

FairRoot software for EIC: status and plans

Alexander Kiselev

Brookhaven, 08.10.2012

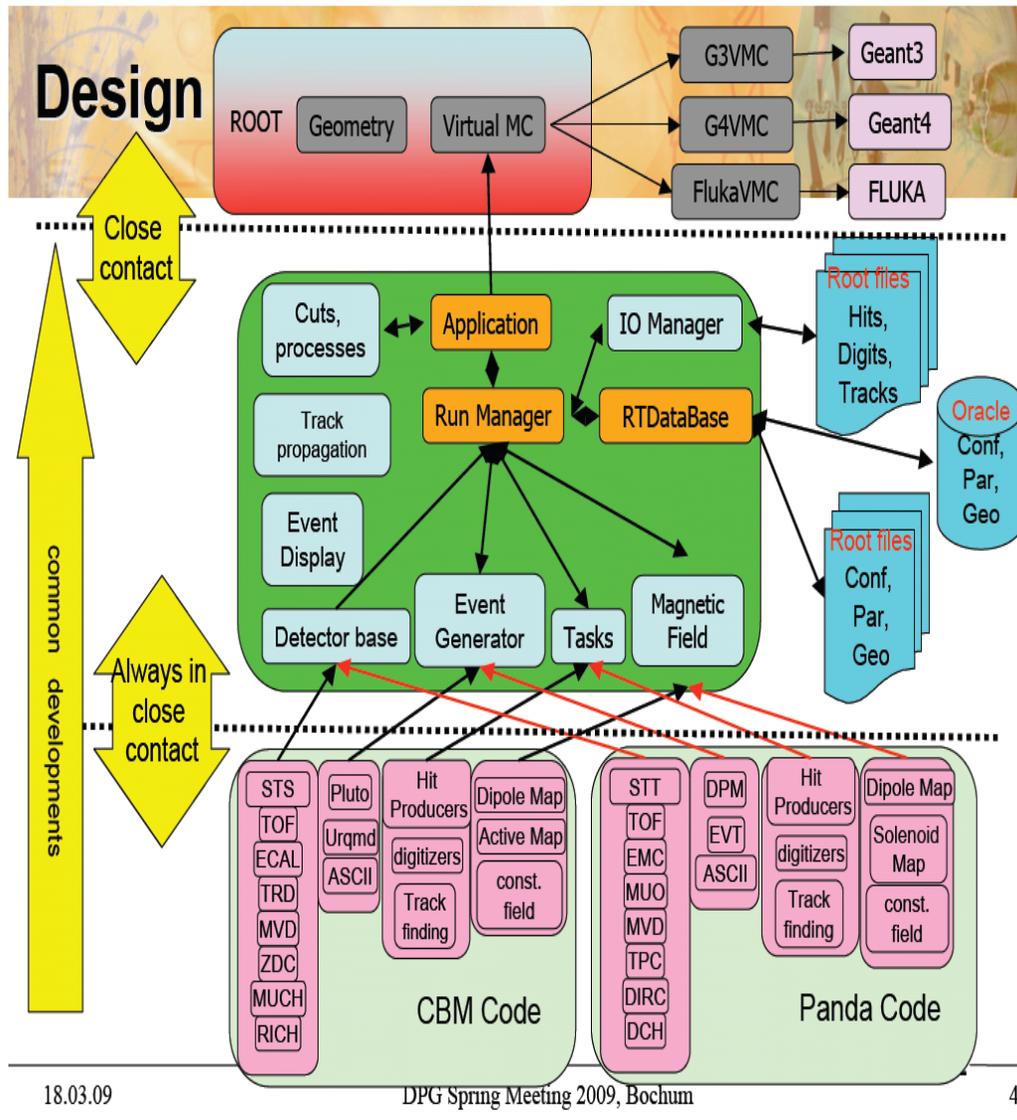
Contents of the talk

- Few words about FairRoot framework
- Software available for EIC simulations
- Outlook

-> (almost) all of the presented stuff was done by Dmitry Arkhipkin and Yulia Zulkarneeva a year ago:

thank you, colleagues!

FairRoot in one slide



- A complete framework (simulation, reconstruction, visualization, ...)
- Modular design
- Open source
- Active community
- Large user/experiment base
- Deeply integrated with ROOT
- Virtual geometry model
- Different transport options

18.03.09

DPG Spring Meeting 2009, Bochum

4

Plots from Nov'2011 LoI

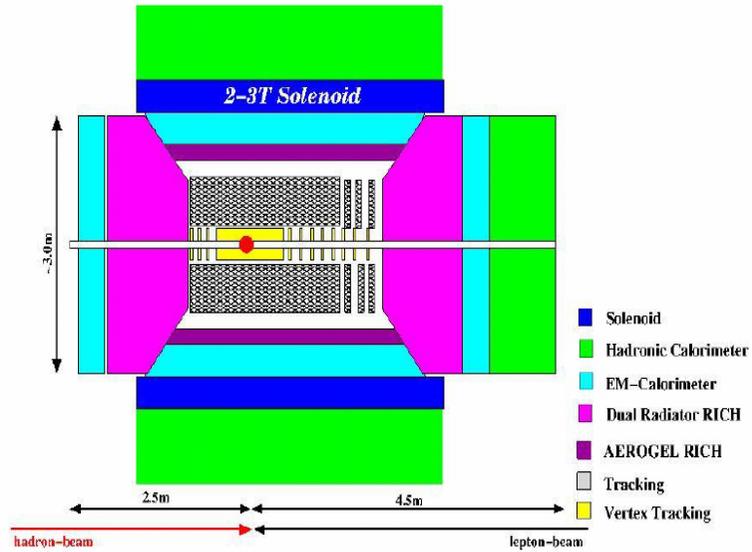


Figure 9: Schematic view of the dedicated detector at eRHIC.

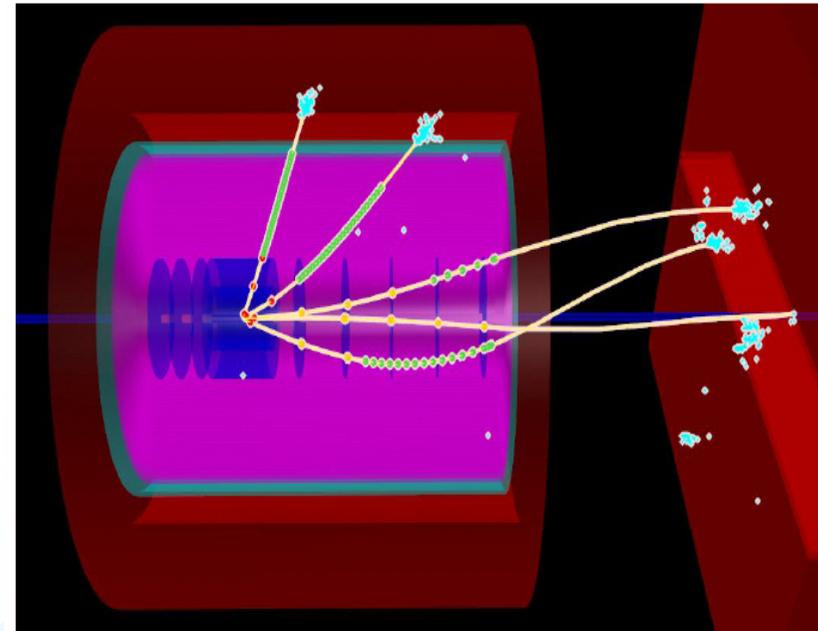
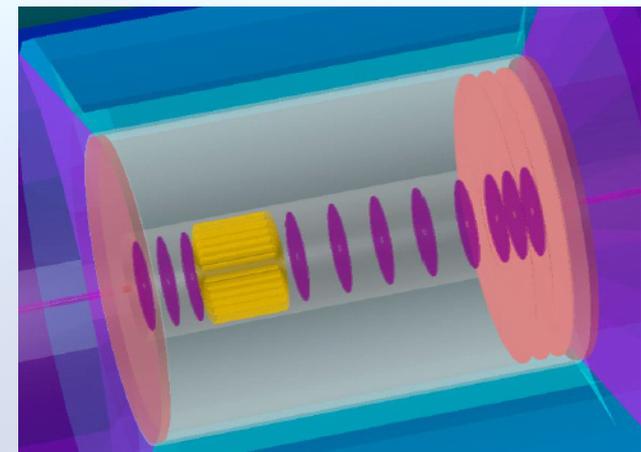
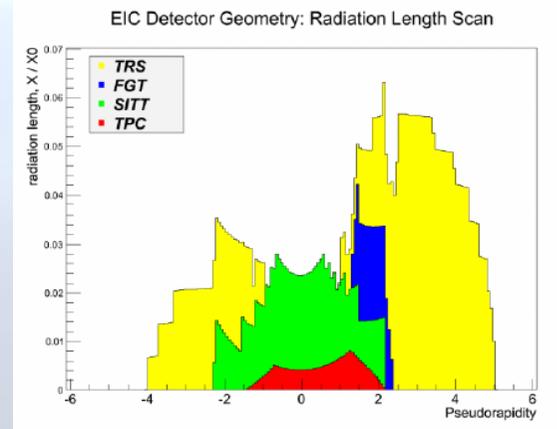
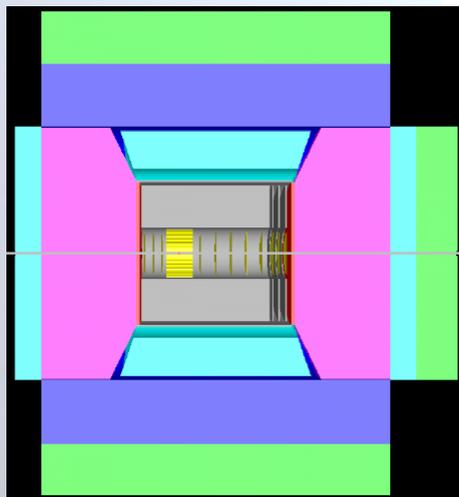


Figure 11: PYTHIA ep event in the detector.



The problem

- This development was frozen a year ago
- Software has never been used on EIC cluster

-> agreement with the authors to give over the codes
(but only in person, upon arrival to BNL)

-> EIC detector-specific libraries missing!

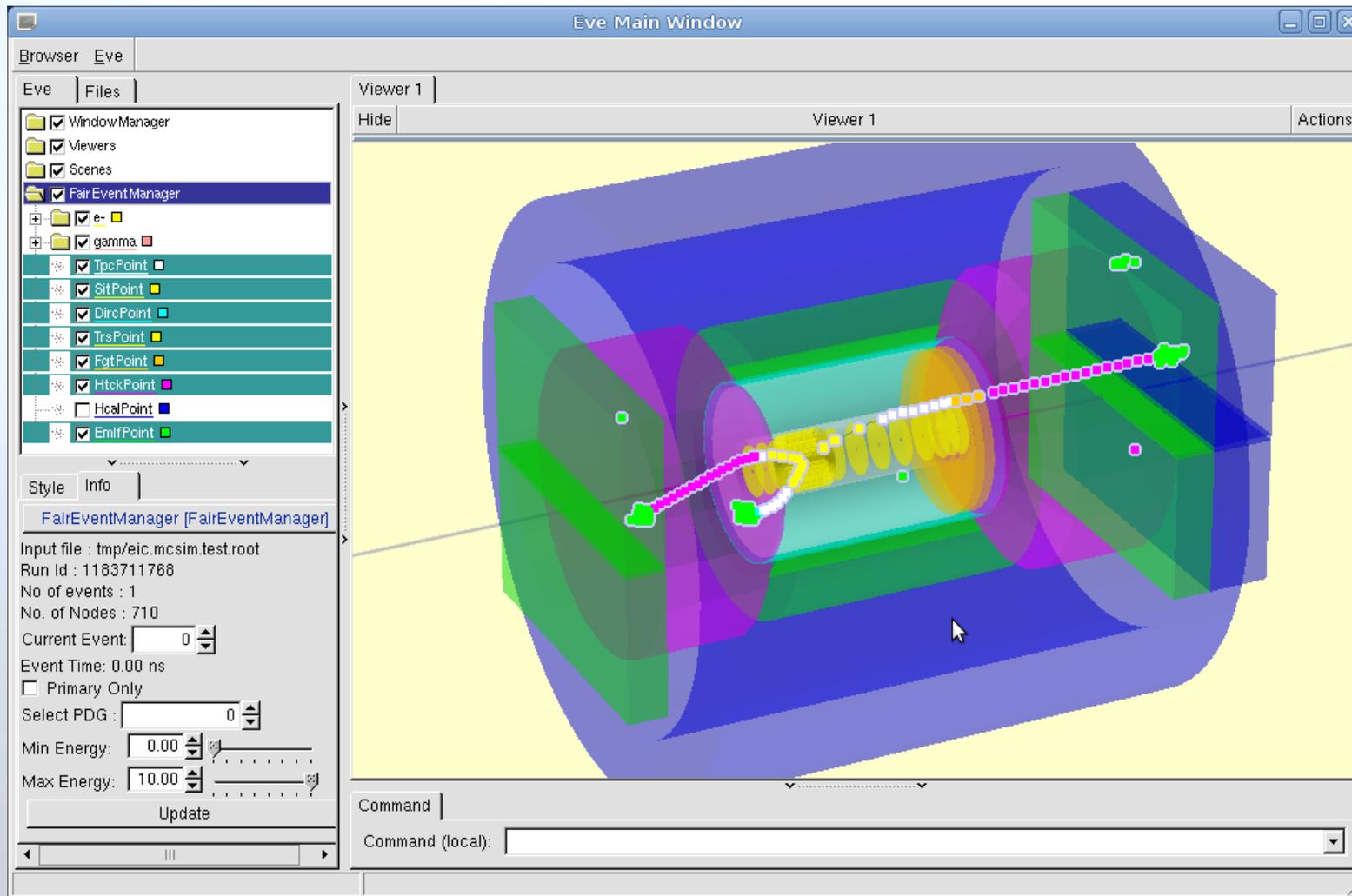
In the meantime

try to speed up the process:

- Install fresh FairRoot bundle on eic000* cluster
- Install NICA MPD software (CBM derivative)
- Reconstruct the essential part of missing EIC libraries using MPD detector codes
- While the geometry description files and various ROOT macros are available

-> this approach worked just fine!

EIC detector in FairRoot browser



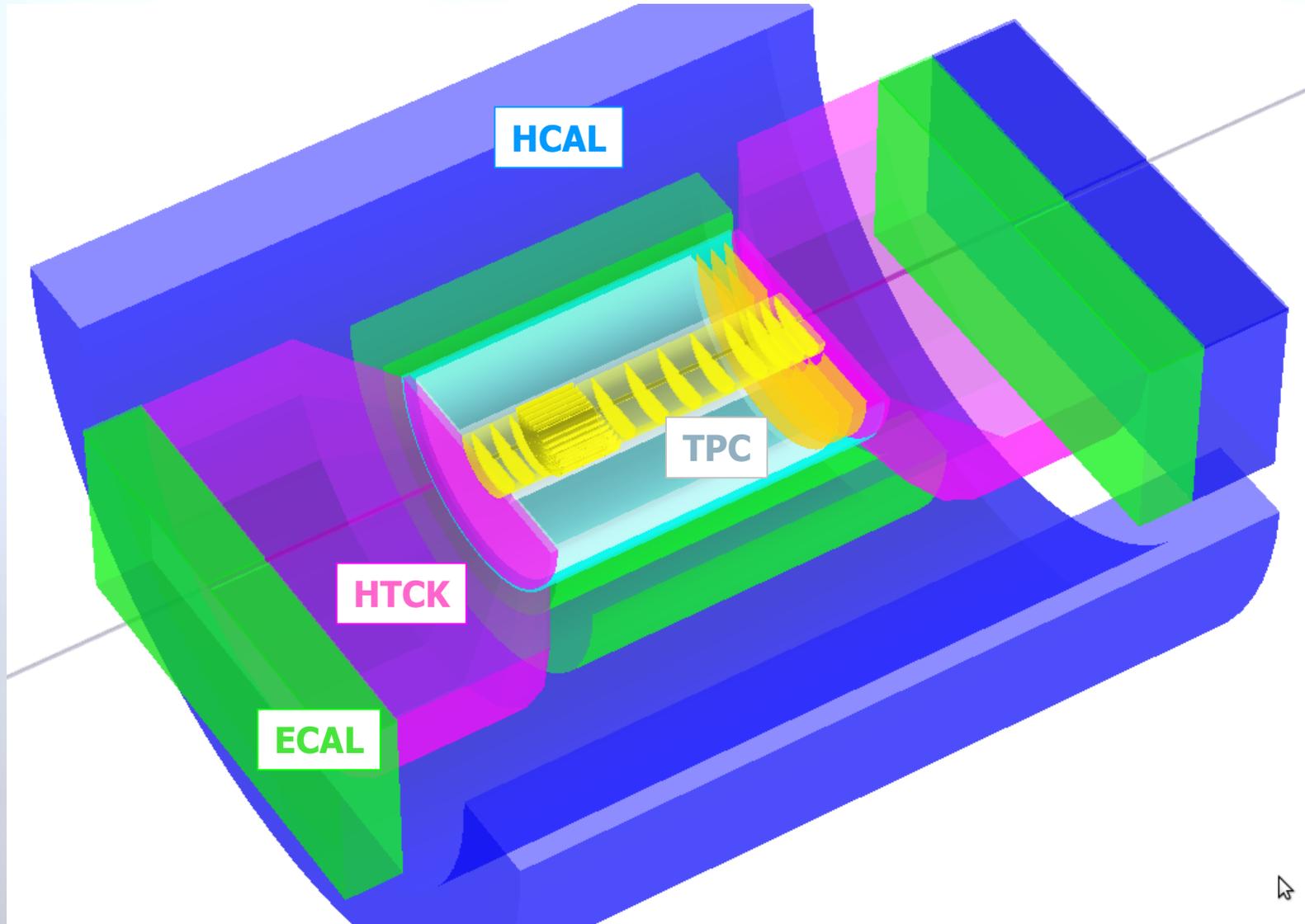
-> took indeed very little effort to see this plot ...

Implemented subdetector list

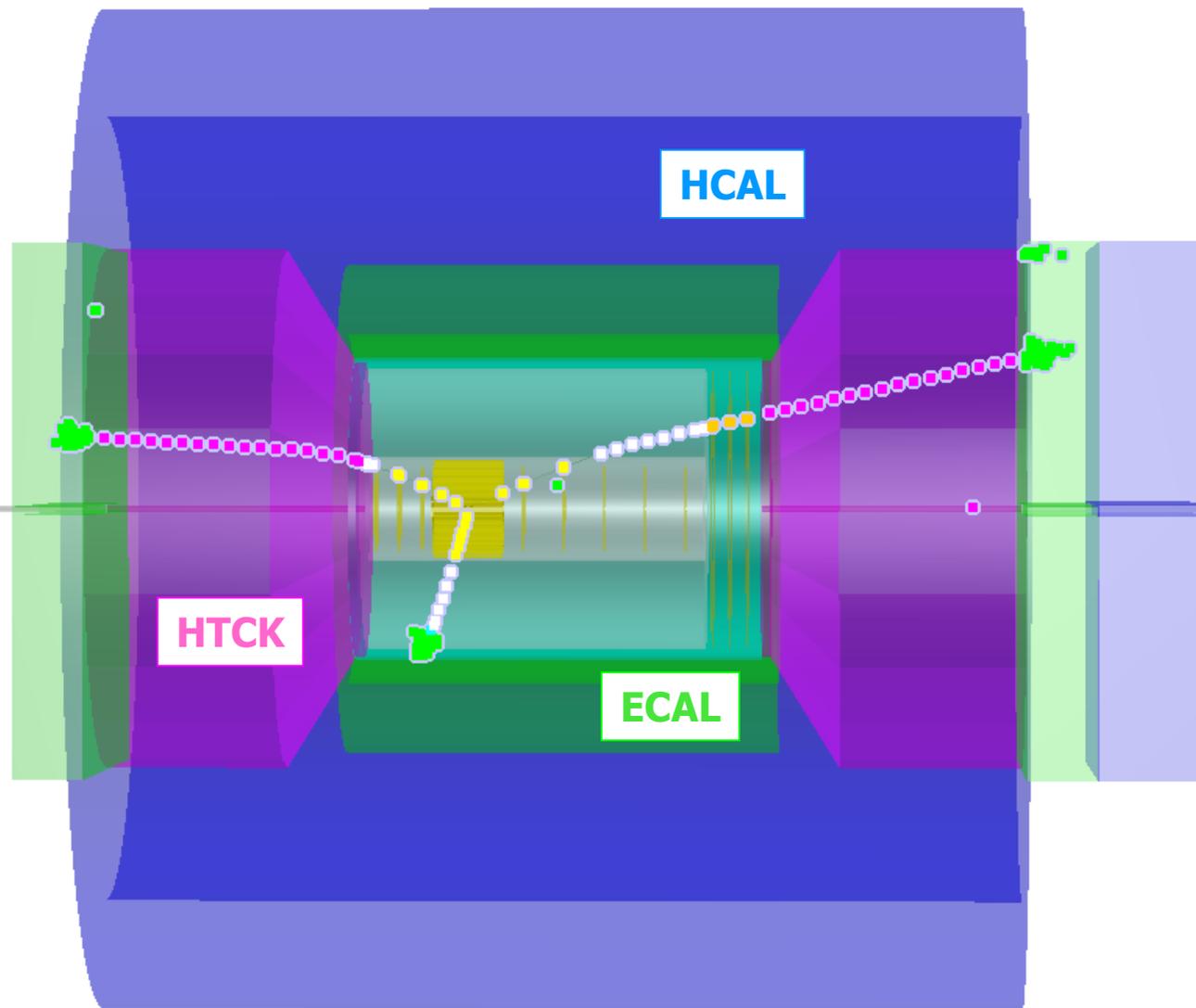
TRS	Dual layer silicon tracker (\sim ZEUS geometry)
FGT	Forward GEM tracker (\sim STAR design)
SIT	Silicon pixel detector (\sim STAR design)
TPC	Time Projection Chamber
DIRC	Internally reflecting Cerenkov counter
HTCK	Dual radiator Cerenkov counter
ECAL	Electromagnetic calorimeter
HCAL	Hadron calorimeter

+ beam pipe and solenoid volumes

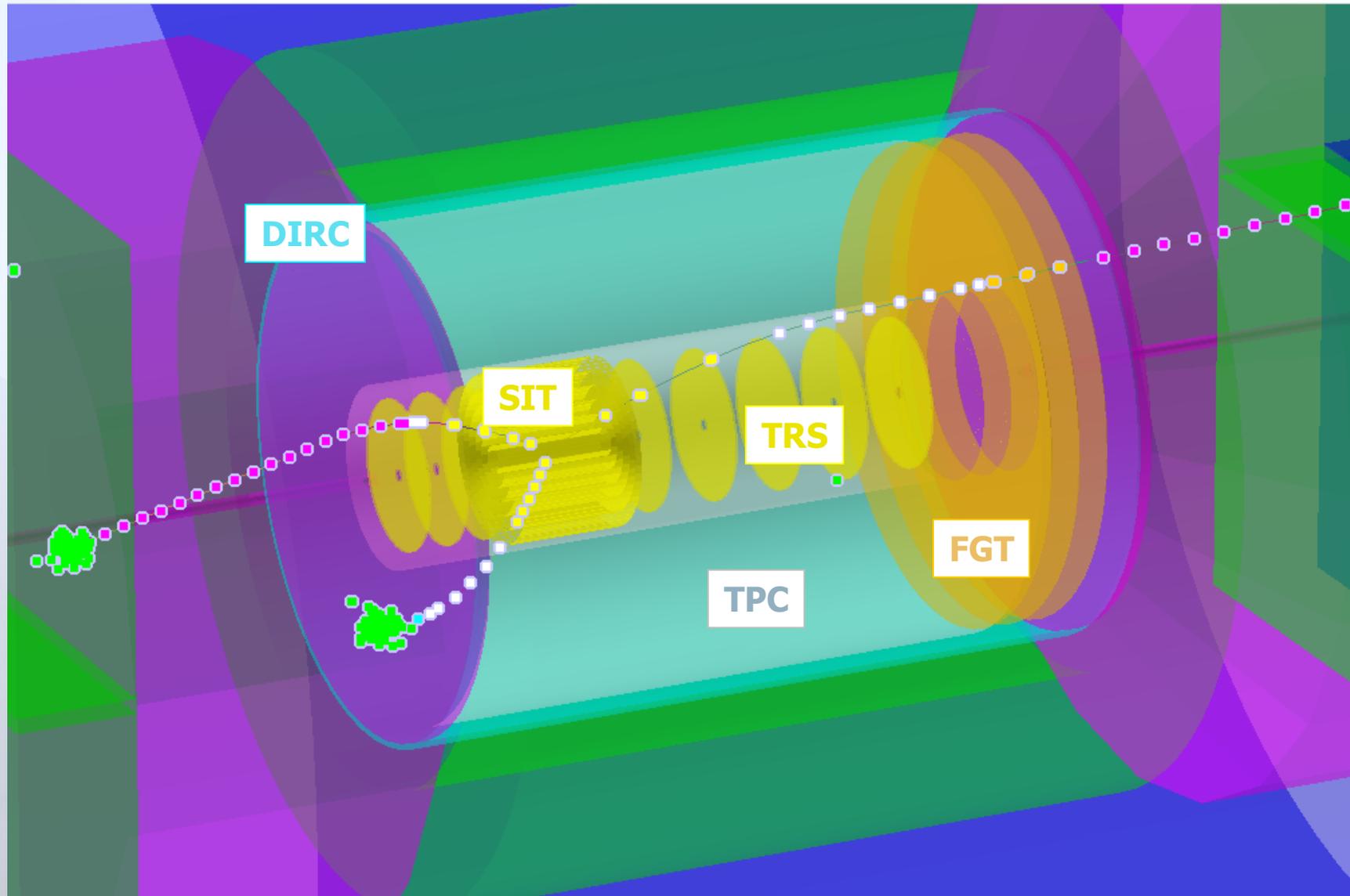
EIC detector: plane cut view



Side view with tracks

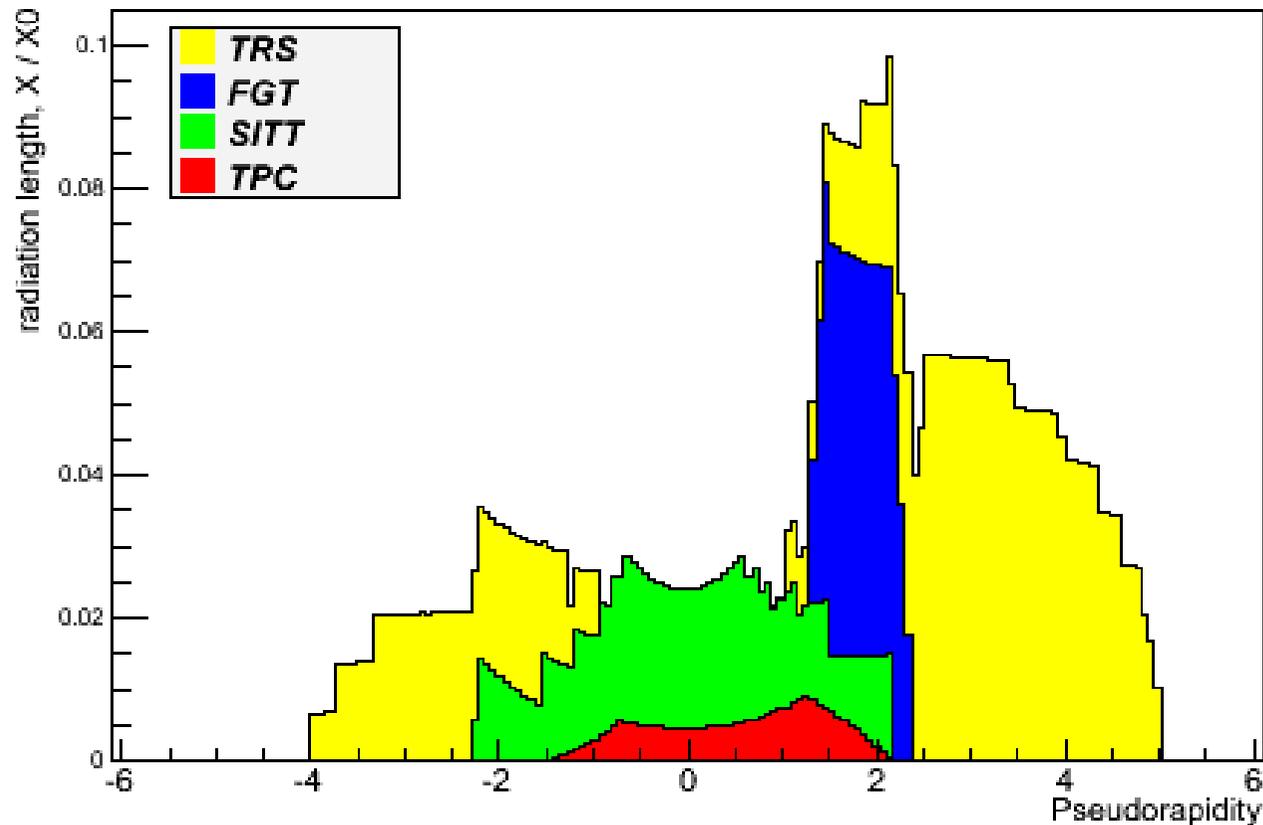


3D view with tracks (zoomed)



Radiation length scan

EIC Detector Geometry: Radiation Length Scan



- Also few other macros available ...

-> code taking over is ~finished

Next steps

- Replace detector “place holders” by real ones
- Think on digitization models
- See which tracking schemes are available
- Implement realistic magnetic fields
- Arrange code management (svn, git, ..?)
- ... and of course proceed with the simulations!
-> input from everybody is expected!