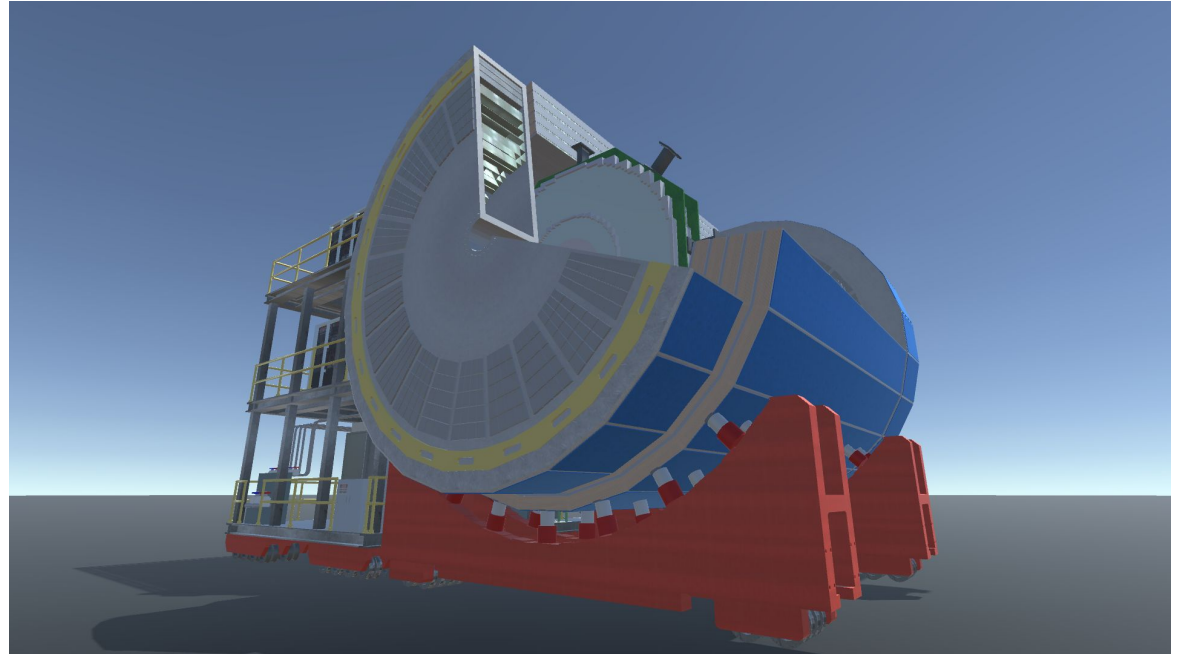


Update on hadronic reconstruction with full sim

Miguel Arratia (UCR)



Files

Draw Option:

- root
 - PROOF Sessions
 - ROOT Files
 - pythia8DIS_trackpluscalo.root
 - events;1
 - mcparticles2
 - outputTrackParameters
 - EcalEndcapNClusters
 - EcalEndcapNClusters#0
 - EcalEndcapNClusters#1
 - EcalEndcapPClusters**
 - EcalEndcapPClusters#0
 - EcalEndcapPClusters#1
 - EcalBarrelClusters
 - EcalBarrelClusters#0
 - EcalBarrelClusters#1
 - EcalBarrelScFiClusters
 - EcalBarrelScFiClusters#0
 - EcalBarrelScFiClusters#1
 - HcalBarrelClusters
 - HcalBarrelClusters#0
 - HcalBarrelClusters#1
 - HcalElectronEndcapClusters
 - HcalElectronEndcapClusters#0
 - HcalElectronEndcapClusters#1
 - HcalHadronEndcapClusters
 - HcalHadronEndcapClusters#0
 - HcalHadronEndcapClusters#1
 - metadata;1

10:15 → 10:30

Report : Jets/HF/EW-BSM WG

Speakers: Brian Page (Brookhaven National Laboratory), Ernst (Riverside), Stephen Sekula (SMU)



ATHENA bi-weekly, ...

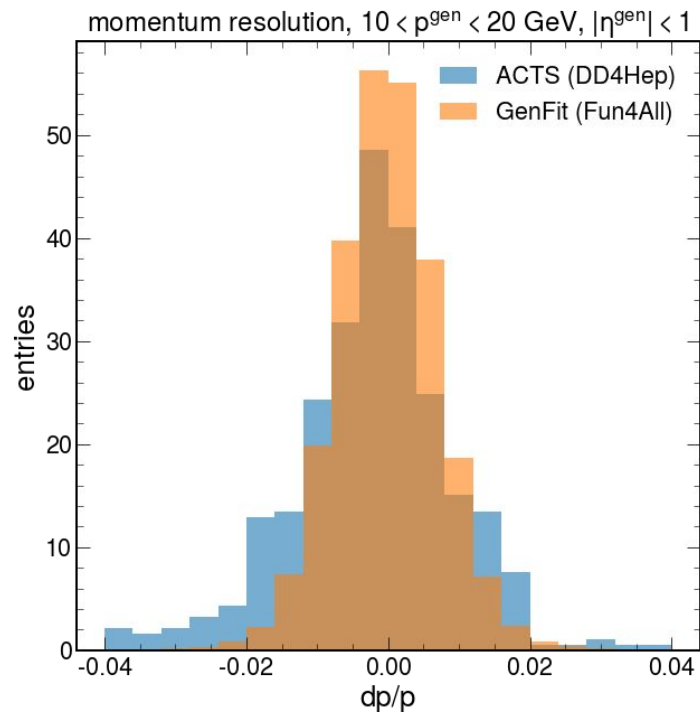
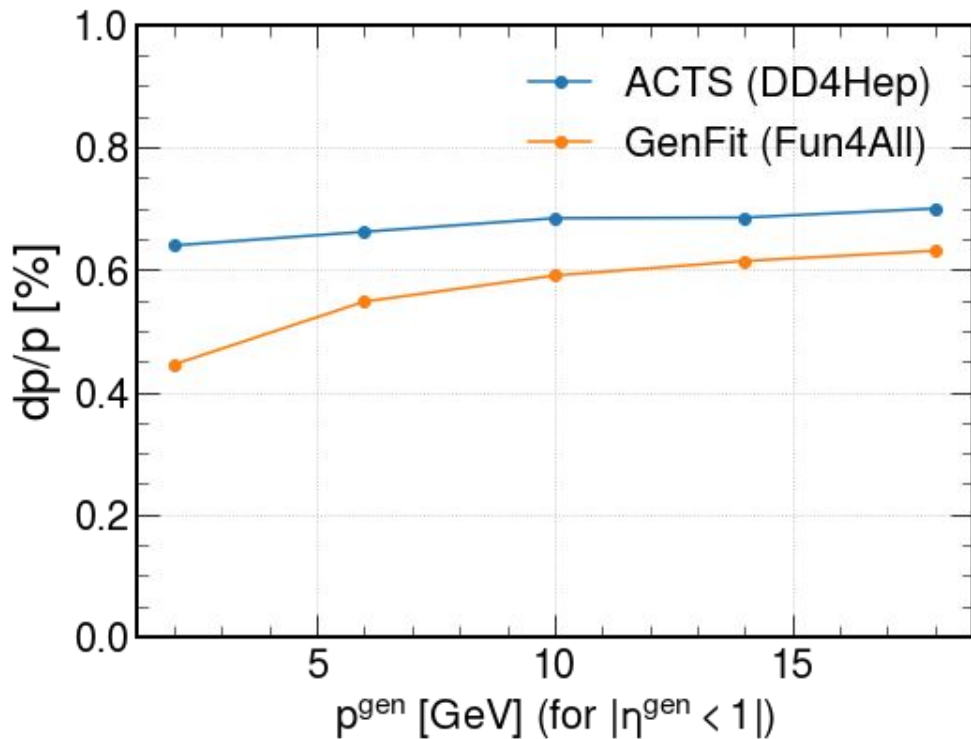


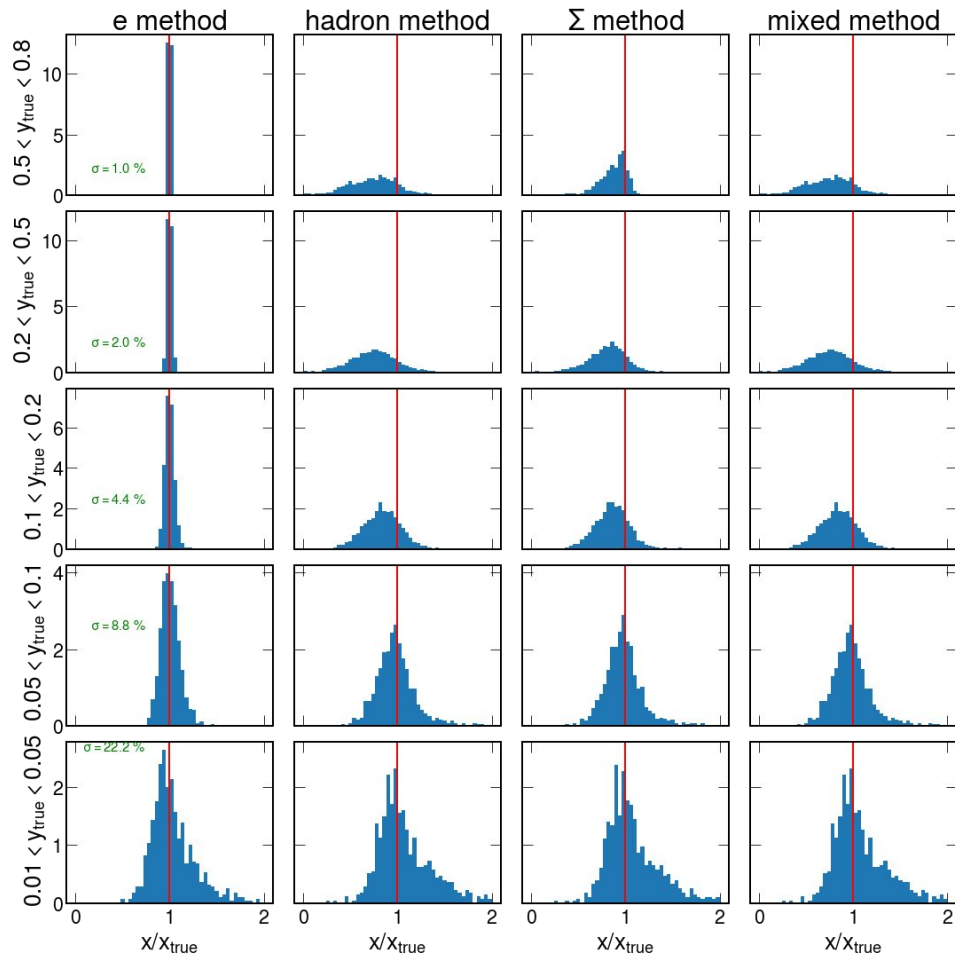
pythia8DIS_trackplu...

While both tracking still needs development, we can work on benchmark analyzes code.

- Track-cluster matching.
- electron ID algorithms
- “Track subtraction” algorithms from calo energy (aka energy flow algo)
- Hadronic reconstruction
- Background rejection algorithms
- etc etc etc.

Early tests are very encouraging, tracking will converge pretty soon





Hadronic reconstruction methods are obtained using calorimeter information only (ECAL + HCAL).

Next step is to add tracking. This requires track-cluster matching and subtraction of charged-energy from HCAL

To keep in mind while analyzing samples

- Need to consider that barrel ECAL is divided in two: EcalBarrel (silicon-tungsten) and EcalBarrelScFi (scintillator-tungsten). The SciFi has no longitudinal segmentation, so you need to match clusters in silicon to SciFi to get polar angle of electron (and any cluster).
- Small samples (~10k) events or so are easier to generate provided you have HEPMC format. (recipe is in slack)

First, get eic container from https://eic.phy.anl.gov/tutorials/eic_tutorial/getting-started/quickstart/

Then follow the instructions shown on the right. Then use the commands shown Below. Voila! You will get a ROOT file with tracks and clusters.

```
# development directory
mkdir development
export LD_LIBRARY_PATH=$PWD/development/lib:$LD_LIBRARY_PATH
export PATH=$PWD/development/bin:$PATH

# intall athena
git clone https://eicweb.phy.anl.gov/EIC/detectors/athena.git
cd athena
mkdir build && cd build
cmake .. -DCMAKE_INSTALL_PREFIX=../../development
make install
cd ../../

# intall beamline
git clone https://eicweb.phy.anl.gov/EIC/detectors/ip6.git
cd ip6
mkdir build && cd build
cmake .. -DCMAKE_INSTALL_PREFIX=../../development
make install
cd ../../

# copy beamline compact files to detector
cp -r ip6/ip6 athena/

# install juggler
git clone https://eicweb.phy.anl.gov/EIC/juggler.git
cd juggler/
mkdir build && cd build
cmake .. -DCMAKE_INSTALL_PREFIX=../../development -DCMAKE_CXX_STANDARD=20
make install
cd ../../

# set environment needed by benchmark
export DETECTOR_PATH=$PWD/athena
export JUGGLER_DETECTOR=athena
export JUGGLER_INSTALL_PREFIX=$PWD/development
```

↓ Latest messa

```
git clone https://eicweb.phy.anl.gov/EIC/benchmarks/reconstruction_benchmarks.git
cd reconstruction_benchmarks/
```

bash benchmarks/clustering/full_trackpluscalo.sh -n NEVENTS -t YOURHEPMC

Happy analysing,
Go ATHENA!

