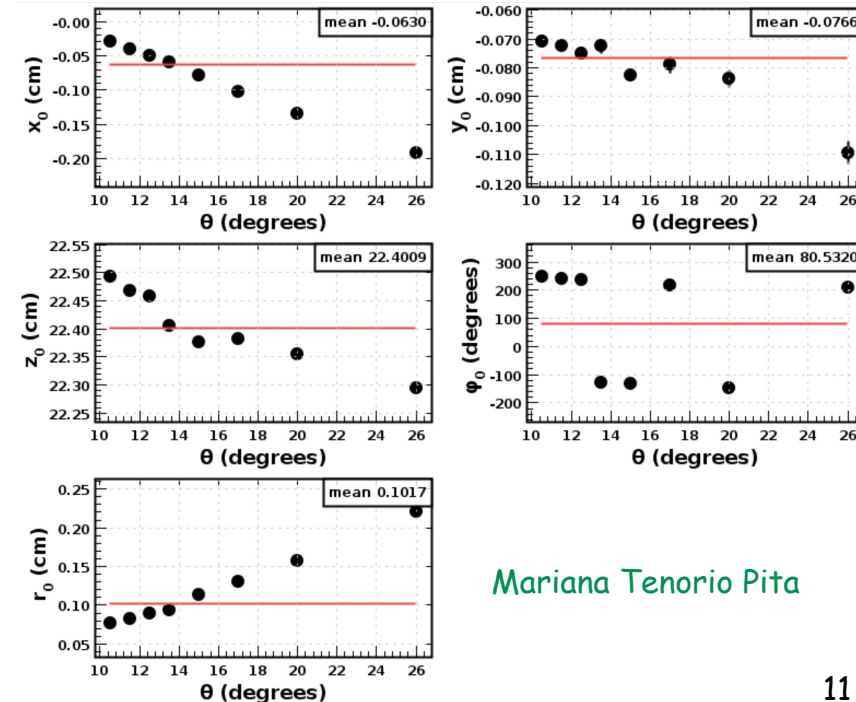
Residuals (all modules)



Yuri Gotra

r18316

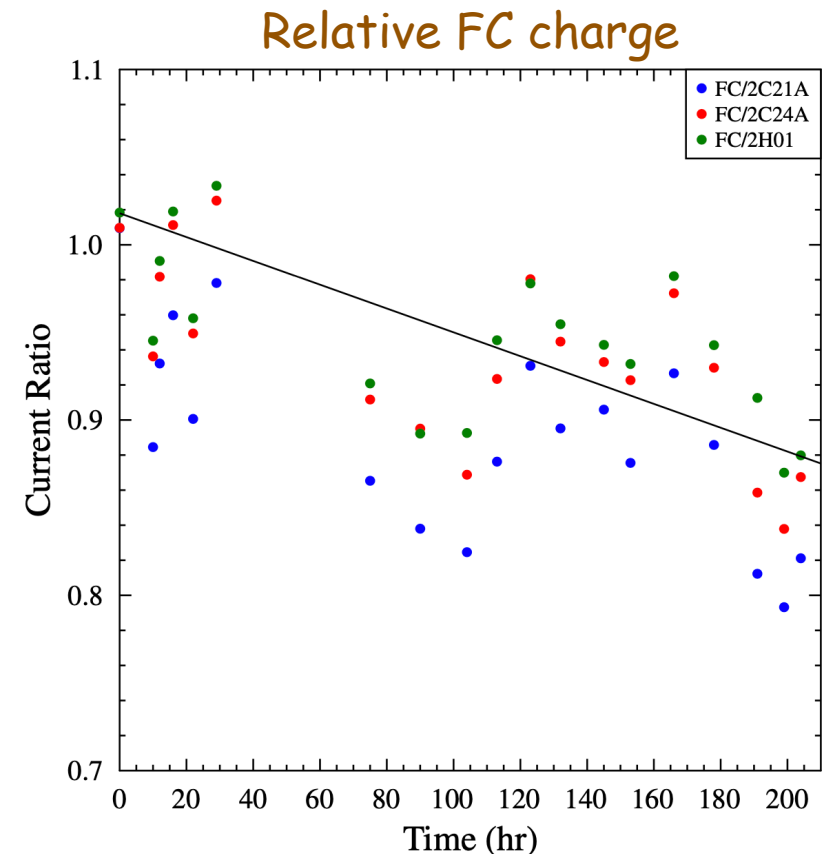
The final calibration of the CLAS12 detector subsystems is now getting underway for the first time during data taking



Mariana Tenorio Pita

RG-D → RG-K Transition

- Luminosity limitations on RG-D solid targets due to CVT currents ⇒ the experiment is well behind their planned data collection
 - This is the only planned beam time for RG-D ⇒ they need to finish their experiment this year
- The ion pump on the Faraday cup failed on Oct. 16
 - FC vacuum has been getting worse with time
 - Charge measure of FC is not precise and changing with time
 - Can calibrate FC run-by-run relative to other beamline devices, but this is not ideal and could limit accuracy (RG-D will need to study this)
 - RG-K much prefers to run experiment with beam charge determined by the FC with nominal FC vacuum
- For these reasons, the decision was made to adjust the Hall B run schedule to allow extend RG-D run and to delay RG-K start until Jan. 2024
 - RG-K run: Jan. 10 - Mar. 10, 2024



RG-K - Commissioning Studies

- The schedule change reduces the RG-K run by 15 days - to be made up when the last part of RG-K is scheduled in 2025/26
- The schedule is set to run 3-/4-pass in a ~50/50 split (*final plan TBD*)
- As a bit of compensation, some of the RG-K commissioning will be completed in 2023:
 - Change from 5-pass to 3-pass on Dec. 15; RG-K commissioning period will run with the LH₂ target until beam off on the morning of Dec. 19:
 - DC HV studies (1.5-2 days) - includes luminosity scans
 - Florian is developing a test plan that includes necessary calibration, cooking, and analysis to be completed by Jan. 10
 - Trigger validation (DC roads?)
 - AI validation (reliant on final trigger)
 - CVT testing (FSSR2 vs. SAMPA readout) (might not be possible but details on work needed)
 - HTCC gain calibration (trigger)
 - Gain calibrations: CTOF, ECAL, FTOF
 - Production test runs for validation
- The ion pump will be repaired/replaced early next year (after the tunnel cools down at bit)
- The solid target assembly and FMT will be removed over the break

RG-K - DC Test Plan

DC HV Studies for RGK

For the DC, we would like to take data under different conditions to study the effects of different HV settings on resolutions as well as opportunistic gathering data for high-lumi operation. The required measurements for resolutions can be separated from the high-lumi data and can be taken at different times. We estimate that all the tests will be overall 1 PAC day (2 beam days).

Resolution study: ~ 1.5 shift

Requirements:

- Hydrogen target
- 3rd or 4th pass beam (3rd pass preferred)
- Established production settings i.e., beam setup, trigger checkout, mini lumi scan done
- Electron trigger

The goal is to determine the effect of changes in DC HV settings on resolutions (tracking and physics quantities). We plan to study the improvement of track and missing mass resolution if the HV is increased in steps in different regions. The largest effect is expected for R2 drift chambers. The study requires collected data with sufficient statistics (~50M) for calibration and analysis of physics channels. The setting from RGM/C is R1=10, R2=10 and R3=10 (10, 10, 10). Note: without DC roads increase statistics goal by ~30%.

HV Settings for study:

| Region 1 HV | Region 2 HV | Region 3 HV | Statistics Goal | Comment |
|-------------|-------------|-------------|-----------------|-----------------------|
| 10 | 10 | 10 | 75M | RGM/C Setting |
| 9 | 10 | 10 | 50M | RGK Fall 2019 Setting |
| 10 | 11 | 11 | 50M | RGD Setting |
| 11 | 12 | 12 | 50M | Highest setting |
| 10 | 10 | 11 | 50M | Study effect of R3 |
| 10 | 11 | 10 | 50M | Study effect of R2 |
| 11 | 10 | 10 | 50M | Study effect of R1 |
| 10 | 12 | 10 | 50M | Study effect of R2 |

We estimated that 50M is about 2h-2.5h at 40nA. Therefore, the plan will take about two-three shifts to measure all the 50M runs.

z: ~ 1h

possible up to 150nA on LH2

determine HV currents as a function of beam current and fill
 nents when the HV supply was limited to 40uA HV currents.
 d no DAQ. The plan is to increase the beam currents in steps
 ps) and wait till we have a stable 30s-60s of beam. The HV
 atically stored and will be analyzed later together with the
 eenshots of the DC HV will be logged. For each HV setting the
 ut 15min. If HV trips at higher beam currents it will be kept off
 a logbook entry will be made.

re:

| Region 3 HV |
|-------------|
| 10 |
| 11 |
| 12 |
| 13 |

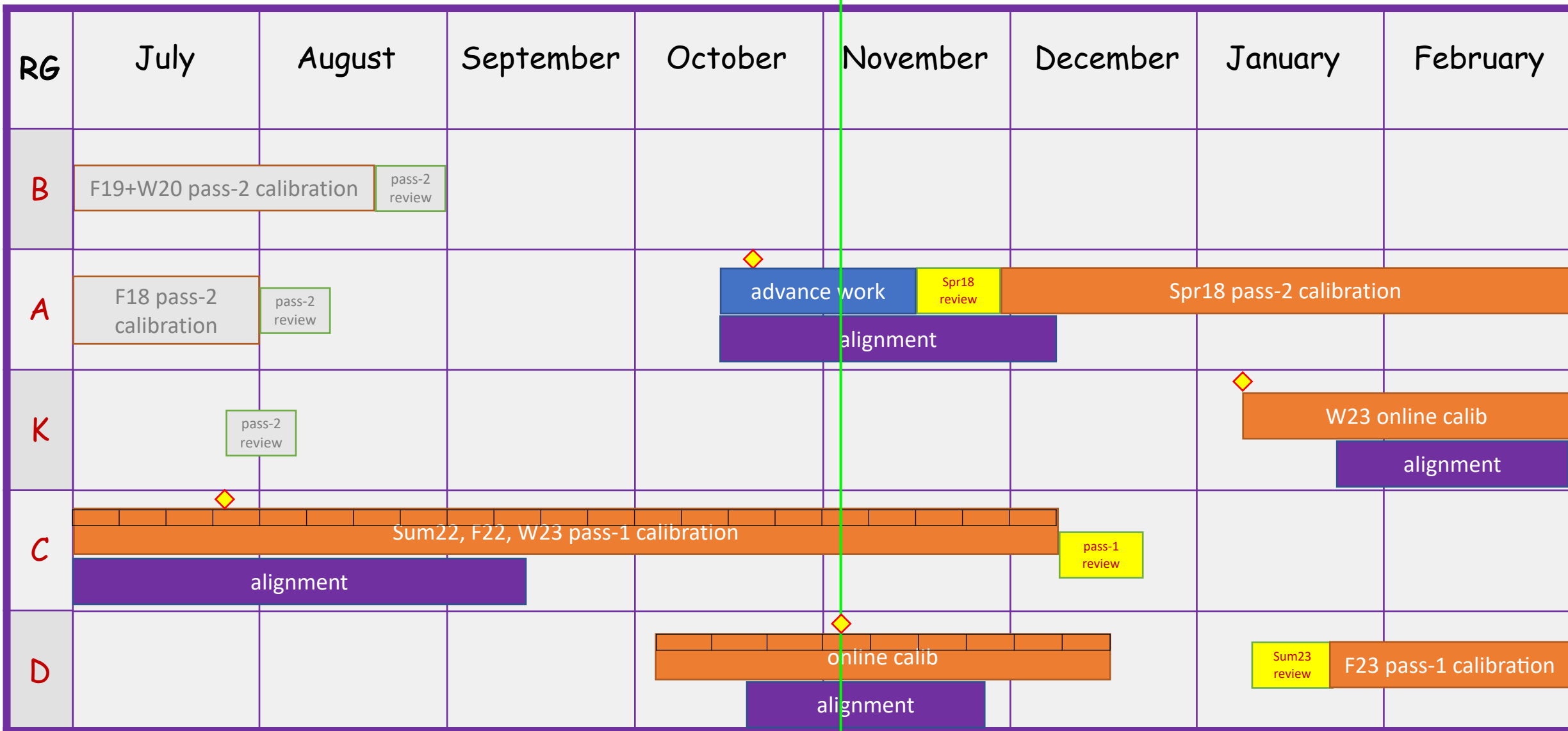
increase of beam currents to avoid any DC issues.



- Plan calls for performing a HV scan with data collection at each point for offline analysis.
- The plan is still being optimized and developed. It will be sent around shortly for feedback.
- The goal is to complete necessary calibrations, cooking, and analysis before the RG-K run starts on Jan. 10.
- The final HV setting choice will need to consider DC efficiency, momentum resolution, and safe DC HVPS channel currents at the operating luminosity.


Calibration Timeline: July 2023 - February 2024

November 3, 2023



Longer-Term CALCOM Work Items

from July CALCOM update

- Documentation of calibration procedures:
 - Tutorials for training
 - Instructions for completing validation
 - Github repository  GitHub

- Automation:
 - Interactive vs. batch running
 - Online reconstruction/calibration compatibility (L3 trigger)

- Streamlining code suites:
 - Increase speed of processing
 - Code stability
 - Updates to common tools across suites



Near-term focus

































- Personnel:
 - Additional calibration team members
 - Cross-training and checking documentation
 - Assign code developers for all suites

- Long lead time procedures:
 - Procedures to improve automation and validation necessary:
 - Final calibrations reliant on tracker system alignment (DC, FMT, CVT, ...)
 - Beam offset calibrations (with or without beam raster)



Good progress over the summer

Calibration Suite Documentation:

- Alignment: [DC and FMT](#) 
- BAND:
- Beam Offset: [suite](#) 
- Cherenkov:
 - HTCC: [suite](#) , [tutorial](#) 
 - LTCC: [suite](#) 
 - RICH: [suite](#) , [Time calibration](#) , [Cherenkov angle calibration](#) 
[Monitoring histograms and timelines](#) 
- CND: [suite](#) , [tutorial](#) , [algorithms](#) 
- CTOF: [suite](#) , [tutorial](#) , [algorithms](#) , [ccdb](#) , [geometry](#) 
- CVT:
 - MM:
 - SVT: [suite](#) 
- DC: [suite](#) , [tutorial](#) , [calibration webpage](#) 
- ECAL: [suite](#) 
- FT:
 - FT-CAL: [suite](#), [tutorial](#) 
 - FT-HODO: [suite](#), [tutorial](#) 
- FTOF: [suite](#) , [tutorial](#) , [algorithms](#) , [ccdb](#) , [geometry](#) 
- RF: [suite](#), [tutorial](#) 
- RTPC: [geom](#) , [ccdb](#) 

Summary

- CALCOM has been overseeing the detector calibrations of the different CLAS12 datasets:
 - Recent focus: RG-A, B, C, D, K, M 6 pass-1/2 reviews completed in the past year
 - Lessons learned are being incorporated into the process (*main advances: DC alignment, DC calibrations, beam offset calibration*)
- “Online” calibrations now established as our standard approach:
 - RG-D alignment (DC, CVT) + beam offsets completed during data taking!
 - Final calibrations in progress during data taking!
 - Organizing plans to continue with the upcoming run group RG-K (Annalisa D’Angelo) and RG-E (Hayk Hakobyan) (with RG-L (Raphael Dupre) on the horizon)
- CALCOM is overseeing the calibration effort to support the CLAS Collaboration:
 - Lots of folks are part of this work: clas12_calcom@jlab.org
 - CALCOM, Analysis Coordinators, chefs, timeline crew, subsystem group leaders, calibration team, alignment team, software group, data validators
 - Dataset calibration is truly a collaboration-wide effort
- Upcoming work focus:
 - Now that pass-2 work is behind us (!), streamline calibration tools towards more automation and improved speed

Backup Slides

CLAS12 Calibration and Commissioning

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- 1 CALCOM Committee
- 2 CLAS12 Subsystem Contact Persons
- 3 Commissioning Plans
- 4 CLAS12 Calibration
- 5 Meetings and Minutes

CALCOM Committee

The role of the CALCOM (Calibration and Commissioning) Group is to be responsible for the development of the tools/algorithms to calibrate the CLAS12 detector and to help ensure that the design performance specifications are met. In addition the CALCOM group is responsible for developing the CLAS12 commissioning plan and overseeing its execution.

The committee is composed by:

- Daniel Carman (chair / hardware)
- Raffaella De Vita (software / hardware)
- Gagik Gavalian (common tools)
- Maurizio Ungaro (simulation)
- Veronique Ziegler (reconstruction)

CLAS12 Subsystem Contact Persons

| System | Subsystem | Contact Person(s) | Software Contact Person |
|------------------------|-----------|-------------------|-------------------------|
| Calorimeters | ECAL | C. Smith | C. Smith |
| | SVT | Y. Gotra | V. Ziegler |
| Central Tracker | MM | Y. Gotra | F. Bossu, M. Defurne |
| | RTPC | M. Hattawy | M. Hattawy |
| Cherenkov Counters | HTCC | Y. Sharabian | I. Illari, W. Phelps |
| | LTCC | M. Ungaro | V. Mascagna, M. Ungaro |
| | RICH | M. Contalbrigo | M. Mirazita |
| Forward Tagger | FT-Cal | R. De Vita | R. De Vita |
| | FT-Hodo | N. Zachariou | R. De Vita |
| | FT-Trk | R. De Vita | V. Ziegler |
| Forward Tracker | DC | F. Hauenstein | V. Ziegler |
| | FMT | Y. Gotra | V. Ziegler |
| RF | | R. De Vita | R. De Vita |
| Scintillation Counters | FTOF | D.S. Carman | D.S. Carman |
| | CTOF | D.S. Carman | D.S. Carman |
| | CND | S. Niccolai | S. Niccolai |
| | BAND | F. Hauenstein | F. Hauenstein |
| | | | |



CLAS12 Calibration

Ready for Calibration Reviews

- RG-A: F18 [D](#), Spr19
- RG-B: Spr19, F19/W20 [D](#)
- RG-C: Sum22 [D](#)
- RG-K: W18
- RG-M: F20/W21 [D](#)

Information for Analysis Coordinators:

- Calibration sequence [1] [D](#)
- What are the calibration standards for CLAS12? [2] [D](#)
- General information on CALCOM and "online" calibrations [3] [D](#)
- Calibration and Software Development Teams: [4] [D](#)
- Run-Based Monitoring [D](#)
- CCDB Tables and Usage Policies [D](#)
- CLAS12 Hardware Status Word Definitions [D](#)

Calibration Suite Documentation:

- Alignment: [DC and FMT](#) [D](#)
- BAND:
- Beam Offset: [suite](#) [D](#)
- Cherenkov:
 - HTCC: [suite](#) [D](#), [tutorial](#) [D](#)
 - LTCC: [suite](#) [D](#)
 - RICH: [suite](#) [D](#), [Time calibration](#) [D](#), [Cherenkov angle calibration](#) [D](#), [Monitoring histograms and timelines](#) [D](#)
- CND: [suite](#) [D](#), [tutorial](#) [D](#), [algorithms](#) [D](#)
- CTOF: [suite](#) [D](#), [tutorial](#) [D](#), [algorithms](#) [D](#), [ccdb](#) [D](#), [geometry](#) [D](#)
- CVT:
 - MM:
 - SVT: [suite](#) [D](#)
- DC: [suite](#) [D](#), [tutorial](#) [D](#), [calibration wikipedia](#) [D](#)
- ECAL: [suite](#) [D](#)
- FT:
 - FT-CAL: [suite](#), [tutorial](#) [D](#)
 - FT-HODO: [suite](#), [tutorial](#) [D](#)
- FTOF: [suite](#) [D](#), [tutorial](#) [D](#), [algorithms](#) [D](#), [ccdb](#) [D](#), [geometry](#) [D](#)
- RF: [suite](#), [tutorial](#) [D](#)
- RTPC: [geom](#) [D](#), [ccdb](#) [D](#)



Meetings and Minutes

- Zoom meeting connection: [5] [D](#)
- 2011 Meetings
- 2012 Meetings
- 2013 Meetings
- 2014 Meetings
- 2015 Meetings
- 2016 Meetings
- 2017 Meetings
- 2018 Meetings
- 2019 Meetings
- 2020 Meetings
- 2021 Meetings
- 2022 Meetings
- 2023 Meetings



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Pass-X Readiness Reviews



Readiness Review for “PASS-X” cooking of CLAS12 data

Cooking any CLAS12 data set is a computing-intensive process requiring detailed planning and preparatory work to guarantee the output data quality. For this reason, a “readiness review” is requested to authorize the start of the reconstruction data processing of any data set that makes a formal request for cooking to the CCC. The charge for this review is outlined below.

The review committee is requested to answer the charge questions based on the material presented by the Run Group and report its findings, comments, and recommendations to the CLAS Coordinating Committee.

Review Charge:

Charge #1: Is the quality of detector calibration and alignment adequate to achieve the performance specifications foreseen for CLAS12 or achievable at the current time, given the “state-of-the-art” calibration, alignment, and reconstruction algorithms?

Charge #2: Is data quality as a function of run number or time for the data set proposed for cooking stable and understood? Have runs been classified in terms of type (empty target, calibration, special, production, ...) and quality (golden run, known issues, ...), and is a detailed list available? Based on validation studies, have all CLAS12 subsystem performances been understood and issues identified?

Charge #3: Has a ‘Hardware (HW) status table (i.e., bad channel table) been compiled for use in the data and MC reconstructions? Has the efficiency versus beam current been studied? How does it compare to MC simulations with the merged background? Are the DAQ translation tables correcting for all known cable swaps? At what stage(s) in the software?

Charge #4: Are analysis plans for the data set developed at adequate levels? Is the list of planned skims defined and tested running the analysis trains on preliminary data? Is all ancillary information (helicity, Faraday Cup, ...) available and understood?

Charge #5: Are the data processing tools that will be used adequate for the proposed processing task? Is the data management plan (staging area, tape destination, directory structure, logs, ...) defined and appropriate given the available resources? Is the estimate of processing time per event available and resources needed to complete the task sound?

Charge #6: Have the tools for monitoring the quality of the cooking output and identify/correct failures been defined and ready to be used?

Charge #7: Is the person-power identified and in-place for the proposed data processing?

Committee: Marco Battaglieri (chair), Nathan Baltzell, Marco Mirazita, Cole Smith, Larry Weinstein

Role: Final review of calibration quality, status tables, software and scripting before recommendation to CCC to approve production cooking (see the generic review charge).

Reviews:

- RG-B Spr19: Oct. 28, 2022
- RG-M 21/22: May 23, 2023
- RG-A Spr19: May 31, 2023
- RG-K W18: Aug. 16, 2023
- RG-A F18: Sep. 22, 2023
- RG-B F19/W20: Nov. 1, 2023
- RG-C Sum22: TBD
- RG-C F22/W23: TBD

6 reviews completed in the past year

Notes:

- The calibration quality for all subsystems should meet the defined QA specifications for all datasets to allow for minimal systematics when combining data taking years apart.
- The calibration QA specifications are well defined and the Run Groups are held to the same standards.
- The committee prepares their report for delivery to the CCC to give approval to start data processing.