



# Combined PWG pTDR and ES Workfest

Rachel Montgomery (Glasgow) & Salvatore Fazio (Calabria)  
Rosie Reed (Lehigh)



ePIC Collaboration Meeting  
BNL - Jan 20-23, 2026

# What's on the Agenda Today?

<b>Introduction from PACs</b> Rachel Mont...
<b>Status update on Particle Flow</b> Dr Derek Anderson
Brookhaven National Labor... 09:55 - 10:15
<b>Electron finder efficiency/purity, pion contamination, cluster finding inefficiency</b> Win Lin
Brookhaven National Laboratory 10:15 - 10:45
<b>Radiative corrections</b> Stephen Maple
Brookhaven National Laboratory 10:45 - 11:15
<b>Machine Background</b> Discussion with a few slides input from all PWGs on what they have so far
Brookhaven National Laboratory 11:15 - 12:00

## Morning

- Particle flow
- Electron finder
- Radiative corrections
- **Discussion:** machine bkd. studies across PWGs and next steps

<b>Systematic Uncertainty</b> Discussion with a few slides input from all PWG on what they have so far
Brookhaven National Laboratory 13:00 - 13:40
<b>Summary of Workshop of ...</b> Carlos Mun...
Brookhaven National Labor... 13:40 - 14:10
<b>Inclusive Conveners Report</b> Stephen Maple et al.
<b>Semi-Inclusive Conveners Report</b>
<b>Break</b>
Brookhaven National Laboratory 14:40 - 15:10
<b>Jets and HF Conveners Report</b> Rongrong Ma
<b>Exclusive, Diffractive, Tag... Stephen Kay...</b>
<b>BSM and EW Conveners R... Juliette Mam...</b>
<b>Discussion on Templates, Next Steps and Plans for the Early Science Document</b> Brookhaven National Labor... 15:55 - 16:25

## Afternoon

- **Discussion:** systematic uncertainty studies across PWGs and next steps
- Summary of planned activities in France
- PWG conveners' reports
- **Discussion and planning next steps on Early Science Report**

# Some shared notes for today's workfest

## [Link to shared notes](#)

Can use for taking notes, comments, extra questions, or to-dos during discussion session

Have put the link also on indico session page for workfest

<https://indico.bnl.gov/event/30532/sessions/8770/#20260121>

And will put in zoom chat too

# preTDR/TDR

4	Detector Performance for the EIC physics program	455
4.1	ePIC and the Science Case of the EIC	455
4.1.1	Connecting the Physics Processes to the NAS Science Pillars	455
4.2	Global Performance Considerations	457
4.2.1	Electron Identification	457
4.2.2	Photon Detection	459
4.2.2.1	Clustering	460
4.2.2.2	Photon Identification	461
4.2.2.3	Photon Energy Measurements	462
4.2.2.4	Photon Position Measurements	462
4.2.2.5	$\pi^0/\gamma$ discrimination	463
4.2.2.6	Additional capabilities with Barrel Imaging EMCal	464
4.2.3	Hadron Identification	464
4.2.4	Jet Reconstruction and Performance	465
4.2.5	Muon Identification	466
4.3	Incorporation of Beam Backgrounds in the Studies	468
4.4	Physics Processes and Detector Performance	469
4.4.1	Inclusive Processes	470
4.4.1.1	Reconstruction of Inclusive Events	470
4.4.1.2	Key Inclusive Physics Measurements using Full Detector Simulation	473
4.4.1.3	Influence of beam Background on Inclusive measurements	476
4.4.2	Semi Inclusive Processes	478
4.4.2.1	Methods and Reconstruction of SIDIS kinematics	478
4.4.2.2	Key Semi-Inclusive Physics Measurements using Full Detector Simulation	479
4.4.2.3	Influence of beam Background on SIDIS measurements	483
4.4.3	Exclusive and Diffractive Processes	485
4.4.3.1	Methods and Reconstruction of Exclusive and Diffractive kinematics	485
4.4.3.2	Key Exclusive and Diffractive Physics Measurements using Full Detector Simulation	487
	DVCS Studies	487
	$\pi^0$ Background to DVCS	488
	Upsilon ( $\Upsilon$ ) production	489
	Gluon Saturation	492
	$e^3He$ Double Tagging	493
	Timelike Compton Scattering (TCS)	494
	Sullivan Process	498
4.4.4	Hard Probes	501
4.4.4.1	Heavy Flavor	501
4.4.4.2	Displaced vertex resolution and tracking	501
4.4.4.3	Key Heavy Flavor Physics Measurements using Full Detector Simulation	504
4.4.4.4	Influence of beam on Background on Heavy Flavor measurements	504
4.4.4.5	Jets as a Hard Probe	506
4.4.4.6	Key Jet Physics Measurements using Full Detector Simulation	507
4.4.4.7	Influence of beam on Background on Jet measurements	507

## preTDR Chapter 4 status

- Completely re-structured last year
- Mammoth amount of work performed by PWGs, conveners, analysers and others in the collaboration for the Dec 19th version of Chapter 4 in preTDR
- Thank you all for the inputs!
- *We currently await feedback*
- Meantime:
  - Today we can look at statuses of where each group stands
  - And discuss if anything needed to help progress things

# ES Report



June 13, 2025

Subject: ePIC Collaboration: Early Science Document

John Lajoie and Silvia Dalla Torre  
Spokespeople, ePIC Collaboration

Dear John, Silvia and the ePIC Collaboration,

As the EIC construction plan becomes more mature, it is apparent that there will be a period of about five years when there will be collisions at the ePIC and early data could be recorded. The EIC Project team has released their expectations for the beam parameters (polarization, luminosity, energy and nuclear species) and their ramp-up during that early operating phase. We are writing to you – the ePIC collaboration - to develop a short document summarizing the science that would be possible from those early data.

Based on the early commissioning beam parameters released by the EIC project [1,2], the ePIC collaboration should summarize for the broader nuclear physics community, the funding agencies, and for the Labs, what exciting scientific results would be possible from this period. The results in the document should be based on the most recent understanding of the ePIC detector including the acceptances, efficiencies of each detector subsystem, and off-line reconstruction capabilities the collaboration has developed so far. We believe this document will also serve to help in the preparation of the ePIC TDR currently under preparation by the collaboration with the EIC Project, as input to CD2/3 milestones for the EIC. Beyond the physics of interest, we think that this ePIC early physics document would also be useful to demonstrate the collaboration's engagement and getting prepared for physics at the EIC and capture the status of ePIC collaboration's activities at this stage. We are happy to support this activity through in-person or hybrid workshops or topical meetings should they be needed.

We recognize that this is an additional exercise for the ePIC community. At the same time, many previous such exercises (like the Yellow Report) were focused on full EIC machine capability. This report should focus on the science that could be produced before the ramp up to the full EIC machine capability.

We suggest that the collaboration prepares this report by May 1, 2026.

## ES Report

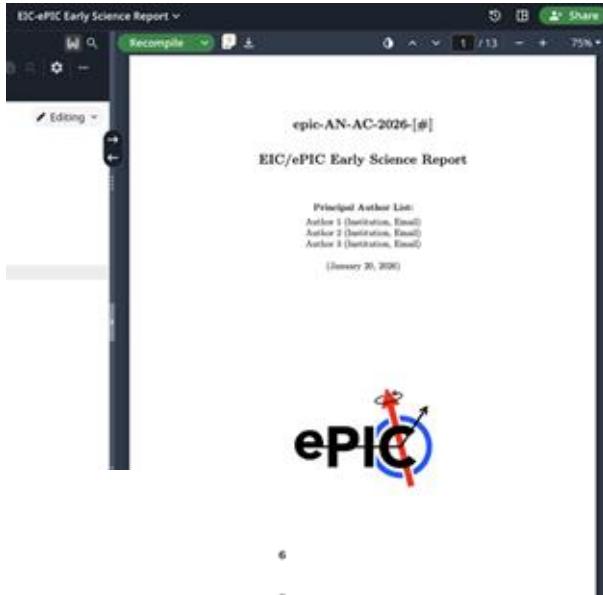
- We have a tight timeline for the ES report
- Currently this is a **very high priority and is becoming urgent**
- Will discuss today action steps we need to take to realise this document in this timeline
- Continue as planned with our existing ES matrix and timeline until otherwise notified or asked

# ES Report

## Reviewers

- Reviewers are ready to receive a draft to provide initial feedback:
  - *General Overview*: Thomas Ulrich; Taju Gunki; John Lajoie; Wim Cosyn
  - *Inclusive*: Katarzyna Witchman; Pia Zurita; Paul Newman; Enrico Tassi; Andy Buckley
  - *Exclusive, Diffractive, Tagging*: Kresimir Kumericki; Nicole D'Hose; Alex Jentsch
  - *SIDIS*: Marco Mirazita; Marco RAdici; Marco Contalbrigo; Charlotte Van Hulse
  - *Jets/HF*: Olga Evdokimov; Deepa thomas; Brian Page; Rithya Kunnawalkam Elayavalli; Cameron Dean
- Thanks to these colleagues who have offered their time to help during the drafting stage
- Of course we will also be requesting feedback from the wider collaboration during this process as we develop the document

# ES Report



The screenshot shows a LaTeX document in Overleaf. The title is 'EIC-ePIC Early Science Report'. The table of contents includes:

Section	Page
1 Introduction	6
2 Executive Summary	7
3 Inclusive measurements	8
4 Semi-inclusive measurements	9
5 Exclusive and diffractive measurements	10
6 Hard probes	11
7 Summary	12

## Template

- On Overleaf
- Contact us if you need the link
- Currently separate sections for PWG
- Today we can discuss further the structure (eg do we put executive summary and refer to PWG sections or re-organise around physics and have PWG appendices or ...)
- PWGs are requested to fill what they have so far by **Feb 16**
- We will polish and send to reviewers to provide initial feedback at March Workshop

# ES Workshop



ePIC and EIC Physics Readiness Workshop

17–19 Mar 2026  
University of Calabria, Physics Department & INFN Cosenza  
Europe/Rome timezone

Overview  
Timetable  
FEE payment  
Virtual/Remote Connection  
WiFi for In-Person Participants  
Registration  
Participant List  
Social Dinner  
Accommodation  
Travel Info

The scope of this workshop includes preparation and readiness of EIC focused physics analyses, impact studies and related activities for the upcoming ePIC preTDR and Early Science documents. We will also have the opportunity to discuss contributed topics outside of this scope. Everyone interested is welcome to attend!

We are very grateful to the Physics Department of the University of Calabria and to the Diffraction Association for supporting this event financially.

The 150€ FEE is waived for students and postdocs.

Starts 17 Mar 2026, 09:00  
Ends 19 Mar 2026, 17:00  
Europe/Rome

University of Calabria, Physics Department & INFN Cosenza  
Seminar Room  
Via P. Bucci - Cubo 31C  
87036 Antavacata di Bivona (Cosenza)  
Italy  
[Go to map](#)

<https://indico.bnl.gov/event/30283/overview>

- We will receive feedback and continue discussions and updates at March workshop
- Join us - everyone is welcome to come and discuss or learn about ES science with us
- We will also have a zoom link
- Please register and pay fee asap
- Final deadline for payment is **Feb 27**
- Please pay earlier - helps us better use the money for supporting ECR travel
- For ECRs fee is waived
- We will evaluate what still needs done and re-work the document after this workshop towards being ready for **May 1st Deadline**

# Physics Forum

**ePIC Physics Forum**

Tuesday Dec 16, 2025, 11:00 AM → 2:20 PM US/Eastern

Description: Please join us for our first Physics Forum for the release of performance results from the ePIC PWGs

Zoom link at: <https://lehigh.zoom.us/j/94442844026?pwd=WEhNUlgwRj9sUTQvTTUvT05tNXRwdz09>

**11:00 AM → 11:40 AM Structure functions via inclusive measurements in ep collisions**

Analysis Note: [here](#)

Speakers: Stephen Maple (University of Birmingham), Stephen Maple (University of Birmingham)

[Inclusive\\_EarlySci...](#)

**11:40 AM → 12:20 PM SIDIS dihadron**

Analysis Note: [here](#)

Speakers: Anselm Vossen (member@duke.edu, faculty@duke.edu), Anselm Vossen (Duke University)

[PhysicsMeeting\\_ePi...](#)

**12:20 PM → 1:00 PM Inclusive measurements in eHe3 collisions with double tagging**

Analysis Note: [here](#)

Speaker: Win Lin (Stony Brook University)

[ePIC physic forum - ...](#)

**1:00 PM → 1:40 PM Exclusive Phi production in eAu collisions**

Analysis Note: [here](#)

Speaker: Maci Kesler (Kent State University)

[Diffractive\\_phi\\_ePIC...](#)

**1:40 PM → 2:20 PM Exclusive pi0 production in ep collisions**

Analysis Note: [here](#)

Speaker: Jihée Kim (Brookhaven National Laboratory)

[ePIC\\_physics\\_forum...](#)

## First physics forum took place Dec 16

- Congratulations to all presenters and thank you for their hard work!
- Thank you to collaboration for joining and providing feedback
- Performance Results shown are current versions approved and ready to be released, and can be updated to new versions in future (with convenor approval)
- Look forward to arrange more forums in coming year
- Please reach out if any analyses would like to release results soon

Thanks!

