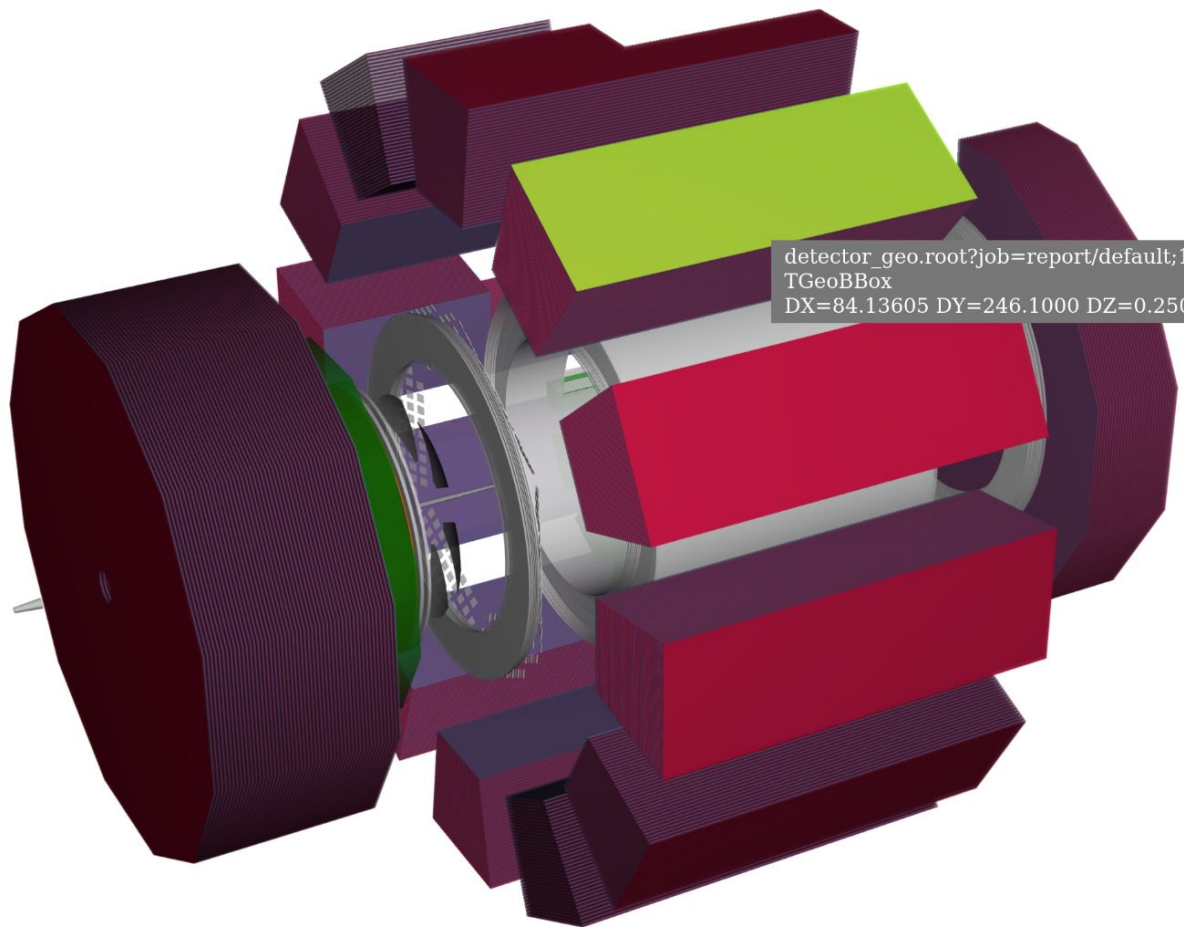
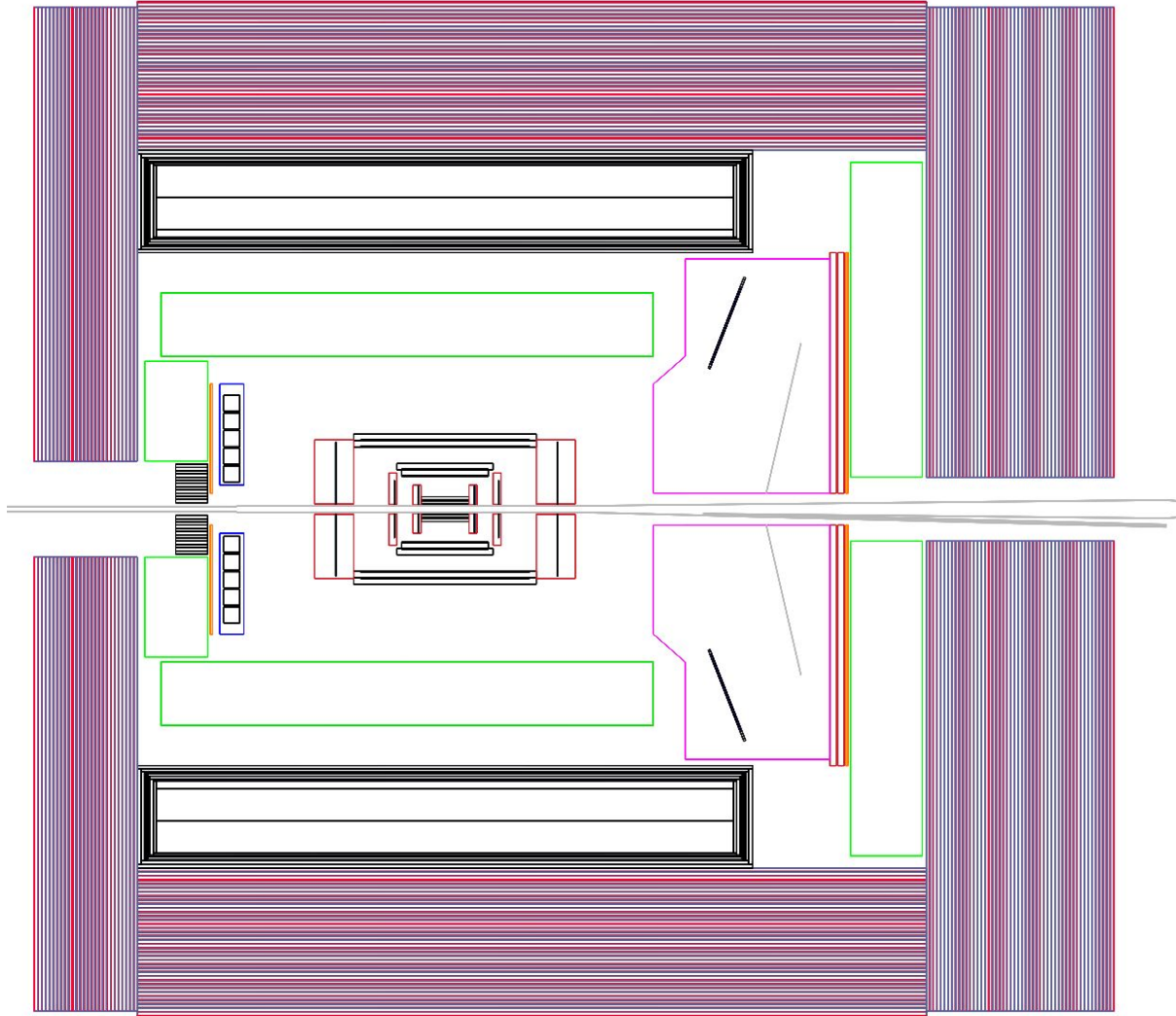


Status of HCAL Model and reconstruction Within DD4HEP

Miguel Arratia (UCR),
June 7 2021
(T-170 days)



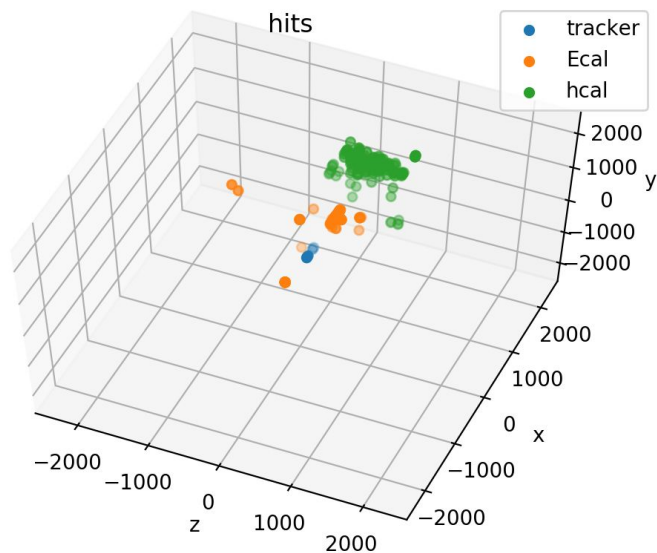


Reminder:

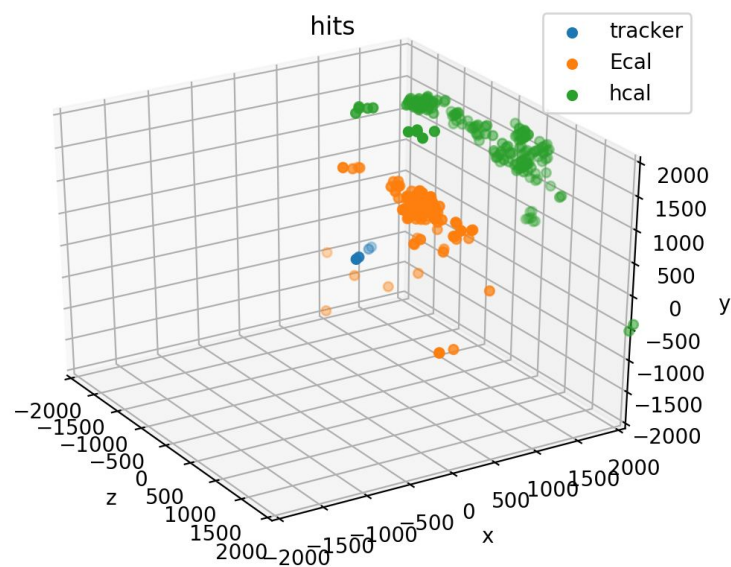
- We have “overspec” granularity in simulation.
- We will “regroup” layers/cells in the reconstruction step to study tradeoff granularity

Simulation status: single-particle G4 simulations

Pion 20 GeV

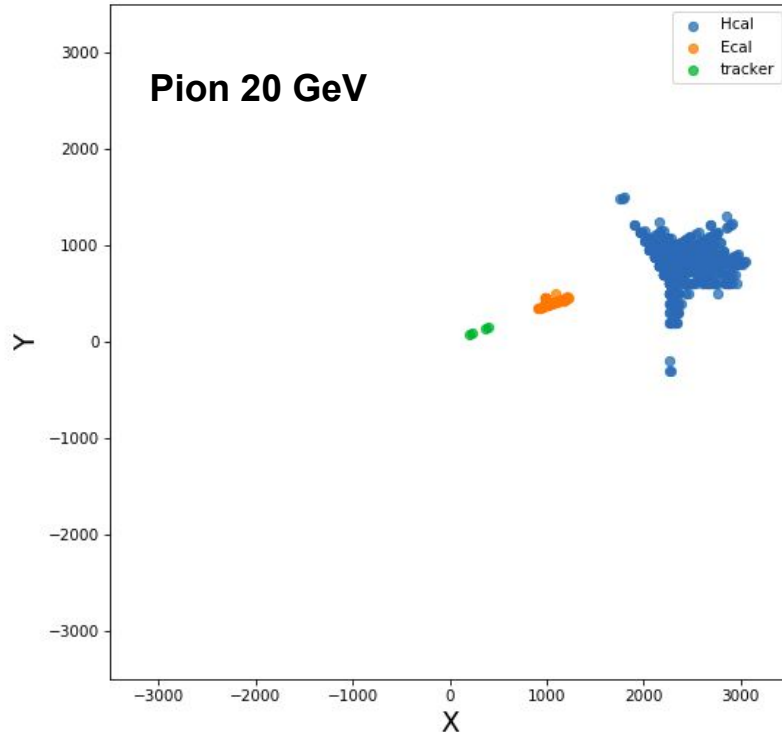


Pion 20 GeV, (showers in ECAL)



“Hits” from tracker, ECAL, and HCAL are shown here

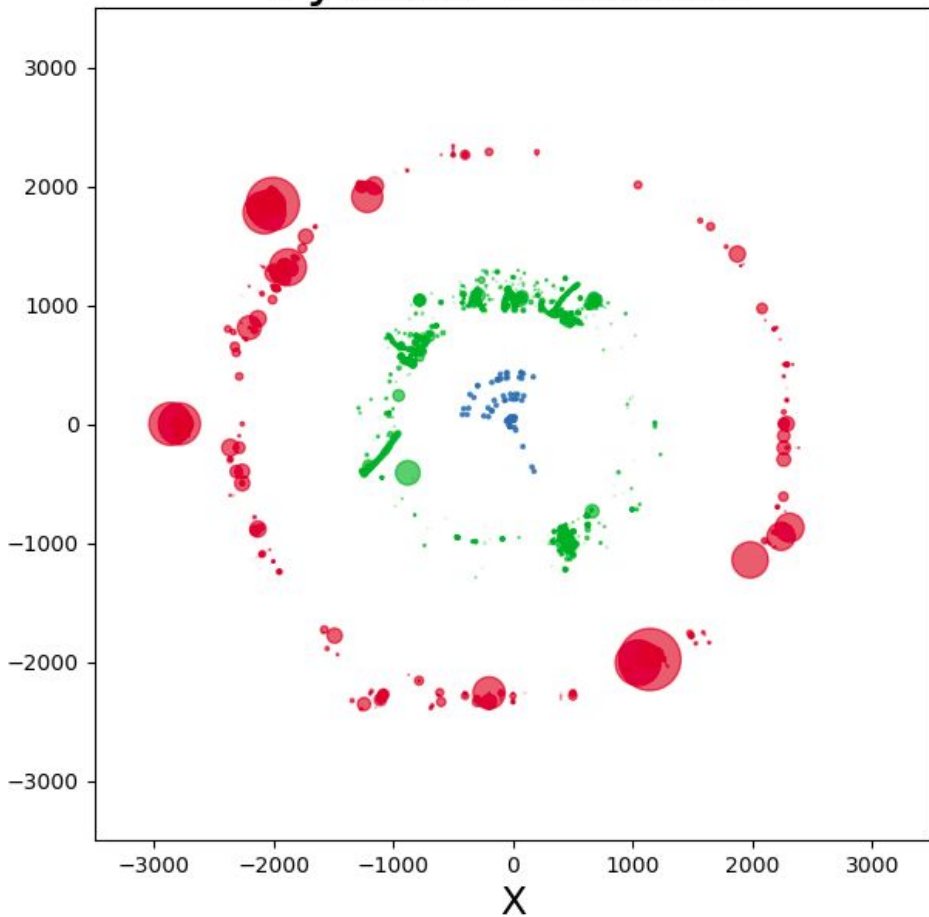
Current status: debugging HCal reconstruction code



- We are still testing output of HCal reconstruction code.
- Updates were required given that it is not uncommon to have HCAL clusters that encompass more than one sector. Chao made improvements, I am about to test this.
- Working in flexible codes for the “merging” of HCAL layers for granularity studies

ATHENA simulation

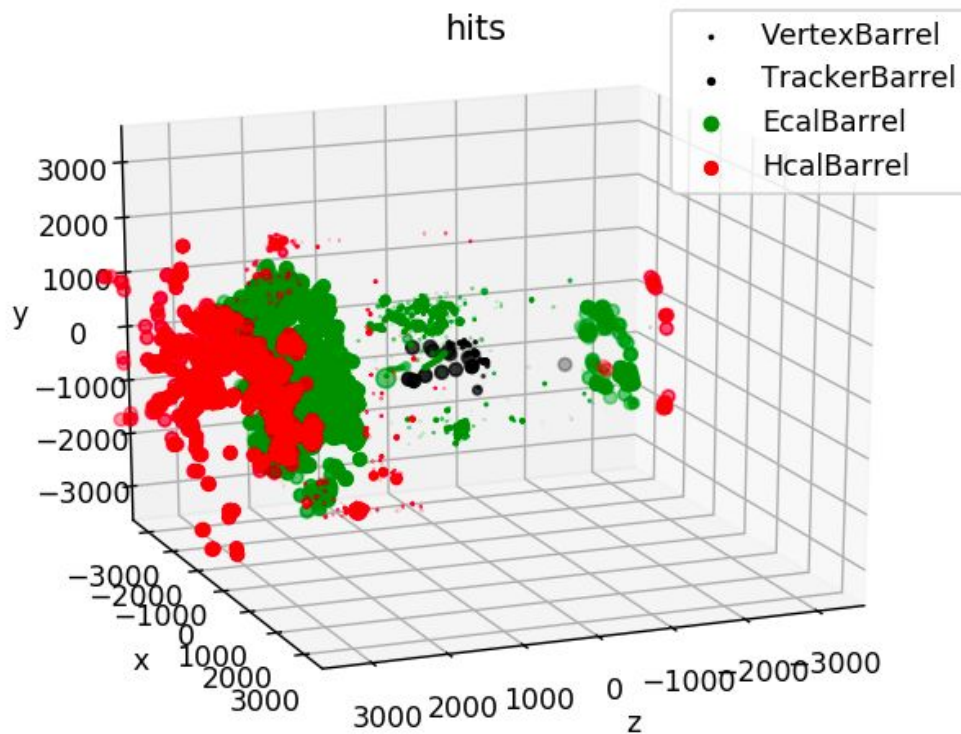
Pythia8 + Geant4



- First full-simulation campaign successfully ran last week (Wouter) using Pythia8 DIS events (Brian)
- Useful test to stress computer resources, estimate data sample sizes, and start physics analysis!

A milestone!

Full simulation files: G4 sim done, reconstruction ongoing



Summary

- HCAL fully integrated in DD4HEP simulations.
- Both single-particle and Pythia8 DIS events are already available.
G4 simulation step done, reconstruction ongoing.
- Once we fix clustering code, we will proceed to perform physics benchmark analyzes.