Simulation of ZDC crystal

- So far, analysis was done with energy deposits in the crystal.

→ Modify to include the effect from number of photons.

Recipe:

For each G4 step,

E_deposited = GetVisibleEnergyDeposition(aStep)

Function to get amount of energy that can make scintillation light, in Unit of GeV

mu = E_deposited * 1000* Nphoton_per_MeV

Nphoton = Random_Poisson(mu)

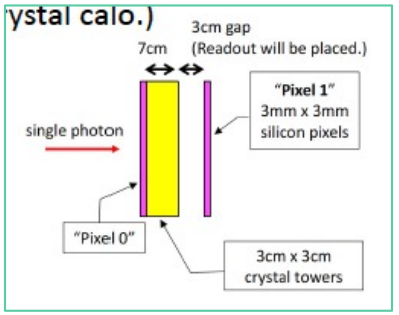
E_reconstructed = Nphoton/Nphoton_per_MeV / 1000

Nphoton_per_MeV

PbWO4: 130

LYSO: 30000 (27000~39000?)

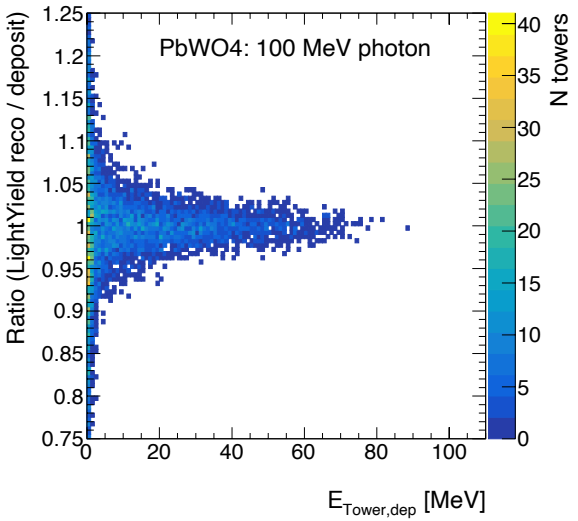
Deposited energy vs reco energy

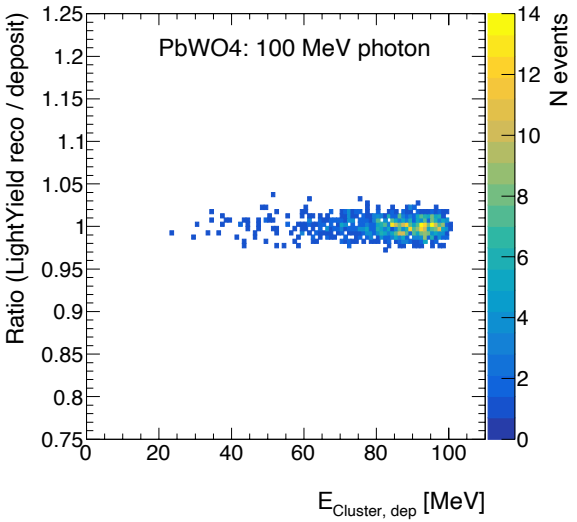


Tower energy

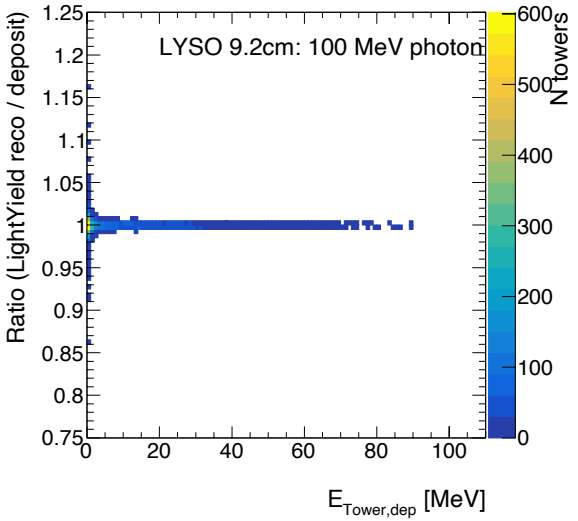
3x3 cluster energy

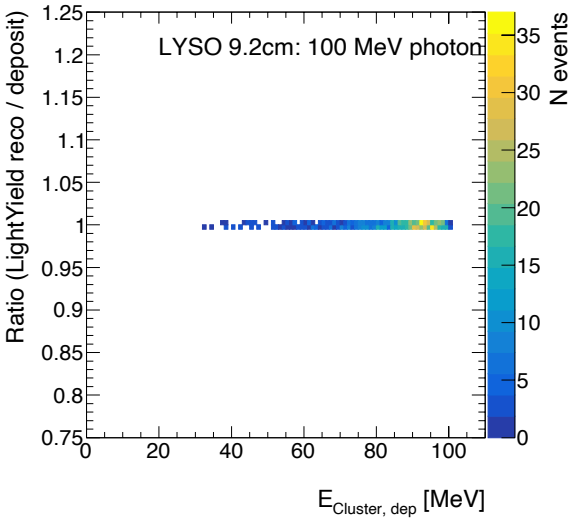
PbWO4 7cm
($7.9X_0$)





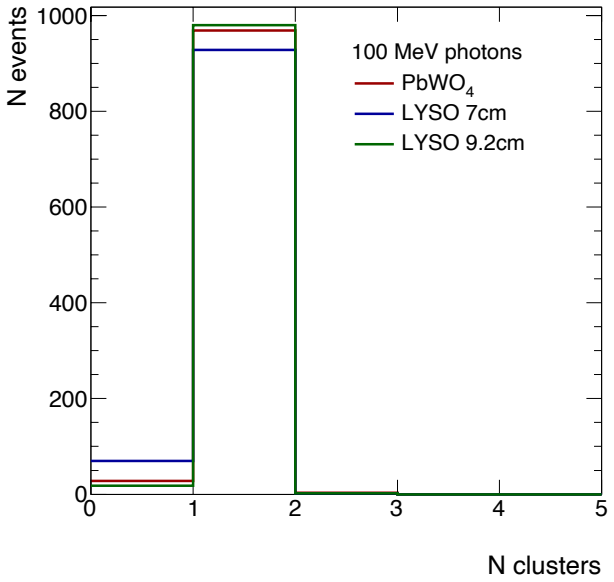
LYSO 9.2cm
($7.9X_0$)



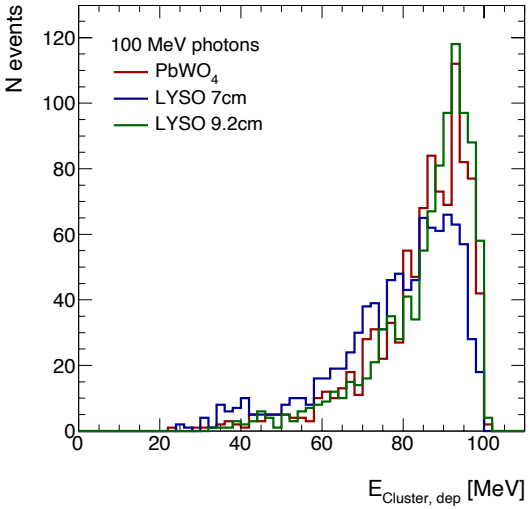


Cluster reconstruction

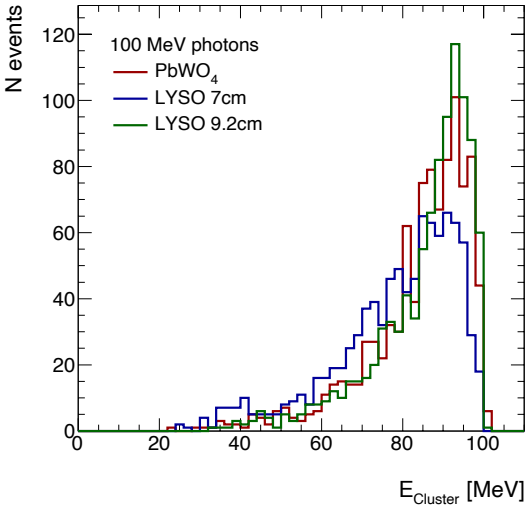
No visible effect on cluster reconstruction efficiency (Green vs Red)



Cluster energy



energy deposit



reconstructed energy using light yield

Is it worth/possible to include detection efficiency of photon detector??

Others

- Photon measurements using PHENIX pp collisions
  - Now able to put EMC variables in my tree.

- PHITS for RANS neutron simulation
  - Registration process seems to be finished.
  - Software is downloaded.