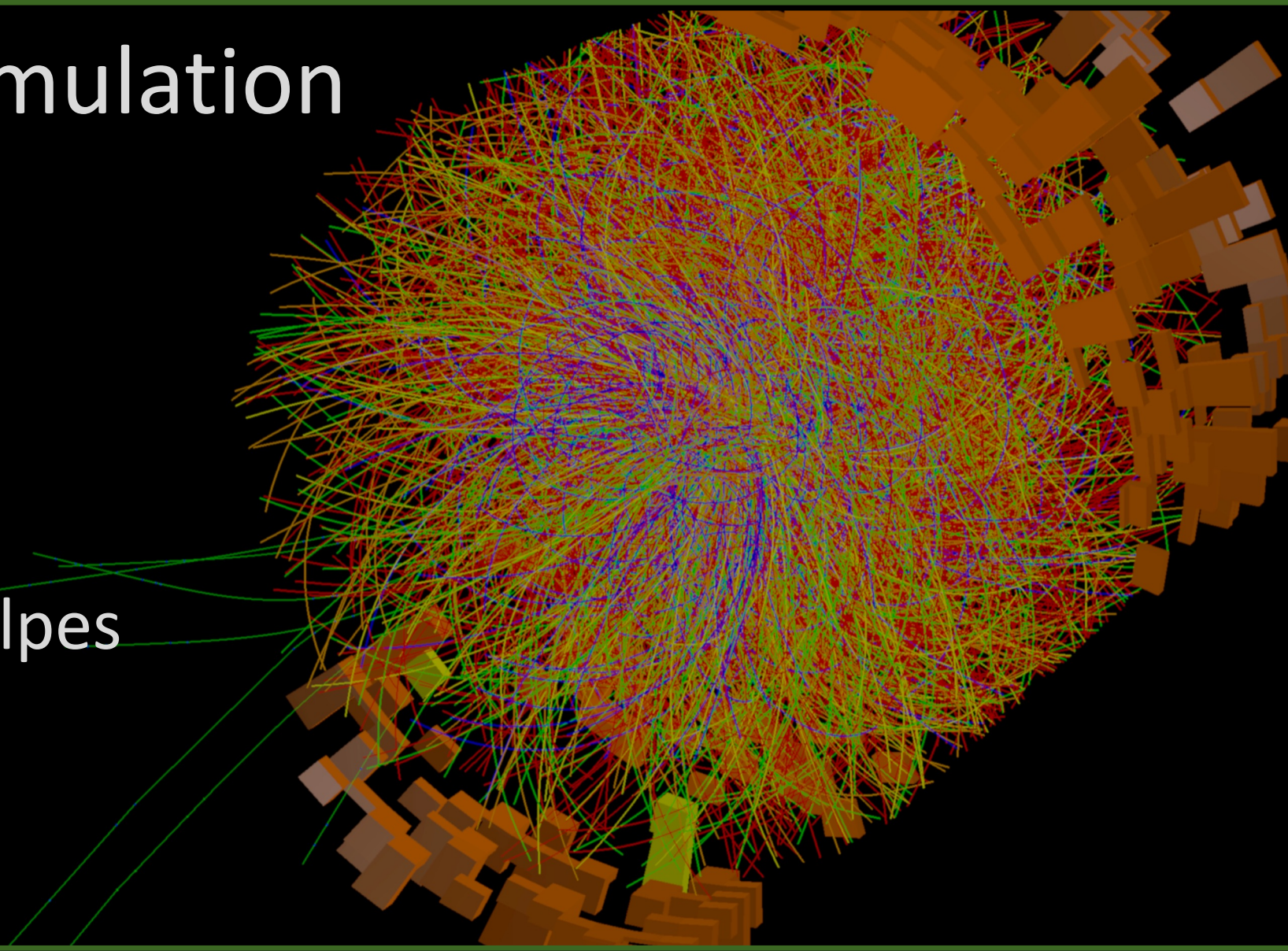
FoCal Trigger simulation



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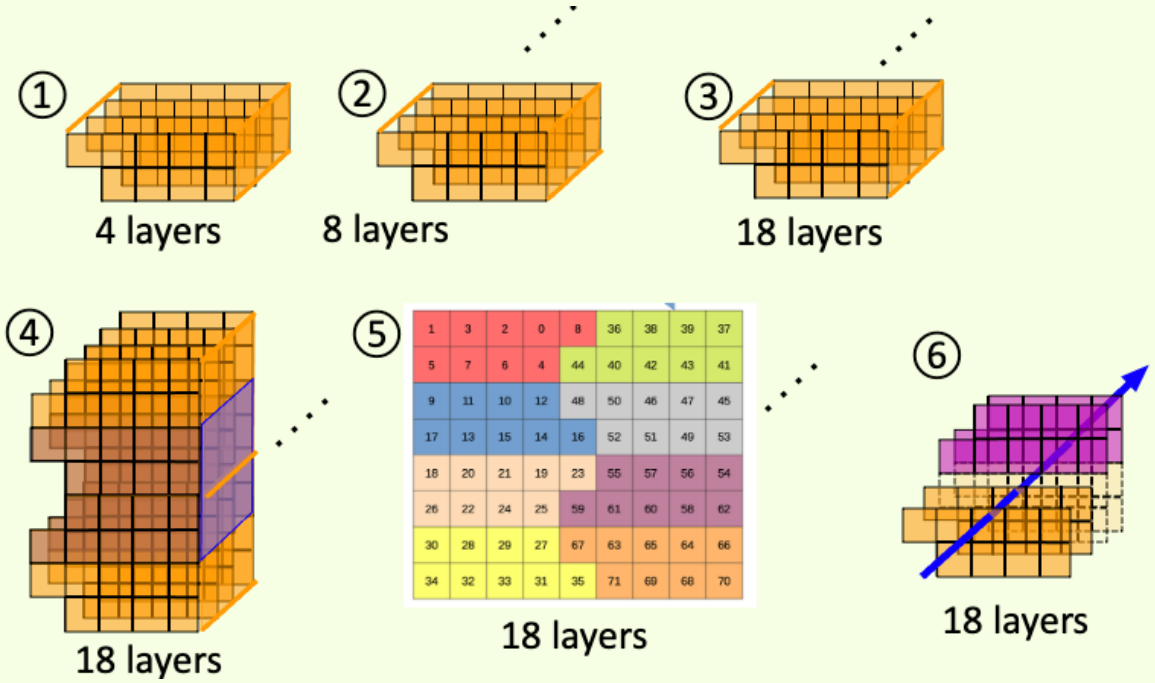
Current progress

1. Made presentation for year update of UGA
2. Checking direct photon data sample
3. Writing thesis of FoCal part
4. Restart my main analysis work

Pi0/Gamma trigger

Test 6 kinds of Towers

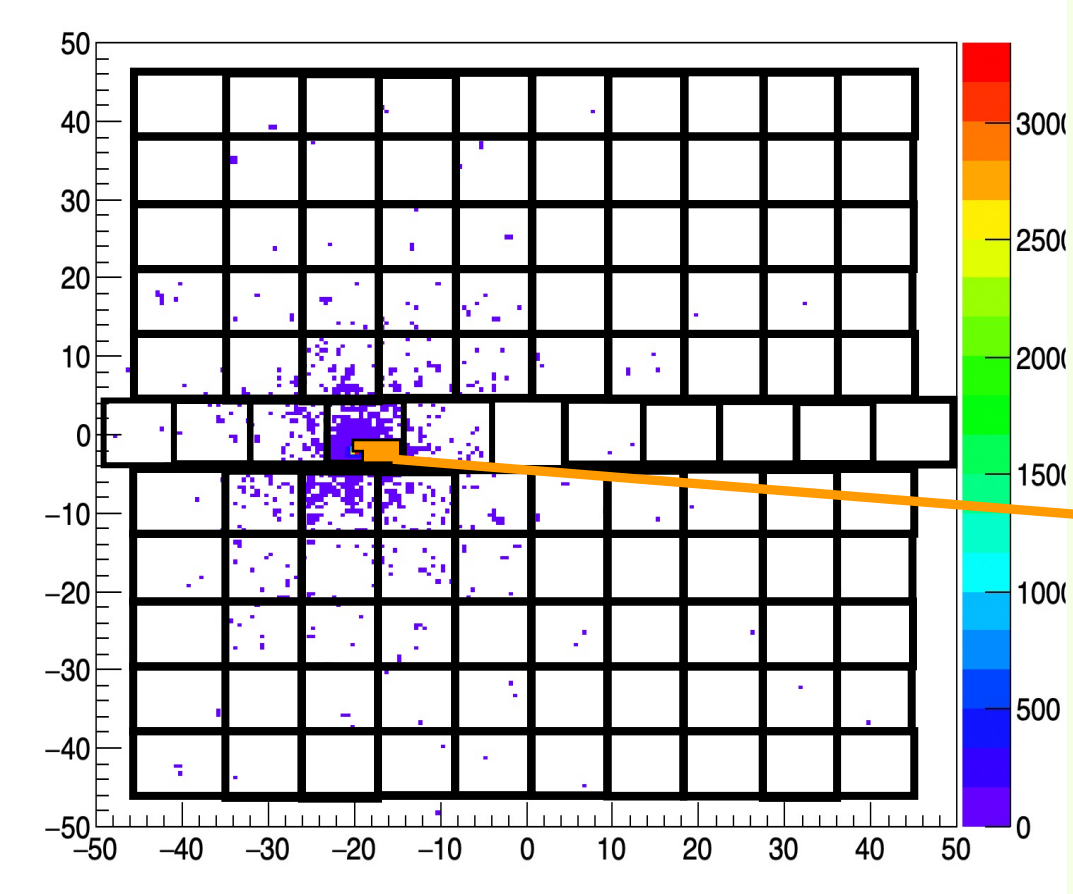


Estimate appropriate thrshold for readout rate by using pp 14 TeV

-> Estimate the efficiency of phons and pi0 using the determined thershold

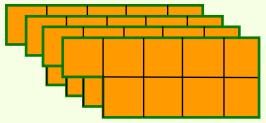
Trigger Decision

FoCal-E Pad



1 Pad

1	3	2	0	8	36	38	39	37
5	7	6	4	44	40	42	43	41
9	11	10	12	48	50	46	47	45
17	13	15	14	16	52	51	49	53
18	20	21	19	23	55	57	56	54
26	22	24	25	59	61	60	58	62
30	28	29	27	67	63	65	64	66
34	32	33	31	35	71	69	68	70



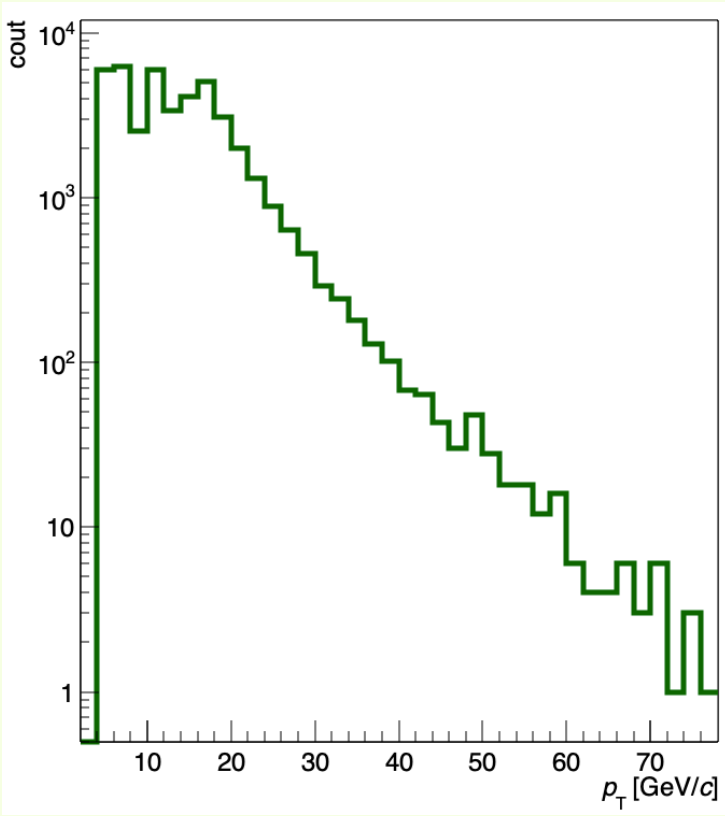
- Find a tower that has the highest deposit energy or p_T. (p_T = deposit energy × sinθ)
- Trigger events that there is a tower having deposit E/ p_T over **threshold.**

→ Determine the threshold value of deposit E/ p_T based on the data reading rate

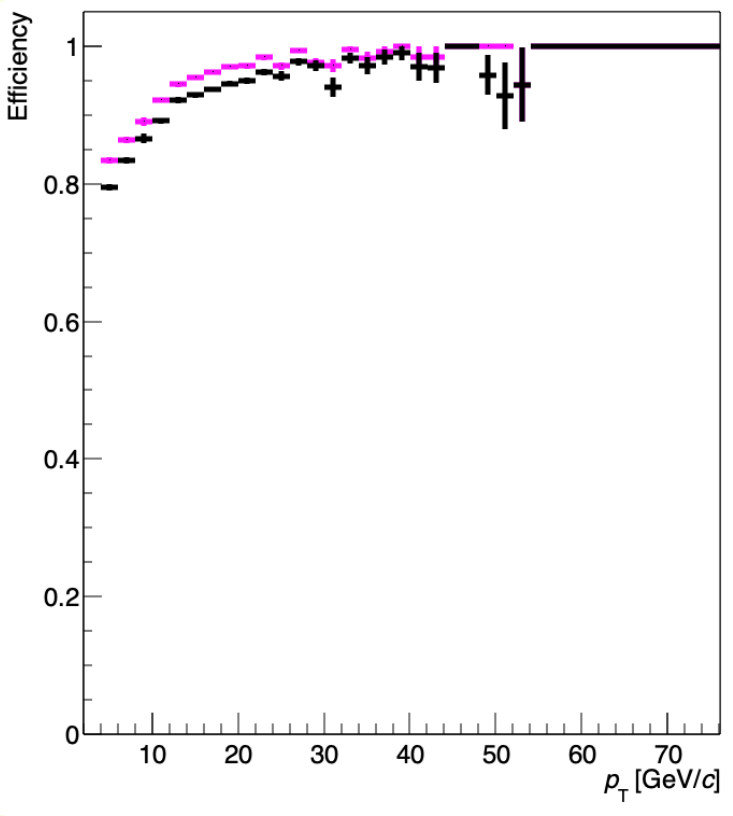
Direct Photon eficiency

Pythia (pp 14 TeV, direct photon in FOCAL, ptmin=5GeV)	v1.1	3	6	pythiaDirGammaMinPt5	40000	v1.1_root6/pythiaDirGammaMinPt5
Pythia (pp 14 TeV, direct photon in FOCAL, ptmin=10GeV)	v1.1	3	6	pythiaDirGammaMinPt10	40000	v1.1_root6/pythiaDirGammaMinPt10
Pythia (pp 14 TeV, direct photon in FOCAL, ptmin=15GeV)	v1.1	3	6	pythiaDirGammaMinPt15	40000	v1.1_root6/pythiaDirGammaMinPt15

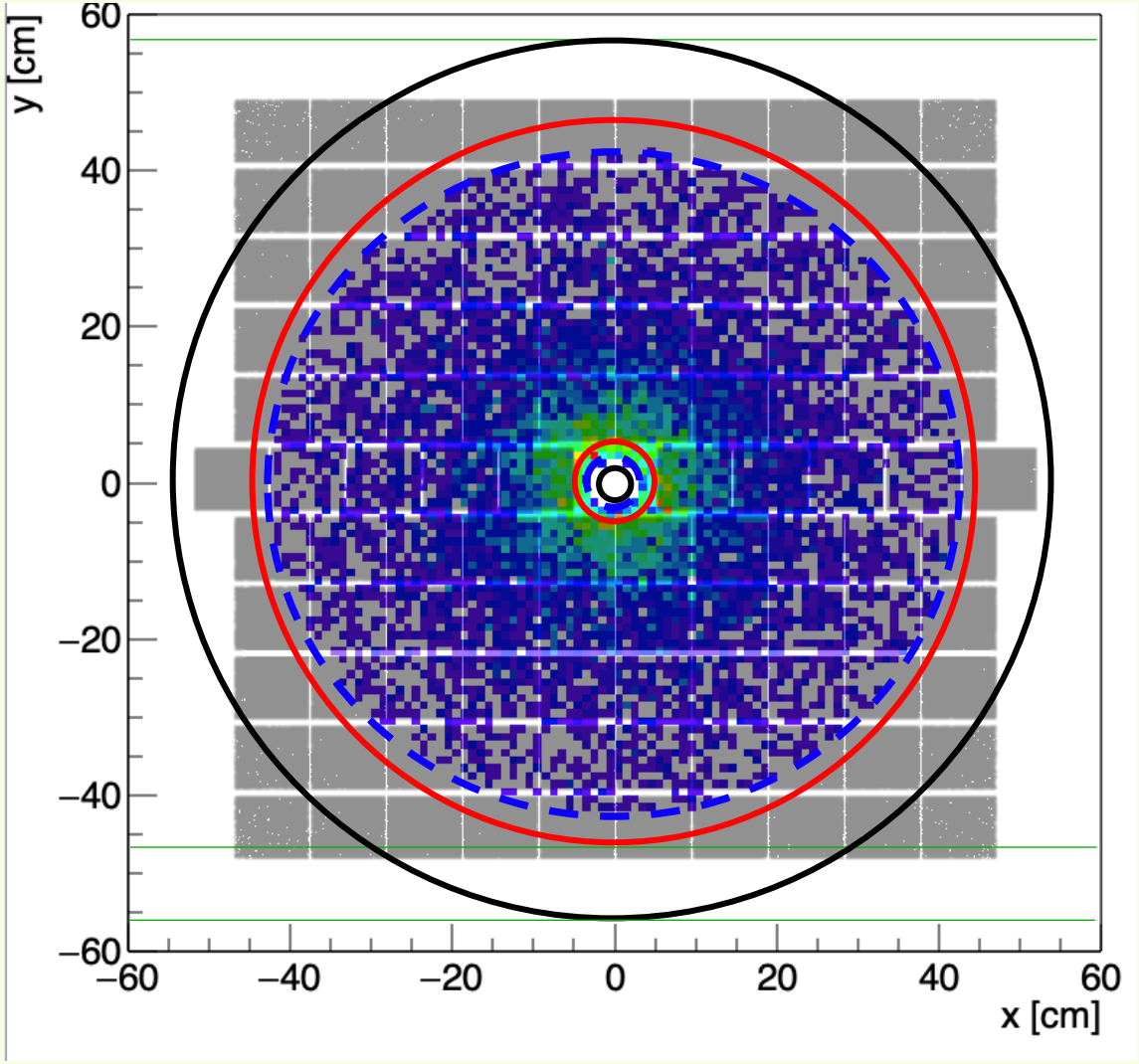
Direct photon pT distribution



Direct photon pT efficiency



Direct Photon Injection area



z = 700 cm

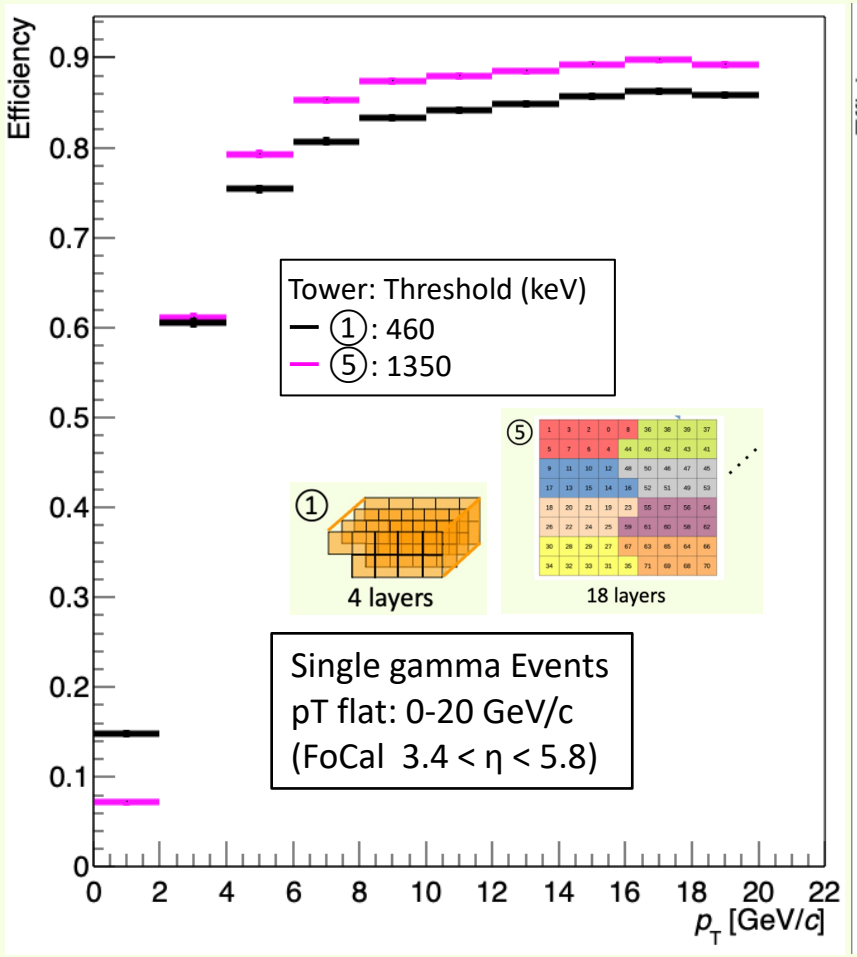
(FoCal 3.4 < η < 5.8)

	cm	eta
acceptance	4.2	5.8
	47	3.4
injection	2.8	6.2
	57	3.2
data	3	6.1
	42	3.5

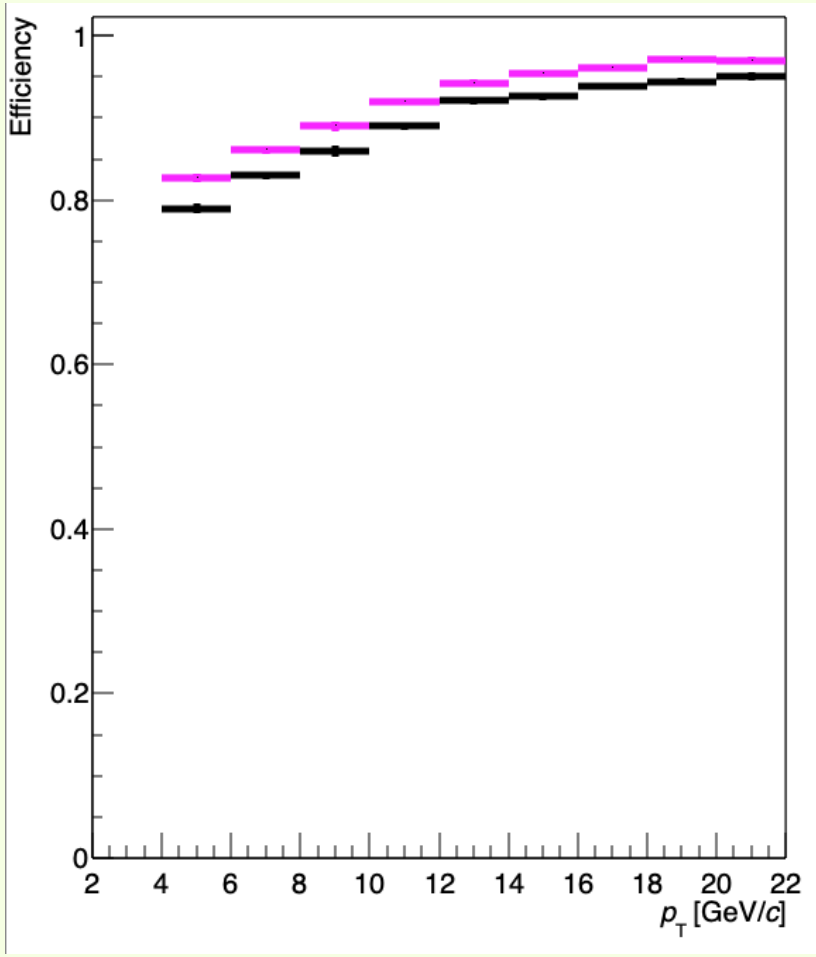
Problem:
I expected the code injection range (brack) matches the data hit range (blue).
Now we are checking the reason.

Coparison with gamma and Direct photon efficiency

Single gamma



Direct photon



The reson the direct photon efficiency is higer than single gamma one is the sample includes some particles with direct photon

Next plan

1. Checking direct photon
2. Writing thesis of FoCal part
3. Restart my main analysis work