

Central Detector integration software update

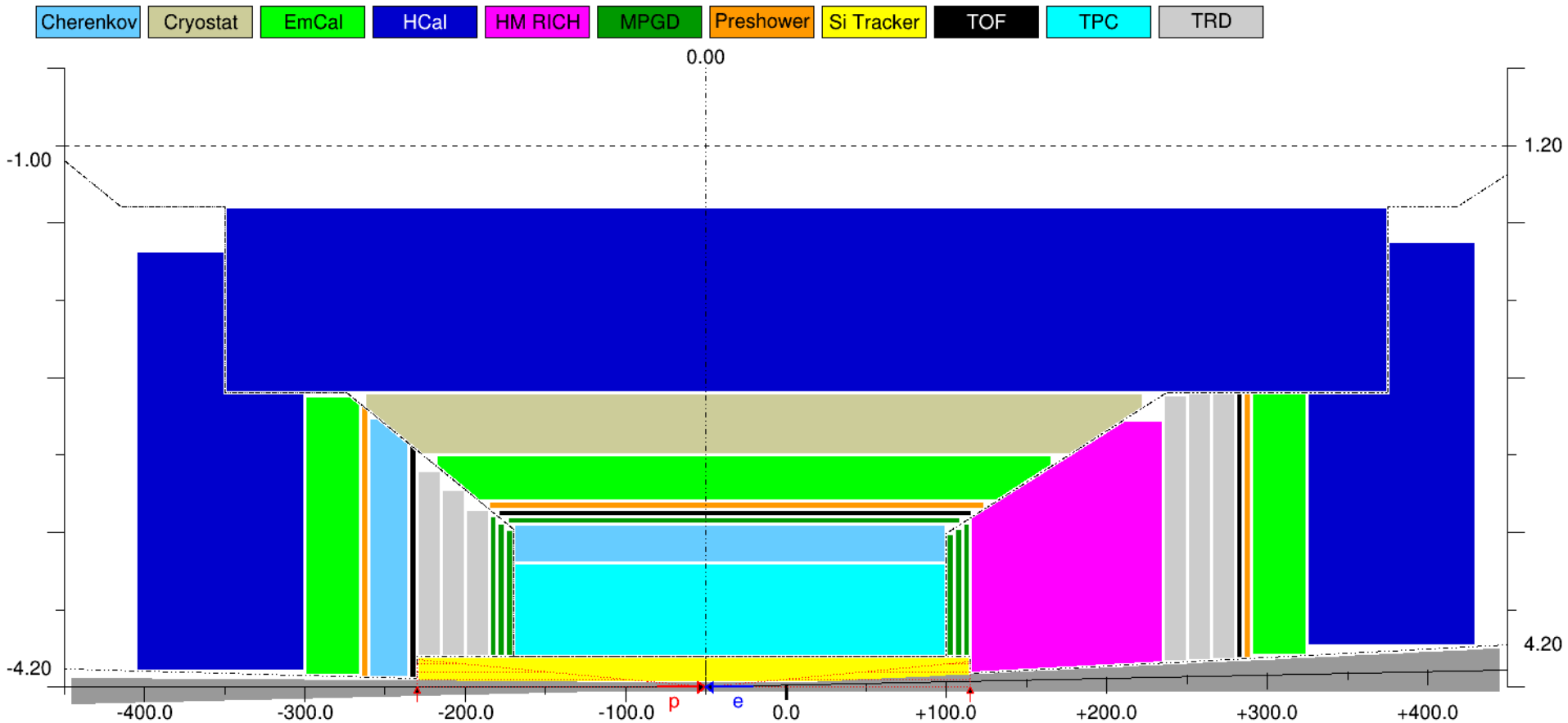
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EIC Tracking WG Meeting July 9 2020

Topics

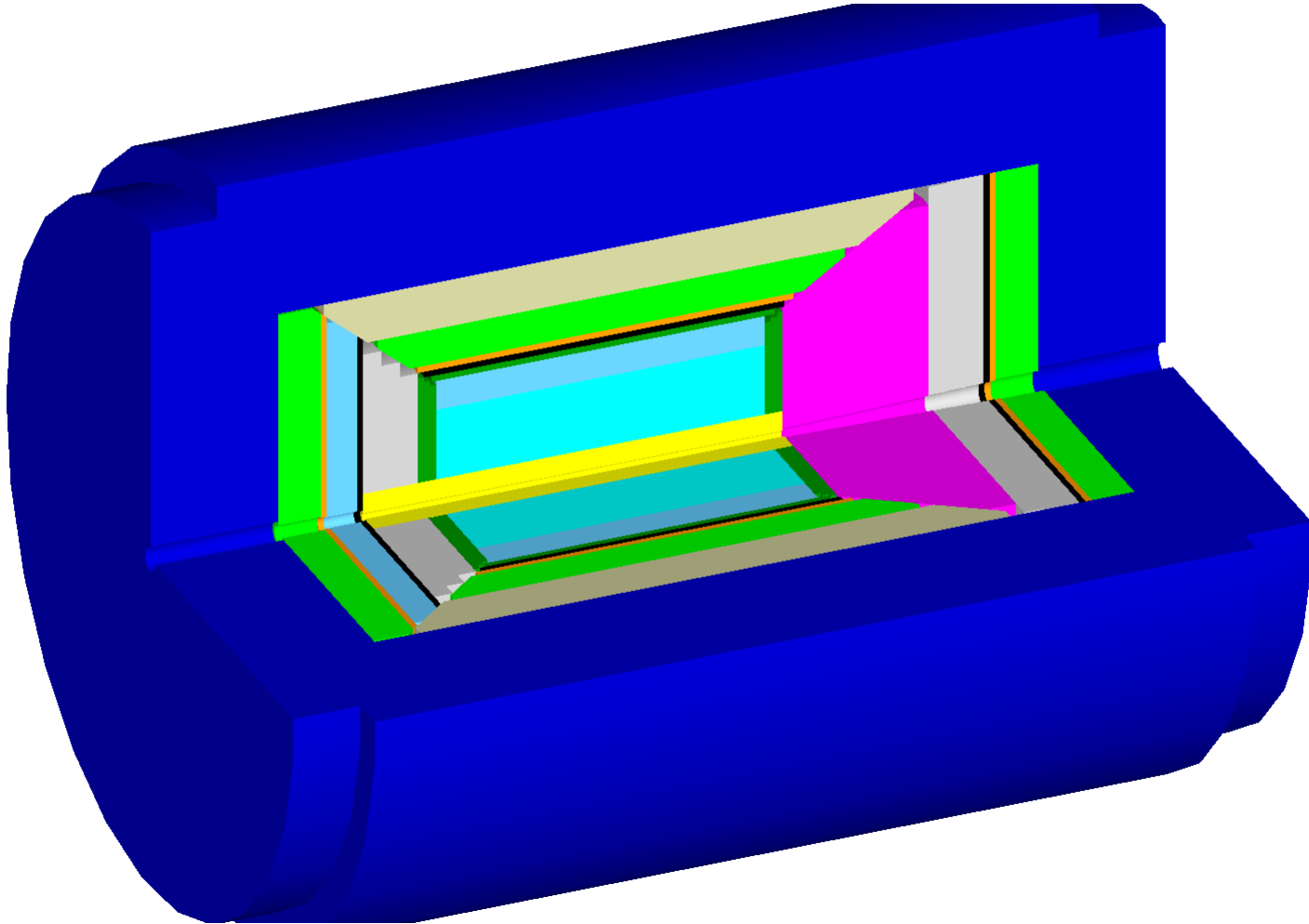
- Integration into the EIC software frameworks
 - escalate
 - fun4all
- Services & dead material

Starting point: a detector “template”



- example.C, as uploaded to <https://github.com/eic/EicToyModel/>

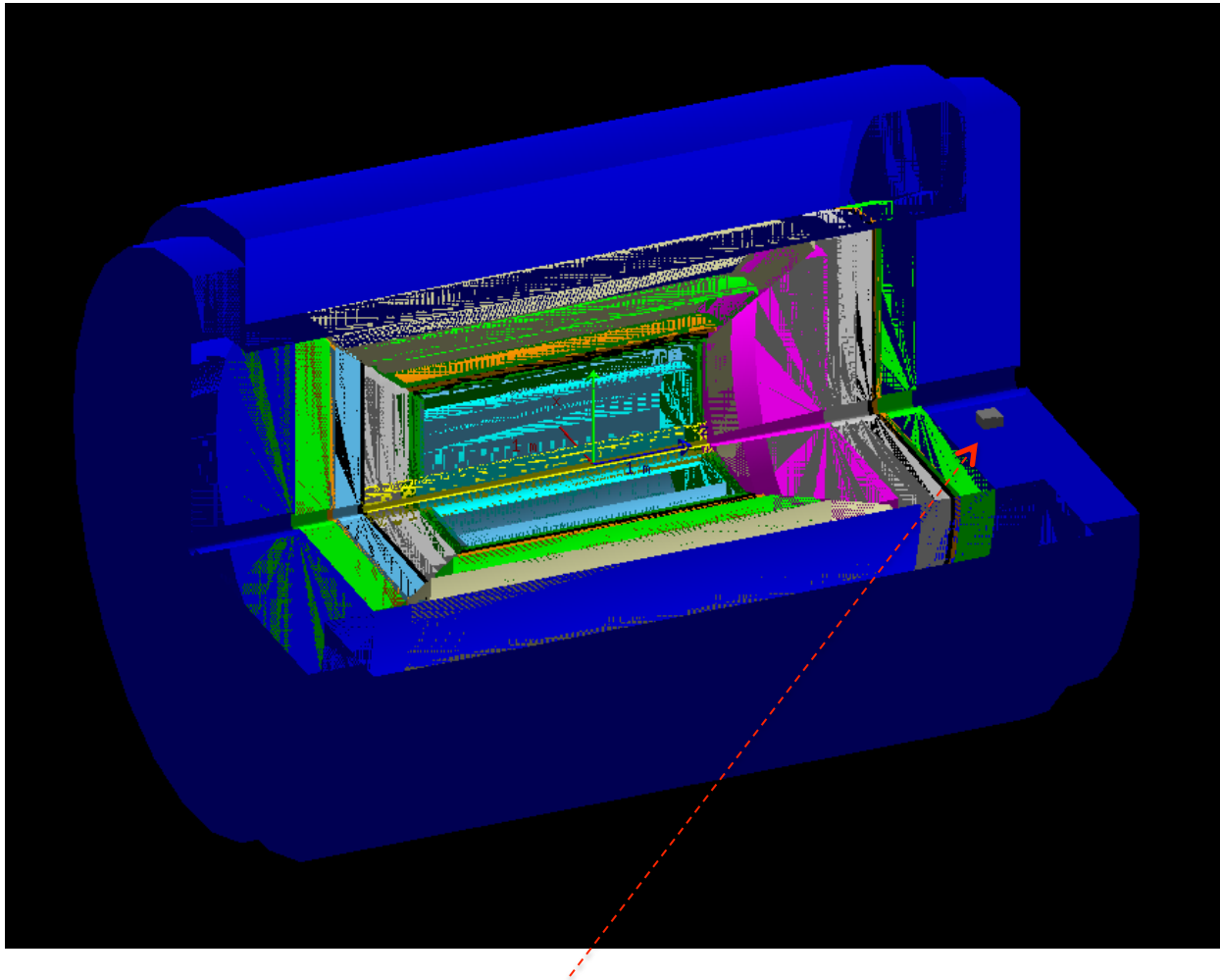
Case#1: standalone G4 application



- Nothing new here: EicToyModel own GEANT4 example code, as uploaded to the GitHub repository

Case#2: *fun4all* event display

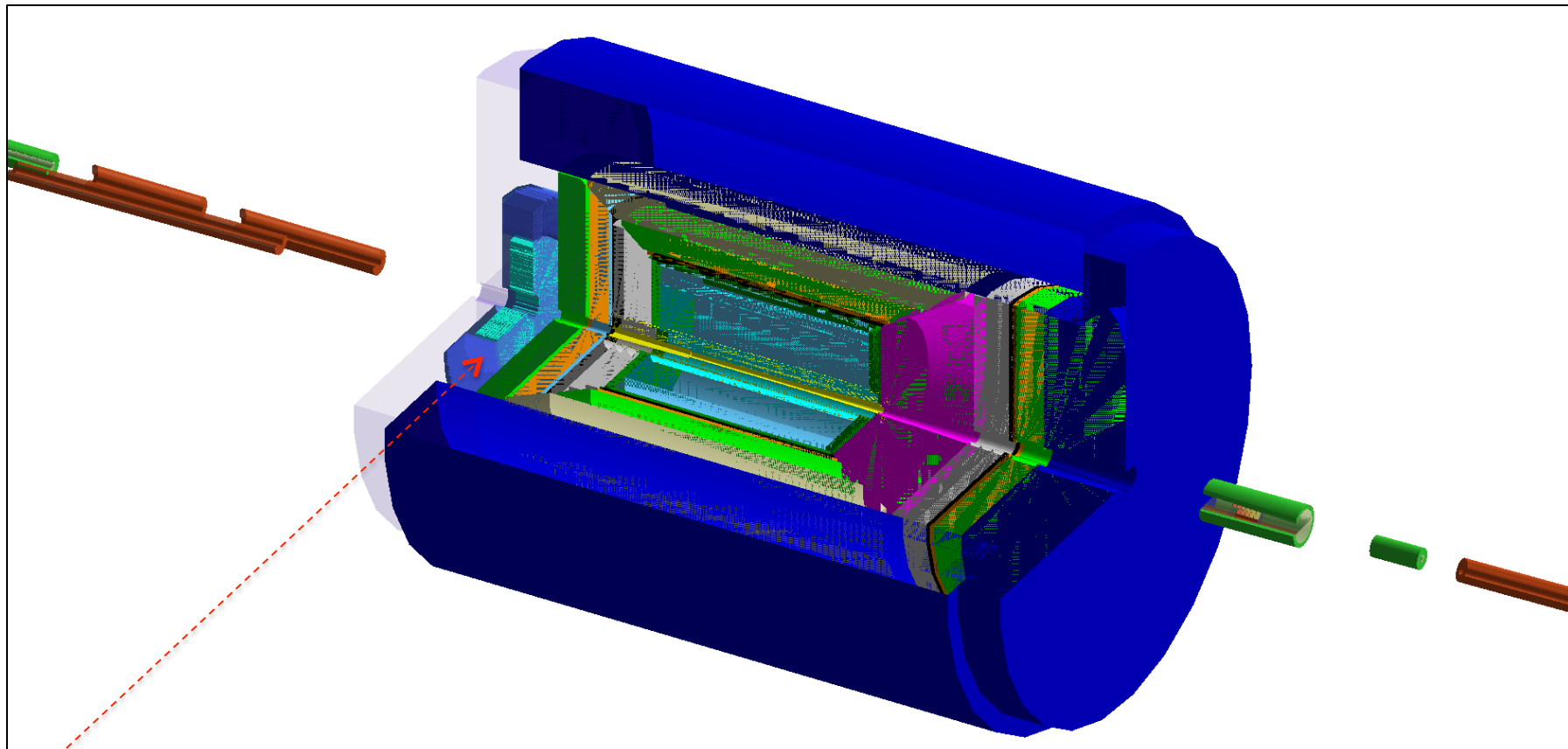
- **RACF: ROOT 6.16.00, GEANT 10.2.2**
 - Shown here: integration in one of the *fun4all* example codes



This object is a “template G4Box” placed into a container volume

Case#3: *escalate* event display

- Latest *escalate* Docker container: ROOT 6.20.04, GEANT 10.6.1
 - Shown here: direct integration into g4e JLEIC source code



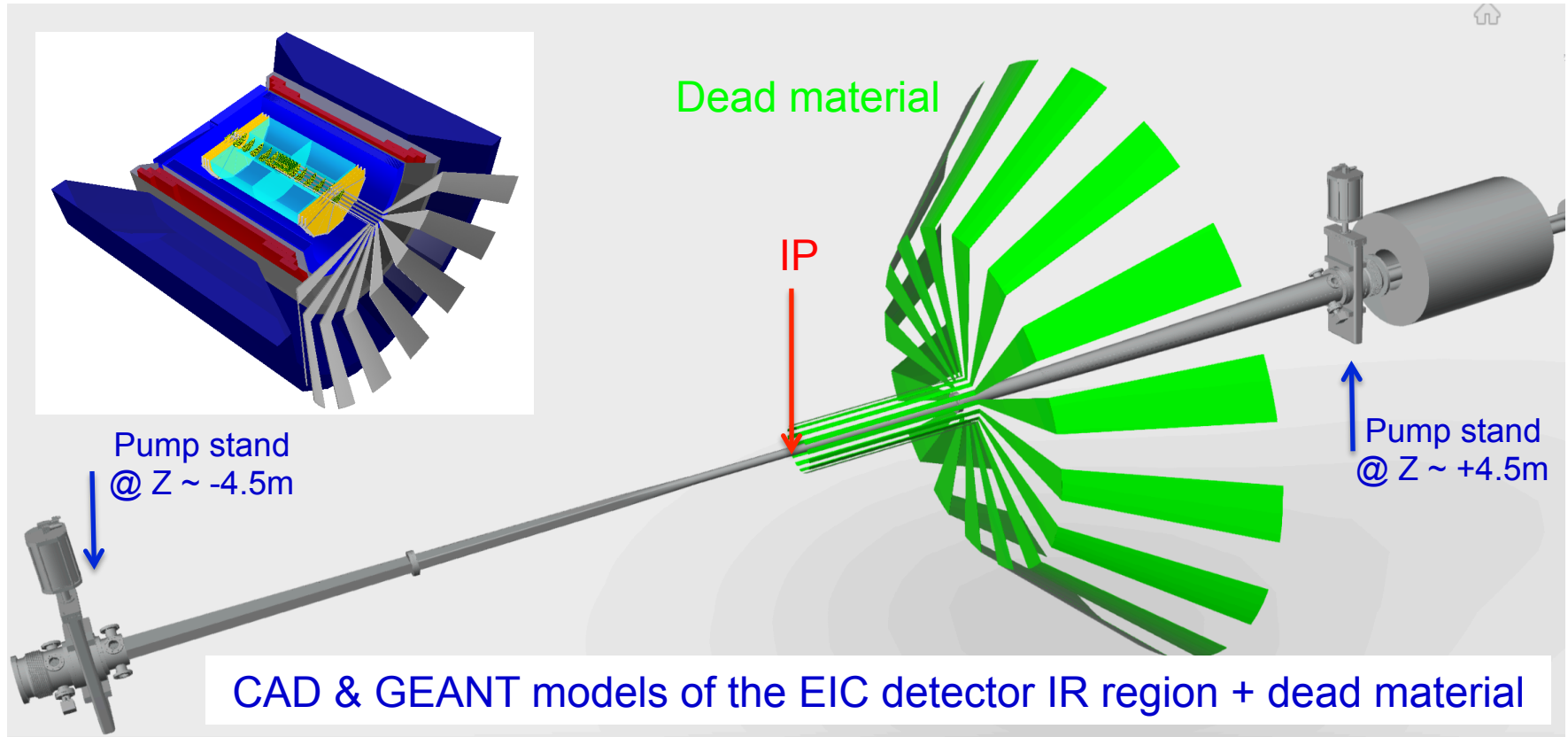
This object is a “native” JLEIC EmCal placed into the respective container volume

Coding overhead: *escalate* case

```
1  void JLeicDetectorConstruction::Create_ce_Endcap(JLeicDetectorConfig::ce_Endcap_Config cfg)
2  {
3      // ...
4
5      // Import ROOT file with an "EicToyModel" singleton class instance;
6      auto eic = EicToyModel::Import("example.root");
7
8      // Construct the integration volumes geometry, internally;
9      eic->Construct();
10
11     // Place them as G4 volumes into the IR world volume all at once;
12     eic->PlaceG4Volumes(World_Phys);
13
14     // Get pointer to a particular G4VPhysicalVolume;
15     ce_ENDCAP_GVol_Phys = eic->bck()->get("HCal")->GetG4Volume();
16
17     // ...
18 }
```

- All in all: the overhead is seemingly very small
- Step by step details are communicated to the framework developers

Support, services, detector frames



- Support structure:
 - Generic part (outside of the integration volumes): engineering effort
 - Matching detector-specific part (inside the integration volumes ?)
- Services: should be configurable, accumulating from / to “inner” detectors
- Detector frames: should naturally come together with the active volumes