ESC Meeting on October 17th

Agenda:

- **Review of existing software** (including examples!): What technology is used? What is available? How flexible?
- **Discussion about requirements**: What does the community need? What is urgently required? What long-term goals do we have?
- **Discussion about our common goals and work plan** (with focus on the geometry and detector interface and the unified tracking projects)

Review of existing software

We have discussed the simulation software we are familiar with:

- EicRoot, the framework used by the EIC task force at BNL
- fpadsim, the collection of analysis tools used by ANL. Main parts are HepSim and SLIC.
- Fun4All, the framework used for PHENIX and sPHENIX
- GEMC, the framework used by the JLEIC project

The presentations on the software frameworks are available on:
https://www.jlab.org/indico/event/187/

Main observations from the discussion:

- EicRoot, fpadsim, Fun4All, and GEMC, are actively maintained.
- SLIC is part of fpadsim. It was developed for the International Linear Collider (ILC) and is now maintained by the community on a best effort basis.
- The analysis environments for the EIC will be chosen when the EIC collaborations will form. Until then, we will examine the requirements for the EIC analysis environment and work on the R&D aspects of the EIC analysis environment.

Discussion about requirements

We have identified two main use cases:

- **Use Case 1:** Requirements for studying a physics process at the EIC:
    - interface to MCEG
    - open access to accelerator specifications
    - open access to detector geometry and detector simulation
    - documentation
- **Use Case 2:** Requirements for studying a detector at the EIC

- open access to physics simulations and / or interface to MCEG
- open access to accelerator specifications
- open access to geometry and detector simulation
- documentation

Use cases 1 and 2 might involve comparison of eRHIC and JLEIC:

- eRHIC settings / geometry might be used in JLEIC software
- JLEIC settings / geometry might be used in eRHIC software

Discussion about our common goals and work plan

Based on the use case and the resulting requirements, we have made the following plan:

- We will put our initial focus on fast simulations.
- We will use HepSim as a repository for EIC MC simulations. The format for the generated MC information will be ProMC.
- We will maintain a repository of accelerator settings and detector geometries (GDML and a list of sensitive detectors (tbd)).
- We will use store the results from the physics and detector simulations as ROOT trees in a fixed format.
- We will work with the EicRoot, Fun4All, GEMC, and SLIC developers so that the existing frameworks meet the following requirements:
  - Readin ProMC files
  - Readin GDML files and the files containing the list of sensitive detectors from our repository
  - Create those files from within the framework or a converter
  - Write the results as flat (POD) ROOT trees in our format.
- We will provide for each framework tutorials for use cases 1 and 2.
- We will promote our work towards interfaces and integrations and the tutorials within the EIC UG.

In addition, we have identified the mid-term requirement for an EIC data model:

- We will develop a data model for the EIC analysis environment.

Our plan is based on our current vision for establishing a EIC software community. It will evolve and change while we start working on our first common projects.