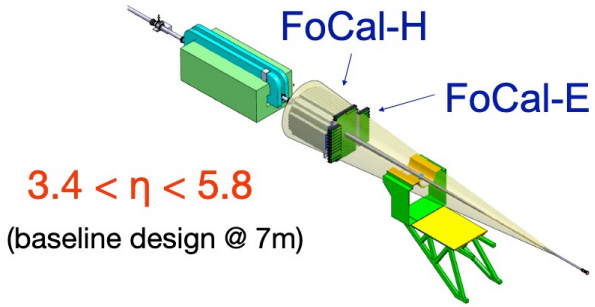
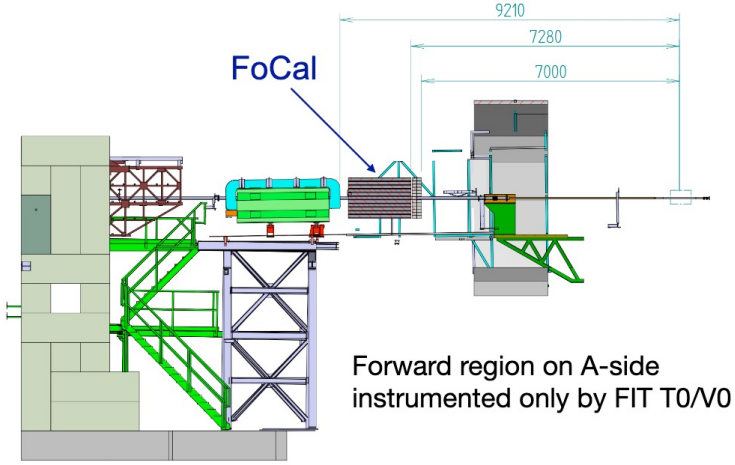
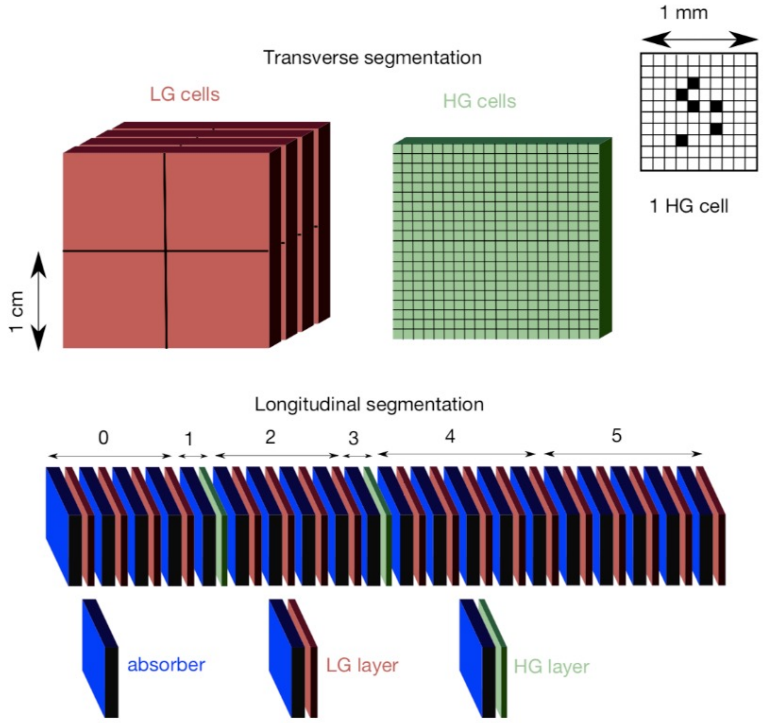
Weekly report

- ALICE FoCal simulation for trigger
  - This is to make trigger logics for ALICE FoCal.
  - 2K events of MinBias sample is provided this week.
    → Take a first look.







First look on ALICE FoCal minbias sample

- The provided file is a ntuple of (geant?) hits.

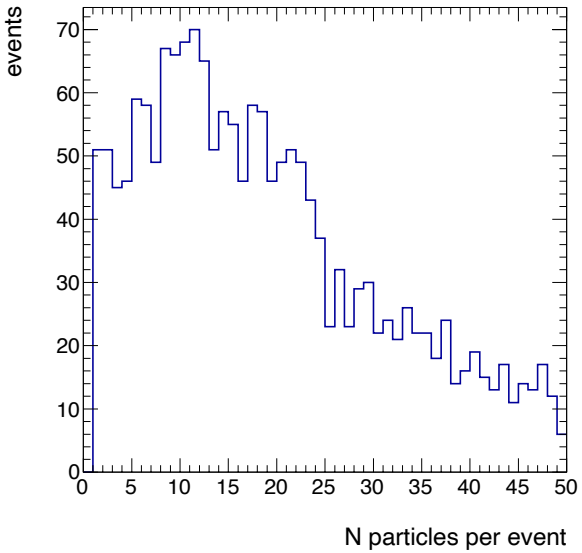
iEvent	row	col	layer	seg	x	y	z	depEn	particleN	pdgCode	px	py	pz
0	75	30	0	0	-16.14249	26.237499	696.375	68654.726	85	22	-0.077486	0.3450198	3.8775069
0	75	30	0	0	-16.15250	26.237499	696.375	79663.421	85	22	-0.077486	0.3450198	3.8775069
0	75	30	0	0	-16.16250	26.242498	696.375	38548.171	85	22	-0.077486	0.3450198	3.8775069
0	75	30	0	0	-16.17250	26.242498	696.375	50277.410	85	22	-0.077486	0.3450198	3.8775069
0	76	29	3	0	-17.08250	27.167499	699.40496	141713.07	85	22	-0.077486	0.3450198	3.8775069
0	93	51	1	0	4.0325012	44.482498	697.38494	167321.64	85	22	-0.077486	0.3450198	3.8775069
0	63	39	3	0	-7.367500	14.612497	699.40496	17078.906	85	22	-0.077486	0.3450198	3.8775069

  - Hit position on the detector and energy deposits.
  - Coordinates of the hit.
  - Primary particle of the hit.
  - Event ID

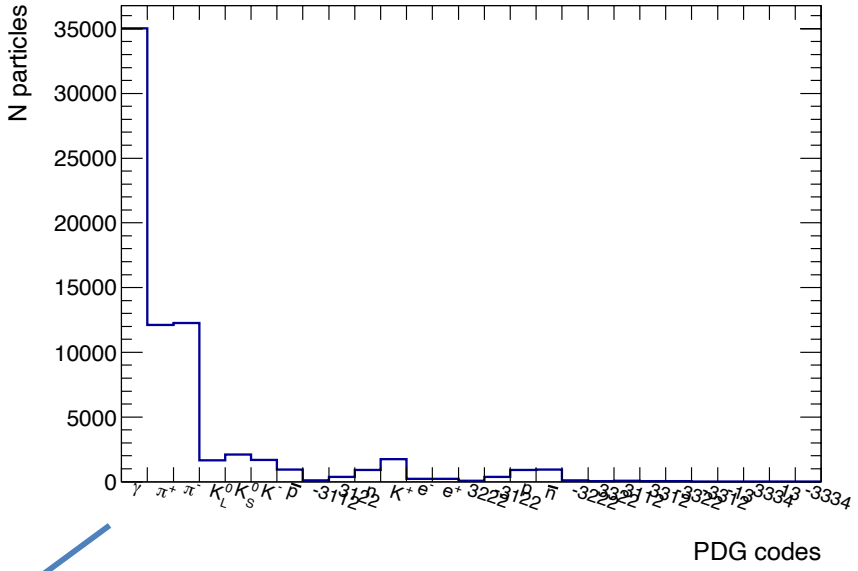
  Still need to check…: criteria to fill, units.

  → Anyway, try to look at event-wise information.

Number of particles giving hits per event



Distribution of PDG codes of the particles

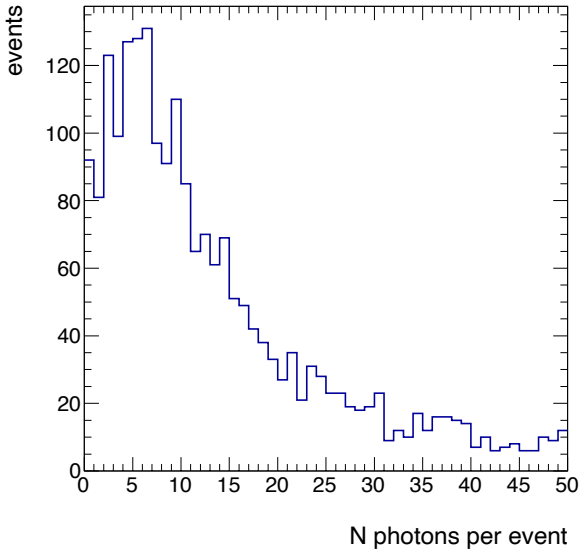


Multiple particles come to FoCal in an event.

Most of hits have photon as primary particles.
(No pi0 → seems they are in photons)

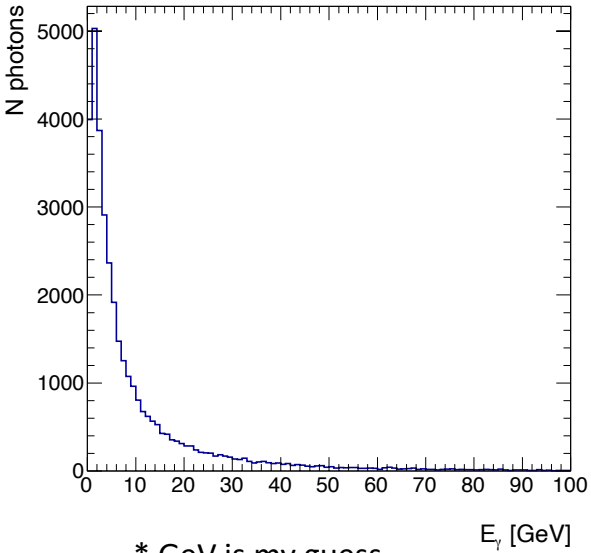
Let‘s look at photons:

Number of photons giving hits per event



Multiple photons in an event.
Event with no photons also exist.

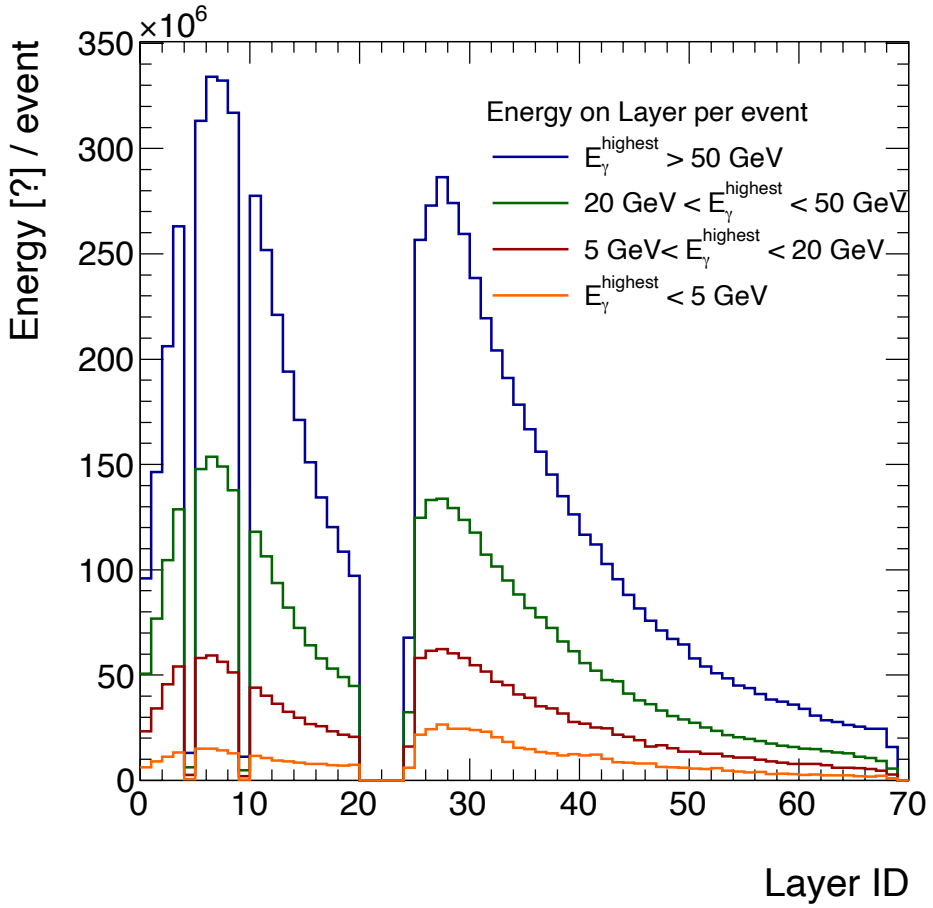
Energy distribution of the photons



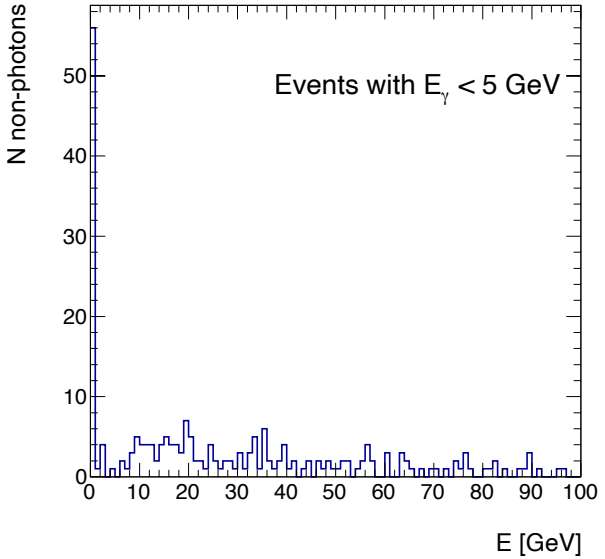
Events are categorized by the highest photon energy in the next slide.
[0-5, 5-20, 20-50, 50-]

* GeV is my guess

FoCal Energy per layer, averaged per event



Energy distribution of non-photon particles for events with no or low energy photons only.



Layer ID 0-20 should be FoCal-E. Rest should be FoCal-H.

→ What are the layer 20-24?

For events with low energy photons (orange), energy in FoCal-H gets larger.

→ Looks reasonable.

Drop of energy at the high-granularity layers (ID=4, 9).

→ Not sure if it is reasonable… probably yes..

Plans for FoCal trigger simulation

- Look at energy on each pad or pixel.
- Get familiar with ALICE softwares.

  (Loaded AliBuild on CERN lxplus, but not really launch FoCal softwares yet.)

Other plans

- Prepare EIC ZDC slides for 27/April, “The far-forward and far-backward detectors and IR integration for the EIC”