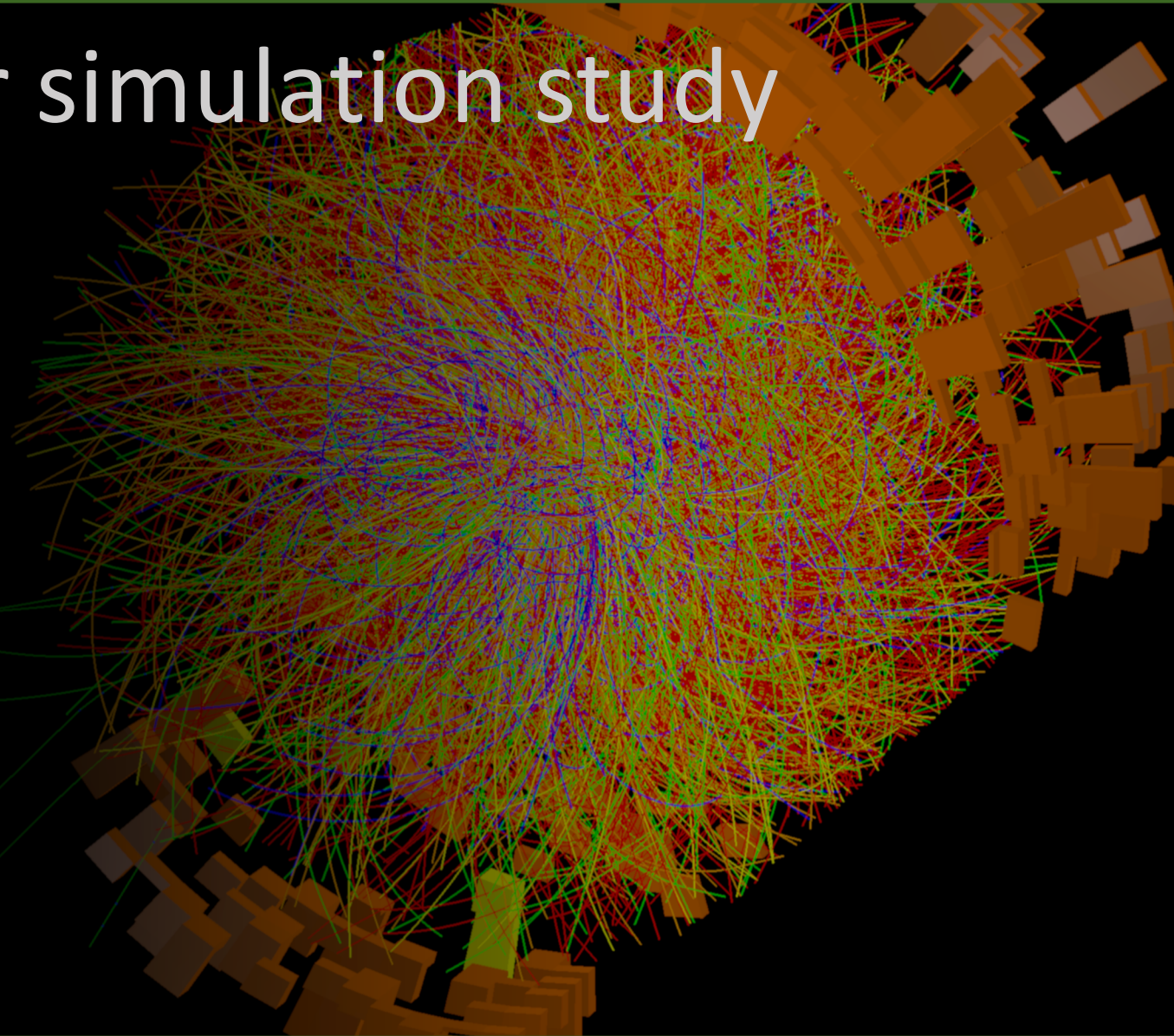# FoCal Geant 4 trigger simulation study
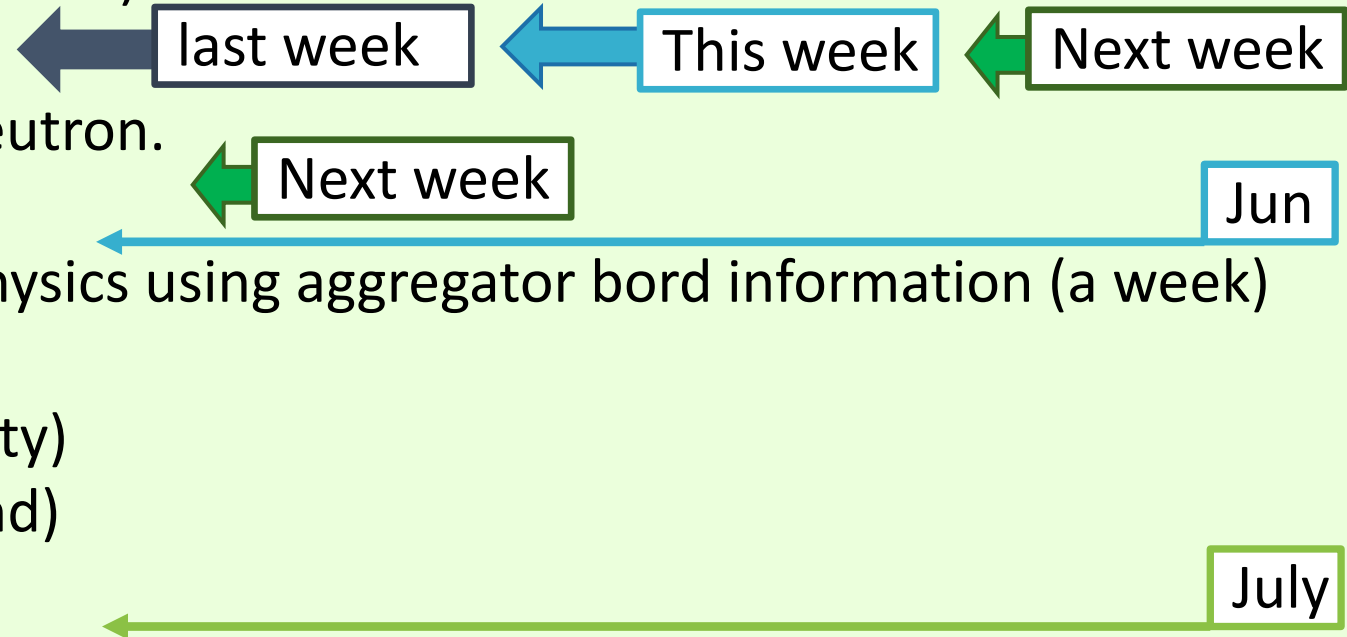
Tsukuba University
Takuya Kumaoka

FoCal trigger study plan

· install Geant4 and understand the output (Done)
· prepare the data for trigger development
· make a trigger to distinguish gamma and neutron.
(consider energy, depth, expansion, and etc…)

last week ← This week ← Next week

Next week ← Jun

· plan algorithm how to fire trigger use for physics using aggregator bord information (a week)
· inplement the trigger algorithm (1.5 weeks)
· check trigger performance (efficiency / purity)
(energy/hit position/angle/particle/background)
(a few weeks)

July

· make a code to convert energy information to real ASIC information (TOT/TOA/AOD) (2 weeks)
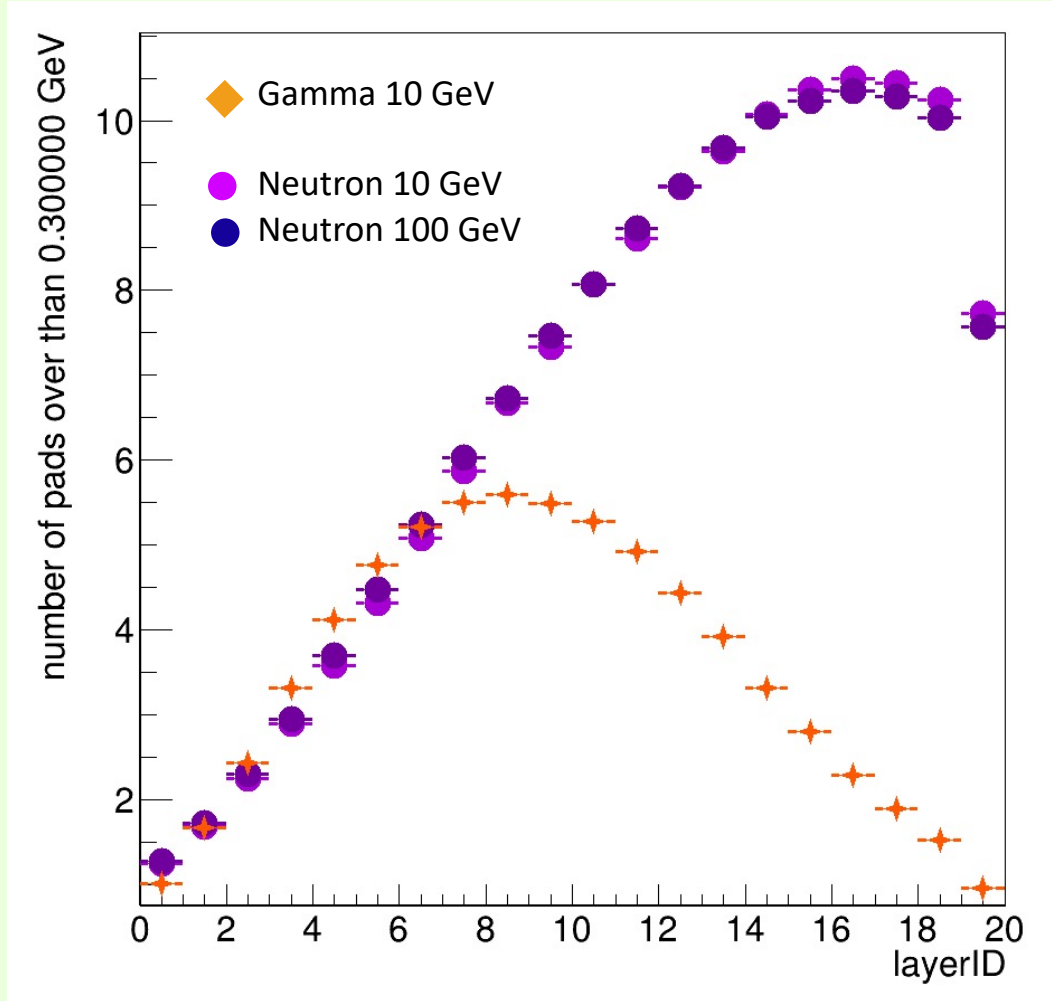· …

New test setting

- set: FoCal-E, 8X9 cells, 1X1 cm²/cell
- particle: Gamma/Neutron, 100/10 GeV, **10000 Events**, → （Gamma 100 GeV fail…）
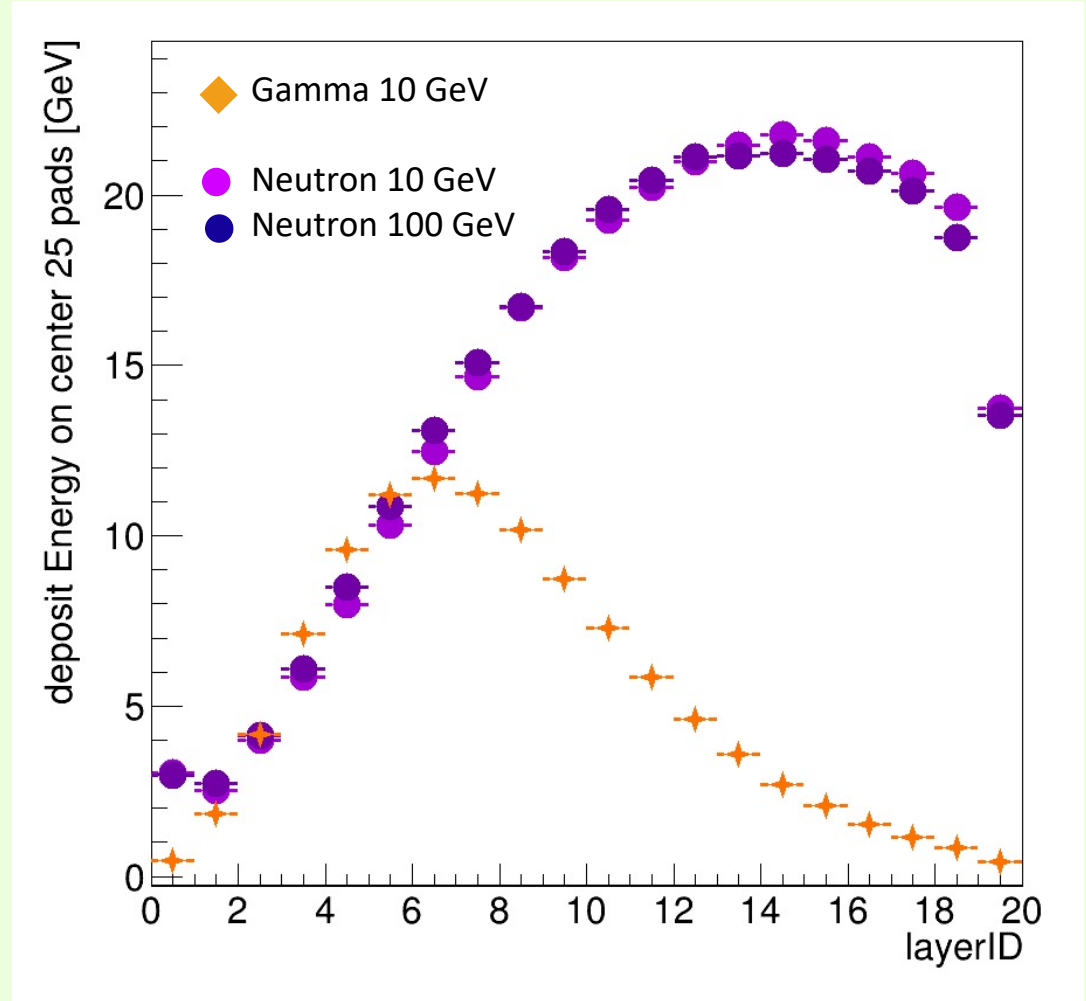angle: 0 degree, position: center

Select the events having the over than 10 layers with the deposit energy.
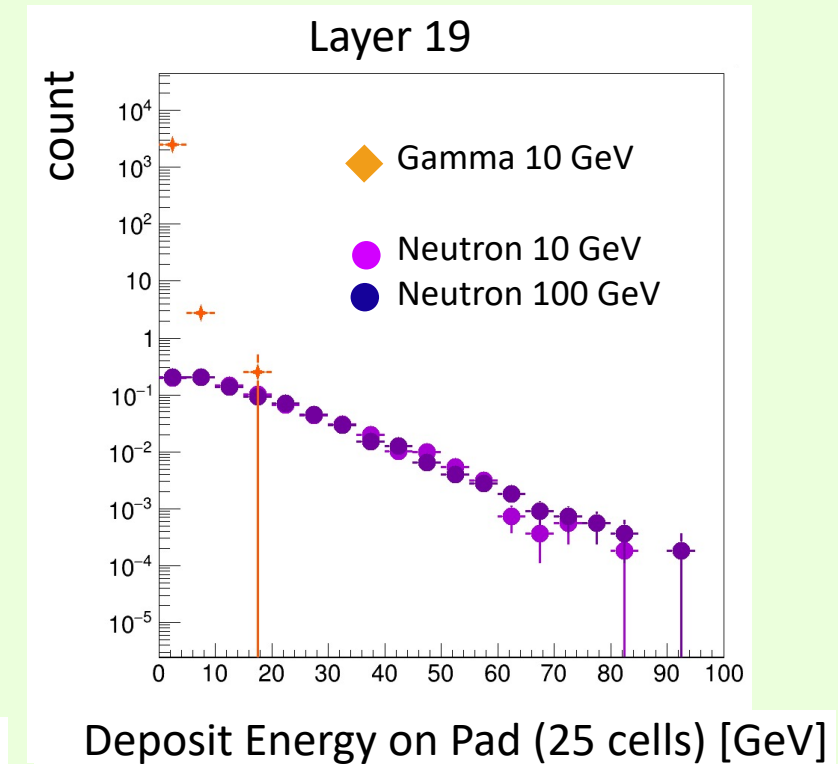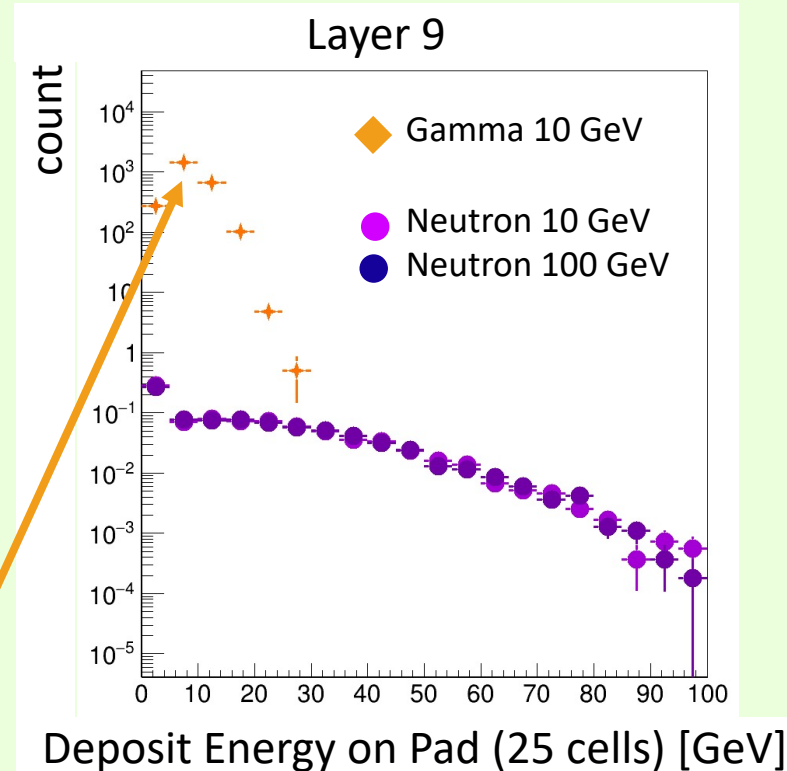(Many Neutron events not interact with detector)

All events integral

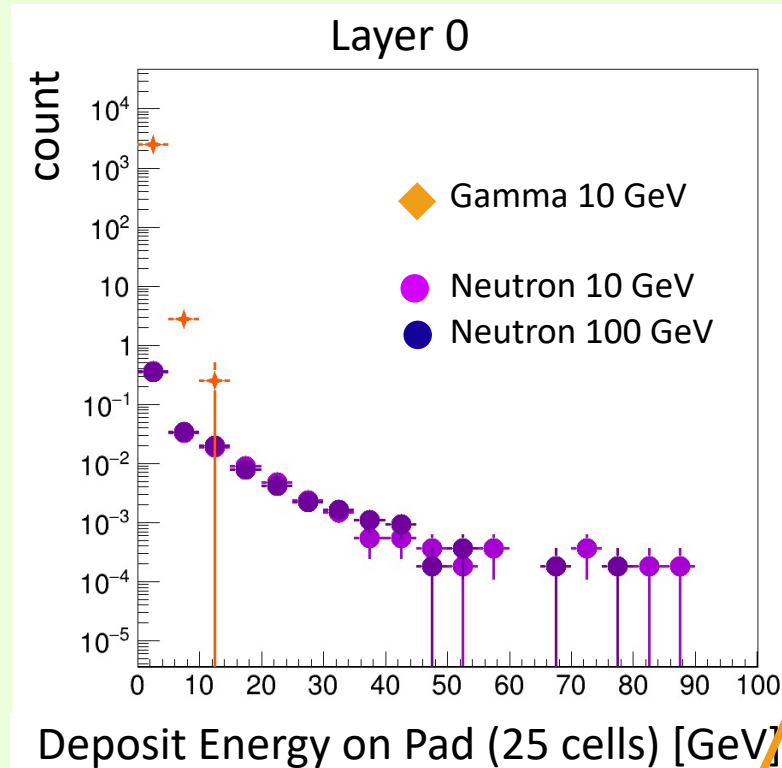## Number of Cells

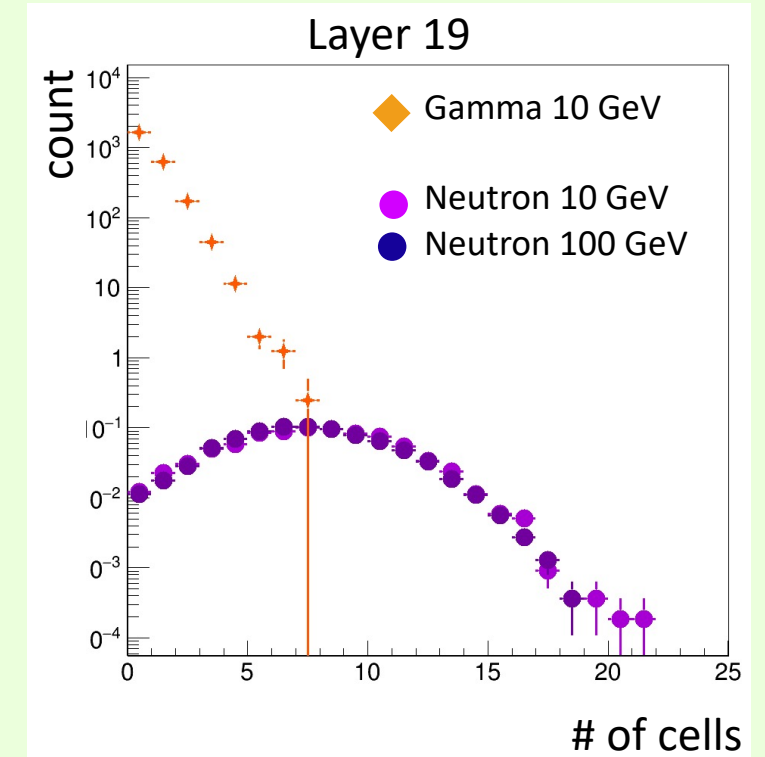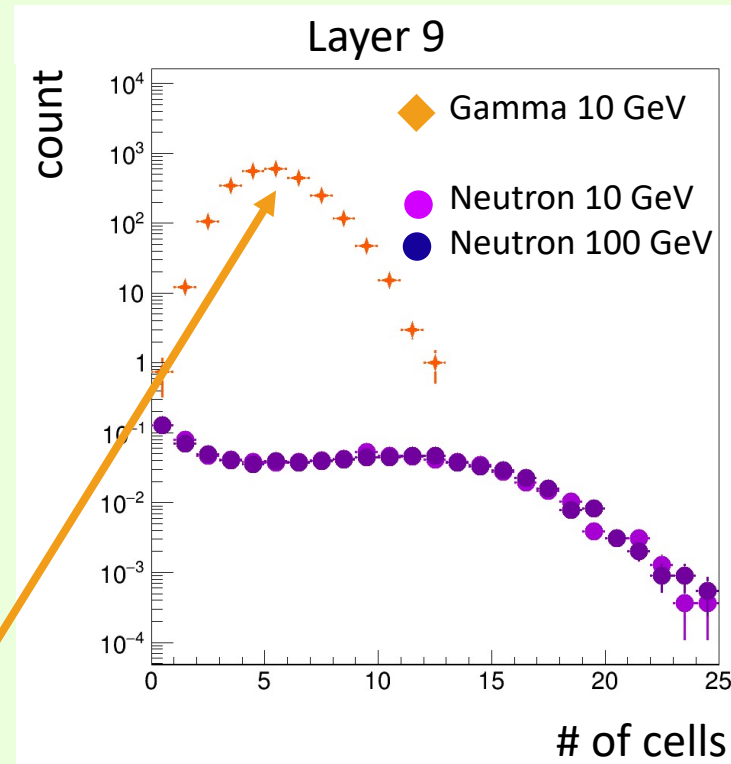## Deposit energy

Deposit energy difference

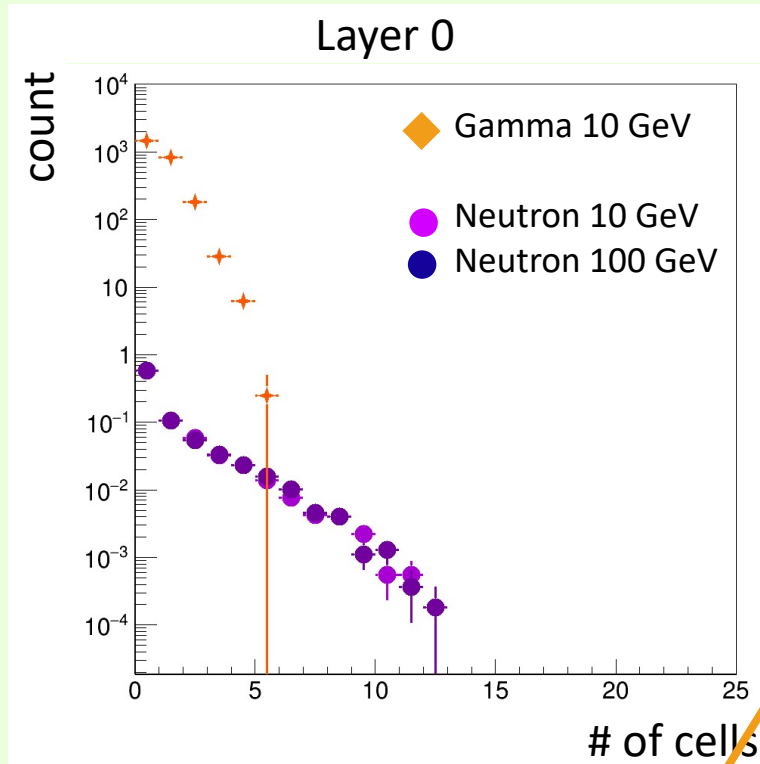(normalized by the events)

-> These plots show the difference

-> Inner layers have a peak acound middle layers of the Gamma events

of cells

Layer 0

Layer 9

Layer 19

(normalized by the events)

-> These plots show the difference

-> Inner layers has peak acound middle layers of the Gamma events

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- ...