

ePIC Software & Computing News

Weekly Meetings (<https://indico.bnl.gov/category/435/>)

07/24 Collaboration Meeting

07/31 Skipped

08/07 Release 24.08; Release Planning, Including Path Towards Holistic Reconstruction

08/14 Skipped

08/21 Support for Test Beam Studies, User Learning

08/28 Joint Meeting with PWGs

09/04 Discuss Draft Report for Review Before Circulation Among Collaboration

09/11 Joint Meeting with PWGs

09/18 Dry Runs for Review Presentations

09/25 No Meeting Due to ePIC Software & Computing Review on September 26–27

Software News

- Major Software Stack Changes

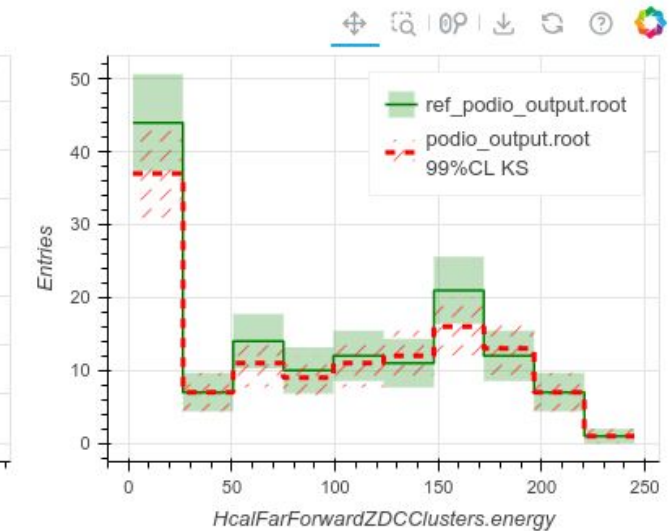
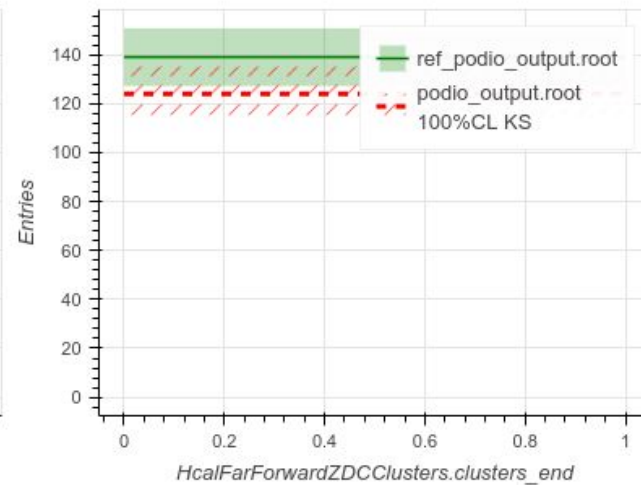
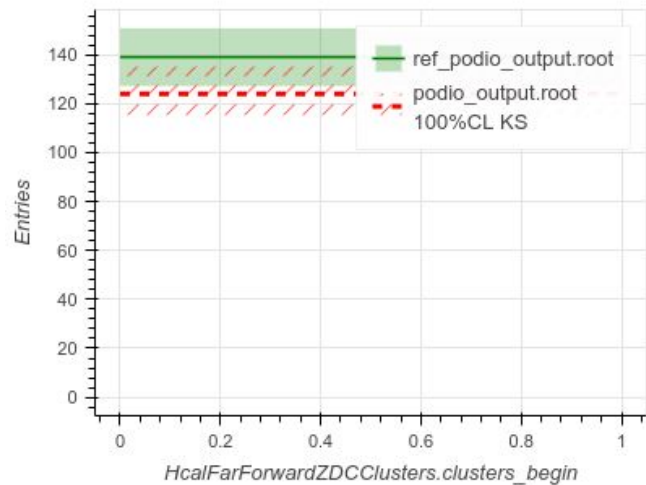
- No stack changes. All changes were on the heap.

- Notable Merges

- Fancier capybara diffs, now including Kolmogorov-Smirnov p-values.

Select branch (**** < 67% CL, ..., * > 99% CL stat. equiv.):

HcalFarForwardZDCClusters (****) ▼



WG News

Physics and Detector Simulations WG

- DSCs are supposed to have the latest CAD model for the corresponding subsystem. Simulation WG will provide a CAD model converted from DD4Hep and a package of figures (and the scripts) for the DSCs to evaluate the differences.
- Develop scripts to compare DD4hep model with integrated CAD (3D view, projections, thin slices, etc.) once received from project. Transition away from geometry table approach.
- Resume regular WG meetings (1st and 3rd Tuesday 10 am EST for physics and detector simulation)

Reconstruction Framework and Algorithms WG

- Computational complexity of topological clustering reduced, allowing for 16x increase in ZDC clustering speed (which had become dominant).
- Cluster time now calculated deterministically: time set to energy-weighted mean rather than time of first entry in `.getHits()`
- MC-Track associations now propagated to ReconstructedChargedParticles
- Calorimeter hit reconstruction now allows for MultiSegmentation (i.e. XZ segmentation)

WG News

Production WG

- See also slide 6 for a draft of our data retention policy.
- See also slides 7–8 for information about storage for the PWGs on XRootD.
- Production campaign now relies on vault mode credmon for token authentication and renewal on JLab access point to allow file transfers over XRootD.
- Working to setup a new access point at BNL
- First successful file read test via Pelican (OSDF) at JLab
- Propose a time change to 10 am EST for start time (2nd and 4th Tuesday of the month alternating with Physics and Simu)

User Learning WG

- See also slide 9 for information about the upcoming software tutorials.

Validation WG

- New physics benchmarks: lambda (in ZDC), sigma (in ZDC), neutron (in forward insert)

Reconstruction WG

- Poll now open for new meeting time: aiming for a time that's more accessible to non-US colleagues. Options are:
 - Monday, 11 am - noon EDT
 - Tuesday, 3:30 - 4:30 pm EDT (i.e. no change)
 - Thursday, 10 - 11 am EDT
- Meeting yesterday: discussed a draft proposal for a new datatype to aid track-cluster matching, and eID/PF workflows

WG News

Streaming Computing WG

- Regular meetings will resume:
- **Sept. 3:**
 - Prepare discussion about data transfer from Echelon 0 to Echelon 1.
 - Start discussion on compute resource estimates.
- **Sept. 10:**
 - Discussion about data transfer from Echelon 0 to Echelon 1.
 - Follow up on discussion on compute resource estimates.
- **Sept. 17:**
 - Finalize discussion on Echelon 0-1 data transfer and compute resource estimates.

ePIC Data Retention **Draft** Policy

Starting from September 2024, simulation productions older than six months will be deleted unless they are integral to a project deliverable, such as the Technical Design Report, or a publication where results need to be reproduced. Simulation productions for these cases will be retained for the lifetime of the ePIC collaboration, serving as relevant references for future studies. These productions remain available for access by the collaboration. The committees¹ will identify which simulation productions need to be preserved.

The six-month period ensures that the revolving set of simulation data is always recent enough to incorporate important updates without disrupting the workflow of detector and physics studies.

Simulation productions from a specific year and month can be reproduced as required. Special attention is given to preserving all necessary steering and configuration files, along with the associated containers.

¹ The Publication Committee and the Conference and Talks Committee are currently discussing the workflow from results to preliminary results and publications. They will revise the responsibilities for each committee involved, and we will update the ePIC Data Retention Policy accordingly.

WG Storage via XRootD

XRootD ensures **fast and reliable access** for our **simulation files**.

We aim to **explore further uses of the XRootD storage** beyond the simulation campaigns.

Initially, we plan to allocate **dedicated workspace on the XRootD server for the Physics WGs to share files**. These may include HepMC datasets for simulation campaigns or outputs of test simulations, among other use cases.

To obtain write access to the XRootD storage, an email must be sent to the Production WG conveners at srahman1@bnl.gov and tbritton@jlab.org, with an endorsement from a PWG convener.

Write access is considered experimental at this point in time and requires coordination with the Production WG to:

1. Ensure use cases are accommodated efficiently and without disrupting the production campaign lifecycle, and
2. Collaboratively develop a usage policy.

Write access during this initial test phase is temporary and must be re-requested once a formal policy has been established.

WG Storage via XRootD: Documentation

- Contact Production WG to get added to [Comanage Registry](#).
- On any machine running eic-shell:
 - `htgettoken -a htvault.jlab.org -i eic`
(Authenticate by web once using CILogon. Can be renewed from command line from that point onwards.)
 - `xrdcp test.txt xroots://dtn2201.jlab.org//eic/eic2/EPIC/xrdtest/`
 - `xrdfs xroots://dtn2201.jlab.org rm /eic/eic2/EPIC/xrdtest/test.txt`

Tutorial Series

Next Tutorial: Working with Simulation Output

Presenter: Stephen Kay (University of York)

Date: Thursday, September 12

Time: Delivered twice on this date to cover multiple time zones

- 10:00 a.m. (BST) for Africa, Asia, Australia, and Europe - <https://indico.bnl.gov/event/24623/>
- 4:00 p.m. (BST) for Africa, Europe, North/South America - <https://indico.bnl.gov/event/24624/>
- Email circular with info - **This afternoon**

- Trial new format of live help desk at same time as tutorials, one week before/after tutorial
 - 5th September and 19th September

Upcoming Tutorials:

- Validation and benchmarking, 3rd of October - <https://indico.bnl.gov/event/24625/>
- Reconstruction algorithms - November, searching for tutor
- Working with simulation output
 - Present on a bi-monthly basis - Next, early November
 - Focus on a different “special” item each time

We **welcome suggestions for future tutorials**, including shorter tutorials on specialized topics, such as calorimeter reconstruction as suggested during the workfests.

Software & Computing Conferences and Workshops

PyHEP.dev 2024

August 26–30, Aachen, Germany.

<https://indico.cern.ch/e/PyHEP2024.dev>

ePIC Software & Computing Review

September 26–27, Washington, DC.

JuliaHEP 2024

September 30 – October 4, CERN.

<https://indico.cern.ch/event/1410341/>

7th Rucio Community Workshop

September 30 – October 4, San Diego Supercomputer Center, San Diego, CA.

<https://indico.cern.ch/event/1343110/>

Fast Machine Learning for Science

October 15–18, Purdue University, West Lafayette, IN.

<https://indico.cern.ch/event/1387540/>

Software & Computing Conferences and Workshops

CHEP 2024

October 19–25, AGH University of Kraków, Institute of Nuclear Physics Polish Academy of Sciences and Jagiellonian University, Kraków, Poland.

<https://indico.cern.ch/event/1338689/>

Submitted five abstracts

Track 2 - Online and Real-Time Computing:

- Nathan Brei: Reconstruction Framework Advancements for Streaming Readout for the ePIC Experiment at the EIC (**accepted**)

Track 5 - Simulation and Analysis Tools:

- Sakib Rahman: The ePIC Simulation Campaign Workflow on the Open Science Grid (**accepted**)

Track 6 - Collaborative Software and Maintainability:

- Dmitry Kalinkin: Collaborative Software and Maintainability for ePIC Experiment at EIC (**accepted**)

Track 7 - Computing Infrastructure:

- Wouter Deconinck: Cache Rules Everything Around Me: Building ePIC Containers With Spack (**accepted**)

Track 8 - Collaboration, Reinterpretation, Outreach and Education:

- Maxim Potekhin - Collaborative Tools for the ePIC Experiment (**poster**)

Software & Computing Conferences and Workshops

ACTS Developers Workshop 2024

November 18–21, Forest of Bogis-Bossey, Vaud, Switzerland.

<https://indico.cern.ch/event/1397634/>

Streaming Readout XIII

December 2–4, University of Tokyo, Tokyo, Japan.

<https://indico.bnl.gov/event/24286/>