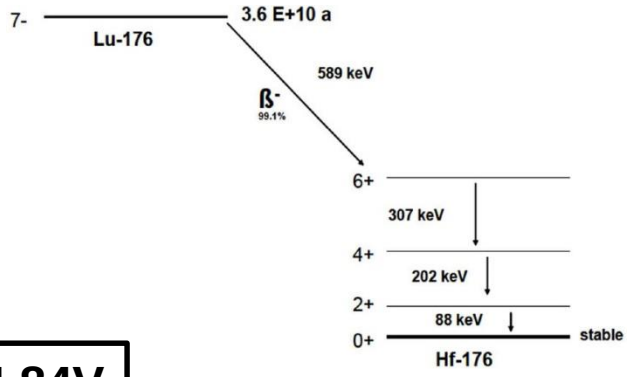
ZDC 1st Prototype Analysis@20240826

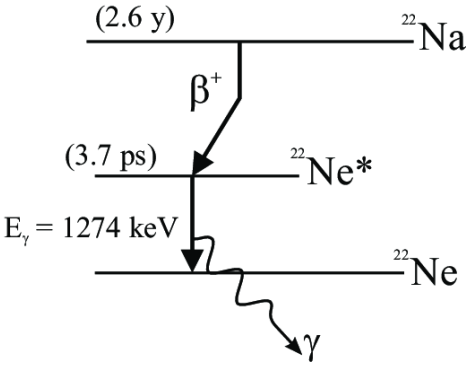
Study ADC to Energy Deposition

ADC VS Energy Deposition w/ **Radiation Source**

LYSO, ^{176}Lu: 307, 202, 88 keV
597 keV = 307 + 202 + 88

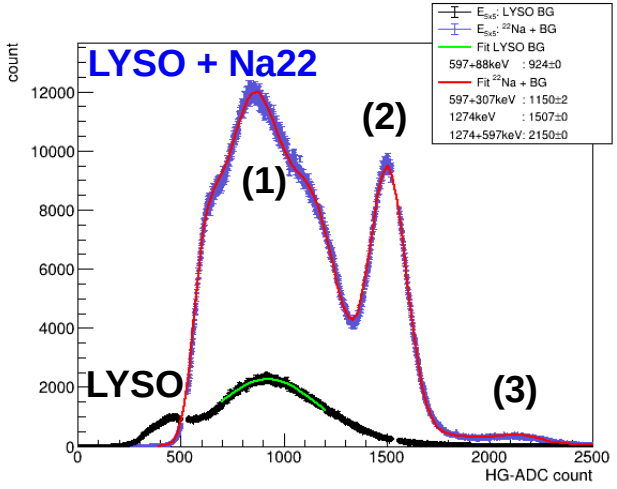


Na22 : 1274 keV



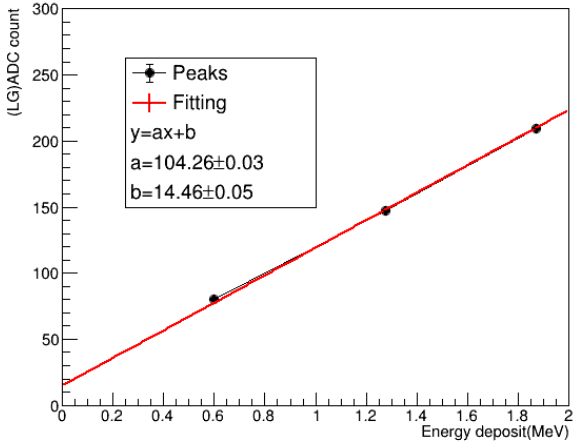
HV=24.84V

E5x5



(1) 597 keV (LYSO)
(2) 1274 keV (NA22)
(3) 1274 + 597 keV

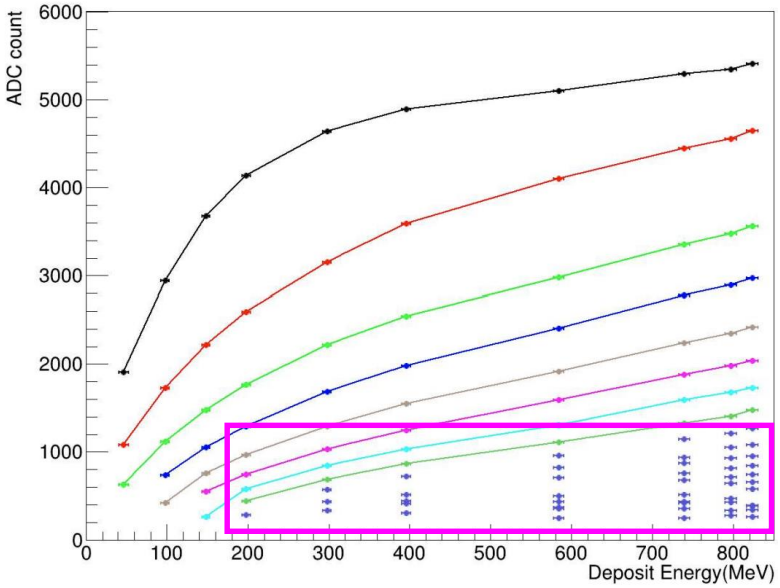
Energy Deposition VS ADC

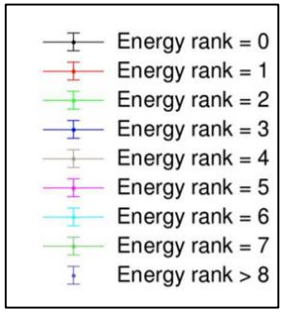


ADC VS Energy Deposition w/ **Electron Beam** (1)

HV=24.84V

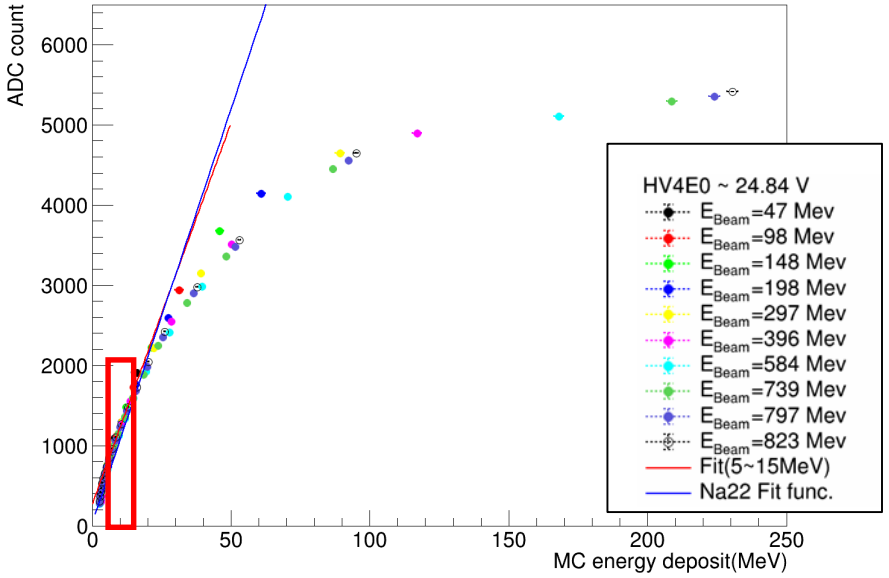
Ebeam VS ADC





Energy rank > 8
Very low energy pixels

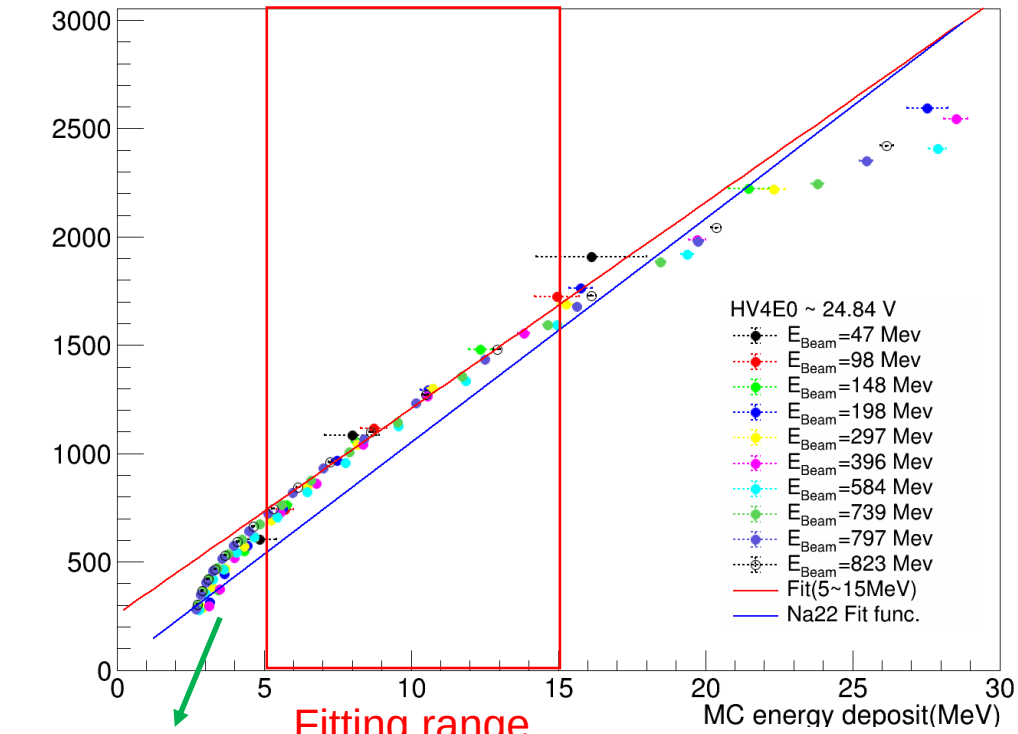
Energy deposition VS ADC



Blue line : radiation source
Edep = 0MeV-2MeV
Red line : electron beam
Edep = 5-15 MV

* Edep = MC(Edep/Ebeam) * Ebeam

ADC VS Energy Deposition w/ **Electron Beam** (2)

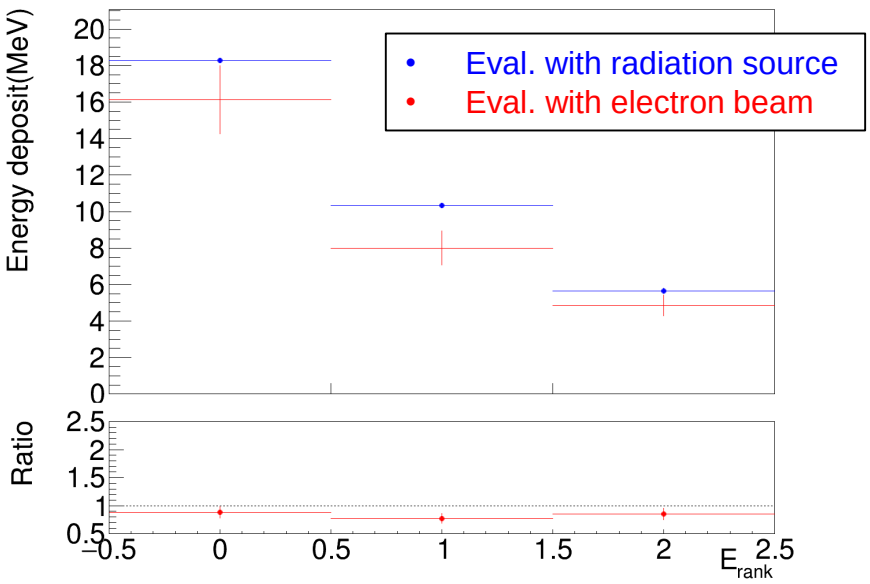


- Blue line : radiation source
- Red line : electron beam

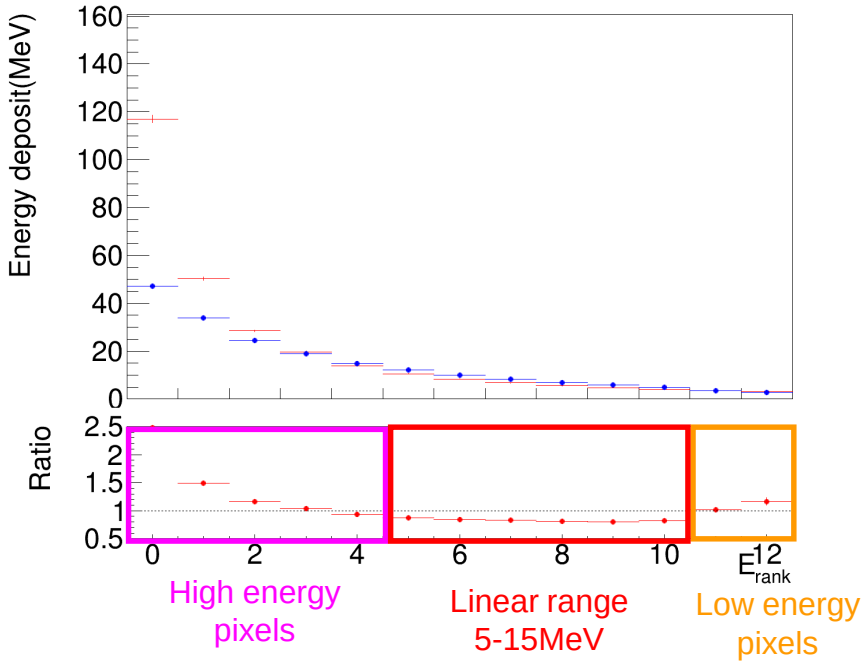
- Results from beam is deviated from results from electron beam.
- Which one is more reliable? Maybe radiation source.
- Does it means the conversion factor of “Edep/Ebeam” from MC is not reliable?

Energy Deposition

47MeV electron beam



395MeV electron beam



- Energy deposition is evaluated w/ both the results from radiation source(blue) and electron beam (red).
- For 47MeV, the ratio between two evaluation is around 0.8-0.9
- For 395MeV, the ratio varies from 0.8 to 2.5.
- Disagreement in high energy pixels ➔ SiPM saturation
- Disagreement in low energy pixels ➔ Not reliable “Edep/Ebeam” from MC.