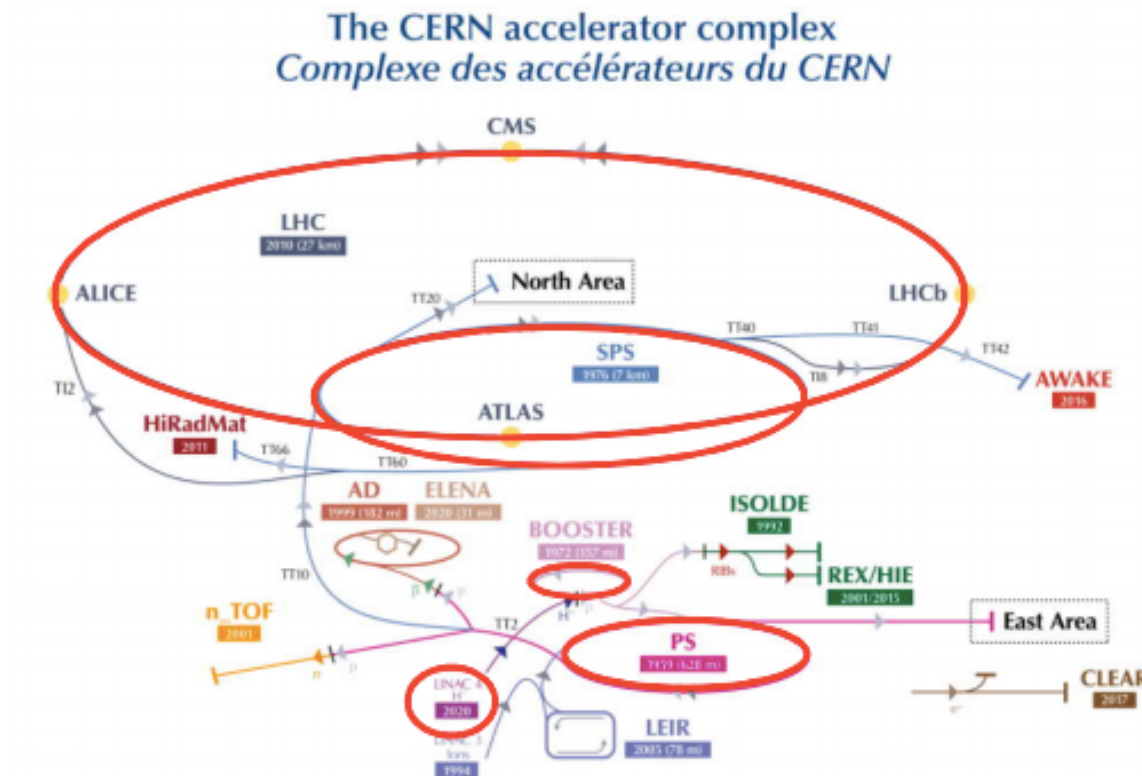


FoCal-E beam test data analysis

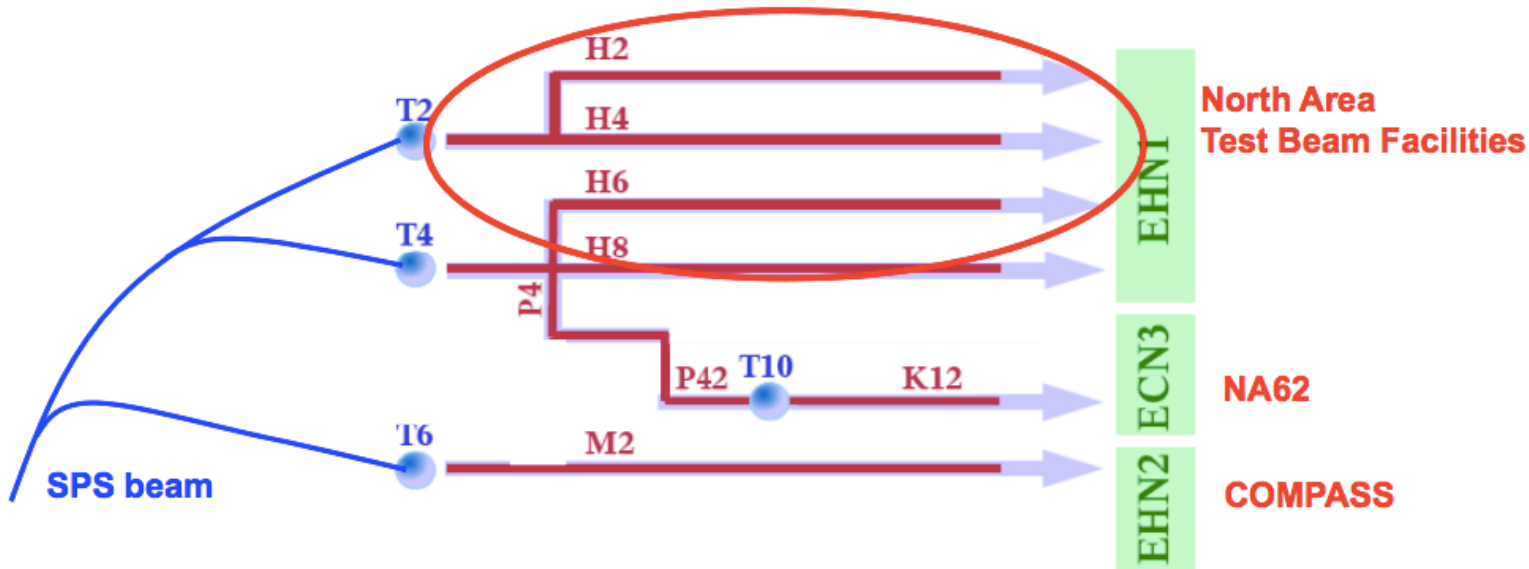
Nov 24
Minho Kim

CERN accelerator complex



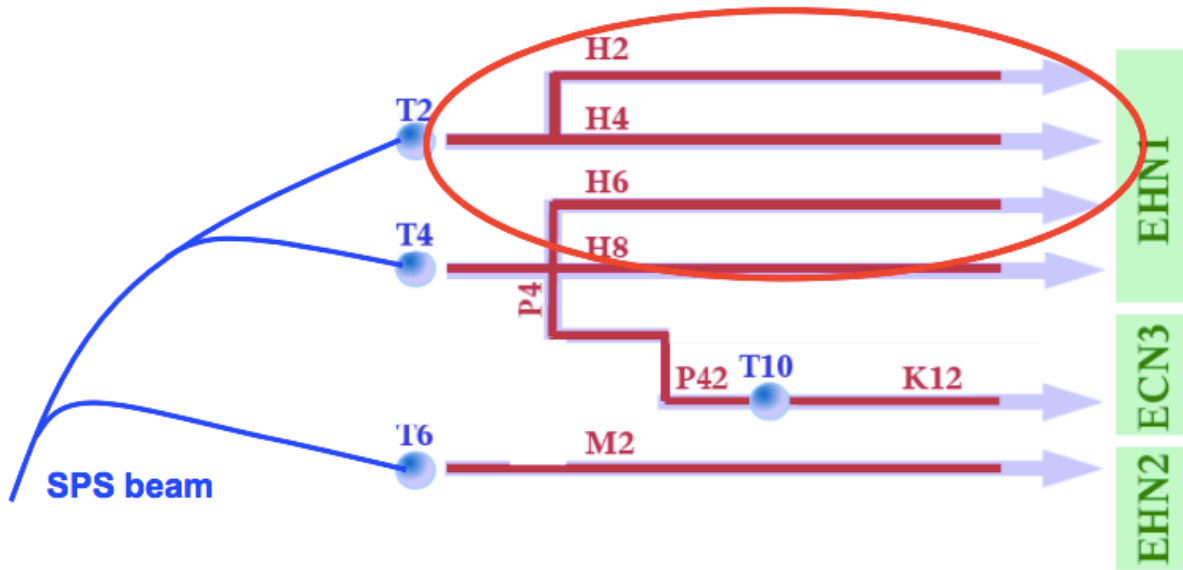
- Proton is delivered to the LHC via Linac → Booster → PS → SPS → LHC.
- ALICE FoCal had the beam test on November at the north experimental area of the SPS.

H2 beam line



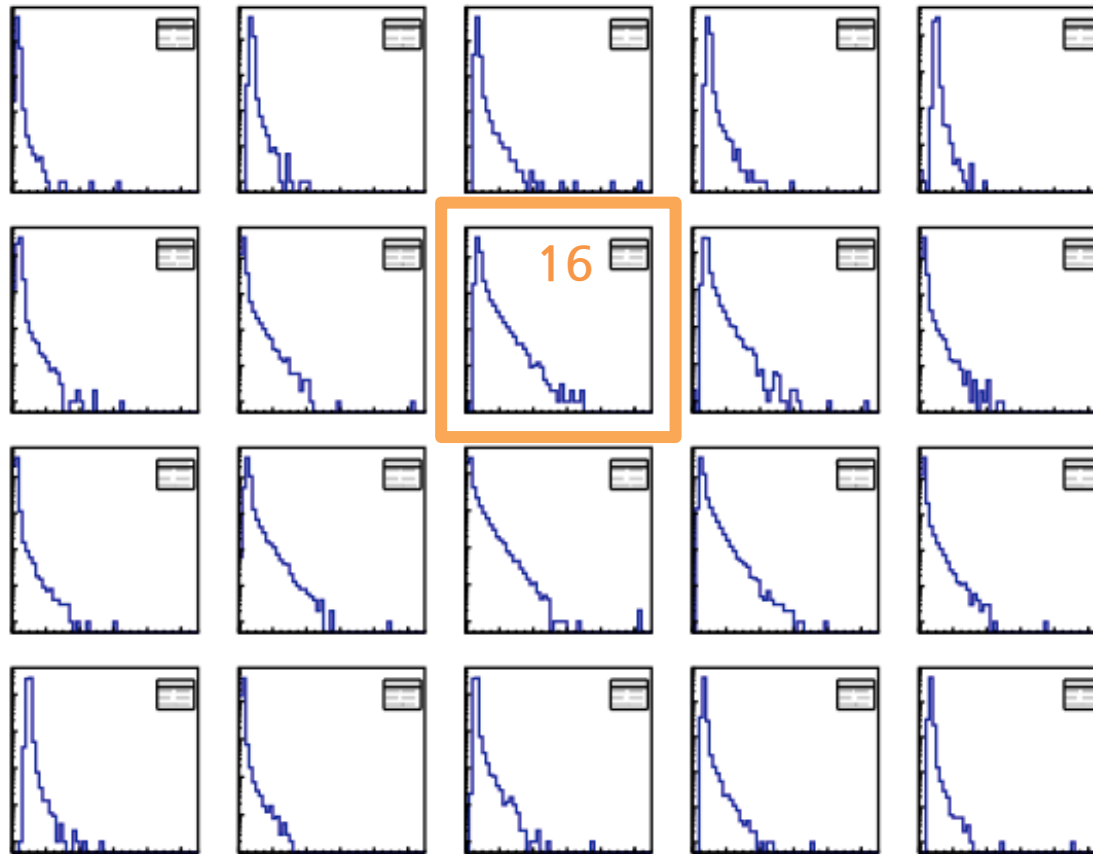
- The primary proton is slowly extracted to the north area. This means the proton spill lasts for several hundred milliseconds to be extracted by the magnet.
- The T2 target makes the secondary electron or hadron beams up to 350 GeV.

H2 beam line



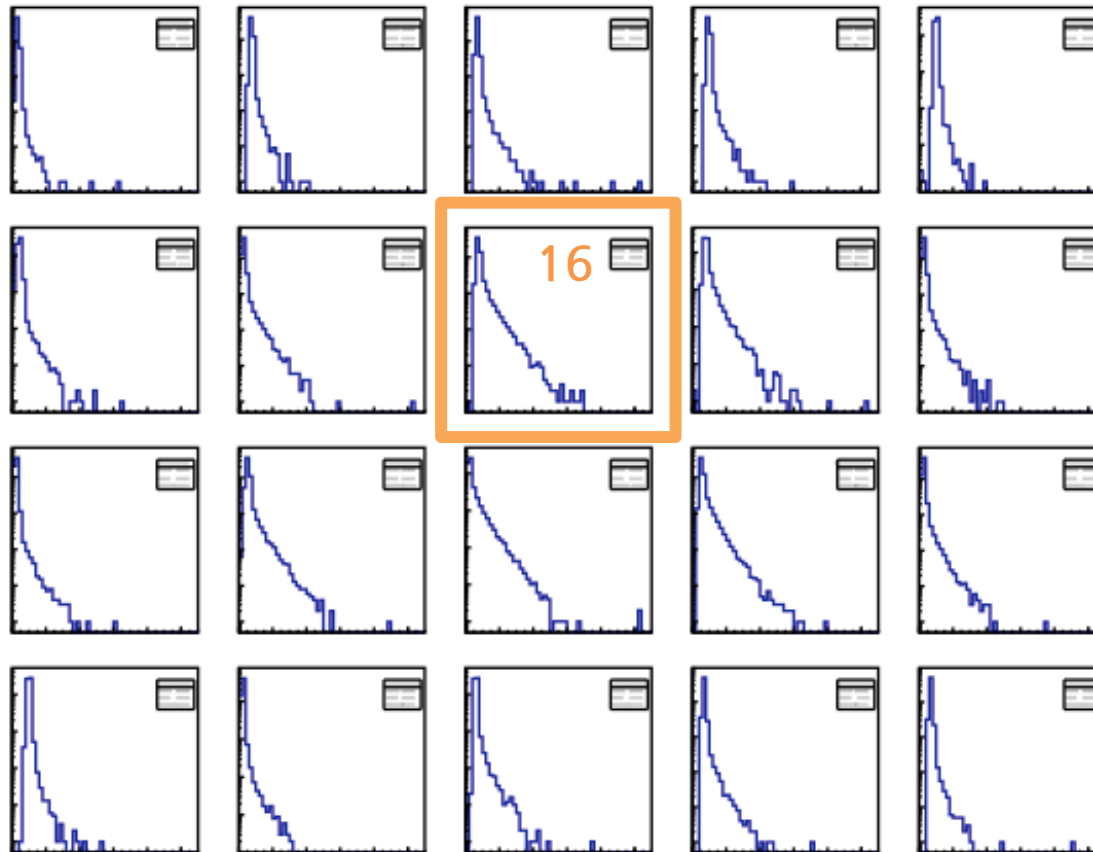
- The primary proton is slowly extracted to the north area. This means the proton spill lasts for several hundred milliseconds to be extracted by the magnet.
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Analysis cuts



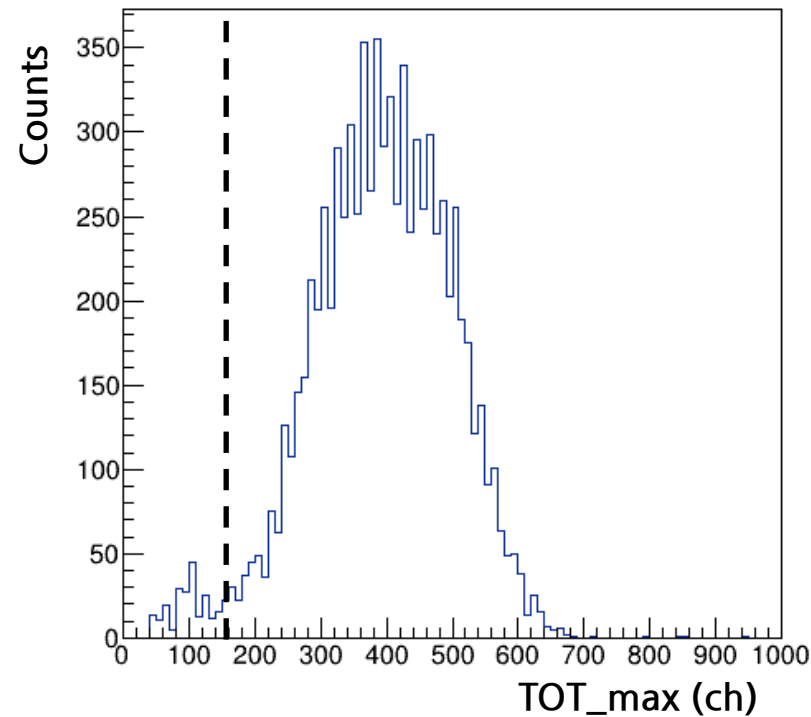
- One of the beam spot channels was selected. In the figure, channel 16.

Analysis cuts



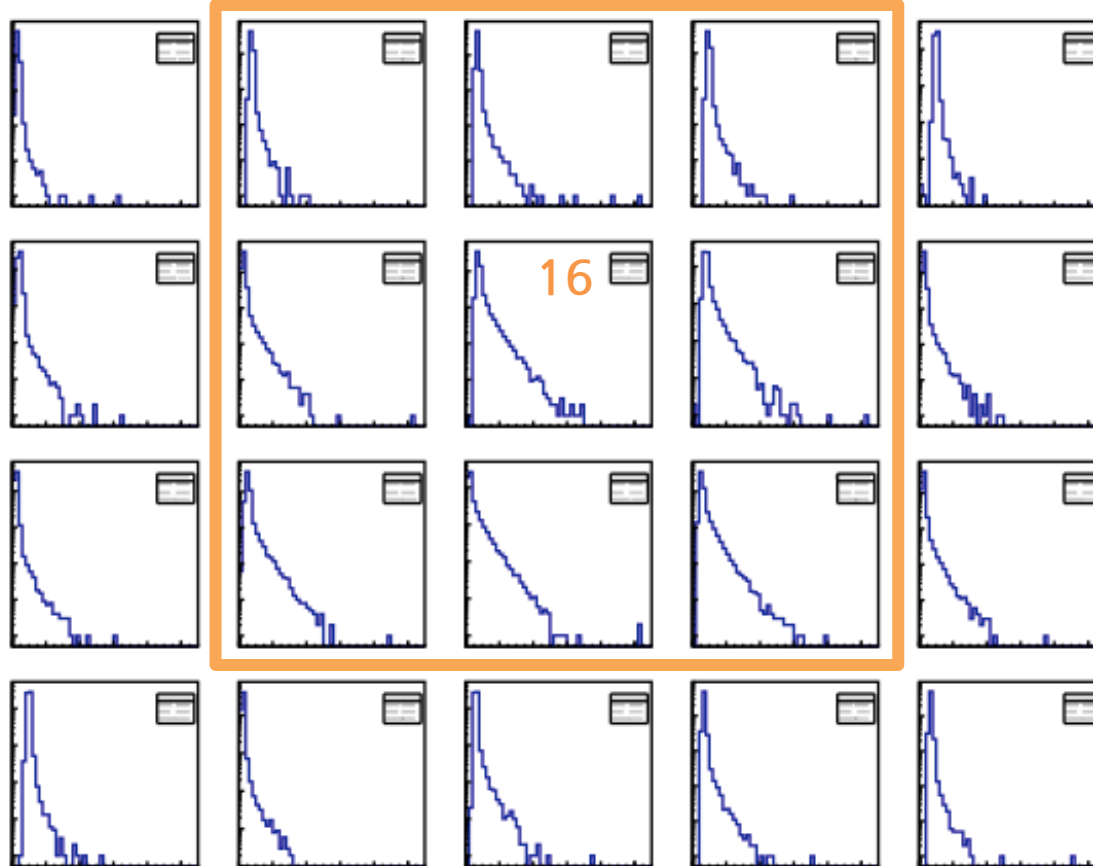
- If an electron hit the channel 16, in a shower maximum layer, the maximum TOT value should also be found in the channel 16.
- This condition was applied to enhance the events where the electron hits the channel 16.

Analysis cuts



- Events where the TOT_max is larger than the dashed line were selected.
- This event may be due to the hadron contamination or lower TOT efficiency. Will be studied in more detail later.

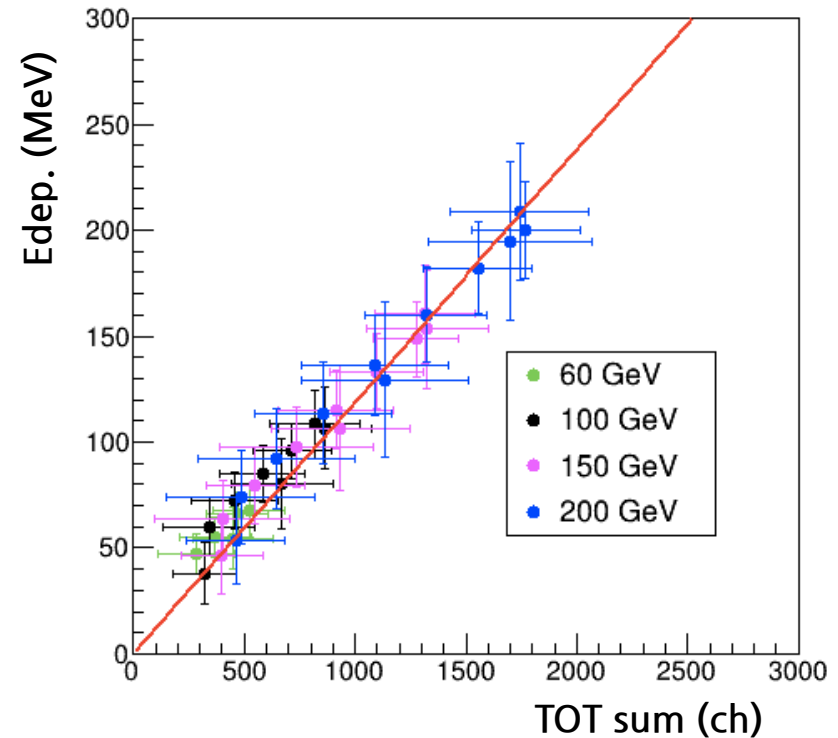
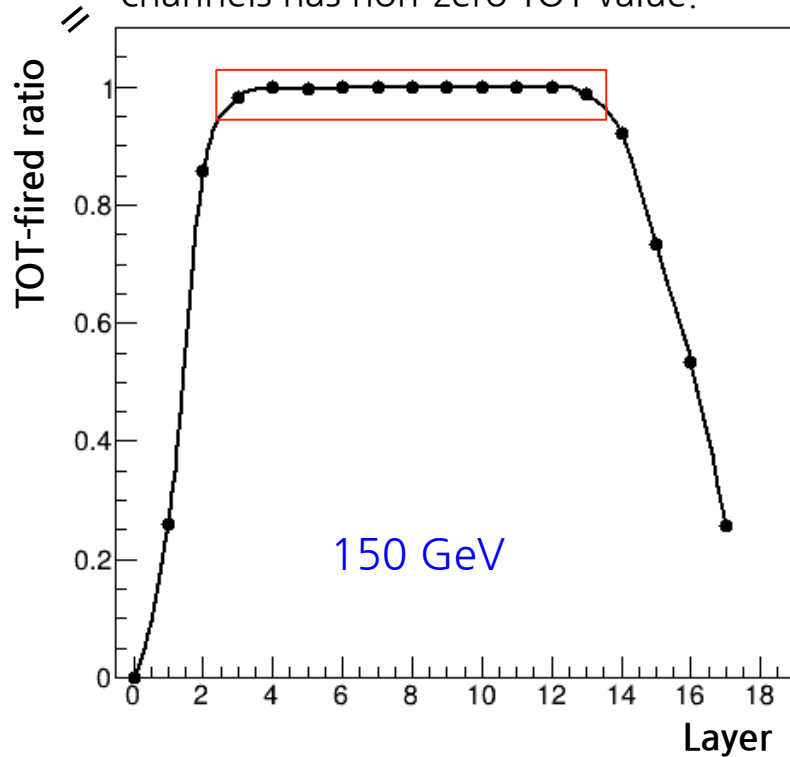
Analysis cuts



- To study the energy deposit by the EM shower, 9 (3 x 3) channels surrounding and including the channel 16 were selected.

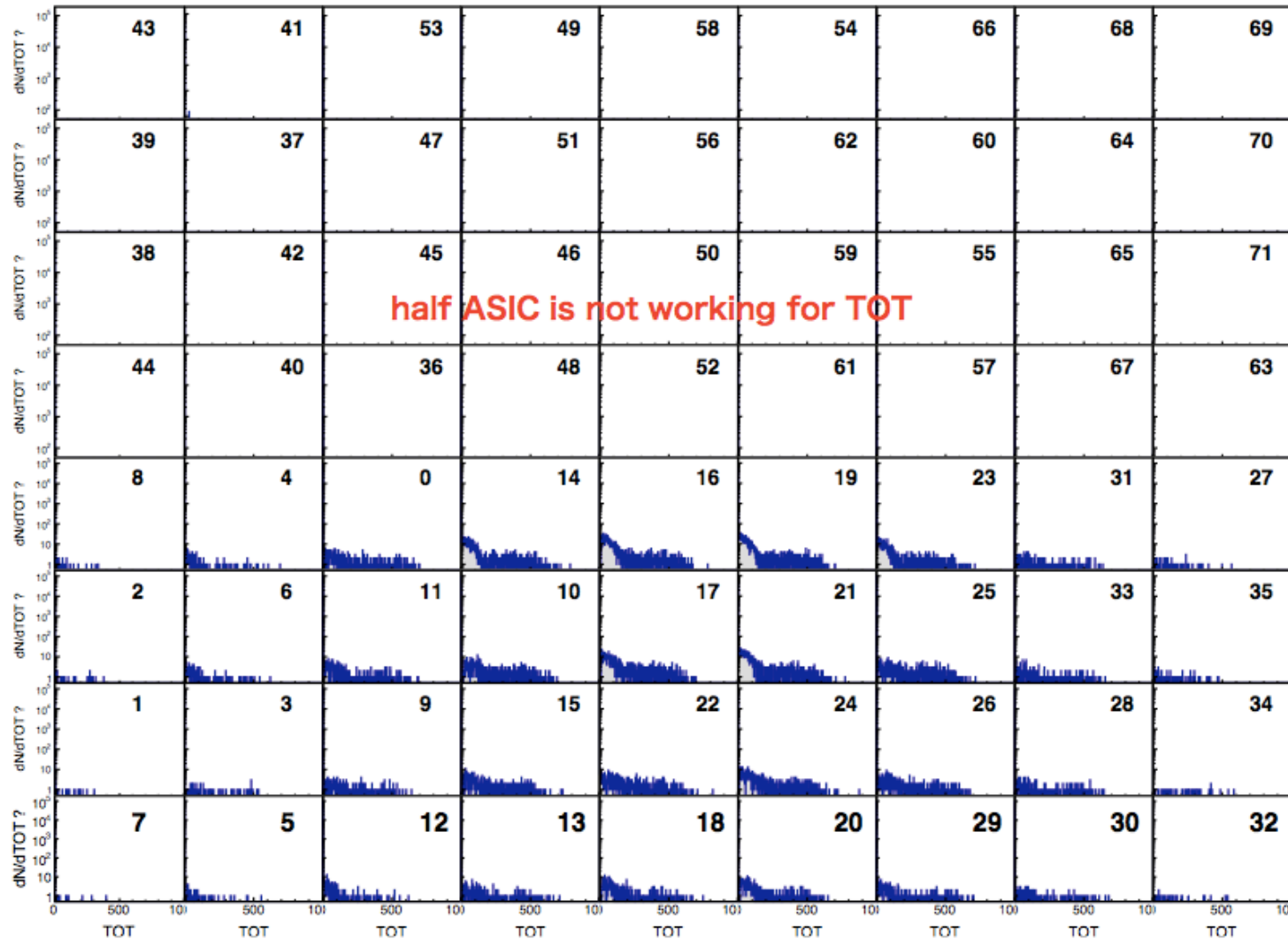
Comparison with simulation (TOT)

Ratio which at least one of the 9 channels has non-zero TOT value.

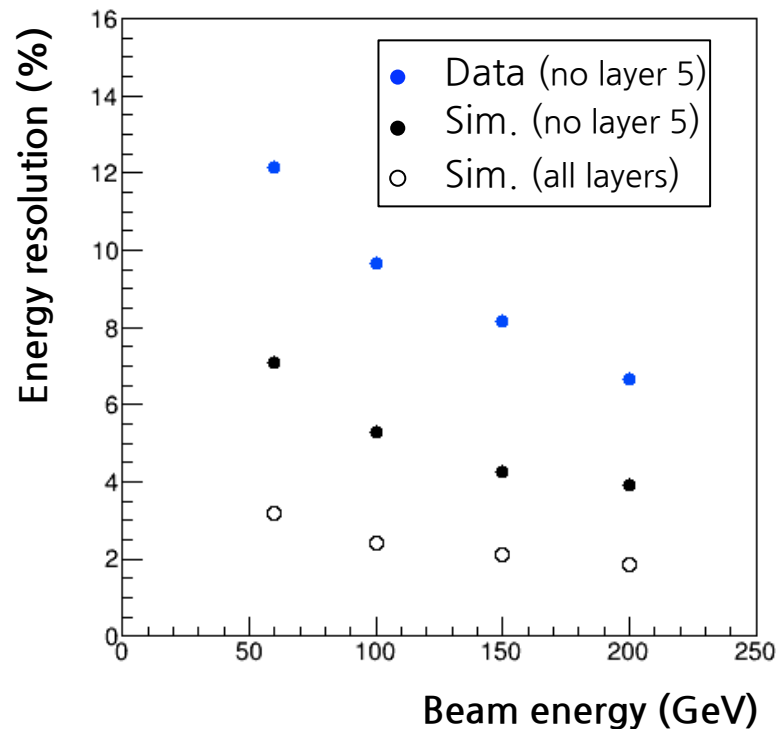


- 9 channels' TOT sum was compared with the energy deposit in the simulation when the TOT-fired ratio is higher than 0.95.
- TOT sum shows a good linearity with the energy deposit in the simulation.
- Combining the ADC and TOT is underway. In this report, only the TOT was used for the detector performance.

Layer 5 was not included



Detector performance



- The energy resolutions look reasonable.
- If the ADC is correctly combined and more strict and optimized conditions are applied, the data and simulation resolutions are expected to be comparable.