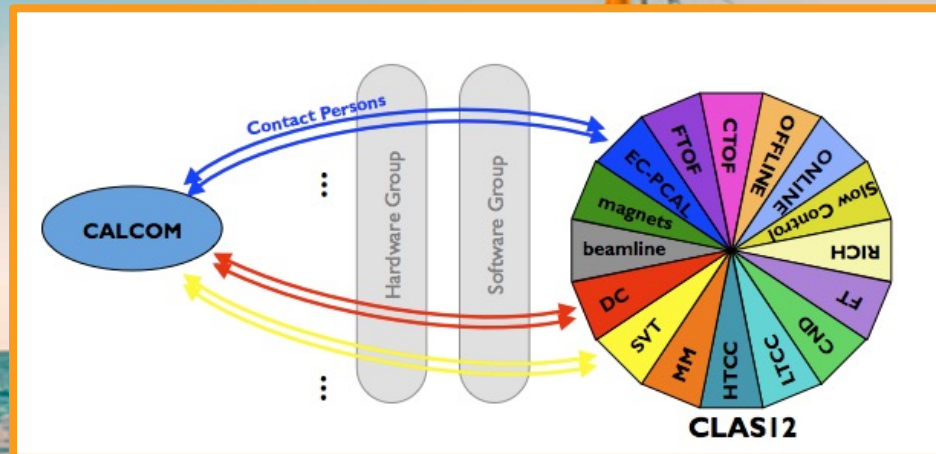


CALCOM Status and Plans



Topics:

- Calibration activities: RG-A, C, D, K
- "Online" calibrations: RG-E, L
- DC calibration, geometry, and alignment
- Summary

Active Run Groups in Calibration Mode - June 2024

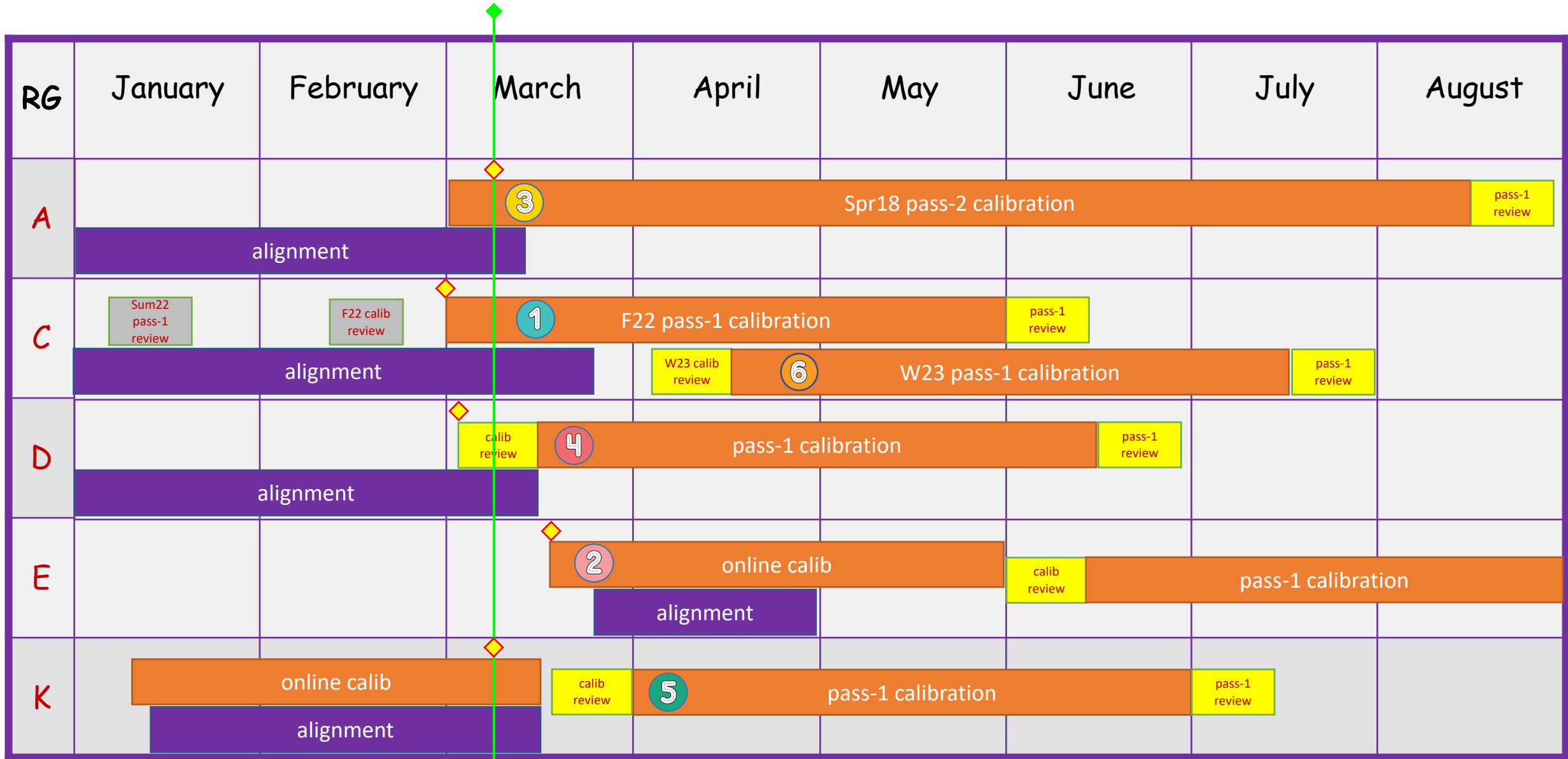
#	Run Group	Dataset	Conditions	Run Range	Stage
1	RG-A	Spr18	LH2 6.4, 10.6 GeV, inbending+outbending (+ 2.2 GeV zero-field from engineering run)	3029 - 4325	Pass-1
2	RG-C	F22 + W23	Polarized NH3, ND3, 10.5 GeV, inbending; FT-On/FT-Off	16843 - 17811	Pass-1
3	RG-D	F23	LD2, C, Cu, Sn 10.6 GeV inbending+outbending	18329 - 19130	Pass-1
4	RG-E	Spr24	LD2, C, Cu, Al, Sn, Pb 10.5 GeV	20015 - 20525	"Online" calibration
5	RG-K	Spr24	LH2 6.4, 8.5 GeV outbending	19200 - 19893	Pass-1

Six different datasets are being calibrated in parallel

	Analysis Coordinator	Chef
RG-A	Latifa Elouadrhiri/Timothy Hayward	Nick Trotta
RG-C	Silvia Niccolai	Li Xu
RG-D	Lamiaa El Fassi	Lamiaa El Fassi
RG-E	Hayk Hakobyan	Antonio Radic
RG-K	Annalisa D'Angelo	Lucilla Lanza

Calibration Timeline: January - August 2024

March 8, 2024

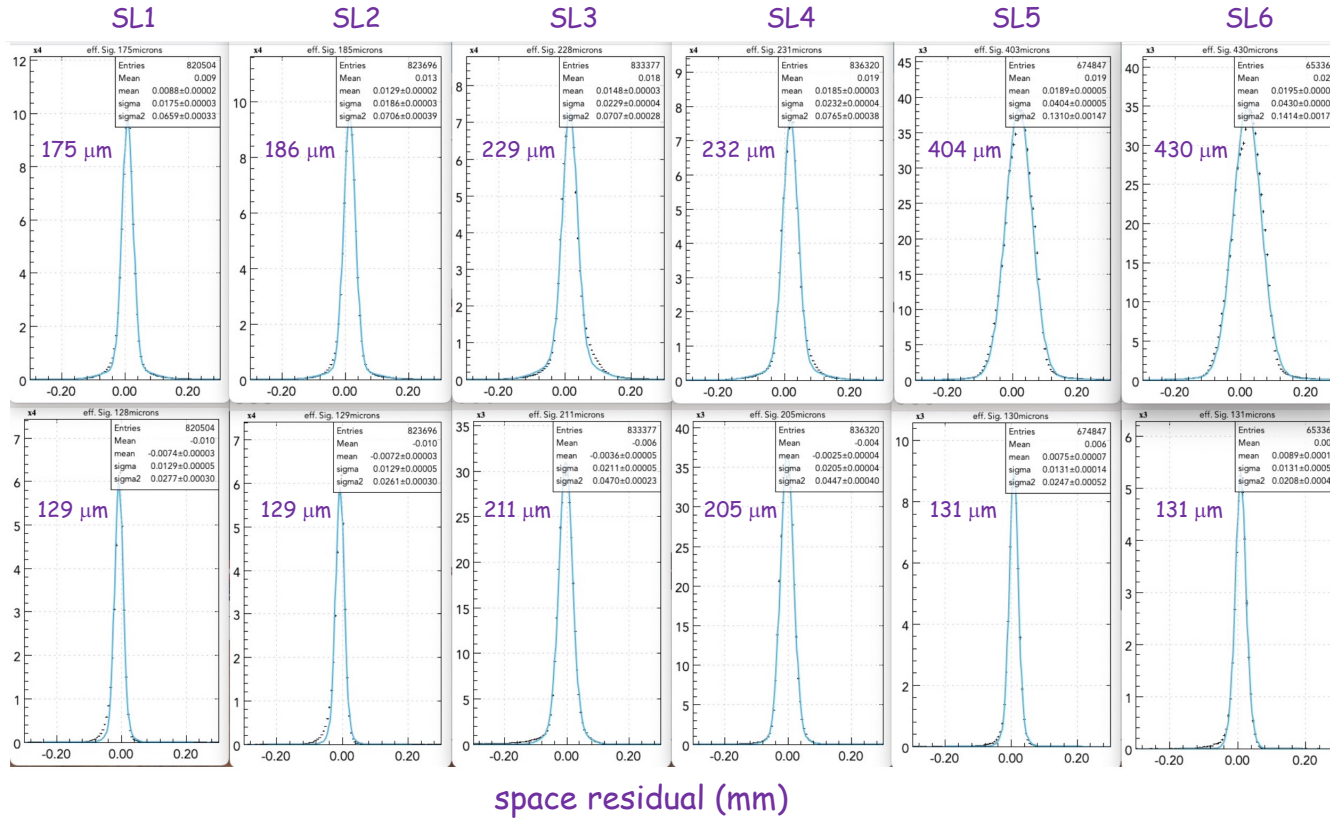


*from March 2024 CALCOM update

DC Calibration Suite

Iteration #1

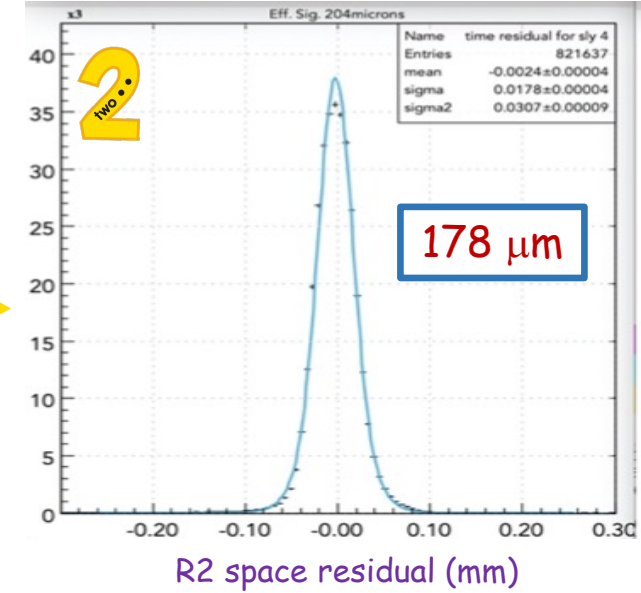
Iteration #3



Recent improvements in the DC calibration suite:

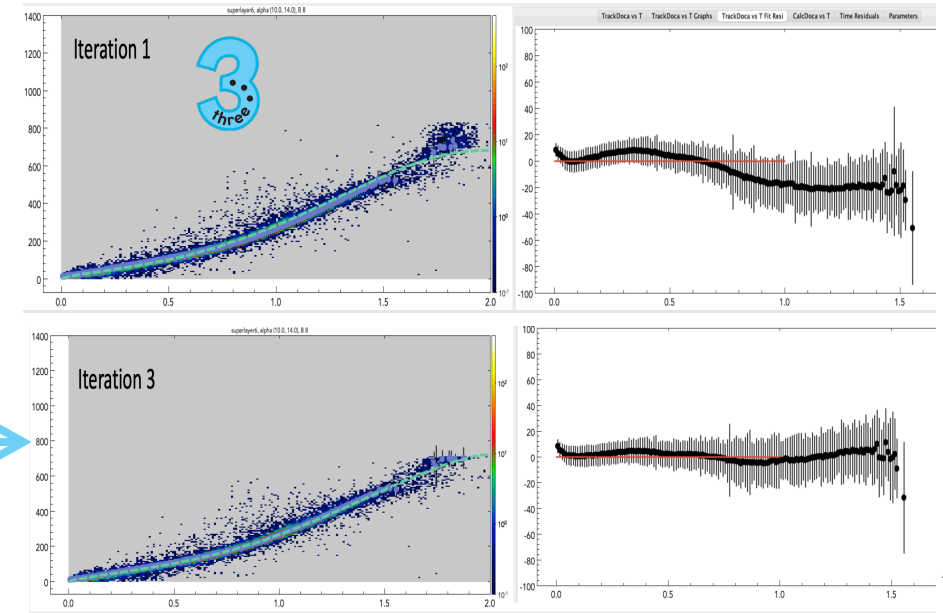
- 1) Improve algorithmic approach to account for time-walk correction
- 2) Improve B-field dependent parameterization for R2
- 3) Add improved metrics for calibration convergence
- 4) Improve event selection + fitting approach

Now working on validation studies and data calibration

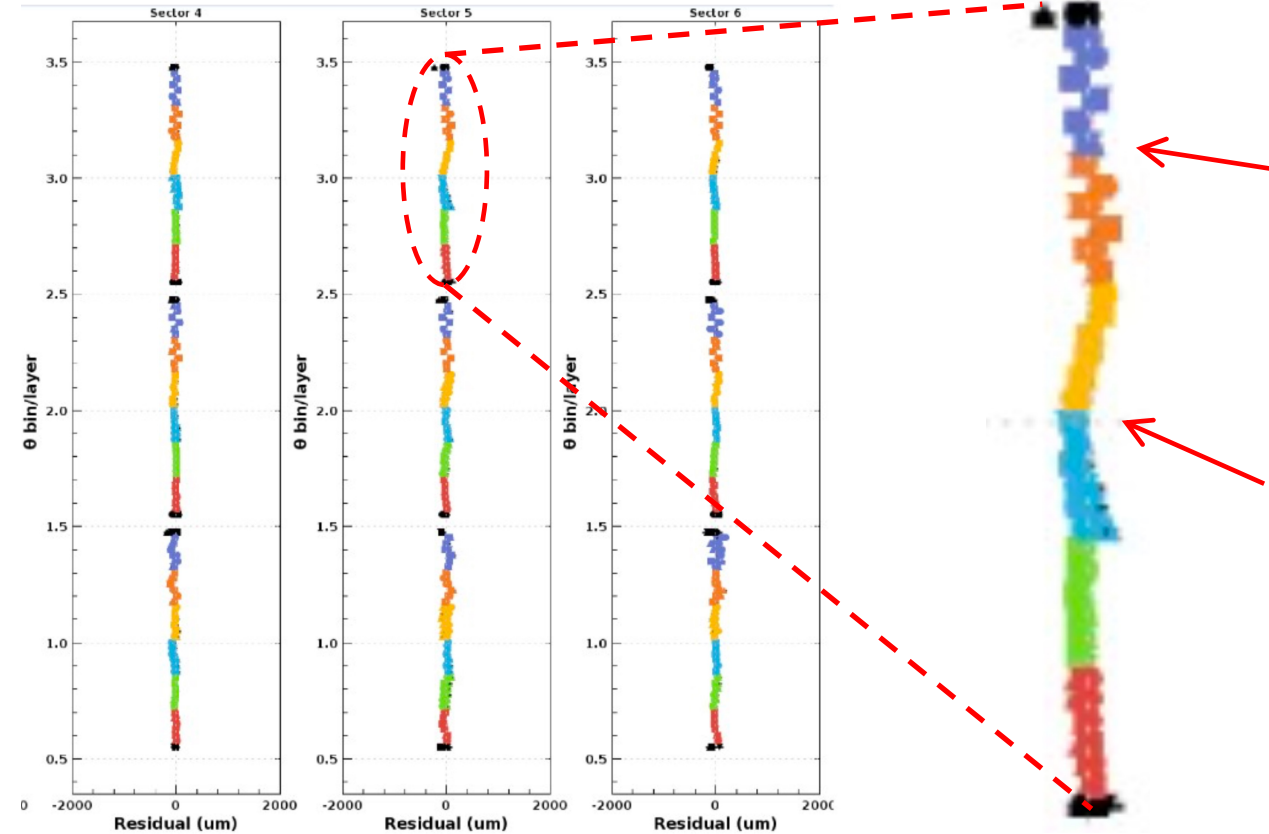


time (ns) vs. DOCA

Δ time (ns) vs. DOCA



DC Geometry and Alignment



Issue #1: R3 S5 and S6 "zigzag":

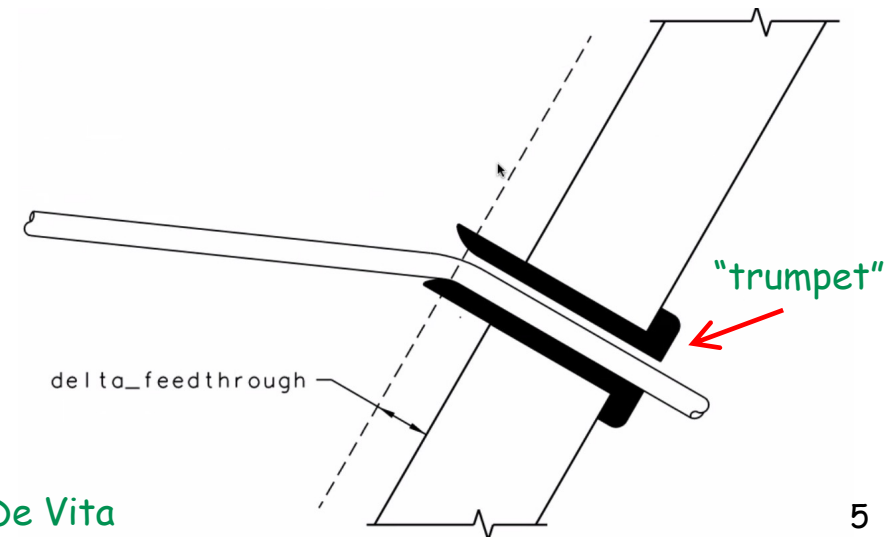
- Found that reference guard wires did not include a $\pm 300 \mu\text{m}$ "mini-stagger" 🐟
- Possible effect of distorted electric field - compensated for with increased effective mini-stagger $\pm 350 \mu\text{m}$ - work in progress

Issue #2: R2 S3 and S4 opposite slope tilts:

- Thought to be caused by incorrect radial distance to reference guard planes 🐟
- Still under investigation - coupling of effect with R3 geometry

Issue #3: Model of wire positions at endplate:

- Geometry model assumes wire is located at center of hole in endplate - but wire actually shifted due to bending at "trumpet"
- Effect causes wire-length-dependent shift at the level of $200 \mu\text{m}$
- Still under investigation



*See update from Raffaella De Vita

DONE

Calibration Status - RG-C

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

[2] RG-C F22 - Pass-1 calibration review Feb. 23, 2024

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

Calibrations sequence:

- 1) 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 (do we need to redo it or can we use the network used for Summer2022?)
- 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: ~10 days
- For 1) pass-0 cooking & timelines: ~3 days (MILESTONE 1)
- For 2) and 4) ~30 runs should be cooked for calibration → ~20 days
- For 2) FTOF calibration of ~30 runs → ~15 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 for pass0 + timelines (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: ~92 days

Timeline:

- Original calibration window:
 - Jul. 1 - Aug. 31, 2023
 - alignment (3 months)
 - beam offset calibration (1 month)
 - calibration - run range extension (1 month)
- Pass-1 review: Jan. 26, 2024
- Cooking: Mar. 15 - May 6, 2024
 - Delayed - update CD materials/fix vertex cuts

Timeline:

- Original calibration window:
 - Aug. 15 - Oct. 31, 2023
- Updated calibration window:
 - Mar. 1 - May 31, 2024
 - Start delayed 4 months to finish Sum22 work
 - 1 month behind schedule
- Pass-1 review: TBD
- Cooking: TBD

RG-C F22 - Status

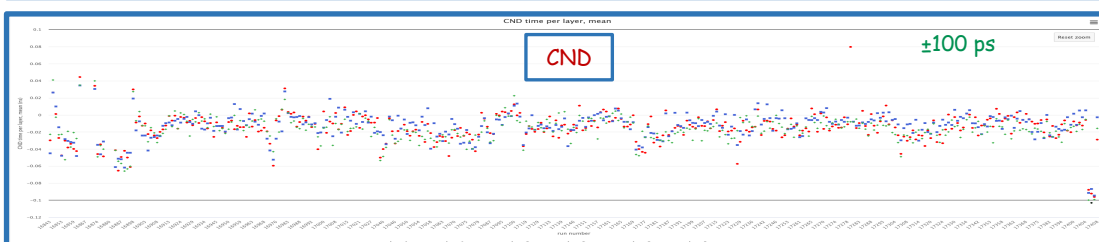
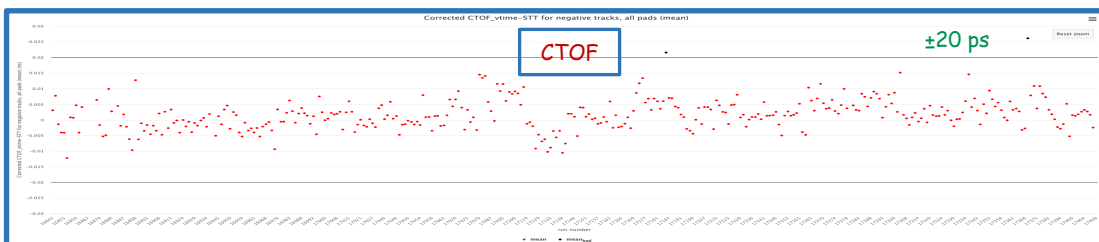
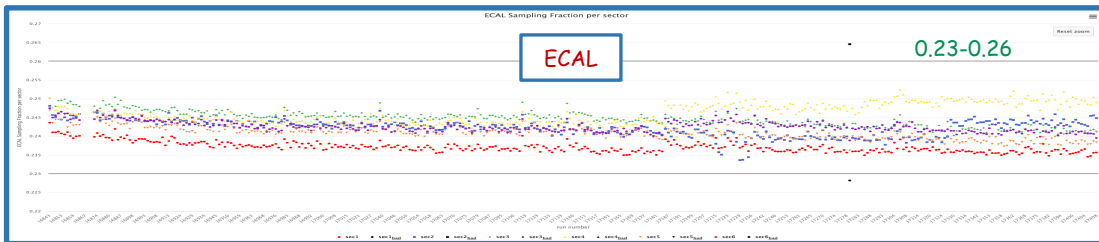
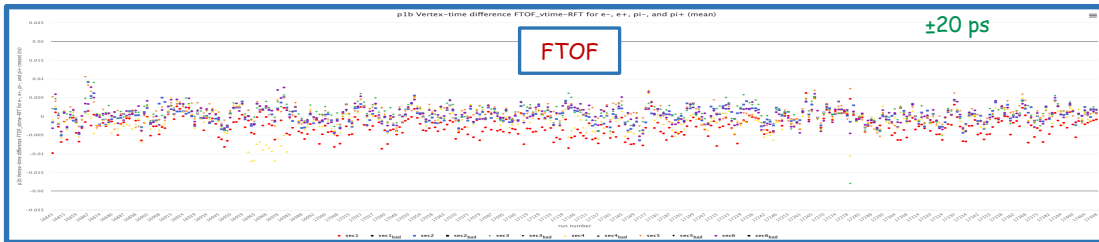
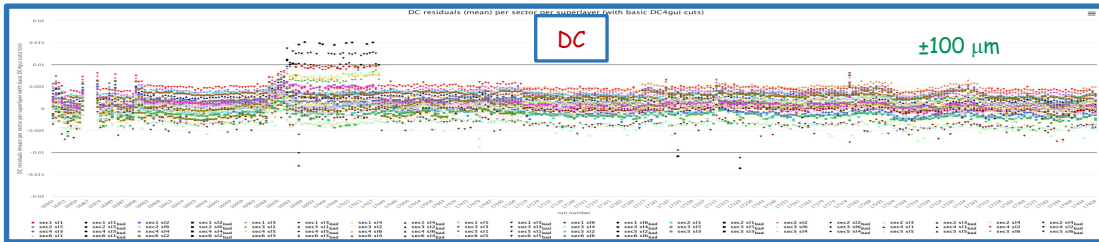
Where do things stand?

- CALCOM "ready for calibration" review complete (Feb. 23, 2024)
- DC alignment/CVT alignment complete
- Beam offset calibration complete
- Raster calibration complete
- Global timing shifts set
- Subsystem calibrations complete (**DC firmware issue*)
- AI network training for forward tracking in progress
- Preparing for pass-1 cooking review in July

Calibration timeline (tentative estimates):

- For 1) cooking needs: **~2 runs** → **1 day**
- For 1) duration of DC calibration: **~10 days**
- For 1) pass-0 cooking & timelines: **~3 days (MILESTONE 1)**
- For 2) and 4) **~30 runs** should be cooked for calibration → **~20 days**
- For 2) FTOF calibration of ~30 runs → **~15 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** for pass0 + timelines (**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: ~92 days**



RG-C W23 - Status

[3] RG-C W23 - Pass-1 calibration
review May 17, 2024

Calibration timeline (tentative estimate):

- For 1) cooking needs: ~1 run → 1 day
- For 1) duration of DC calibration: ~2 days
- For 1) raster + beam offset calibration: 2 days
- For 1) pass-0 cooking & timelines: ~3 days (MILESTONE 1)
- For 2) and 4) ~10 (?) runs should be cooked for calibration → ~4 days
- For 2) FTOF calibration of ~10 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 ~10 runs → ~3 days
- For the calibrations 4) of ~10 runs → ~7 days (done in parallel)
- For 5) 3 days (MILESTONE 3)
- For 6) ~10 days including cookings, recalibrations, and further monitoring passes (MILESTONE 4)
- + 1 week to account for delays in cooking due to resource limitations.

→ TOTAL: ~55 days

Timeline:

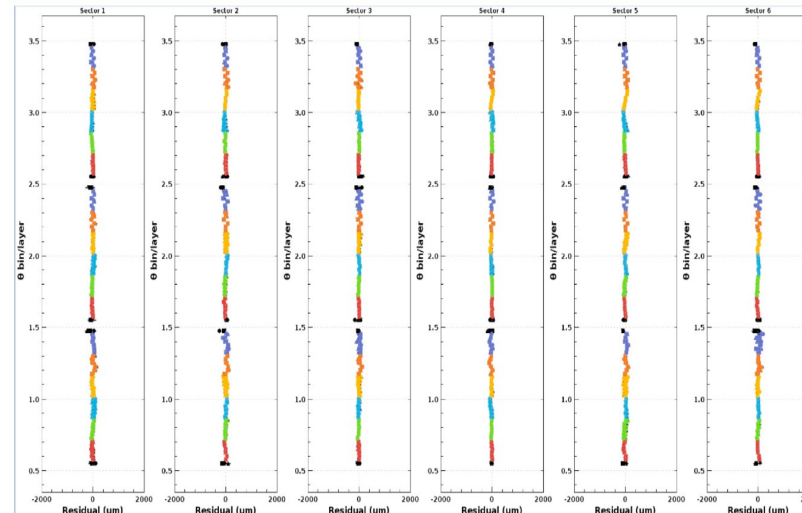
- Original calibration window:
 - Apr. 15 - Jul. 15, 2024
- Updated calibration window:
 - Jul. 1 - Oct. 31, 2024
 - Start delayed 2.5 months to finish F22 work
- Pass-1 review: TBD
- Cooking: TBD

Noémie
Pilleux

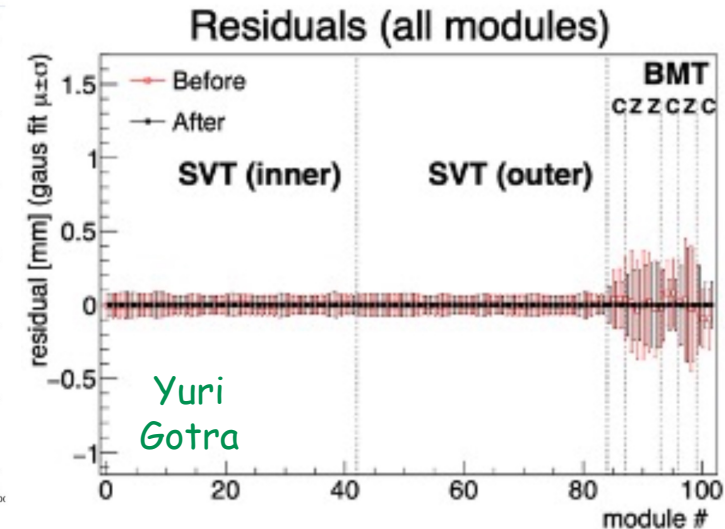
Where do things stand?

- DC alignment complete
- CVT alignment complete
- Beam offset calibration complete
- Initial raster calibration complete
- Global timing offsets set
- Initial pass-0/timelines available for assessment
- First round of FTOF calibrations in progress

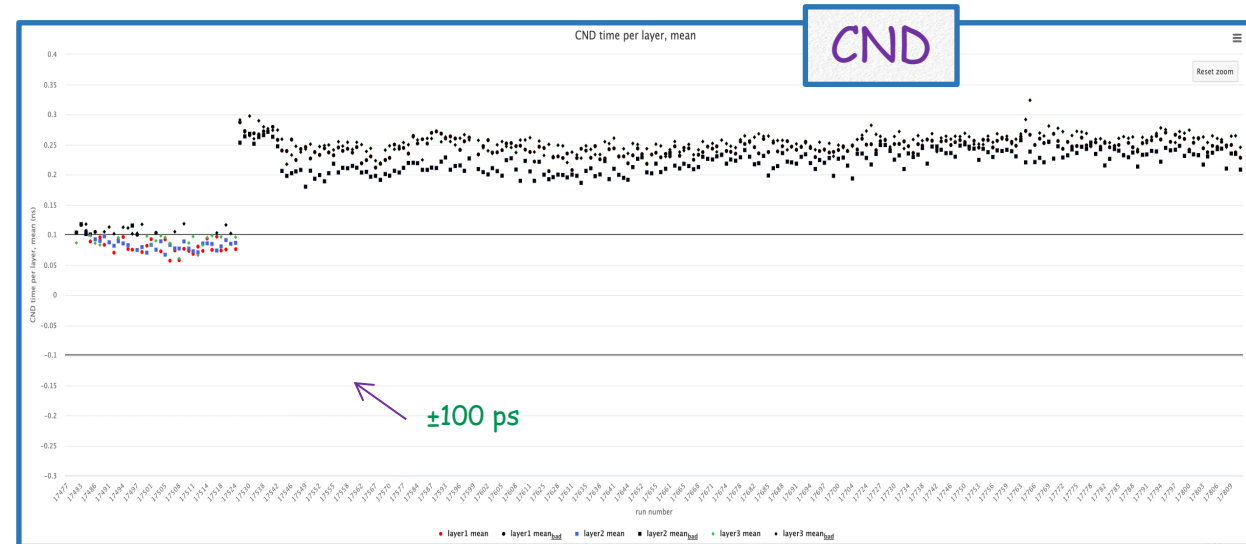
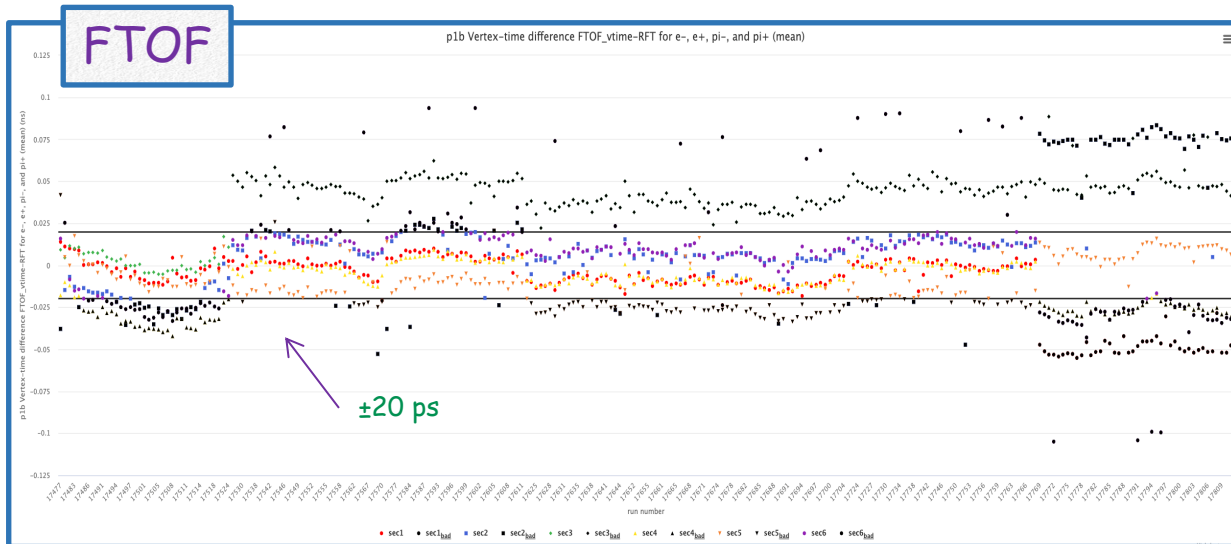
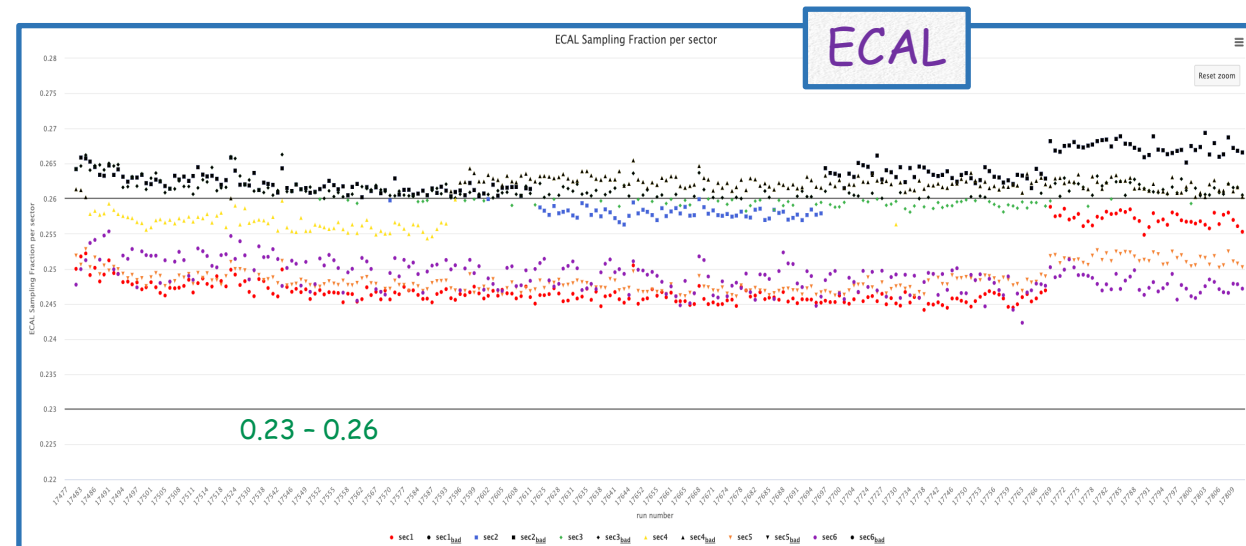
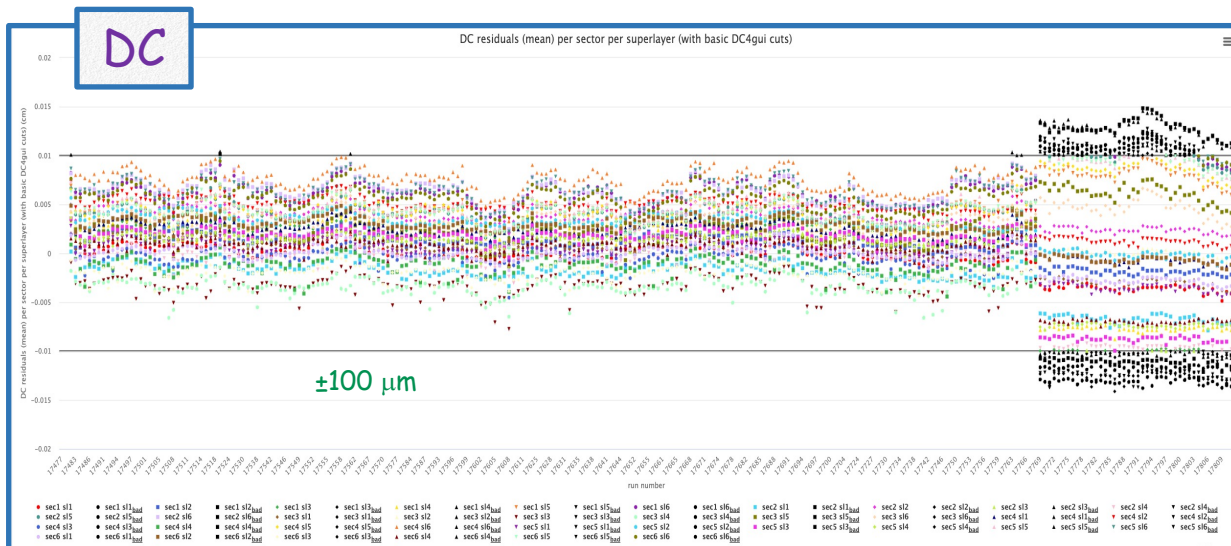
Forward Detector - DC



Central Detector - CVT



RG-C W23 - Current Timelines



*Note: No online calibrations were done during this portion of the run

RG-A Spr18 - Status

[4] RG-A Spr18 - Pass-1 calibration review Dec. 1, 2023

	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%

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

Timeline:

- Original calibration window:
 - Jan. 8 - Jun. 21, 2024 (includes alignment tasks)
- Updated calibration window:
 - Jun. 1 - Aug. 31, 2024
 - Start delayed 3 months to finish/investigate alignment
- Pass-1 review: TBD
- Cooking: TBD

1. Day 0 (January 8th): Initial CCDB tables set by Florian for engineering runs
2. Day 1-21: DC and central alignment (central nominally completed)
3. Day 22-32: Beam-offset (forward and central; cooking needed)
4. Day 1-32: Pass 0-v0, Mini-timelines for initial DC calibrations
5. Day 32-35: Pass 0-v1 cooking with beam-offset and initial DC calibrations
6. Day 36: Pass 0-v1 timelines *Milestone 1*

1. Day 37-45: Cook ~12 runs for FTOF calibration
2. Day 46-59: FTOF calibration, extra DC calibrations ongoing
3. Day 60-63: Pass 0-v2 with FTOF calibration
4. Day 64: Pass 0-v2 timelines
5. Day 65-69: Cook ~6 runs for FTOF contingency calibration
6. Day 70-74: FTOF contingency calibration
7. Day 75-79: Pass 0-v3 with FTOF contingency calibration
8. Day 80: Pass 0-v3 timelines *Milestone 2*

1. Day 81-83: RF calibration using pass-0 v3
2. Day 84-87: Pass 0-v4 with RF calibration
3. Day 88: Pass 0-v4 timelines *Milestone 3*

1. Day 89-100: Cooking of ~20 full runs for subsystem calibration
2. Day 101-115: Subsystem calibrations and AI training/denoising validation
3. Day 116-119: Pass 0-v5 with initial subsystem calibrations
4. Day 120: Pass 0-v5 timelines
5. Day 121-126: Cooking of ~10 full runs for subsystem contingency calibration
6. Day 127-133: Subsystem contingency calibrations
7. Day 133-136: Pass 0-v6 with subsystem contingency calibrations
8. Day 137: Pass 0-v6 timelines
9. Day 138-143: Cooking of ~12 full runs for physics analysis validation
10. Day 143-172: Misc contingency *Milestone 4*

RG-A Spr18 - Status

[4] RG-A Spr18 - Pass-1 calibration review Dec. 1, 2023

	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%

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

Status:

- Alignment:
 - Work needed to update DC calibration code and complete DC alignment delayed start of calibration efforts from original plan by 3 months - DC alignment completed on May 17
 - CVT internal alignment complete (fixing DC-CVT offset)
 - FMT alignment 1st round done (2nd round in progress)
- Dataset "archaeology" in progress
 - Lots of trigger/condition changes
 - Entire run range has not been calibrated/explored to date
- Pass-0/timelines completed for initial assessment
- Sequence: beam-offset, FTOF/DC, subsystem calibration

Goal: Complete calibrations by this fall

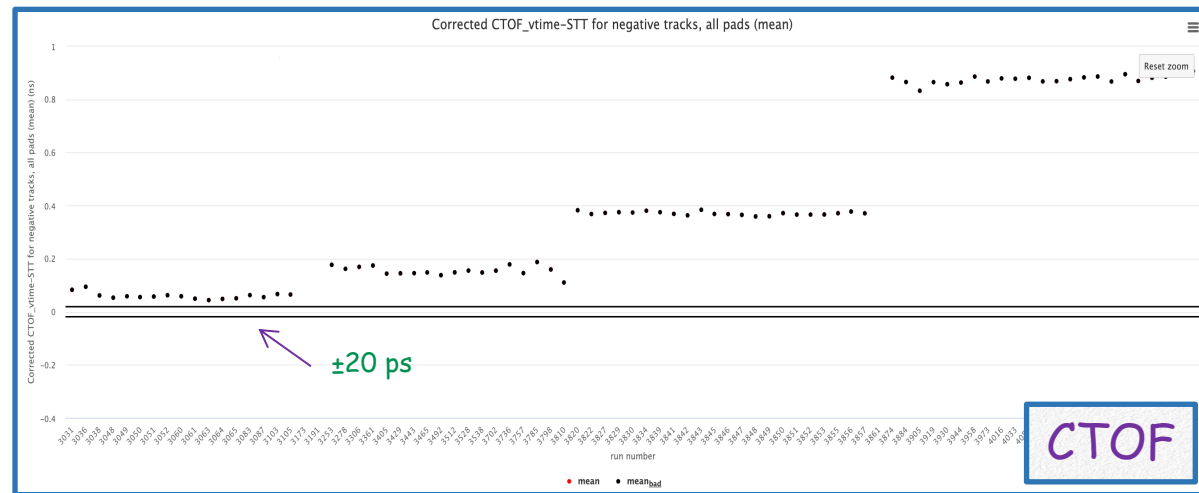
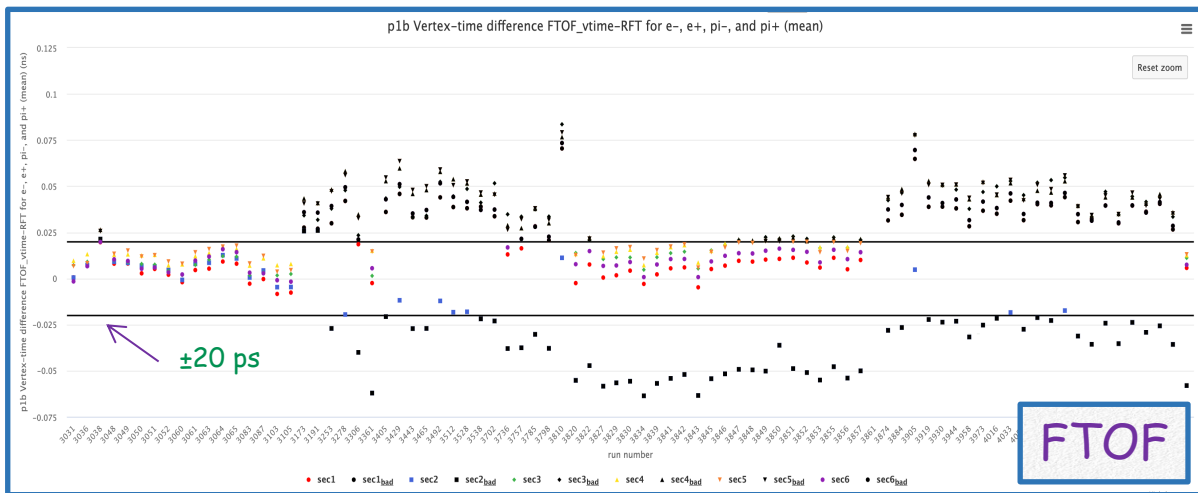
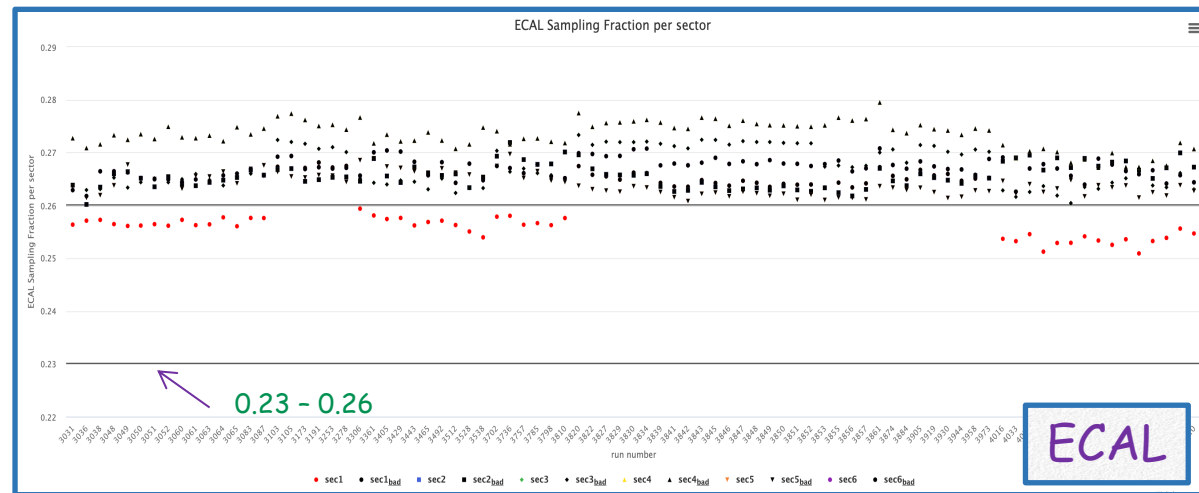
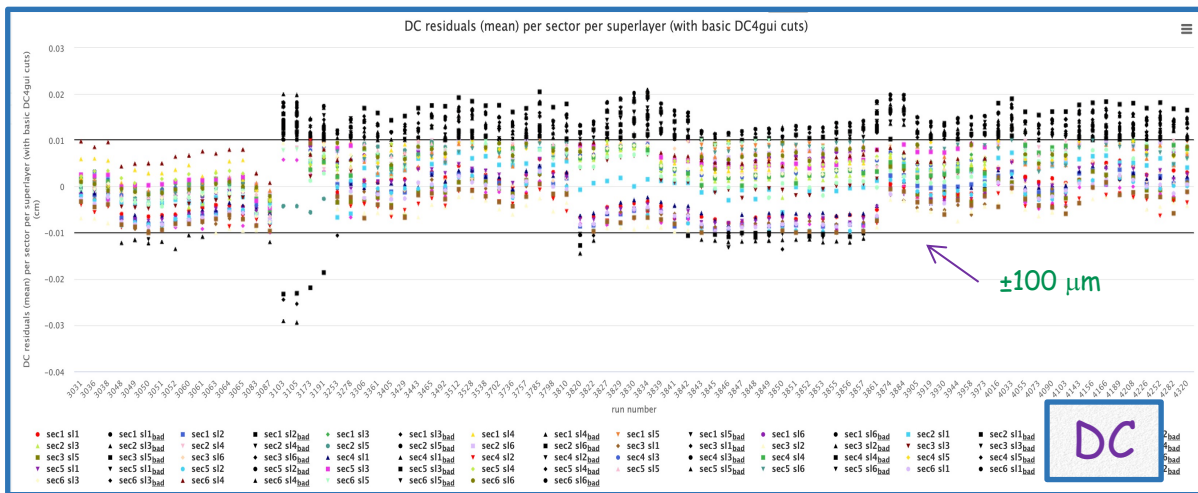
1. Day 0 (January 8th): Initial CCDB tables set by Florian for engineering runs
2. Day 1-21: DC and central alignment (central nominally completed)
3. Day 22-32: Beam-offset (forward and central; cooking needed)
4. Day 1-32: Pass 0-v0, Mini-timelines for initial DC calibrations
5. Day 32-35: Pass 0-v1 cooking with beam-offset and initial DC calibrations
6. Day 36: Pass 0-v1 timelines *Milestone 1*

1. Day 37-45: Cook ~12 runs for FTOF calibration
2. Day 46-59: FTOF calibration, extra DC calibrations ongoing
3. Day 60-63: Pass 0-v2 with FTOF calibration
4. Day 64: Pass 0-v2 timelines
5. Day 65-69: Cook ~6 runs for FTOF contingency calibration
6. Day 70-74: FTOF contingency calibration
7. Day 75-79: Pass 0-v3 with FTOF contingency calibration
8. Day 80: Pass 0-v3 timelines *Milestone 2*

1. Day 81-83: RF calibration using pass-0 v3
2. Day 84-87: Pass 0-v4 with RF calibration
3. Day 88: Pass 0-v4 timelines *Milestone 3*

1. Day 89-100: Cooking of ~20 full runs for subsystem calibration
2. Day 101-115: Subsystem calibrations and AI training/denoising validation
3. Day 116-119: Pass 0-v5 with initial subsystem calibrations
4. Day 120: Pass 0-v5 timelines
5. Day 121-126: Cooking of ~10 full runs for subsystem contingency calibration
6. Day 127-133: Subsystem contingency calibrations
7. Day 133-136: Pass 0-v6 with subsystem contingency calibrations
8. Day 137: Pass 0-v6 timelines
9. Day 138-143: Cooking of ~12 full runs for physics analysis validation
10. Day 143-172: Misc contingency *Milestone 4*

RG-A Spr18 - Starting Point



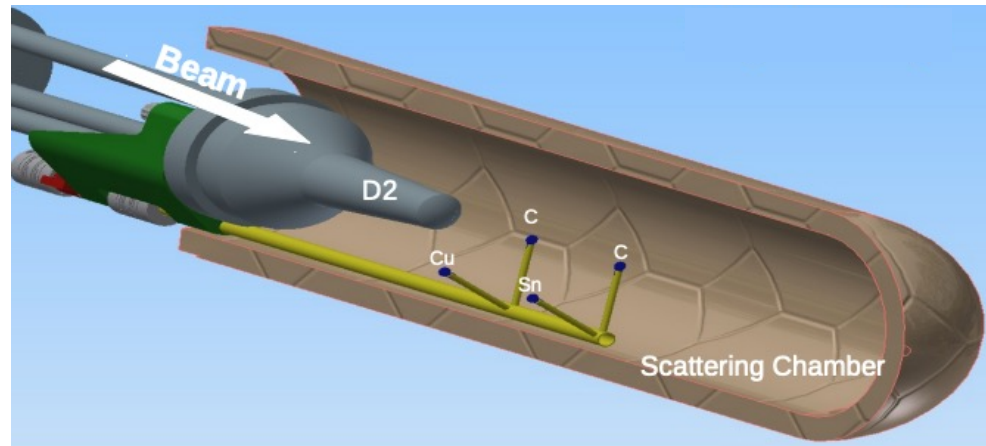
RG-D - Status

[5] RG-D F23 - Pass-1 calibration review TBD

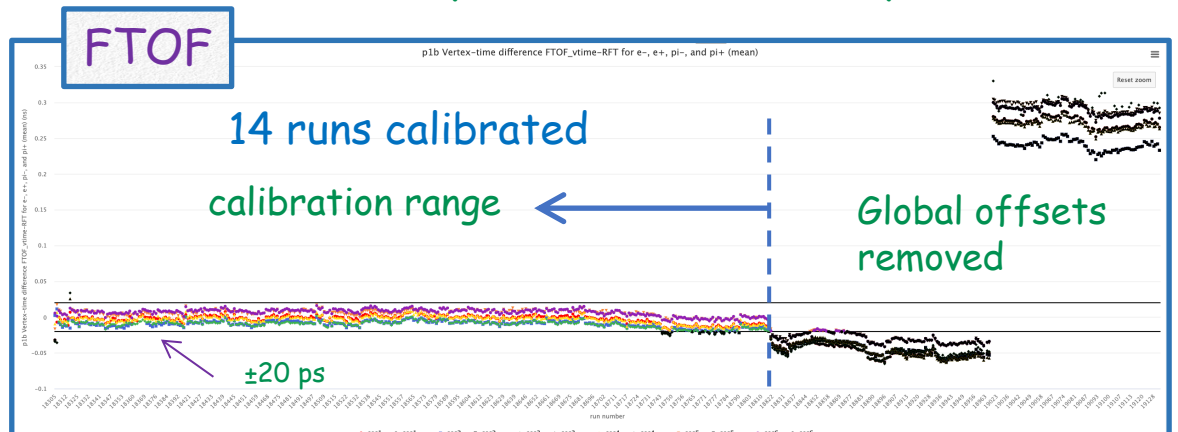
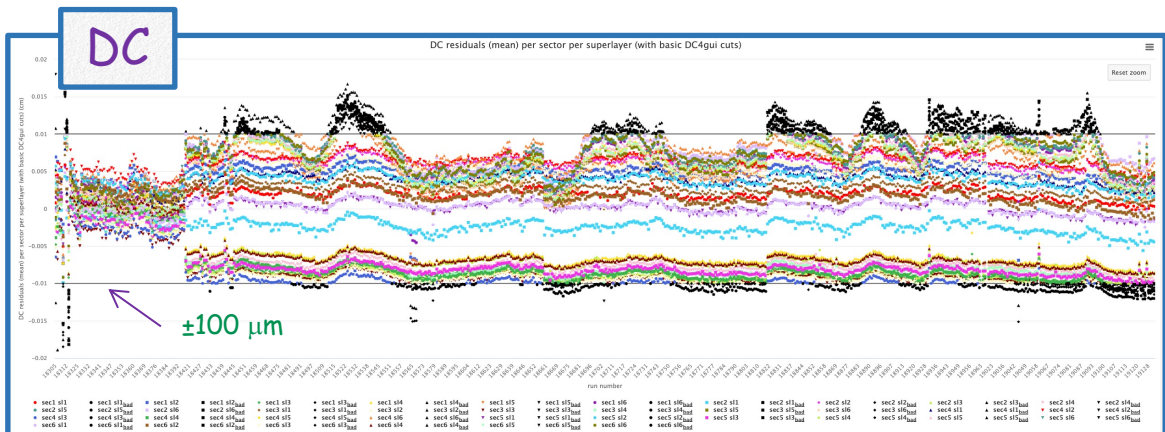
Status:

- DC alignment:
 - Revisited due to 7 mm sag of Moller cone
 - Redone with new alignment procedure and after reviewing DC geometry modeling
 - Initial alignment in Oct. 23 - completed work in June 24 - 5 month delay to original schedule
- DC calibration:
 - Awaiting updated DC suite
- Next steps: Run pass-0/timelines for assessment of current status
- Ready for calibration review - planned for early July

Target	Schedule
LD ₂	3
⁶³ Cu/ ¹¹⁸ Sn	8
LD ₂	3
¹² C/ ¹² C	7
LD ₂	2
⁶³ Cu/ ¹¹⁸ Sn	9
LD ₂	3
¹² C/ ¹² C	7
LD ₂	3
⁶³ Cu/ ¹¹⁸ Sn	11



Goal: Complete calibrations by this fall



RG-K Spr24 - Status

[6] RG-K Spr24 - Pass-1 calibration review TBD

Calibration details:

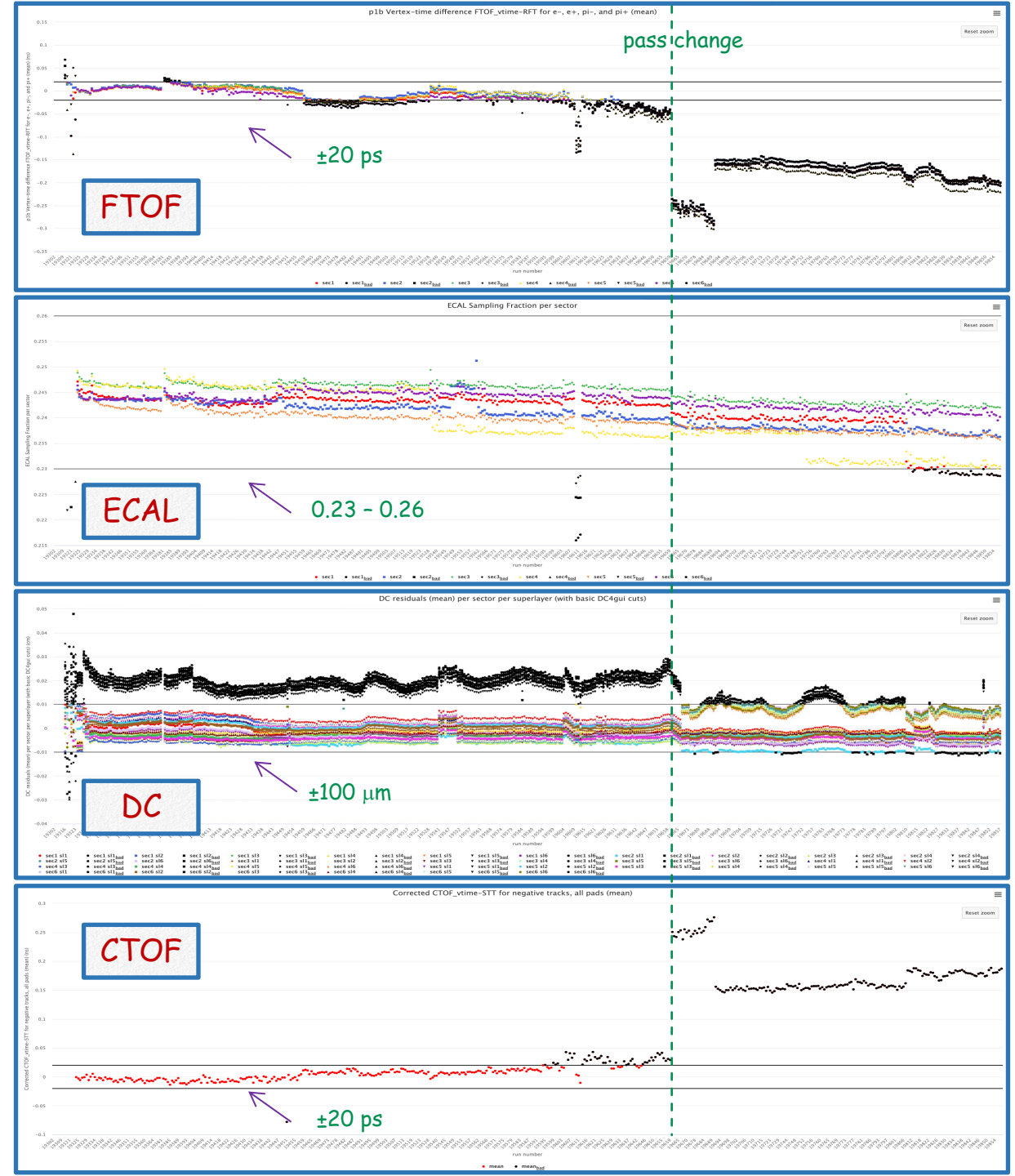
- Completed calibration of 6.4 GeV and 8.5 GeV online reference runs (4 runs total)
- DC alignment in progress - used as testing ground of new DC calibration and DC alignment procedures
- Next step: Run pass-0/timelines for initial assessment
- Calibration includes Dec. 2023 commissioning run - DC HV study, reversed solenoid running

Goal: Complete calibrations by end of fall

Next steps:

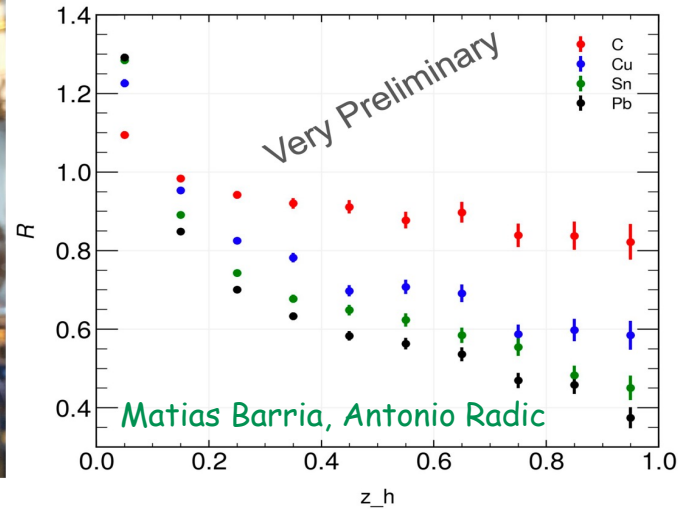
"Ready for calibration" review at CALCOM

- Review dataset "archaeology"
- Prepare calibration schedule with trackable milestones
- To be scheduled in July



RG-E - Status

[7] RG-E Spr24 - Online calibration



Target configurations: LD2+(C, Cu, Al, Sn, Pb)

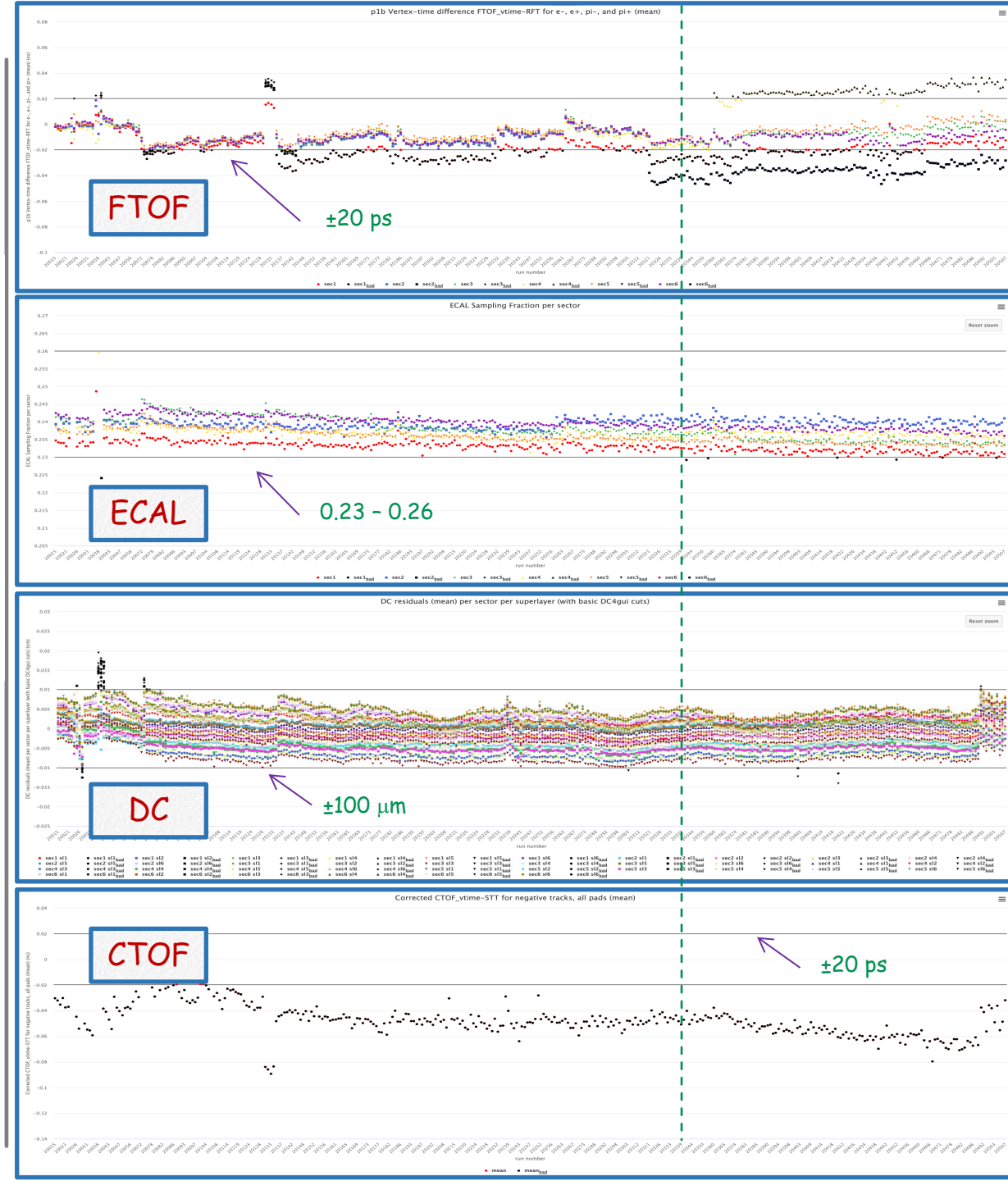
Calibration details:

- Completed calibration of 6 reference runs as part of online calibration efforts

Goal: Complete calibrations by end of the year

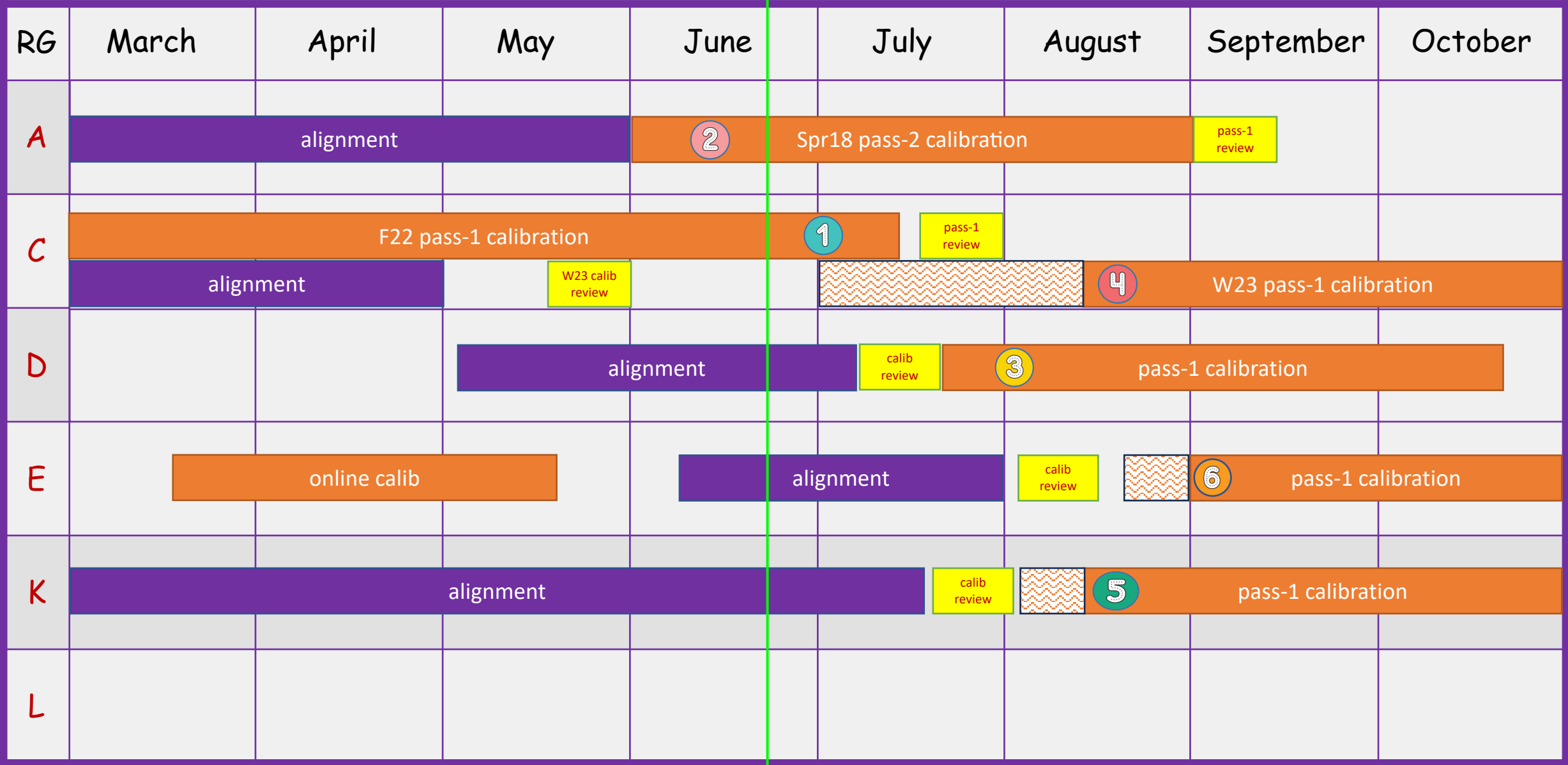
Next step:

“Ready for calibration” review at CALCOM - beginning of August



Calibration Timeline: March - October 2024

June 21, 2024



Summary

- CALCOM has been overseeing the detector calibrations of the different CLAS12 datasets:
 - Recent focus: **RG-A, C, D, E, K**
 - Development of algorithms for **DC alignment** and **DC calibrations** has taken a significant amount of effort since the last CLAS meeting, as well as validation of **DC geometry** - *forced calibration pause*
- "Online" calibration update:
 - Supported online calibration approach for **RG-E** - good success
 - Integration of **RG-L (ALERT)** into **CALCOM** on the near-term horizon
- CALCOM is a critical service-work committee for the CLAS Collaboration:
 - Lots of folks are part of this work:
 - **CALCOM, Analysis Coordinators, chefs, timeline crew, subsystem group leaders, calibration team, alignment team, software group, data validators**
- Notes:
 - Delays due to work on **DC alignment** + **DC calibration suite/protocols** + **DC geometry validation** have caused a bit of a calibration backup - the summer/fall will be a very busy period of calibration (hopefully 🙌)!
 - Beginning work to streamline calibration tools for more automation and improved speed (more to come).
 - Discussion of upcoming pass-3 ramping up (new **DC tracking** + **AI advancements** for **CVT tracking**)

clas12_calcom@jlab.org

Backup Slides

RG-K Commissioning Run - Dec. 2023


Run Number	R1 DC HV Setting	R2 DC HV Setting	R3 DC HV Setting
19220	10	11	11
19222	11	12	12
19223	9	10	10
19224	10	10	10
19225	10	10	11
19226	10	10	11
19228	10	12	11
19229	10	11	10
19238	10	11	12
19239	12	13	13
19243	11	11	11
19244	10	12	10

START	STOP	FRIDAY, DEC 15	SATURDAY, DEC 16	SUNDAY, DEC 17	MONDAY, DEC 18	TUESDAY, DEC 19
0000	0100		"	TGT issue	60 nA	r19260 200 MeV, 60 nA
0100	0200		lumi scan runs:	TGT issue	300 MeV no DC roads	r19249
0200	0300		r19209 - 19218	TGT issue	r19233 - 19234	300 MeV no DC roads
0300	0400		10, 20, 30 nA	TGT issue	75 nA	75 nA
0400	0500		40, 50, 60 nA	TGT issue	"	r19250
0500	0600		75, 90 nA	TGT issue	300 MeV no DC roads	300 MeV no DC roads
0600	0700		DC HV scan 10 11 11	TGT issue	r19235	90 nA
0700	0800	beam off	r19219 - 19220	TGT issue	90 nA	r19251 - 19252
0800	0900	pass change; tgt work	"	TGT issue	Streaming Test	Solenoid POS to NEG
0900	1000	"	DC HV scan 11 12 12	TGT issue		
1000	1100	"	r19222	TGT issue		
1100	1200	"	DC HV scan 9 10 10	TGT issue	TGT issue	
1200	1300	ACC ready; TGT ready	r19223	TGT issue		
1300	1400	beam tuning	DC HV scan 10 10 10		DC HV scan 10 11 12	
1400	1500	beam tuning	r19224		r19238	
1500	1600	Moller runs	DC HV scan 10 10 11		DC HV scan 12 13 13	
1600	1700	beam tuning	r19225 - 19226		r19239	r19254 - trig valid prod
1700	1800	detector	DC HV scan 10 12 11		DC HV scan 11 11 11	DC & CVT thr study
1800	1900	r19204 - trig valid prod	r19228		r19243; DC HV scan 10 12 10	r19258 200 MeV, 60 nA
1900	2000	r19205 - trig valid rnd	DC HV scan 10 11 10		r19244	
2000	2100	r19206 - trig valid rnd	r19229		200 MeV no DC roads	solenoid trip
2100	2200	"			60 nA	
2200	2300	"	200 MeV no DC roads		r19245 - 19248	r19259 300 MeV, 75 nA
2300	2400	r19208 - trig valid mod	r19231 - 19232		200 MeV no DC roads	

































History of HV settings for (R1, R2, R3):

- (8, 10, 9) : RG-A Spr18
- (8, 9, 9) : RG-A F18 (early)
- (9, 10, 10) : RG-A F18, RG-A/B Spr19
- (10, 10, 10) : RG-M, RG-C
- (10, 11, 11) : RG-D
- (11, 12, 12) : RG-K Spr24 (1)
- (10, 12, 11) : RG-K Spr24 (2)

Longer-Term CALCOM Work Items

- 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
- 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)

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 wikipedia](#) 
- ECAL: [suite](#) 
- FT:
 - FT-CAL: [suite](#), [tutorial](#) 
 - FT-HODO: [suite](#), [tutorial](#) 
- FTOF: [suite](#) , [tutorial](#) , [algorithms](#) , [ccdb](#) , [geometry](#) 
- RF: [suite](#), [tutorial](#) 
- RTPC: [geom](#) , [ccdb](#) 

CLAS12 Calibration and Commissioning

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- 2 CLAS12 Subsystem Contact Persons
- 3 Commissioning Plans
- 4 CLAS12 Calibration
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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](#) [✉](#)
- BAND:
- Beam Offset: [suite](#) [✉](#)
- Cherenkov:
 - HTCC: [suite](#) [✉](#), [tutorial](#) [D](#)
 - LTCC: [suite](#) [✉](#)
 - RICH: [suite](#) [✉](#), [Time calibration](#) [D](#) [Cherenkov angle calibration](#) [D](#) [Monitoring histograms and timelines](#) [D](#)
- CND: [suite](#) [✉](#), [tutorial](#) [D](#), [algorithms](#) [D](#)
- CTOF: [suite](#) [✉](#), [tutorial](#) [D](#), [algorithms](#) [D](#), [ccdb](#) [D](#), [geometry](#) [D](#)
- CVT:
 - MM:
 - SVT: [suite](#) [✉](#)
- DC: [suite](#) [✉](#), [tutorial](#) [D](#), [calibration wikipedia](#) [✉](#)
- ECAL: [suite](#) [✉](#)
- FT:
 - FT-CAL: [suite](#), [tutorial](#) [✉](#)
 - FT-HODO: [suite](#), [tutorial](#) [✉](#)
- FTOF: [suite](#) [✉](#), [tutorial](#) [D](#), [algorithms](#) [D](#), [ccdb](#) [D](#), [geometry](#) [D](#)
- RF: [suite](#), [tutorial](#) [✉](#)
- RTPC: [geom](#) [✉](#), [ccdb](#) [✉](#)



Meetings and Minutes

- Zoom meeting connection: [\[5\]](#) [✉](#)
- [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](#)
- [2024 Meetings](#)



clas12_calcom@jlab.org



https://clasweb.jlab.org/wiki/index.php/CLAS12_Calibration_and_Commissioning

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: Jan. 26, 2024

7 reviews completed since Oct. 2022

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.