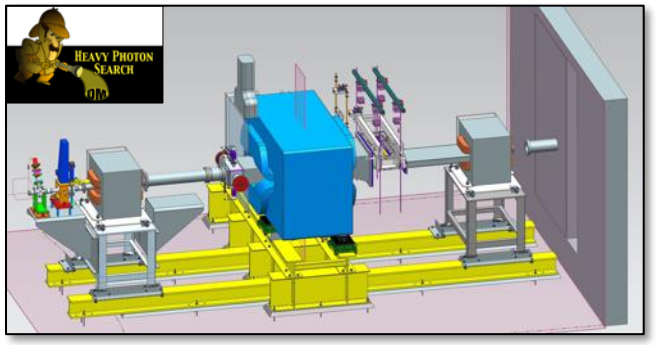
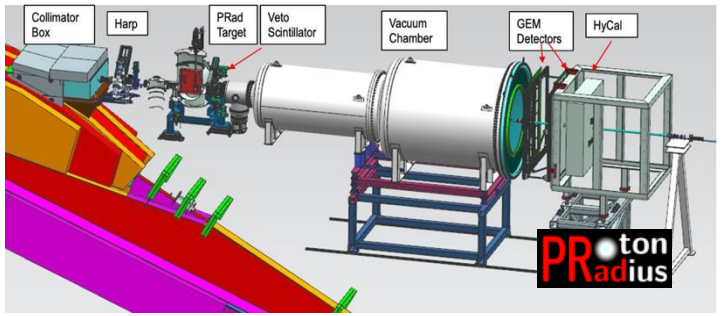
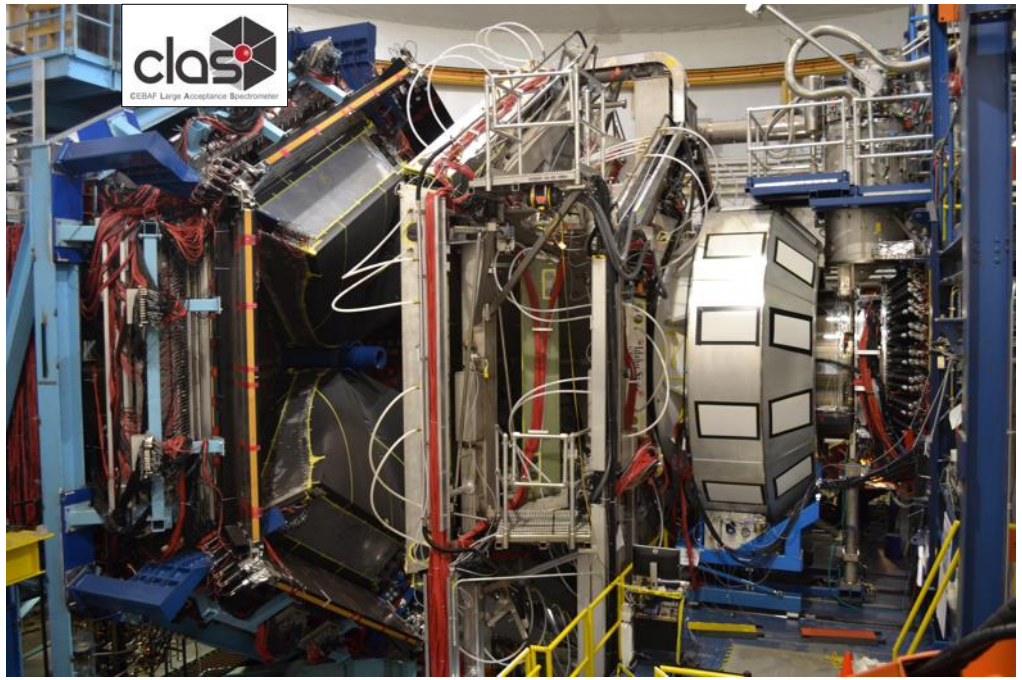
Status of Hall-B







S. Stepanyan (JLAB)

CLAS Collaboration meeting

June 29 – July 2, 2026

OFFICE OF SCIENCE
Jefferson Lab
Thomas Jefferson National Accelerator Facility
JSA

Outline of the talk:

- News from the Hall B group
- Activities in CY26
- CLAS/CLAS12 publications/presentations
- Highlights of recent results (CLAS/CLAS12)
- Update on HPS
- The current run: Prad II/X17
- R1 μRWELL upgrade
- Software group update
- CalCom activities
- Tentative run plan for coming years
- Summary

Hall B staffing

- Veronique Ziegler is leaving the Hall B group and will be returning as a user in a few months. To thank her for her many contributions and wish her well, we will hold a farewell reception during the coffee break this afternoon.

  Veronique has been a cornerstone of the CLAS12 software effort. Since joining Jefferson Lab in 2011, she has played a leading role in developing our reconstruction and calibration software, including tracking algorithms and detector calibration tools for both the Forward and Central Detectors. Her impact on the success of CLAS12 has been profound and far-reaching. The scientific output of CLAS12 would not be where it is today without her dedication, expertise, and leadership. We thank Veronique for her outstanding service and wish her every success in the next chapter of her career.

Hall B staffing (continued)

- Hiring in progress:
  - a technician to replace Calvin Mealer
  - a designer to replace Christopher Guthrie
- The Hall B postdoctoral fellow position, which was left vacant after Richard Tyson departed, is now open (we could not begin hiring earlier due to budget constraints). Daniel Carman is chairing the hiring committee, and we are collecting applications (for another few weeks).
- We also expect to fill the staff scientist position later this year.

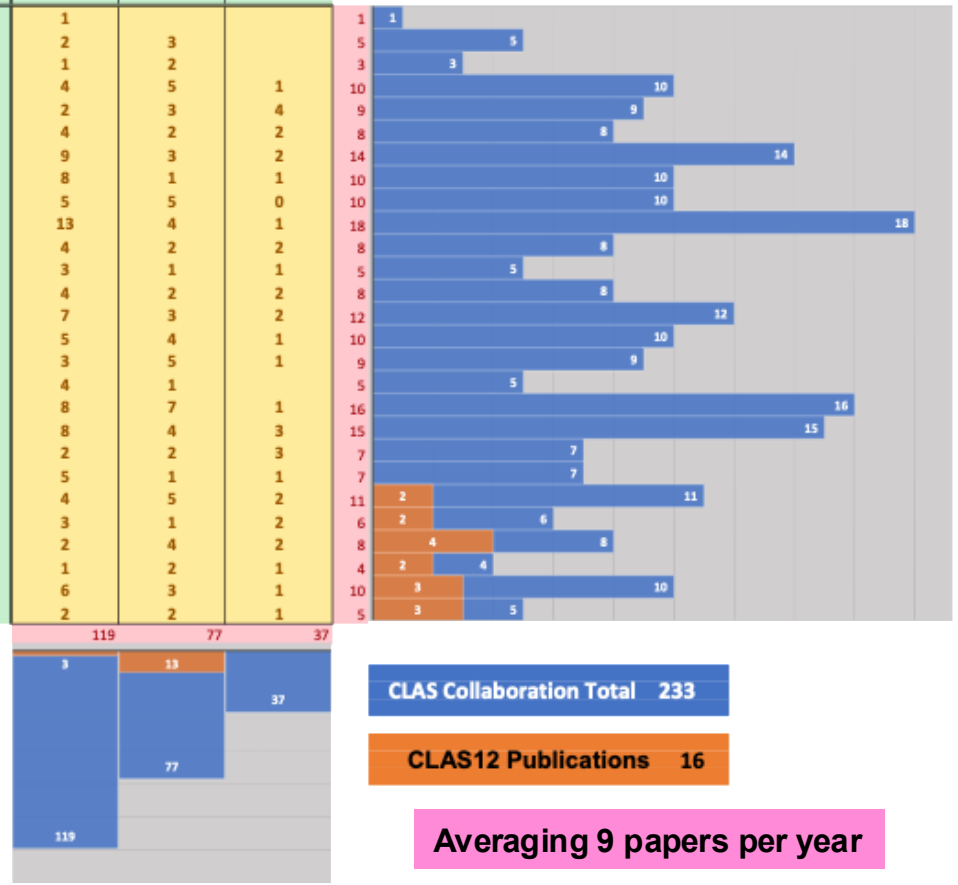
Activities in CY26

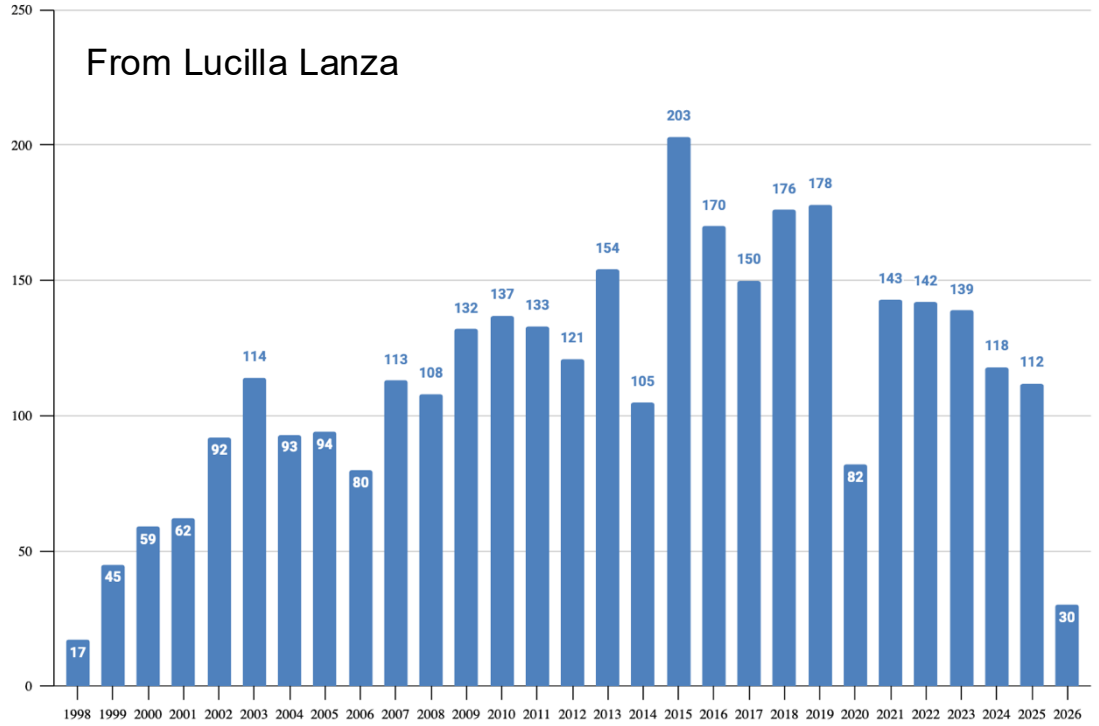
1. Completed the Prad II experiment and transitioning to the X17 experiment.
2. Preparing for FY27 run period: schedule includes RG-K and RG-E. There will be a low-energy (~1 GeV/pass) period at the beginning, about 21 PAC days. Hall B is TBD (HPS, …).
3. Preparations for the next CLAS12 run include partially completing the BMT upgrade and module replacement. *The project is fully approved and funded.*
4. The high-luminosity R1 upgrade – the second prototype was received from CERN in mid-April, and cosmic tests are in progress. Design of the full-size detector continues.
5. Started preparations for the RG-H run (in FY30), including completing the field calculation and beginning the beamline design with the magnet, accelerator, and engineering groups.
6. Continue advancing simulations and a full reconstruction of the μCLAS12 detector system. *The proposal has been converted into an article and has been accepted for publication in EPJ.*
7. Address key Pass-3 objectives, including improvements to calibration suites, acceleration of the calibration workflow, and enhancements to forward and [possibly] CVT tracking.
8. PAC 54 – Collaboration submitted one proposal and two LOI.

Physics publications and Conference presentations

Maintain a strong publication record in 2026: 1 is going through author check, 4 are in ad hoc review, and 1 is ready for ad hoc review. We are on track to exceed last year's publication output, driven largely by CLAS12 results.

Year	HSWG	DPWG	NPWG
2000	1		
2001	2	3	
2002	1	2	
2003	4	5	1
2004	2	3	4
2005	4	2	2
2006	9	3	2
2007	8	1	1
2008	5	5	0
2009	13	4	1
2010	4	2	2
2011	3	1	1
2012	4	2	2
2013	7	3	2
2014	5	4	1
2015	3	5	1
2016	4	1	
2017	8	7	1
2018	8	4	3
2019	2	2	3
2020	5	1	1
2021	4	5	2
2022	3	1	2
2023	2	4	2
2024	1	2	1
2025	6	3	1
2026	2	2	1
	119	77	37





Conference and workshop participation appears lower this year, possibly due to underreporting to the PPC and/or travel funding constraints.

More news

- Mariana Tenorio Pita (ODU) defended her PhD on June 22. Congratulations, Dr. Pita!
- The paper by J. S. Alvarado, N. Baltzell, M. Bondi, P. Chatagnon, et al., "*Electro- and photoproduction of muon pairs with μCLAS12: Double Deeply Virtual Compton Scattering, Timelike Compton Scattering, and J/ψ production*" has been accepted for publication in EPJ (2605.11690).
- The paper "*Electromagnetic production of kaons on the nucleon*", by Terry Mart, Jovan Alfian Djaja, and Daniel S. Carman, has been published in Progress in Particle and Nuclear Physics 150 (2026) 104252.
- The Journal of Symmetry is organizing a Webinar on the Topical collection chaired by Prof. Dr. Victor I. Mokeev, titled "*Shedding Light on Emergence of the Nucleon Resonance Structure from QCD in Experiments with Electromagnetic Probes*," as part of the MDPI Symmetry Webinars series. [Details in Victor's talk].

Recent results: CLAS12

Paper J. S. Alvarado, M. Hoballah, and E. Voutier, "High precision measurements of Deeply Virtual Compton Scattering at small nucleon momentum transfer" in ad hoc review.

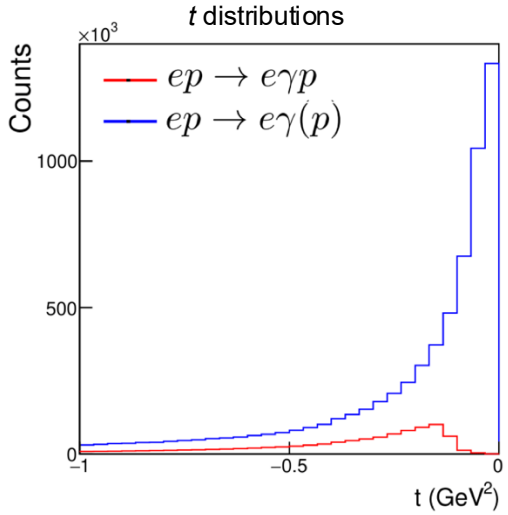
First DVCS studies in $ep \to e'\gamma(p)$ reaction, extending kinematical coverage to low -$|t| \to |t_{min}|$.

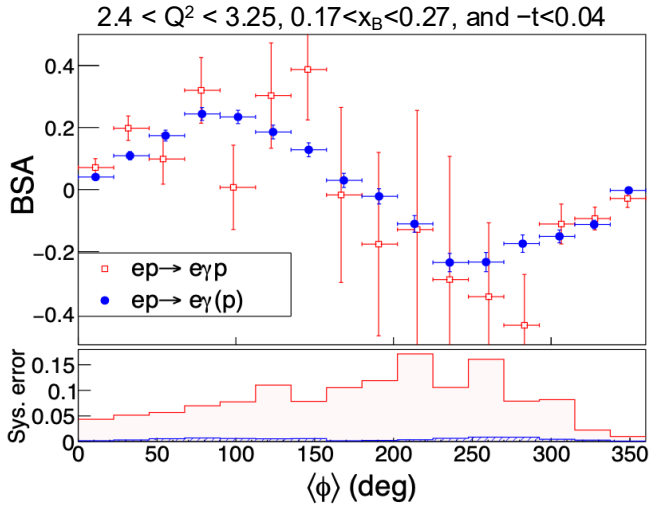
The most important observables are not determined by the form factors at large momentum transfer, but by their values and slopes at $t = 0$. Extending measurements to the lowest possible $|t|$ therefore directly improves our knowledge of the nucleon's mass distribution, angular momentum, and internal forces.

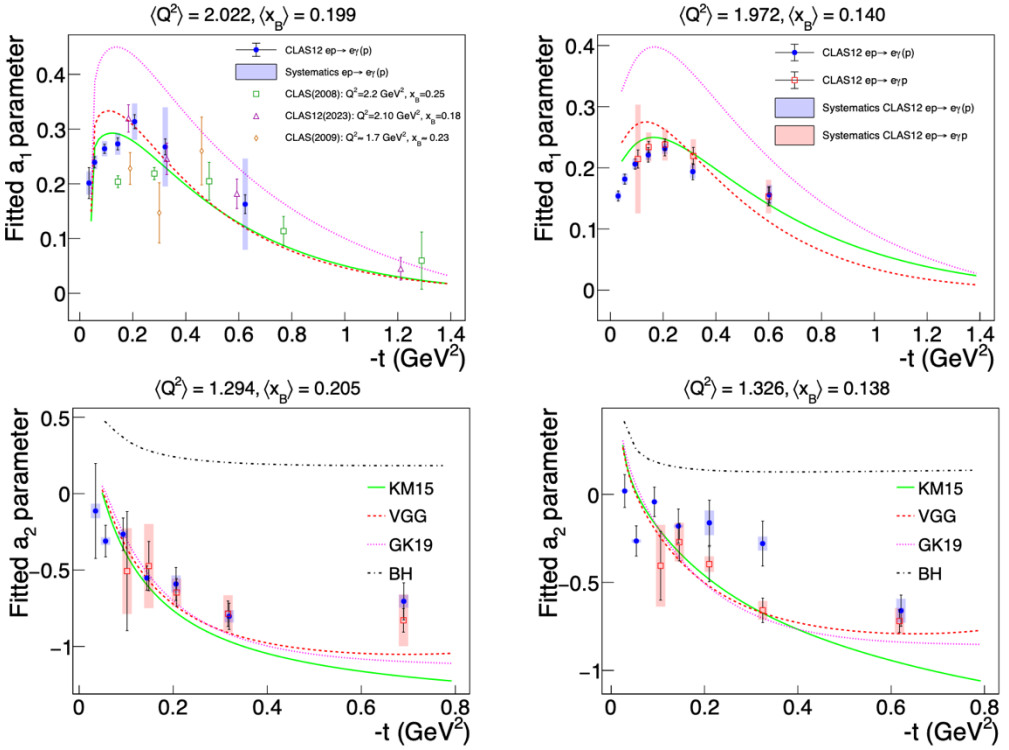
The largest uncertainty is from extrapolating towards $t = 0$

$$J_Q = \sum_q \frac{1}{2} \int_{-1}^{1} dx\, x(H^q(x,\xi,0) + E^q(x,\xi,0)) \qquad \langle r_m^2 \rangle = 6 \frac{dA(t)}{dt}|_{t=0}$$

$$p(r),\ s(r) \iff D(t)$$

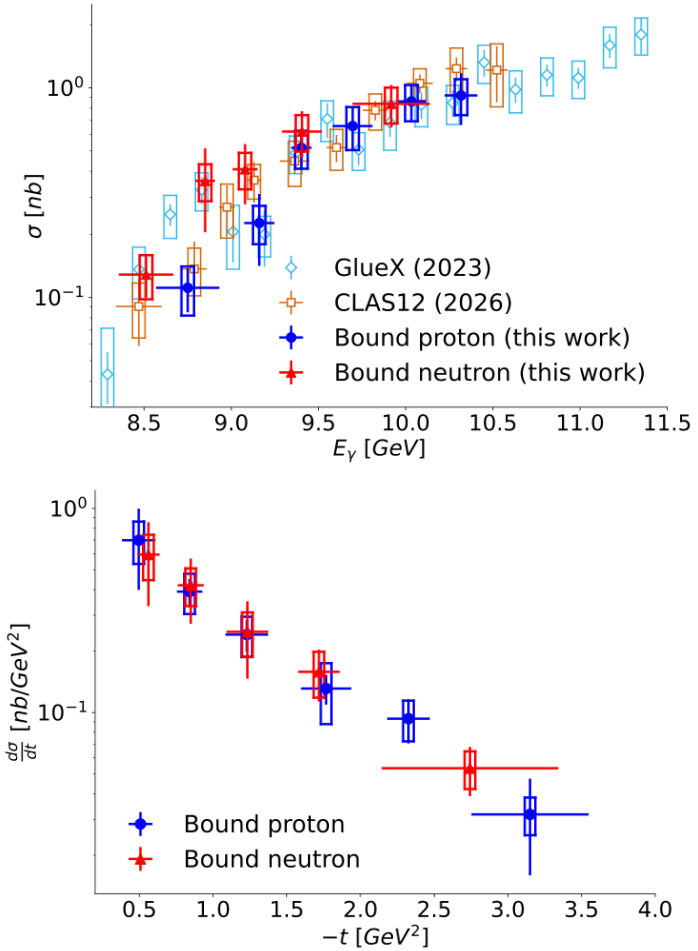




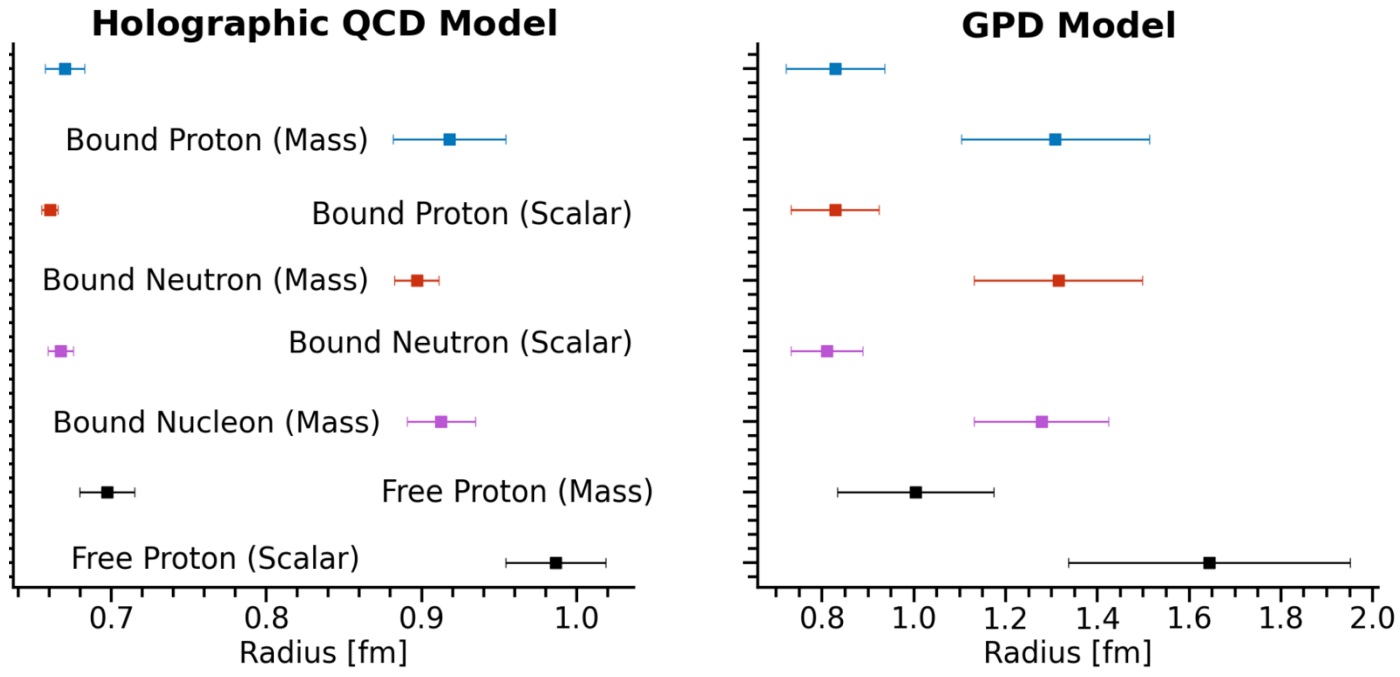


Recent results: CLAS12

Paper R. Tyson *et al.*, "Measurement of Near-Threshold J/ψ Quasi-real Photoproduction on the Proton and Neutron at CLAS12," soon to be in ad hoc review.



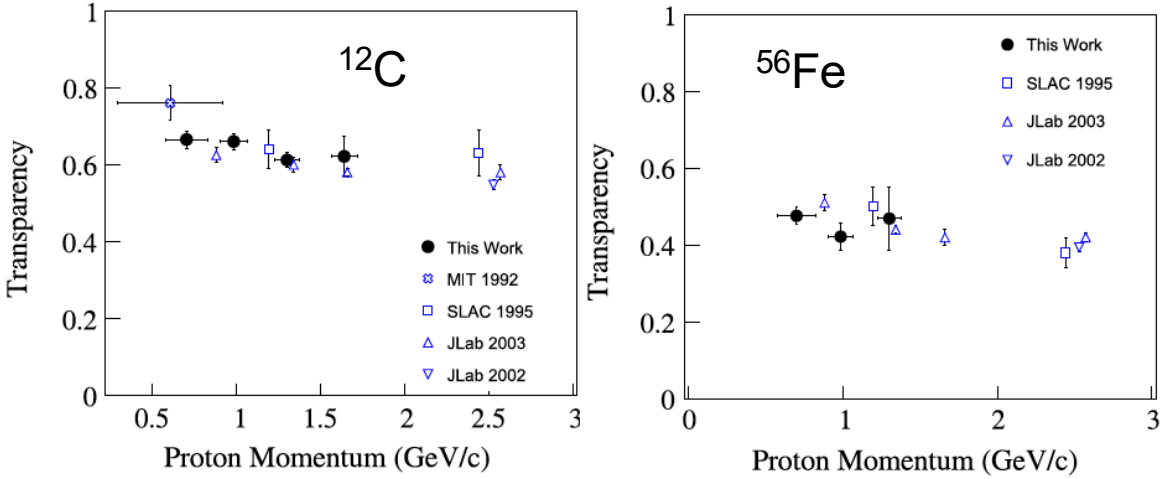
First exclusive near threshold photoproduction measurement of $\gamma n \to n' J/\psi$, enabling a comparison of gluonic properties in the neutron and proton, as well as in free and bound nucleons, including the gluonic mass and scalar radii.

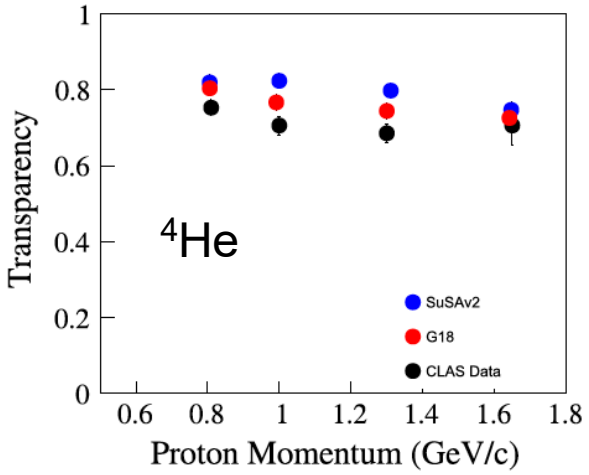


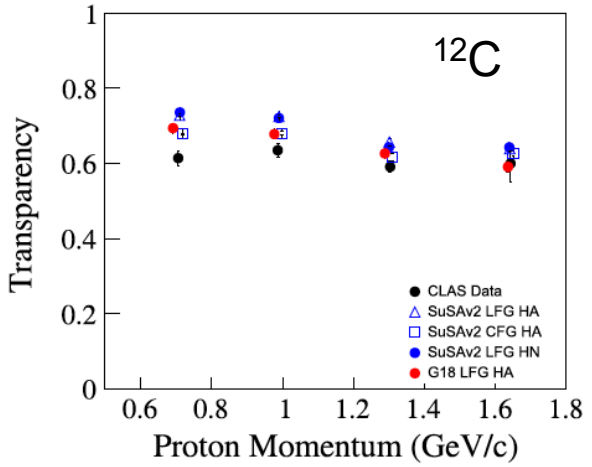
Recent results: CLAS

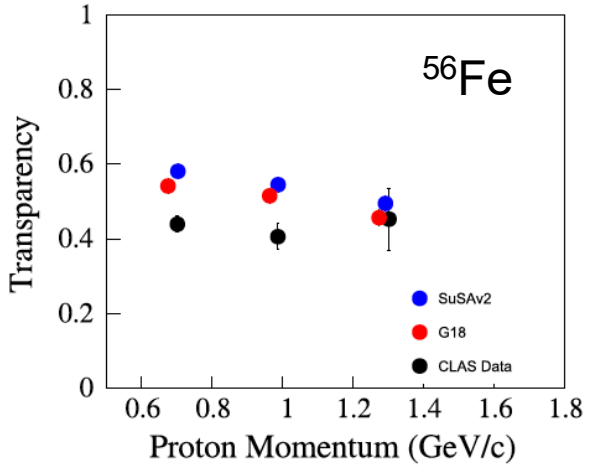
S. Dytman *et al.*, [the CLAS collaboration], "Proton transparency and neutrino physics: New methods and modeling," Phys. Rev. D 113, 092007 (2026).

- The aim is to study the propagation of hadrons (in this case, protons) through nuclear matter to improve event generators used in neutrino oscillation and cross-section experiments.
- A key feature of this study is that the nuclear transparency is determined directly from the data as the ratio of QE $(e, e'p)$ events to QE (e, e') events, where a proton should have been detected. This data-driven definition avoids relying on model-based expectations used in previous studies.
- CLAS data from e2a – 1999 – are used, with nuclear targets ^{4}He, ^{12}C and ^{56}Fe, with electron beams of 2.26 GeV and 4.46 GeV.



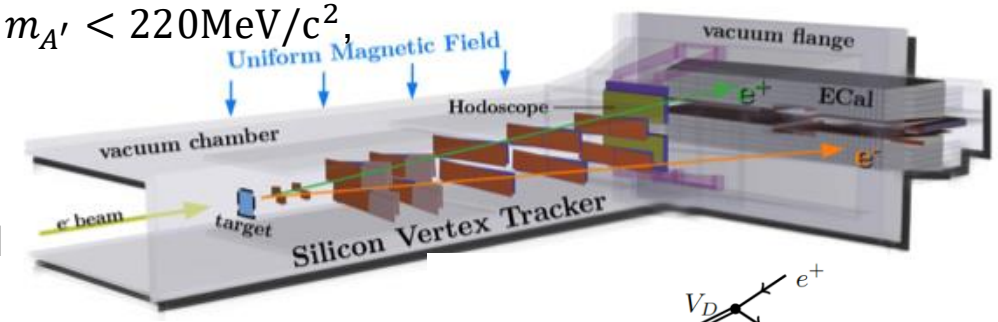




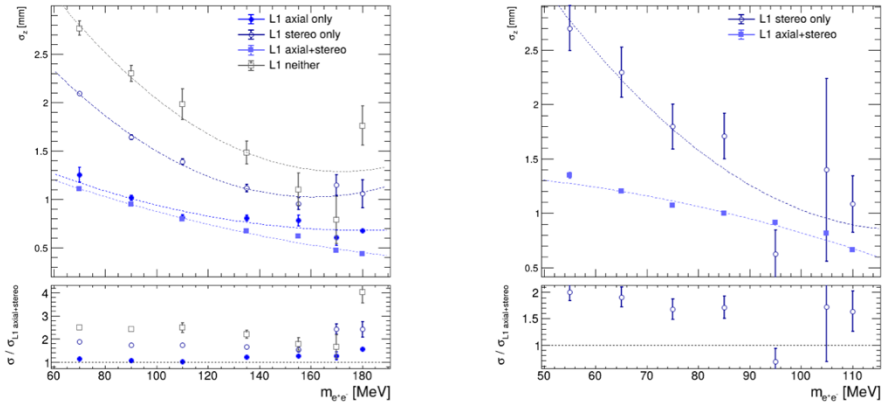


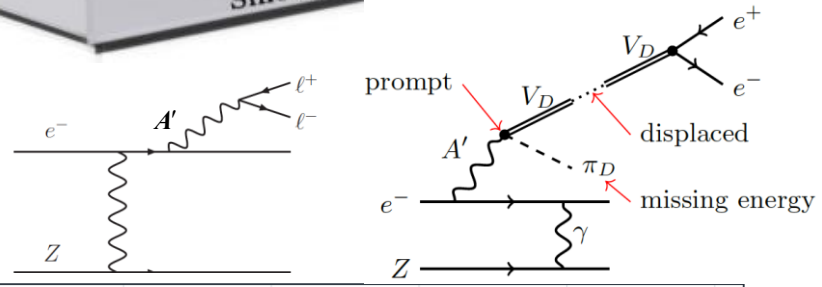
HPS update

- HPS exploits resonance and displaced vertex signatures to search for dark photons (A') over a wide range of couplings, $\epsilon^2 > 10^{-10}$, and masses, $20\text{MeV}/c^2 < m_{A'} < 220\text{MeV}/c^2$, using a compact, large-acceptance forward spectrometer.
- A number of publications from 2015 and 2016 *engineering* run data for canonical A' and SIMPs candidates.
- Recently, the collaboration completed processing of the 2021 data, and analysis of the blinded 1% sample is ongoing.

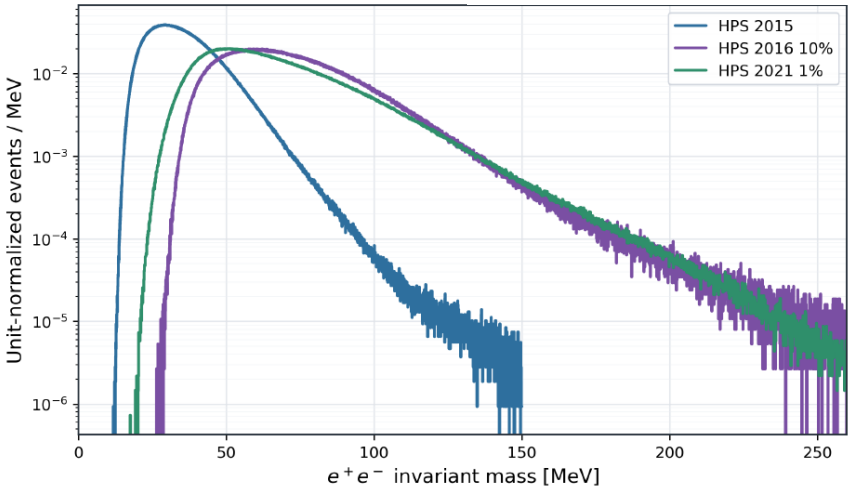


- The essential goal of the detector upgrade in 2017-2028 was to improve the vertex resolution, bringing it down to $\sigma_z \sim 1$ mm.





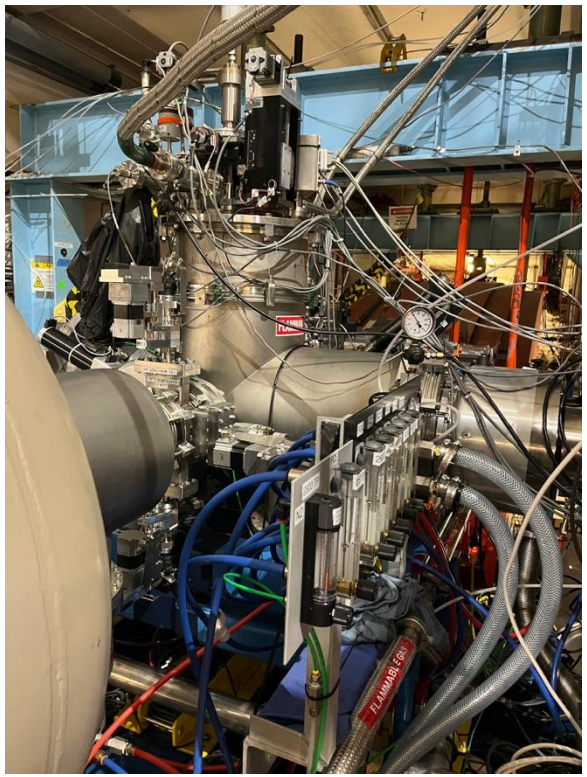
- Another important development in analysis is the implementation of Gaussian process regression (GPR) for bump-hunt searches. GPR is used to predict the unknown background in the fit region and to estimate uncertainties. GP is trained on bins across the full mass range except for a narrow excluded region of the signal.

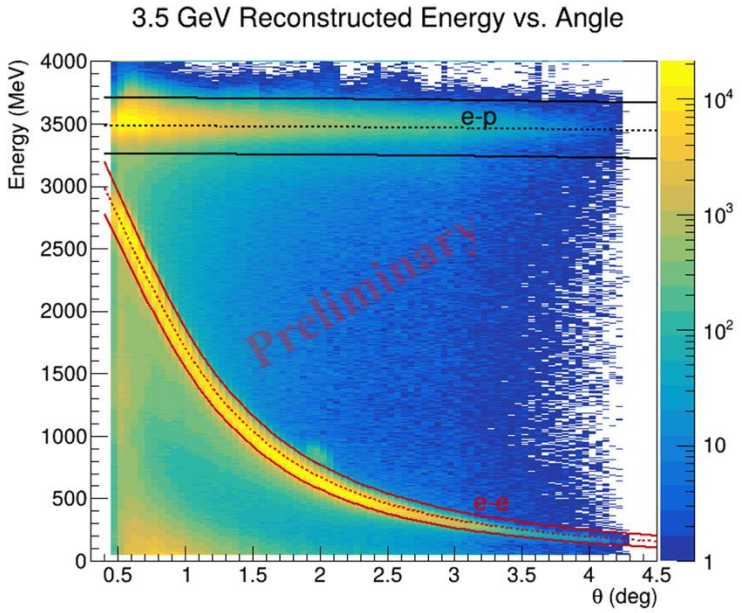


More in Nathan Baltzell's talk.

PRad II

Installation completed at the end of March. The first beam at 3.5 GeV was delivered on April 5.

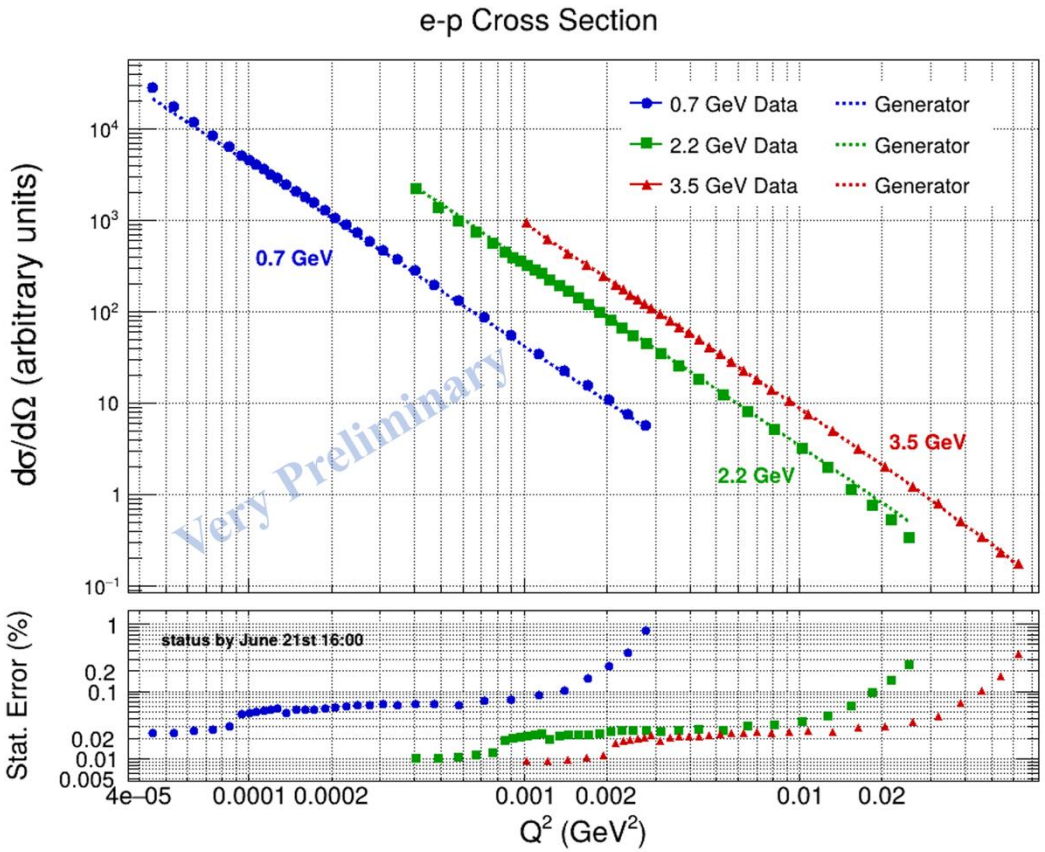




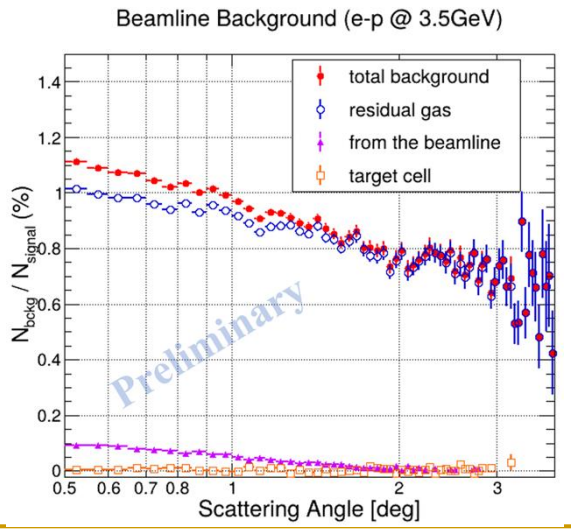
- What started out as a very challenging endeavor, with a wiggly beam (especially at high passes), a large bleed-through from other halls, and an improvised HyCal calibration, ended up being a very successful run.
- All planned data at beam energies 0.7 GeV, 2.1, and 3.5 GeV were successfully collected.

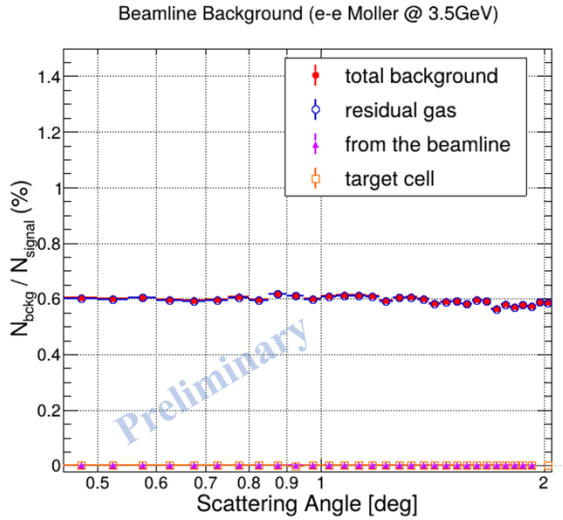
PRad II – exceptionally successful run!

The experiment achieved, and in many cases exceeded, its original goals and performance expectations.



	PRad-I	PRad-II
H2 cell pressure	470/2.7 mTorr	**1030/4.3 mTorr**
H2 gas flow	600 cc/min	**1300 cc/min**
H2 gas density	2x10^{18} H/cm^2	**5.5x10^{18} h/cm^2**
Scatt. Cham. pressure	0.5 mTorr	**0.012 mTorr**
GEM	1-plane, No Tracking	**2-planes, with Tracking**
HyCal	Full HyCal, $PbWO_4$ +Pb-glass	Only $PbWO_4$
Beam Background	~ 10-30% for ep-events	**~ 2% for ep-events**
DAQ rate	4-5 kHz	**20-25 kHz**
Beam current	~ 50 nA	**~ 600 nA**
Luminosity	~ 6x10^{29} /cm^{2}s	**~ 2.6x10^{31} /cm^{2}s**
Q^2 Range	~ 10^{-4} GeV^2, No Veto counters	~ **10^{-5} GeV^2**, with Veto counters (Moller background suppression)





More in Ashot Gasparian's talk.

Congratulations to the Prad collaboration! Excellent execution of the run!

Well-organized, very efficient, coherent, and safe work by students, postdocs, and senior members.

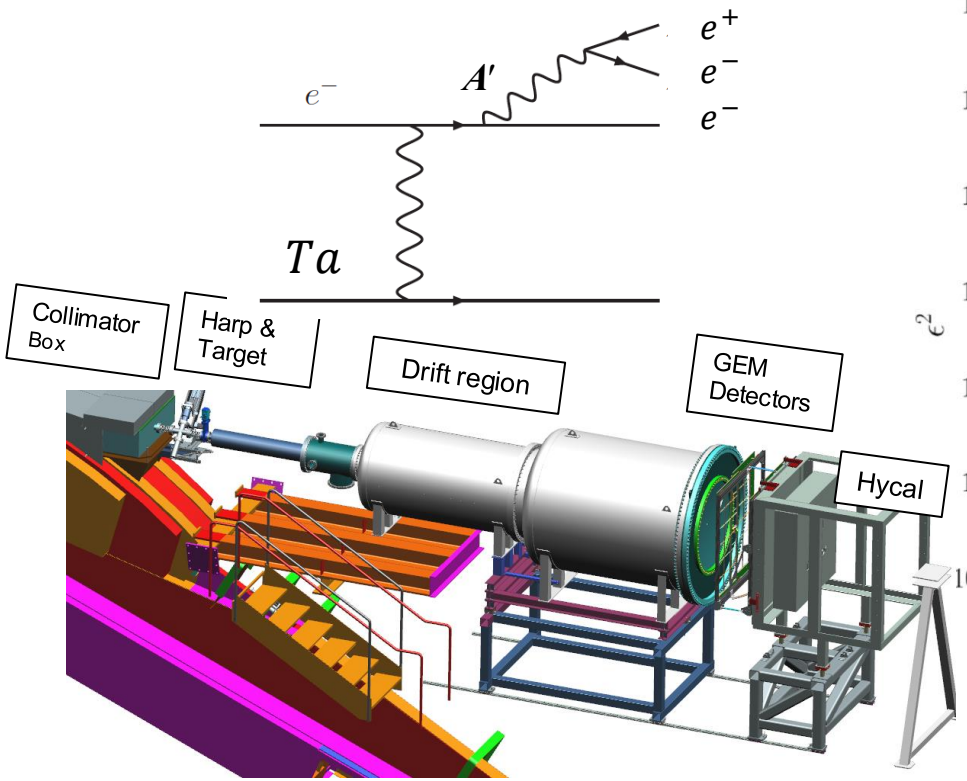
Many thanks to the Hall B staff, technicians, engineers, and physicists.

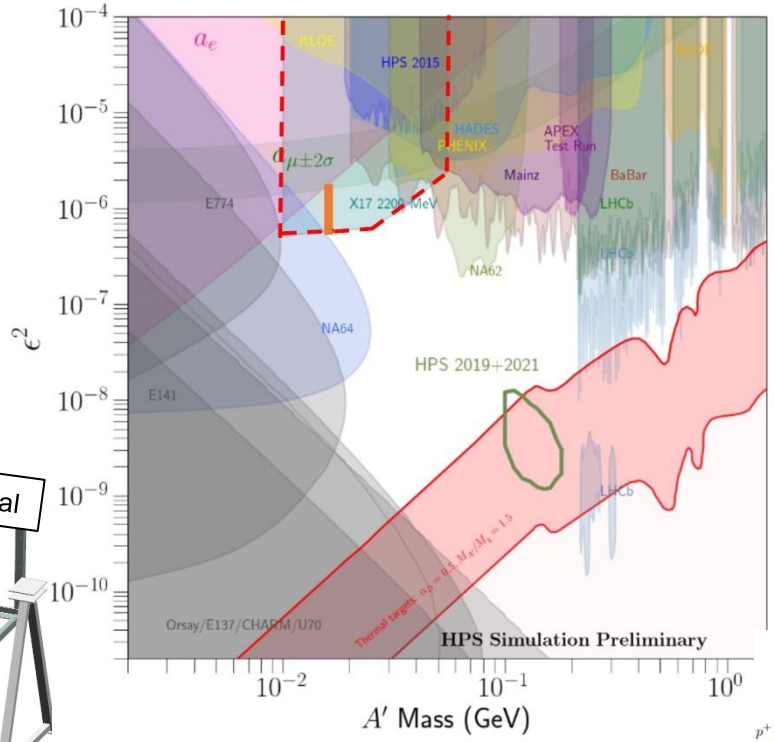
Special thanks to the target group; James Brocke's involvement was crucial in the operation of the complex H_2 gas-jet target.

Of course, we could not have done this without Fast Electronics and Detector Support groups.

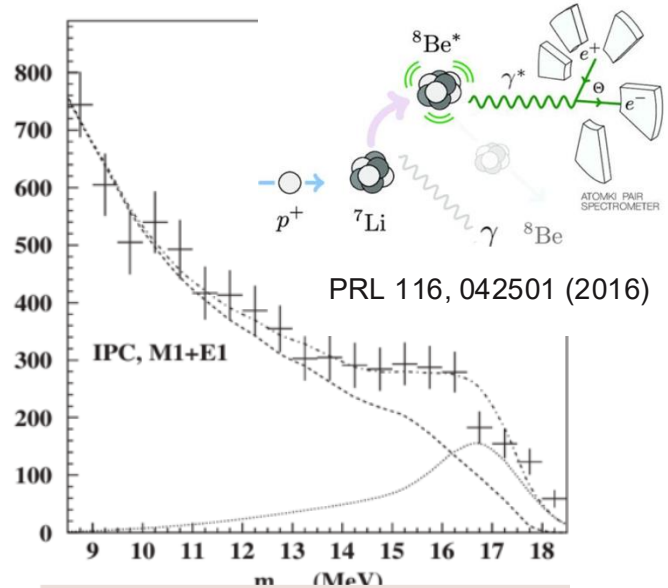
Next experiment – X17

- The transition from Prad II to X17 is underway.
- The experiment will run from Wednesday or Thursday (when the beam becomes available) until the end of August.
- The same PRad II detector system, 4 μm tantalum, and 2.1 GeV beam.
- Trigger is a triple coincidence in HyCal.





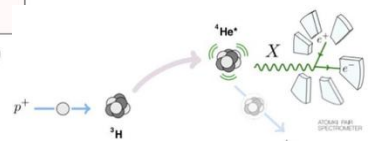
- The goal of the experiment is to search for a hypothetical neutral boson at 17 MeV, seen in nuclear transitions by the Atomki group.



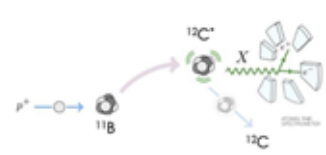
PRL 116, 042501 (2016)

$m_X c^2 = 16.70.35_{stat} 0.5_{syst}$ MeV

PRC **104**, 044003 (2021)

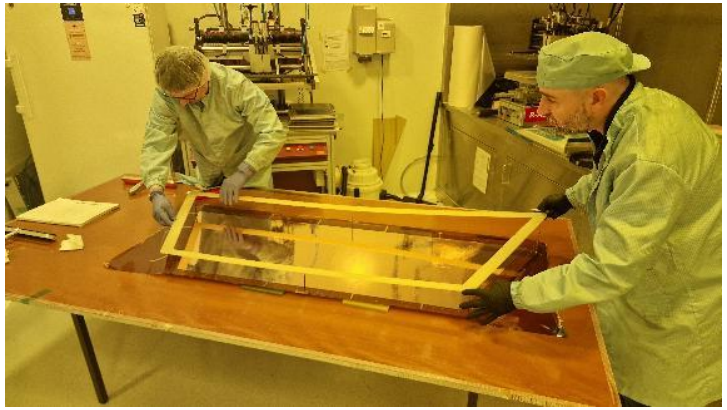


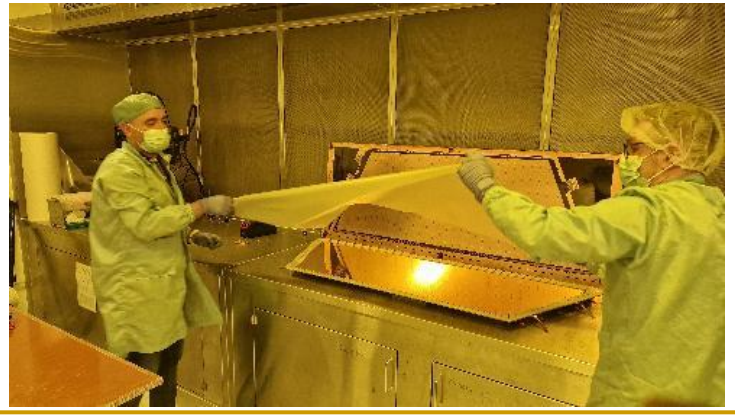
PRC **106**, L061601 (2022)



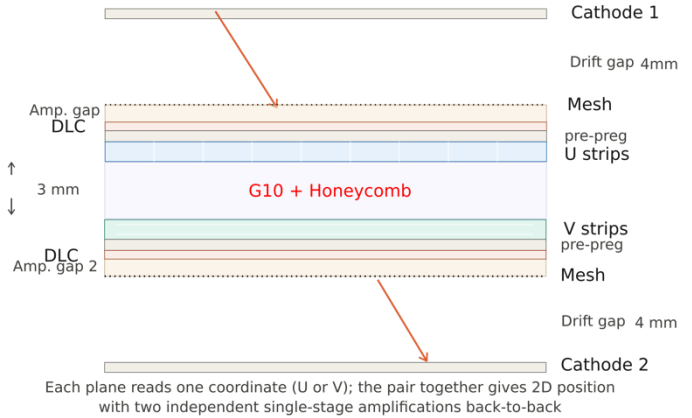
CLAS12 luminosity upgrade – R1 μRWell project

- The 2nd μRWELL prototype (V7), with near-final arrangements for the readout layers, was fully assembled at the CERN MPGD group and arrived in April as expected.
- 2X1-D detectors are almost identical; they differ only in the pre-preg thickness of the μRWells.

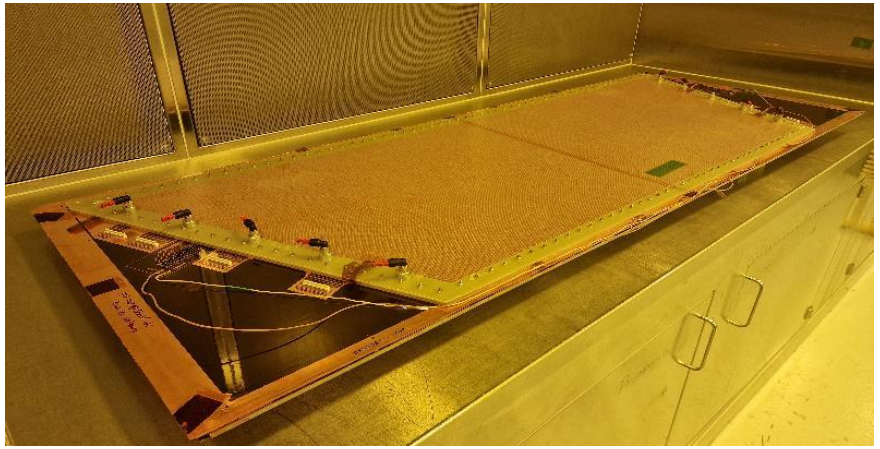




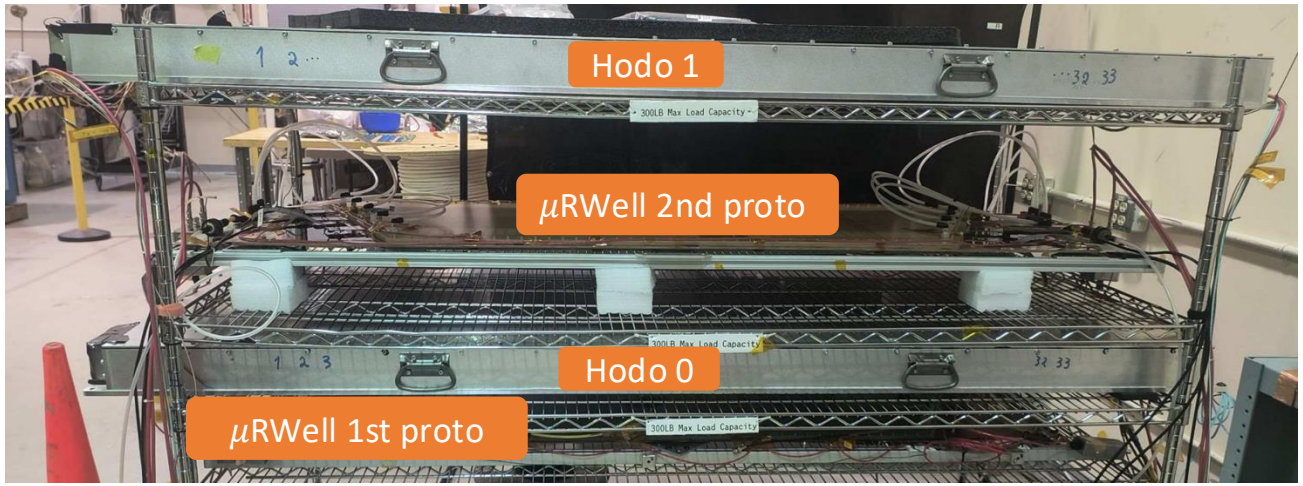
2nd prototype: Dual 1D detector

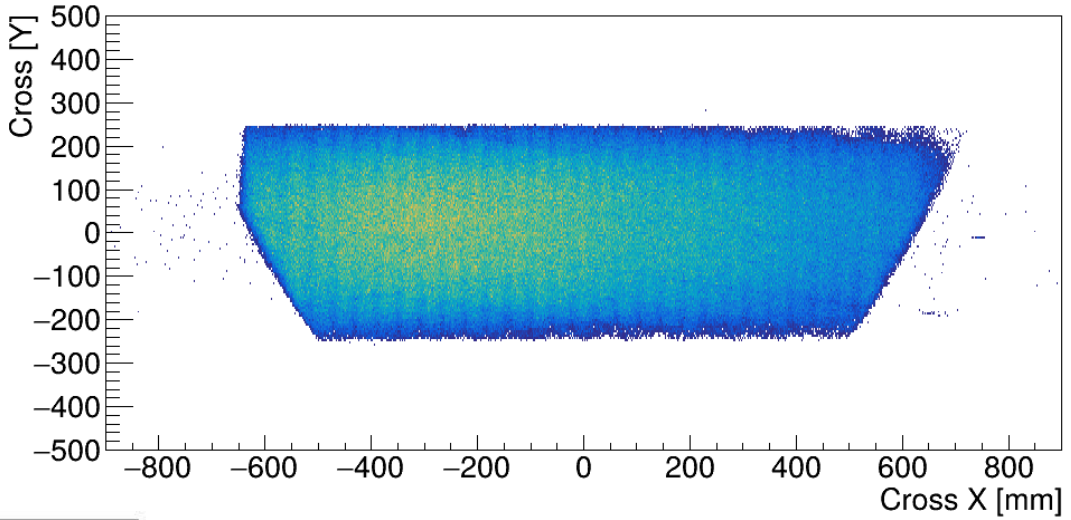


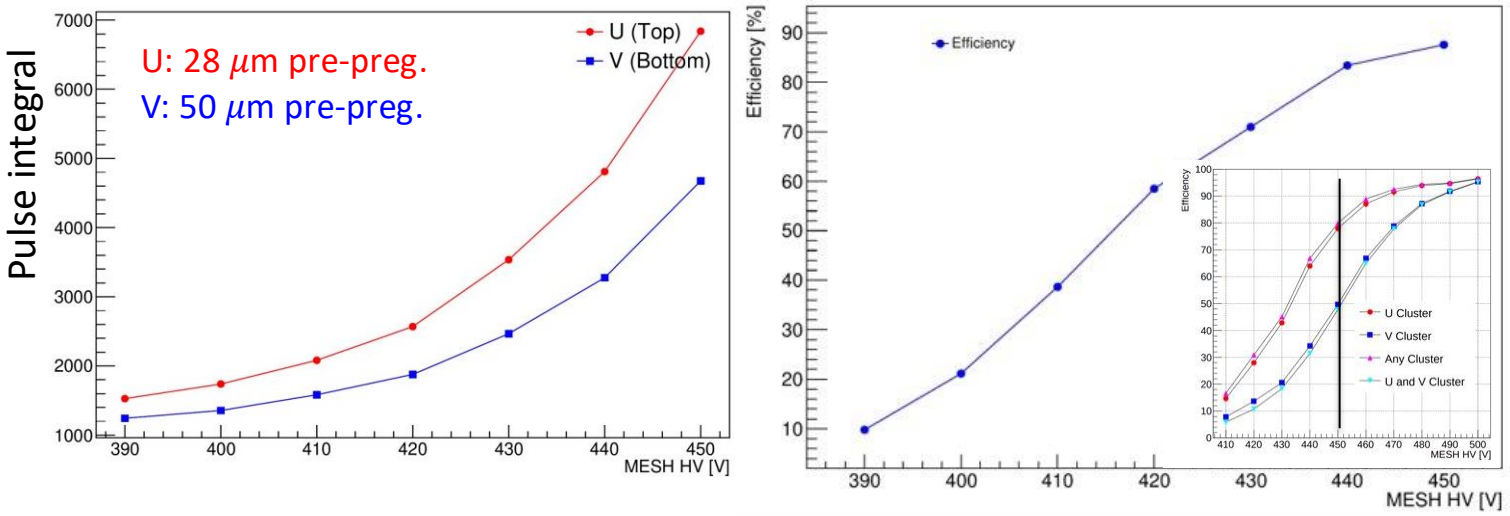
Each plane reads one coordinate (U or V); the pair together gives 2D position with two independent single-stage amplifications back-to-back



Ongoing tests of new μRWell prototype (v7 design)







- After a month of preparations, cosmic tests are in full swing.
- Got the expected efficiency results, higher than the 1st prototype with capacitive sharing and higher for thinner pre-preg.
- Challenge: time resolution is ~ 35 ns for UV coincidence.
- Parallel efforts by Fast Electronics Group:
  - Finishing design of the VMM3 RO board w/ Hirose connectors,
  - Panasonic-to-Hrose adapter design is nearly complete,
  - By the end of summer, boards should be ready to read out μRWell with VMM3.

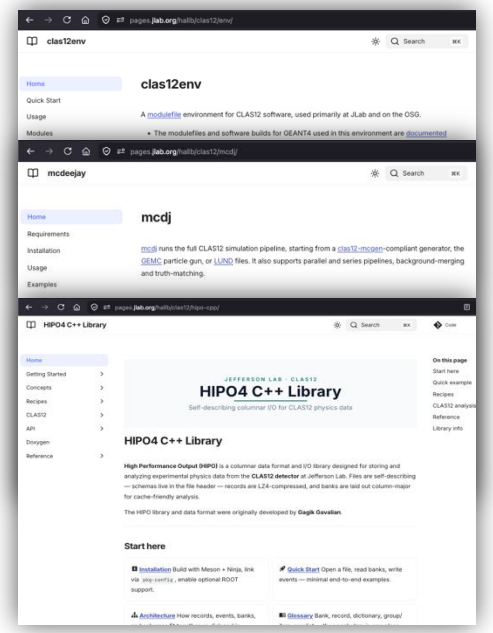
The results of this prototype test and what we learn from operating it will define the final design of the full module.

CLAS12 S&C Status

- Gemc and Coatjava now capable of real-run-number simulations
- Coatjava and Gemc: RG-L/ALERT/AHDC/ATOF upgrades, RG-H recoil detector and μRWell URWT merged, μCLAS12 detector available
- OSG simulations running smoothly; Smooth processing of RG-E and RG-K, 80 billion events, 1.5 PB, due to the JLab farm changes since RG-D
- Coatjava speedups, scaling, profiling improvements; Decoding now CLARA-fied and multi-threaded, in use by RG-L
- HIPO/C++ library multi-threading upgraded, Iguana PID and correction algorithm additions and thread safety, mcdj for user-friendly running of the simulation pipeline
- Various documentation upgrades, *software wiki next ...*

2026.5

- *Move to CCDB v2 schema and software*
- *Clasdb upgraded, more needed for mysql apps, e.g., service/speakers*
- *Leveraging real-run-number simulations, OSG submit portal updates; Leverage workflow improvements with offsite computing resources*
- *RICH integration in EB/DSTs*
- *Fast MC, kinematic fitting, ...*



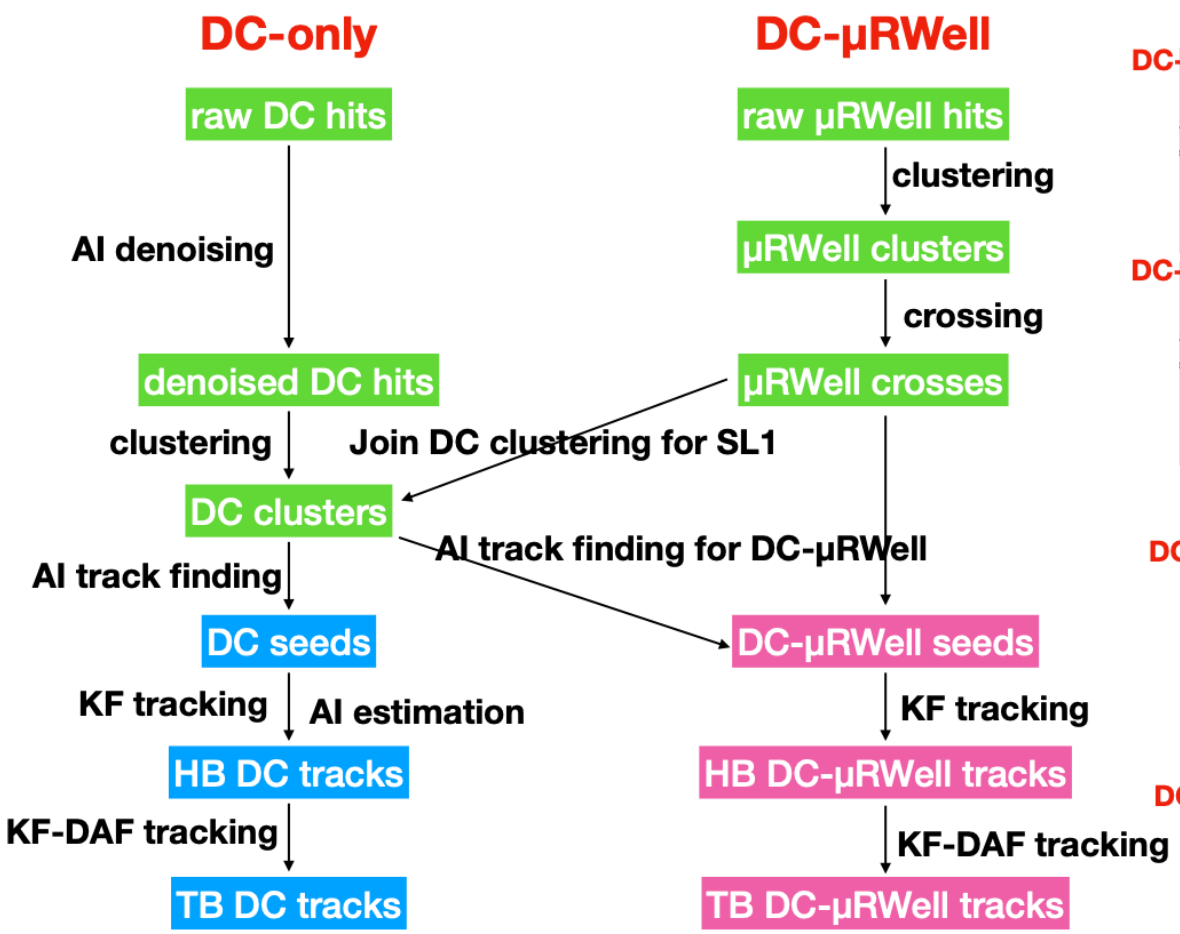
	+/- Track Inefficiency (%) per nA	
	Pass 2	***Now***
RG-A	0.143 / 0.140	0.077 / 0.074
RG-B	0.225 / 0.199	0.106 / 0.100
RG-D	0.167 / 0.159	0.079 / 0.087

Forward tracking

- μRwell+DC framework is final and comprehensively upgraded
- DC-only inefficiency down to <0.1%/nA, and ~0.1%/nA with FT, resolution and speed improvements
- *Some digitization, resolution, covariance tuning work remains ...*

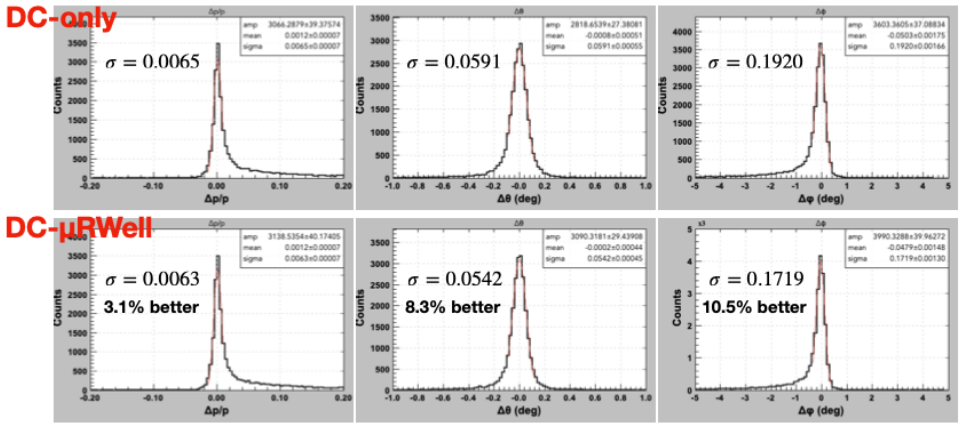
Slide from Nathan

Offline Software update – progress on FD tracking



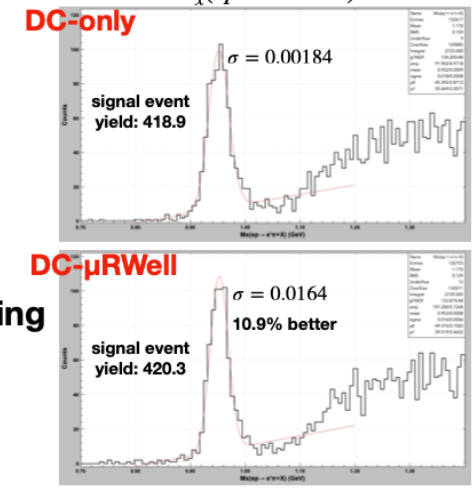
- Development for DC–uRWell tracking framework is essentially done.

MC for e^-



MC for RGA with 50nA Bg

$M_x(ep \rightarrow e'\pi^+X)$



- Inclusion of μRWell improves tracking resolution.
- DC-only tracking efficiency in the MC sample exceeds 98%, which is higher than that observed in experimental data.
- To reliably evaluate impact of μRWell on tracking efficiency, simulation needs to be refined so that it more closely reflects the experimental environment.

Slide from Tontong

μCLAS12 status update

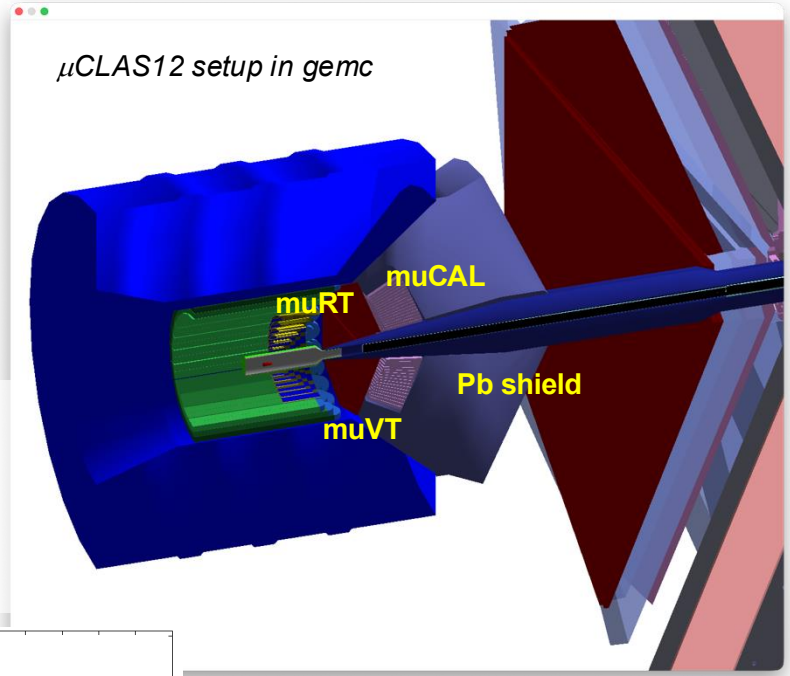
Slide from Raffaella

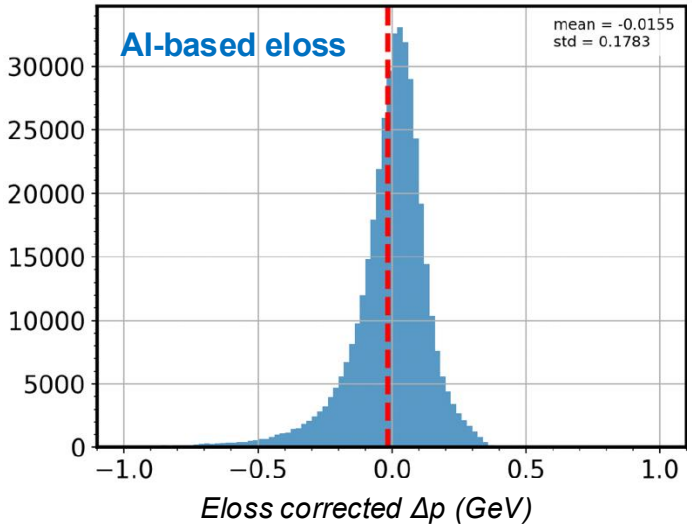
Simulations:

- μCLAS12 configuration available from gemc 5.14:
  - μCAL geometry generated from coatjava (Ethan)
  - Updated DC frames and other passive volumes
- Ready to resume background studies

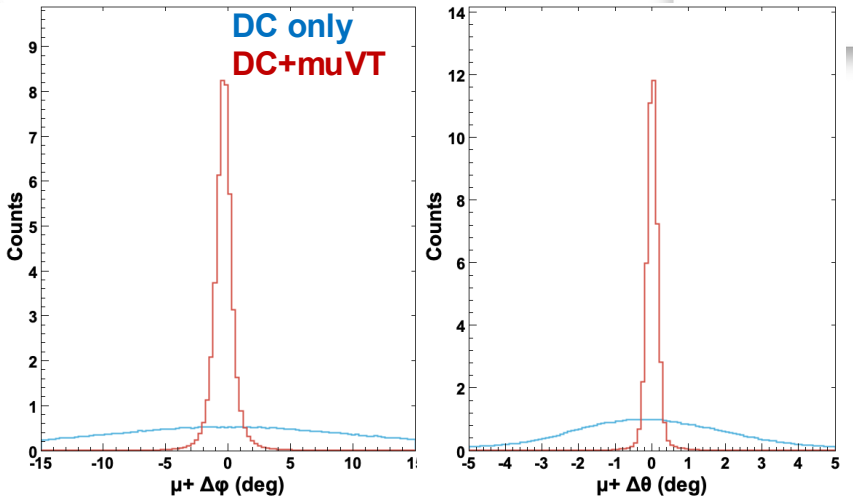
Reconstruction:

- Part of the standard coatjava releases:
  - muCAL geometry factory (Ethan)
  - muVT segment finding and matching to DC
  - AI network for muon track propagation through the shield (Kayleigh&Tongtong)

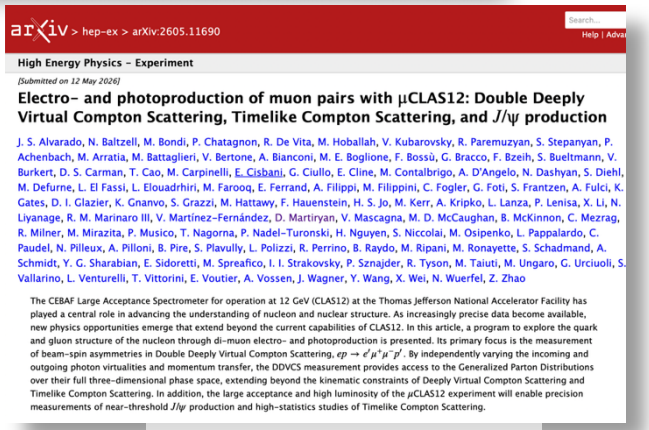




Eloss corrected Δp (GeV)



Reconstructed muon vertex angles


arXiv > hep-ex > arXiv:2605.11690

High Energy Physics – Experiment

[Submitted on 12 May 2026]

Electro– and photoproduction of muon pairs with μCLAS12: Double Deeply Virtual Compton Scattering, Timelike Compton Scattering, and J/ψ production

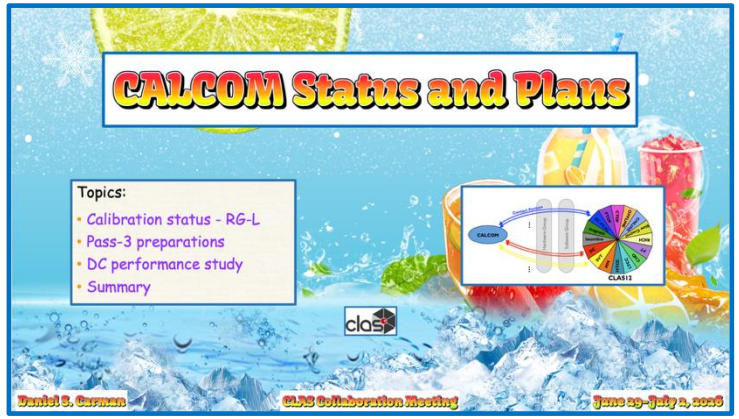
J. S. Alvarado, N. Baltzell, M. Bondi, P. Chatagnon, R. De Vita, M. Hoballah, V. Kubarovsky, R. Paremuzyan, S. Stepanyan, P. Achenbach, M. Arratia, M. Battaglieri, V. Bertone, A. Bianconi, M. E. Boglione, F. Bossù, G. Bracco, F. Bzeih, S. Bueltmann, V. Burkert, D. S. Carman, T. Cao, M. Carpinelli, E. Cisbani, G. Ciullo, E. Cline, M. Contalbrigo, A. D'Angelo, N. Dashyan, S. Diehl, M. Defurne, L. El Fassi, L. Elouadrhiri, M. Farooq, E. Ferrand, A. Filippi, M. Filippini, C. Fogler, G. Foti, S. Frantzen, A. Fulci, K. Gates, D. I. Glazier, K. Gnanvo, S. Grazzi, M. Hattawy, F. Hauenstein, H. S. Jo, M. Kerr, A. Kripko, L. Lanza, P. Lenisa, X. Li, N. Liyanage, R. M. Marinaro III, V. Martínez-Fernández, D. Martiryan, V. Mascagna, M. D. McCaughan, B. McKinnon, C. Mezrag, R. Milner, M. Mirazita, P. Musico, T. Nagorna, P. Nadel-Turonski, H. Nguyen, S. Niccolai, M. Osipenko, L. Pappalardo, C. Paudel, N. Pilleux, A. Pilloni, B. Pire, S. Plavully, L. Polizzi, R. Perrino, B. Raydo, M. Ripani, M. Ronayette, S. Schadmand, A. Schmidt, Y. G. Sharabian, E. Sidoretti, M. Spreafico, I. I. Strakovsky, P. Sznajder, R. Tyson, M. Taiuti, M. Ungaro, G. Urciuoli, S. Vallarino, L. Venturelli, T. Vittorini, E. Voutier, A. Vossen, J. Wagner, Y. Wang, X. Wei, N. Wuerfel, Z. Zhao

The CEBAF Large Acceptance Spectrometer for operation at 12 GeV (CLAS12) at the Thomas Jefferson National Accelerator Facility has played a central role in advancing the understanding of nucleon and nuclear structure. As increasingly precise data become available, new physics opportunities emerge that extend beyond the current capabilities of CLAS12. In this article, a program to explore the quark and gluon structure of the nucleon through di–muon electro– and photoproduction is presented. Its primary focus is the measurement of beam–spin asymmetries in Double Deeply Virtual Compton Scattering, $ep \to e'\mu^+\mu^- p'$. By independently varying the incoming and outgoing photon virtualities and momentum transfer, the DDVCS measurement provides access to the Generalized Parton Distributions over their full three–dimensional phase space, extending beyond the kinematic constraints of Deeply Virtual Compton Scattering and Timelike Compton Scattering. In addition, the large acceptance and high luminosity of the μCLAS12 experiment will enable precision measurements of near–threshold J/ψ production and high–statistics studies of Timelike Compton Scattering.

Accepted by EPJA

CALCOM Status and Plans – June 2026

Daniel Carman, chair



- Data processing is complete for RG-E and RG-K (FY24 datasets).
- A quick turnaround compared to RG-D is largely due to JLAB computing farm upgrade and an increase in Hall B fairshare.

RG-L (FY25) calibration status:

- FD calibrations are almost complete. A few systems: DC, FT-Cal, FT-Hodo, and HTCC are in progress and are expected to be done by the end of summer.
- ALERT: AHDC and ATOF calibrations are progressing toward completion by sometime in the fall.

Pass-3 preparations:

- Suite development: improved fitting convergence, batch farm compatibility, DC suite benchmarking
- Workflow improvements: decoding speedup, configuration file streamlining, single chef model
- Reconstruction development: new DC denoising algorithm, HBT with AI methods, studies of CVT reconstruction
- Calibration procedure tracking: new calibration dashboard
- Miscellaneous checks: studies of the systematics of FD tracking to resolve charge-dependent z-vertex

The biggest open question for starting pass-3 processing of some of the already-processed large datasets is whether substantive improvements in CVT tracking can be achieved.

Also, the CCC should decide which dataset to prioritize first.

Tentative run plan

Start with a low-energy (~1 GeV/pass) machine, about 21 PAC days. Hall B is TBD.

FY27

Run Group	Setup / Status	Target	Beam Energy	Start Date	End Date	Scheduled Calendar Days	Remaining PAC Days Before Run	Scheduled PAC Days	Actual PAC Days from ABUs	Remaining PAC Days After Run
RG-E		liq. D2 & nucl. doublet	11			66	33	33		0
	reconfigure	change				7		4		
RG-K		liq. H2	8.8			120	52	60		0
							sum:	**97**		

FY28

Run Group	Setup / Status	Target	Beam Energy	Start Date	End Date	Scheduled Calendar Days	Remaining PAC Days Before Run	Scheduled PAC Days	Actual PAC Days from ABUs	Remaining PAC Days After Run
RG-C		long. pol. NH3/ND3	11			80	40	40		0
RG-G		long. pol. 7LiD	11			110	55	55		0
							sum:	**95**		

Summary

- Hall B continues productive work on all fronts and is on track to hit the yearly average publication rate.
- Successfully completed PRad-II and now transitioning to the next experiment, X17.
- Has been several key improvements in the simulation and reconstruction software. Most notably, the implementation of the real-run number in simulations, code speed-ups, and FD tracking. Work on improvements to CD tracking is moving along.
- The CalCom group is finishing calibrations of RG-L (ALERT) and preparing to recalibrate and reprocess large datasets (Pass-3).
- The high luminosity upgrade project is moving forward. The second large-area prototype, with a near-final layer layout, has been delivered by CERN and is undergoing tests at JALB.
- The Prad and HPS collaborations in Hall B are doing well in running experiments and analyzing data.
- The run schedule for the next two years is nearly finalized, with 30 weeks of physics expected.

Experiment ID	Proposal title	Contact	PAC rating	Days approv.	PAC	Jeop. PAC	PR days	Detector	Beam energy	PR3 & Contact	Target	Days complete	% complete	Days remain	Total publications	Letter publication	Publications in peer-reviewed journals
E12-06-119(a)	Deeply virtual Compton scattering	M. Defurne	A	60	30	48, 52									1	1	PRL 130, 211902 (2023)
E12-06-108	Hard exclusive electro-production of π^0, η	P. Stoler	B	60	35	48, 52									1	1	PL B 848, 138459 (2024)
E12-12-007	Exclusive ϕ meson electroproduction	P. Stoler, C. [illegible]	B+	60	39	48, 52											
E12-06-112	Proton's quark dynamics in SIDIS pion production	H. Avakian	A	60	35	48, 52									5	5	PRL 126, 152501 (2021), PRL 128, 062005 (2022), PRL 130, 022501 (2023), PL B [illegible]
E12-06-112A,I	Semi-inclusive Λ production in target fragmentation region	M. Mirazita			42	48, 52											
E12-06-112B	Collinear nucleon structure at twist-3 in dihadron SIDIS	M. Mirazita				48, 52									1	1	PRL
E12-09-007(a)	Study of partonic distributions in kaon SIDIS	W. Armstrong	A-	110	35	48, 52	139	CLAS12	11	A L. Elouadrhiri	Liquid H_2	15	53%	65.00	1		PRC 112, 055202 (2025)
E12-12-001	Timelike Compton scattering and J/ψ photoproduction	P. Nadel-[illegible]	A-	120	39	48, 52									1	1	PRL 127, 262501 (2021)
E12-12-001A	Near threshold J/ψ photoproduction and LHCb pentaquarks	S. Stepanyan		45		48, 52									1		PRC
E12-09-003	Nucleon Resonance Studies with CLAS12	R. Gothe	B+	40	34	48, 52									2		PRC 112, 035201 (2025)
E12-06-108A	Exclusive K^* to $K\gamma$ studies with CLAS12	D. Carman		42		48, 52									1		PRC 105, 065201 (2022), PRC 112, 035206 (2025)
E12-06-108B	Transition form factor of the η' meson with CLAS12	S. Schadmand		44		48, 52											
E12-11-005	Hadron spectroscopy with forward tagger	M. Battaglieri	A-	110	37	48, 52											
E12-11-005A	Photoproduction of very strange baryon	L. Gao			40	48, 52											
E12-07-104	Neutron magnetic form factor	G. Gilfoyle	A-	30	32	48, 52											
E12-09-007(b)	Study of partonic distributions in kaon SIDIS	W. Armstrong	A-	110	35	48, 52											
E13-07-104A	Quasi-real photoproduction on deuterium	F. Hauenstein		47		48, 52											
E12-09-008	Beer-Mulders asymmetry in kaon SIDIS with H and D targets	M. Contalbrigo		56	35	48, 52	90	CLAS12	11	B S. Niccolai	Liquid D_2	39	43.33%	51			
E12-06-108B	Collinear nucleon structure at twist-3 in dihadron SIDIS	M. Mirazita		42		48, 52											
E12-11-003	DVCS on the neutron	S. Niccolai	A (H)	90	38	48, 52									1	1	PRL 133 (2024).
E12-11-003A	In medium structure functions, SRC, and the EMC effect	O. Hen		43		48, 52											
E12-11-003B	Study of J/ψ photoproduction from the deuteron	Y. Ilieva		46		48, 52											
E12-06-109	Longitudinal spin structure of the nucleon	S. Kuhn	A	60	30	48, 52											
E13-06-109A	DVCS on the neutron with polarized deuterium target	S. Niccolai			44	48, 52											
E12-06-119(b)	DVCS on longitudinally polarized proton target	M. Defurne	A	120	35	48, 52											
E12-07-107	Spin-orbit correlations with longitudinally polarized target	H. Avakian	A-	180	35	48, 52	120	CLAS12	11	C S. Kuhn	Longit.Pol. NH3 & ND3	81	68%	39			
E12-07-107A	Single baryon production in the target fragmentation region	T. Hayward			50	52											
E12-09-007(c)	Study of partonic distributions using SIDIS K production	W. Armstrong	A-	60	38	48, 52											
E12-08-007A	Dihadron electroproduction in DIS	C. Dilks			45	52											
E12-09-009	Spin-orbit correlations in K production with polarized targets	H. Avakian	B+	165	38	48, 52											
E12-06-104	Color transparency in exclusive vector meson production	L. El Fassi	B+	30	30	48	30	CLAS12	11	D L. El Fassi	Nuclear & Liquid D2	40	133%	0			
E12-06-105A	Nuclear THIDs	R. Dupre			45												
E12-06-117	Quark propagation and hadron formation	W. Brooks	A-	60	30	45	60	CLAS12	11	E H. Hakobyan	Nuclear & Liquid D2	27	45%	33			
E12-06-117A	Dihadron measurements in electron-nucleus scattering	M. Arratia			48												
E12-09-113	Free neutron structure at large x	S. Bueltmann	A	42	30		42	CLAS12, Radial TPC	11	F S. Kuhn	Gaseous D_2	42	100%	0			
E12-06-113A	Neutron DVCS measurements with SoLID	R. Dupre			47												
E12-14-001	EMC effect in spin structure functions	W. Brooks	B+ > A-	55	35	48, 52	55	CLAS12	11	G I W. Brooks	Long.pol. TUD	0	0%	55			
E12-11-111	SIDIS on transverse polarized target	M. Contalbrigo	A>C2>A	110>125	38, [illegible]	48, 52	125	CLAS12	11	H M. Contalbrigo	Trans.Pol. NH3	0	0%	125			
E12-12-009	Transversity with di-hadron on transverse target	H. Avakian	A>C2>A	110>125	38, [illegible]	48, 52											
E12-12-010	DVCS with transverse polarized target	L. Elouadrhiri	A>C2>A	110>125	38, [illegible]	48, 52											
E12-11-111A	Measurements of Single Spin Asymmetries in exclusive production of hadrons with CLAS12 transversely polarized [illegible]	H. Avakian			53												
E12-16-010	A search for hybrid baryons	A. D'Angelo	A-	180	44	48	180	CLAS12, Forward Tagger	6.6, 8.8	K A. D'Angelo	Liquid H_2	49	69%	91			
E12-16-010A	Nucleon Resonances in exclusive KY electroproduction	D. Carman			44	45											
E12-16-010B	DVCS at 6.6 and 8.8 GeV	L. Elouadrhiri			44	45											
E12-16-010C	Exploration of the GK and GT contributions to Nucleon [illegible]	H. Avakian			51												
E12-17-012	Partonic structure of light nuclei	Z. Meziani	A-	55	45		88	CLAS12, ALERT	11	L R. Dupre	Gaseous H, D, ^{3}He	88	100%	0			
E12-17-012A	Tagged EMC measurements on light nuclei	R. Dupre			45												
E12-17-012B	Spectator-tagged DVCS on light nuclei	W. Armstrong			45												
E12-17-012C	Other physics opportunities with ALERT	R. Dupre			45												
E12-17-006	Electrons for neutrinos addressing neutrino-nucleus issues	O. Hen	A	45	45		65	CLAS12	2.1, 2.2, 4.4, 6.4	M O. Hen	Nuclear	35	78%	10			
E12-16-003	Exclusive studies of short-range correlations in nuclei	O. Hen			48												
C12-20-003	Spin-dependent electron scattering with polarized 3He target	R. Milner	C1 (A-)	30	48		30	CLAS12	11	(RG-N)	Pol. ^{3}He	0	0%	30			
E12-20-005	Precision measurements of A=3 nuclei	H. Szumila-[illegible]	A-	60	48		60	CLAS12	2.2, 6.6	(RG-P)	^{3}He/^{3}Hep	0	0%	60			
C12-25-001	Electro- and photo-production of meson pairs with μCLAS12	S. Stepanyan	C1 (A)	245	53		245	μCLAS12	11	RG-H	Liquid H_2	0	0%	245			
							1186							784			

CLAS12 remaining beam time - 748 PAC days.
With 30 weeks of running, it will take 7 years to complete the 12 GeV e^- program.

None-CLAS RGs

E12-11-006	Heavy Photon Search (HPS)	T. Nelson	A	180	37, 39	48, 52	180	HPS setup	2.2, 6.6	RG-I	Nuclear	78	43%	102	3		PRD 98, 091101 (2018), PRD 108, 012015 (2023), PRD 113, 032019 (2026)
E12-11-106	High precision measurement of proton charge radius (PRad)	A. Gasparian	A	15	39		15	HyCal/GEM	1.1, 2.2	RG-J	H2 gas jet	15	100%	0	1	1	Nature 575, 147–150 (2019)
E12-20-004	High precision measurement of proton charge radius (PRad II)	A. Gasparian	A	40	48		80	HyCal/GEM	0.7, 1.4	RG-O	H2 gas jet	0	0	40			
E12-21-003	A direct detection search for hidden sector new particles (X17)	A. Gasparian	A	60	50			HyCal/GEM	2.2		Ta foil	0	0	40			
E12-22-003	Precision measurement of neutral pion transition form factor	I. Larin	A-	67	50		67	HyCal/GEM	11	RG-Q	Si foil	0	0	67			
							Total for Non-CLAS12	342						249			

Positron beam experiments

C12+23-008	A direct measurement of hard two-photon exchange with e+/-	A. Schmidt	A	55	51			CLAS12	2.2, 4.4, 6.6		Liquid H_2	
C12+23-002	Beam charge asymmetries for DVCS on the proton	E. Voutier	A-	100	51			CLAS12	2.2, 11		Liquid H_2	
C12+24-005	A Dark Photon Search with a JLab positron beam	B. Wojtsekhowski	A-	55	52			HyCal setup	2.2,4.4,1.1		New liquid H_2 target	

For non-CLAS12 experiments, the remaining beam time is 170 PAC days or two years with 30 weeks of running.

Another two years to complete the 12 GeV e^+ program.

Hall B has 10 years of running on books, not counting the new time that will be added over the years.