

Event Display Tutorial (ROOT Based)

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Event display (**ROOT Based by me**) and **Web based by Sakib**

If you have any request regarding event display feel free to contact me

Event Display (Experience)

- I am working on it since 2012 and written a root based code
- I used it for ATHENA (Fun4All), Detector1 (DD4HEP), EPIC (DD4HEP) and always showing on slides

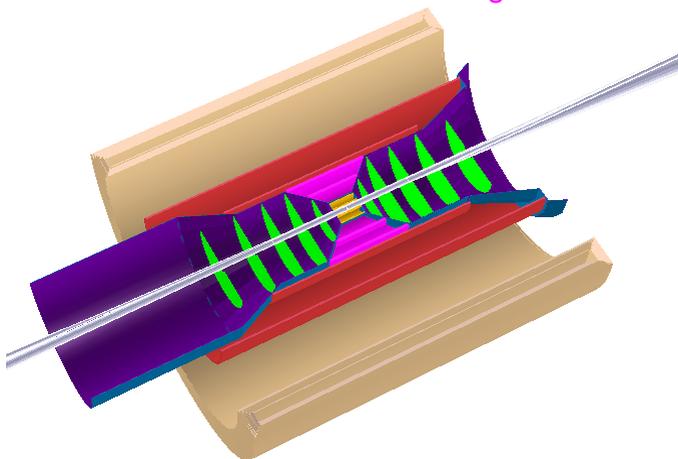
https://indico.bnl.gov/event/13443/contributions/56792/attachments/38039/62689/Baseline2_TrackerStudy_Shyam.pdf

https://indico.bnl.gov/event/16352/contributions/65463/attachments/42152/70572/EIC_Detector1_Tracking_Shyam.pdf

https://indico.bnl.gov/event/17347/contributions/69024/attachments/43676/73592/EPIC_Tracking_Meeting_Shyam%2006Oct2022.pdf

- Also prepared high resolution detector (eps and pdf) images for the conveners
- EIC Recon Document website also have event display picture created by me

High Resolution



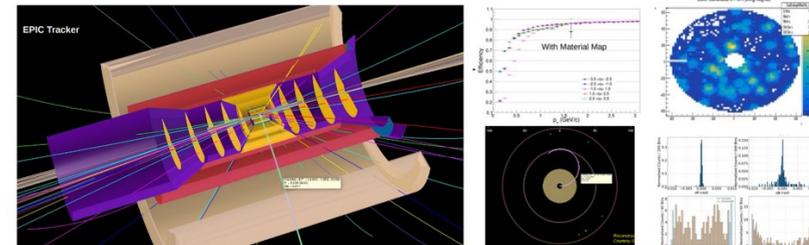
EICrecon

- Home
- Getting started
 - EIC shell (recommended)
 - Manual build
 - EDPM
- HowTo
 - Run DD4Hep simulation
 - Use docker
 - Use singularity
 - Make Plugin
 - Add Factory
 - Visualize Callgraph

<https://eic.github.io/EICrecon/#/>

EICrecon

JANA based reconstruction for the EPIC detector



Drawing Geometry (Using Simple ROOT)

To draw any geometry from root/gdml file:

epic_brycecanyon.xml with calorimeters and far forward detectors removed

From Root file:

ogl: OpenGL viewer

```
root [0] TGeoManager::Import("epic_brycecanyon_Shyam.root");  
root [1] gGeoManager->GetTopVolume()->Draw("ogl")
```

From GDML file:

```
root [0] TGeoManager::Import("example.gdml");  
root [0] gGeoManager->GetTopVolume()->Draw("ogl")
```

If you want to remove volumes, GeoManager is not comfortable. We can use TEveManager, I shared my code with Nicholas Schmidt also given below

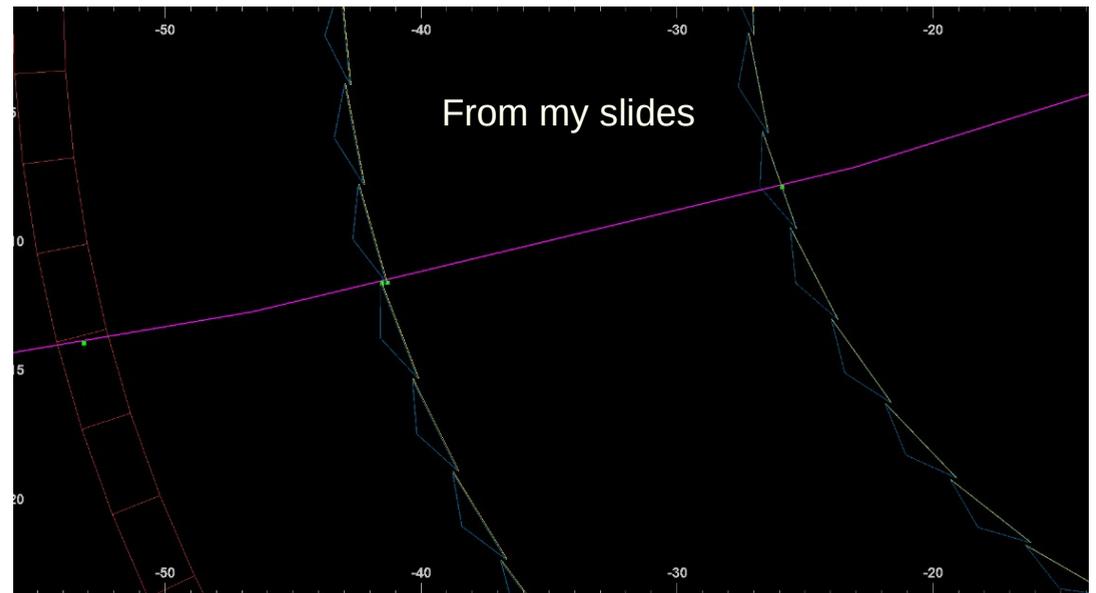
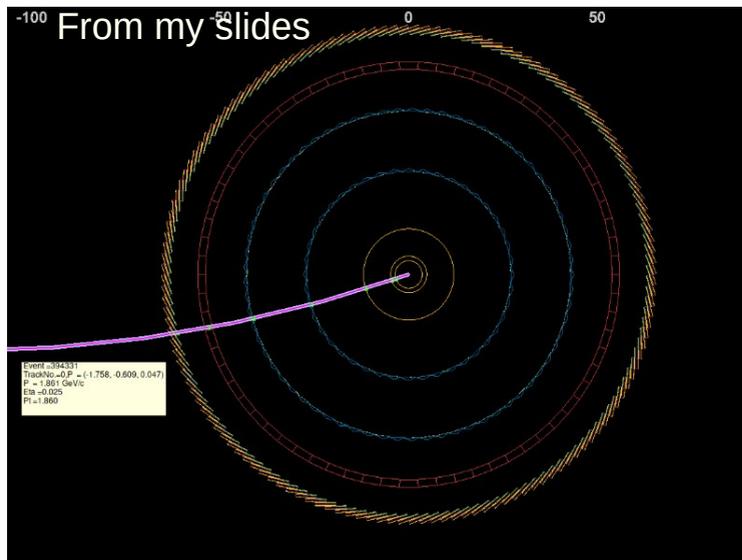
```
void draw_geom()  
{
```

The code can be used with epic_arches or any others

```
    TString rootfile="epic_brycecanyon_Shyam.root"; // Change geometry file name  
    TEveManager::Create();  
    gGeoManager = TGeoManager::Import(rootfile); // or use TGeoManager::Import(rootfile)  
    if (gGeoManager == nullptr) return;  
    TEveGeoTopNode *EPIC = new TEveGeoTopNode(gGeoManager,gGeoManager->GetTopNode()); // pass node here instead of  
    topnode  
    gEve->AddGlobalElement(EPIC);  
    gEve->FullRedraw3D(kTRUE);  
}
```

Event Display (ROOT Based)

- Event display is more powerful in visualizing tracks/hits and more information with the geometry
- I shared my private code (will show the demo), you need to change geometry file name and simulated file name, it will be able to visualize tracks/hits
- If any other information required to be added then please inform me I will add it
- I can make detector specific event display (e.g. someone wants to study only TOF Hits, then I can do only with TOF)
- Currently I implemented a function to go to the next event, previous event and specific event with 3D view, R-Phi view and R-Z view



Summary and Future Plan

- I shared my code for event display with EPIC for the use of the Collaboration (You just simply need ROOT)
- If you need any special feature, please feel free to contact me
- There are versions of Event display (**ROOT Based by me**) and **Web based by Sakib**

Thank You