



**Towards final detector configuration/update
since the last meeting**



ATHENA Software & Computing

Thursday 2021-06-03

The ATHENA S&C WG conveners:

Andrea Bressan (University of Trieste and INFN) ,
Dmitry Romanov (Jefferson lab) ,
Sylvester Joosten (Argonne National Laboratory) ,
Whitney Armstrong (Argonne National Laboratory) ,
Wouter Deconinck (The University of Manitoba).

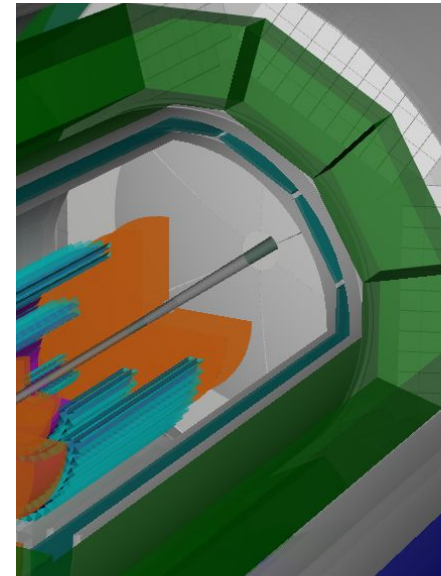
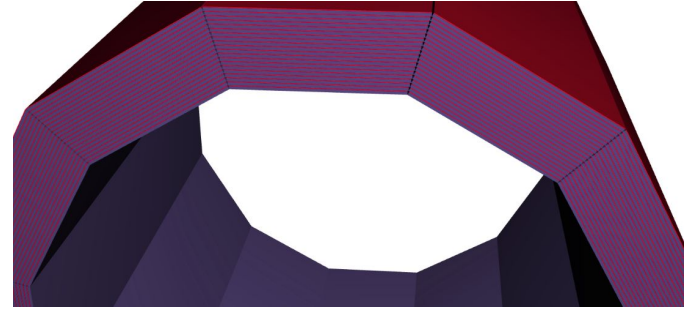
Updates

Simulation

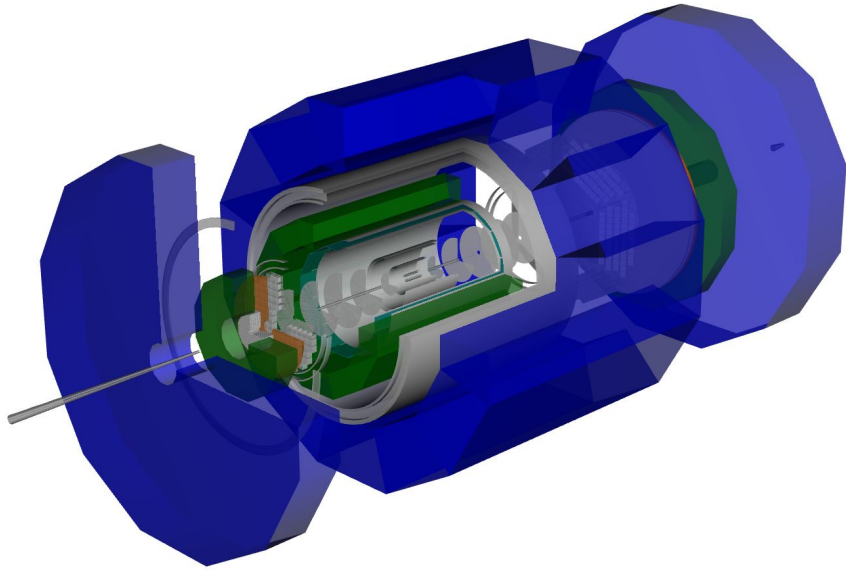
- Released first general purpose software container (used in the tutorial)
- Added more realistic parametrization for the silicon tracker barrels to the athena repository, fixed geometries for use in ACTS
- New HCAL layout (Miguel)

Misc

- [Deployed web-viewer for ATHENA geometry implementation](#)
 - ([view with full beamline](#))
- Geometries ready for tracker validation
- Computing update → Wouter
- Documentation → Dmitry
- We have people attending all WG meetings, still need “Official” WG contacts to the S&C WG



New [Athena](#) repository (fork from reference_detector)



- Implemented geometries for most subsystems based on the reference detector.
- New interactive in-browser geometry viewers:
 - [Central detector](#)
 - [Full detector with beamline](#)
- Reasonable detail in central detector tracking
- In particular RICH, DIRC and HCAL need input from the WGs
- Next TODO
 - Update the far-forward detector system (had meeting yesterday with Alex Jentsch)
 - Add more detail to tracking system
 - Add updated magnet designs



Tutorial focus: full simulation

https://eic.phy.anl.gov/tutorials/eic_tutorial/getting-started/quickstart

Environment setup

```
BASH
curl https://eicweb.phy.anl.gov/containers/eic_container~/raw/master/install.sh | bash
```



Quick-start Guide

Home

GETTING STARTED

Overview

TUTORIAL

Quick-start

Part 1: Simple Detectors

Part 2: Adding Detectors

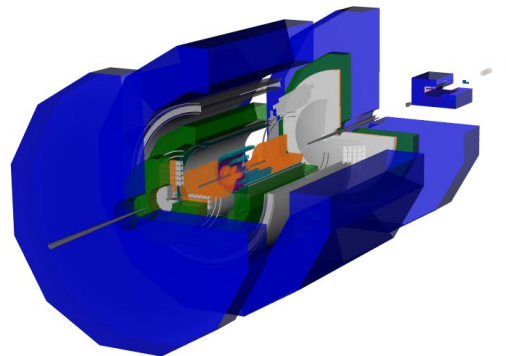
Prerequisites

We assume that you are somewhat familiar with:

- git and gitlab (<https://eicweb.phy.anl.gov>)
- working in the terminal over ssh and can copy files to your local machine.
- cmake, C++, python, and shell scripting

This tutorial requires that *singularity* is installed on the local system. Singularity can most recent version as of January 2021.

Geometry visualization



Realistic geometry descriptions

A more detailed GEM Tracker

Uncomment the include line in `gem_tracker.xml`

```
<include ref="compact/gem_tracker_endcap.xml"/>
```

And have a look at the detector part of `compact/gem_tracker_endcap.xml`

```
<detector
  id="GEMTrackerEndcap_10"
  name="GEMTrackerEndcap"
  type="MyGEMTrackerEndcap"
  readout="GEMTrackerEndcapHits"
  vis="true"
  reflect="false">
  <module name="GEMModule1" vis="GreenVis">
    <tr x1="GEMTrackerEndcapFoil1/2.0" x2="GEMTrackerEndcapFoil1/2.0" z="GEMTrackerEndcapFoil1/2"/>
    <comment> Going from HV side to readout side</comment>
    <module_component thickness="0.127 * mm" material="MyIar"/>
    <module_component thickness="30.8*um" material="Krypton" name="entrance_window"/>
    <module_component thickness="3.8*um" material="Al1000" name="entrance_region"/>
    <module_component thickness="30.8*um" material="Krypton"/>
    <module_component thickness="3.8*um" material="Copper"/>
    <module_component thickness="3.8*um" material="Al1000" name="drift_region"/>
    <module_component thickness="30.8*um" material="Krypton" name="gem_foil"/>
    <module_component thickness="3.8*um" material="Copper" name="gem_foil_cu"/>
    <module_component thickness="2.8*um" material="Al1000" name="transfer_region 1"/>
    <module_component thickness="30.8*um" material="Krypton" name="gem_foil 2"/>
    <module_component thickness="3.8*um" material="Copper" name="gem_foil_cu 2"/>
```

Introduction to geometry plugins

The corresponding detector constructor function is in `src/TrapEndcapTracker_geo.cpp`

```
static Ref_t build_detector(Detector& description, xml_h e, SensitiveDetector sens) {
  typedef vector<PlacedVolume> Placements;
  xml_det_t x_det = e;
  Material vacuum = description.vacuum();
  int det_id = x_det.id();
  string det_name = x_det.nameStr();
  bool reflect = x_det.reflect(false);
  DetElement sdet(det_name, det_id);
  Assembly assembly(det_name);
  Volume motherVol = description.pickMotherVolume(sdet);
  int m_id = 0, c_id = 0, n_sensor = 0;
  map<string, Volume> modules;
  map<string, Placements> sensitives;
  PlacedVolume pv;

  assembly.setVisAttributes(description.invisible());
  sens.setType("tracker");
}
```

Tutorials feedback and future plans

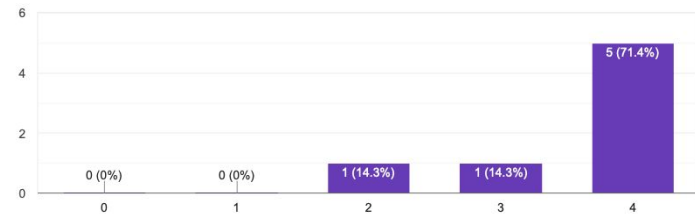
- 54 sign-ups for the tutorial sessions, and over 60 people total in the sessions
- Due to the large interest, we held two (identical) sessions
- Currently collecting (anonymous) feedback to help guide future sessions
- Next topics will include:
 - geometry hack-a-thon,
 - reconstruction algorithms,
 - doing physics analysis from fully reconstructed events

Feedback form (takes ~5min):

https://docs.google.com/forms/d/e/1FAIpQLScIPBXv13pVtawt35XeaCDMOcmDo8fhKTapdmiFO_6gPTV-8w/viewform?usp=sf_link

How would you rate the usefulness of the tutorial?

7 responses



Computing Update

Wouter Deconinck (The University of Manitoba)

ATHENA full/fast computing resource estimates

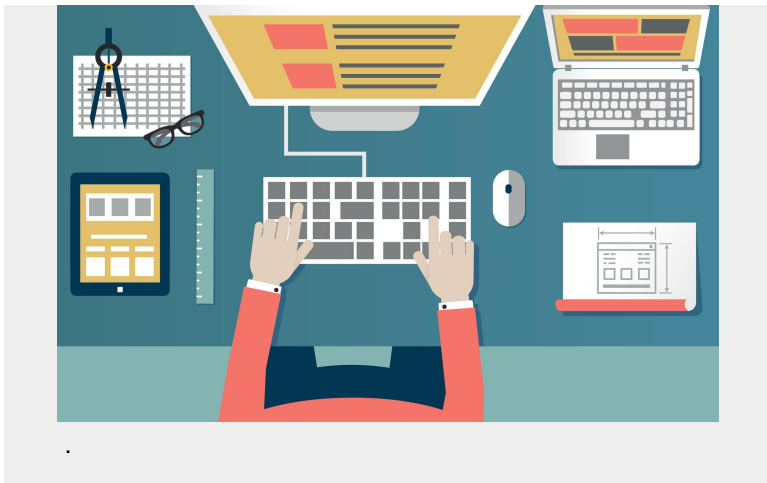
We are working on a better bottoms-up estimate of full/fast computing resources for the period until the detector proposals are due, as requested by the computing coordinating group. This will better support our case for our large CPU allocations and storage space.

We request your help in developing this estimate. Please delegate one of your convenors or working group members to complete this information **by next week Thursday, June 10**.

The table to be completed is at the following google spreadsheet link:

<https://docs.google.com/spreadsheets/d/1Fpzl20WqMalhbOqeGEiJMsXRwAvzisWRjCMfOHasUz0/edit?usp=sharing>

User support and documentation



Documentation portal

athena-soft.readthedocs.io/

Central documentation hub.

Goal: one-stop-shop with easy to navigate content.

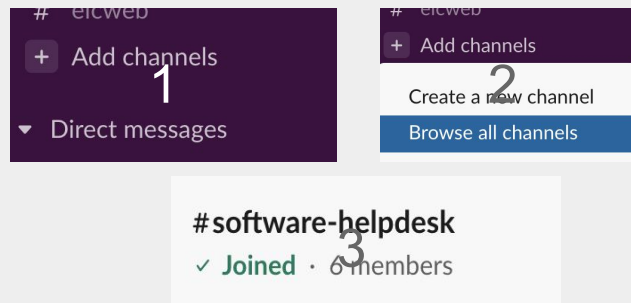
Full simulation tutorials

https://eic.phy.anl.gov/tutorials/eic_tutorial/getting-started/quickstart

Where should I ask questions about software and computing?

Your choice! either send to the eic-ip6-software-l@lists.bnl.gov mailing list, or use the brand new **#software-helpdesk** Slack channel.

You can subscribe to this new channel by clicking “Add Channels, then “Browse all channels”.



Meetings: Every other Thursday, 12pm