

October-November 2022 Simulation Campaign Status

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Simulation Status - 1 Slide Summary

- We are ~4 weeks past our initial deadline to submit jobs (October 17)
- However, jobs have been processing and files are available
- TLDR: your analysis of available files is informing our next steps
 - **S3/eicctest/EPIC/RECO/22.10.0/** ([October geometry release](#))
 - **S3/eicctest/EPIC/RECO/22.11.0/** ([November geometry release](#) + [bugfixes in 22.11.1](#))
 - We are starting with single particles and general SIDIS events (Pythia8)
 - SimQA requested that all DWGs show 1-2 slides at today's SimQA meeting detailing the performance of their subdetector/physics channel
 - Known and resolved issues:
 - Hcal hit and cluster reconstruction issue identified in 22.10.0, resolved in 22.11.0
 - Track reconstruction issue identified in 22.11.0 and will be resolved in next batch of files
 - Immediate plan:
 - Next readiness meeting Monday November 14, time TBD
 - One more set of singles and SIDIS events for validation

Geometry in Simulation

- Geometries are version tagged for documentation and DAP
- Example: `S3/eic/test/EPIC/REC0/22.10.0/` clearly identifies which version of the geometry is used to do the simulation and reconstruction
- You can see everything that went into the geometry with the fixed release versions at <https://github.com/eic/epic/releases>
- We are working on adding all this info to the metadata of the reconstructed files as well
- We will update the geometry if documented issues arise in the process of validation
 - Nonetheless, a version will always be tagged such that any part of the geometry can be looked up

Reconstruction

- EICRecon clustering issues have been worked through this week - new files reflect the latest and greatest
- Reconstruction code is also versioned for DAP purposes - you can look at it yourself here <https://github.com/eic/EICrecon/releases>
- We need you to
 - Find issues in the reconstruction and report them as an issue in the EICrecon repository
 - Help fix them! CompSW/SimQA may not necessarily have the expertise to fix your fancy clusterizer

Issues Uncovered, Fixed, and Outstanding

Thanks to the large number of analyzers who have looked at these files

TRACKING [\[Overview by Xuan\]](#)

- Magnetic field map: the field map is likely incorrect, slides by Rey [\[1\]](#)
 - Waiting for field map to be fixed; contact person Elke
- MPGD hits not stored, since do not deposit more than 1 keV, by Matt [\[2\]](#)
 - Enable 0 keV energy deposition threshold, <https://github.com/eic/epic/issues/289>
- TOF endcap surface errors: DD4hep TOF geometry not exported to Acts
 - Work in progress; contact person: Nicolas, <https://github.com/eic/epic/issues/286>
- TOF surface errors cause full tracking to fail; no ReconstructedParticles
 - Fixed and in EICrecon 0.3.5, <https://github.com/eic/EICrecon/pull/326>
 - Confirmed to fix absence of Reconstructed(Charged)Particles

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CALORIMETRY [\[Overview by Carlos\]](#)

- Backward Hcal: clustering parameters are not correct
 - Work in progress; contact person: Leszek, no issue yet to keep track of this
- Barrel Ecal SciGlass: pion rejection factor seems too small
 - Possible material budget issues in front of Ecal, Dmitry looking into this
- Barrel Ecal Imaging: total hit energy mismatch, missing clusters
 - Incorrect unit conversion from parameters to algorithm; fix in progress, contact person: David
 - Clusters are not created: under investigation, solution not clear
- Forward Ecal: not looked at simulation production, standalone looks ok
- Forward Hcal: no hits in first production, needs look at second production
- Forward Inserts: many hits when not even enabled in arches geometry

Issues Uncovered, Fixed, and Outstanding

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FFWD/FBKD

- Singles did not extend to less than 3 degrees
- But no off-momentum, B0 silicon, or ZDC Hcal hits
 - Needs further investigation

Conclusions

- We are calling on the collaboration to help validate and verify that the single particle and initial SIDIS simulations look as expected
- At the next SimQA readiness meeting (Monday November 14, time TBD), we will assess the progress on the issues uncovered
- Next set of simulation production jobs will require at least:
 - Update of the magnetic field that makes sense
 - Resolve Barrel Ecal Imaging clustering issues
- We need you to
 - Find issues in the reconstruction and report them as an issue in the EICrecon repository
 - Help fix them! CompSW/SimQA may not necessarily have the expertise to fix your fancy clusterizer
- As a reminder, we have tutorials and documentation available:
 - <https://indico.bnl.gov/category/443/>
 - <https://eic.github.io/EICrecon/#/>