Report on KOTO EMCal Study

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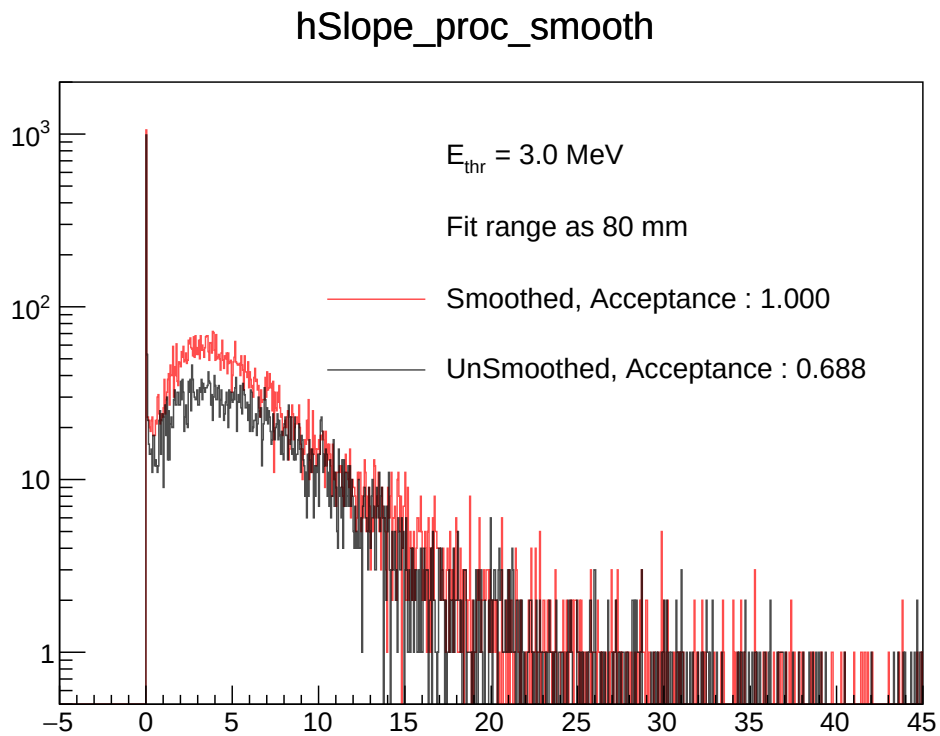
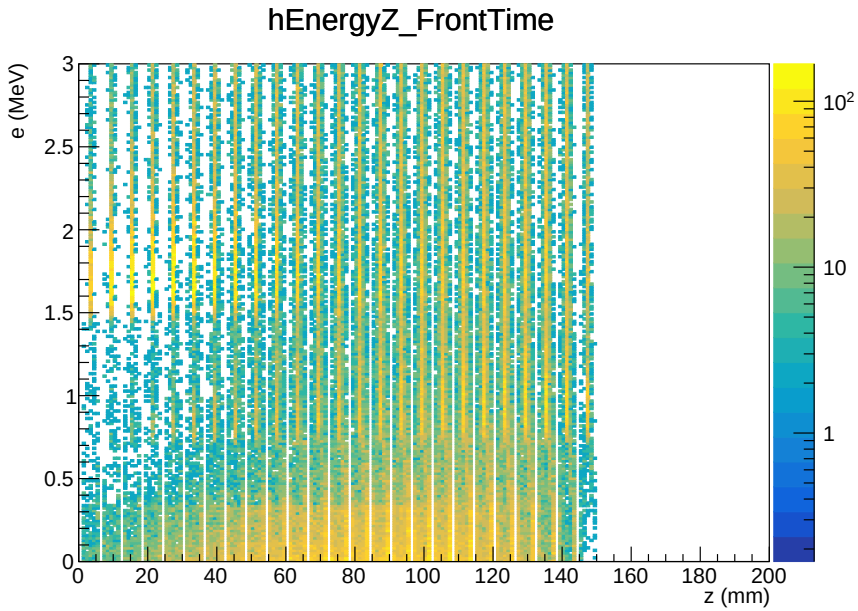
September 1, 2020

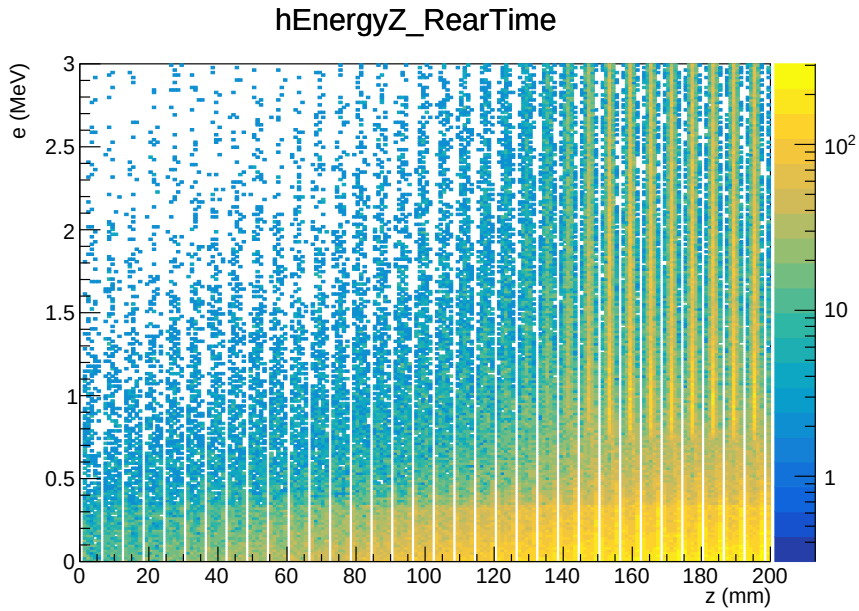
Delta peak near ~ 0?



- The x and y position are defined as segment ID in the detector level so that transverse positions can be identical.
- If x and y position are identical, estimated slopes can be identical to zero.

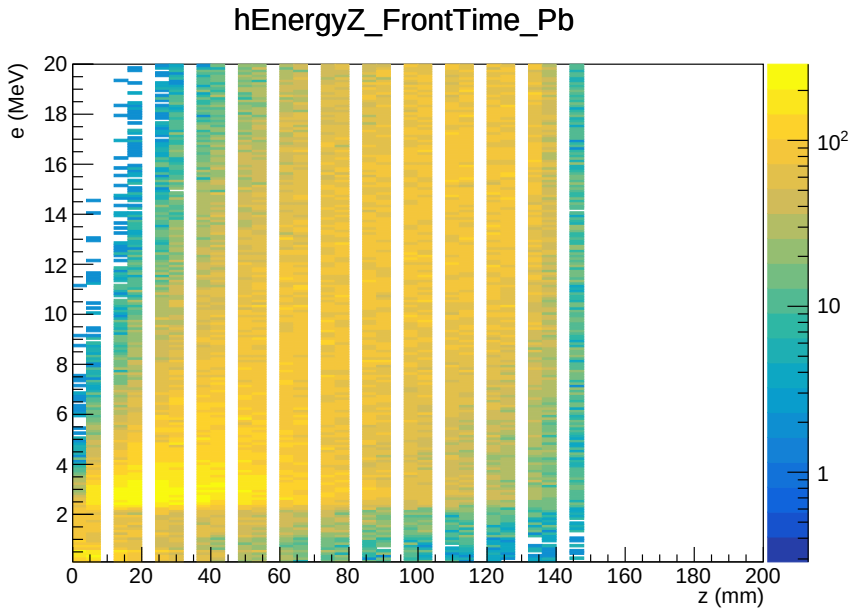
Energy and z for scintillators

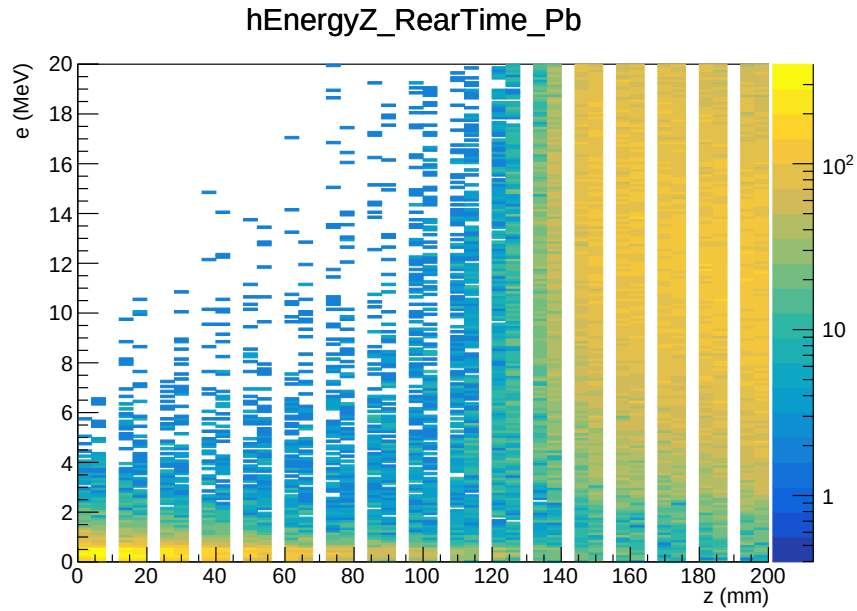




- Left for $t < 0.5$ ns, right for $t > 0.5$ ns.
- Hits on the $z < 100$ mm after $t > 0.5$ ns.
  - Mainly not coming from the parent γ but coming from secondaries.
  - Bad candidates for reconstructing the direction of the shower.

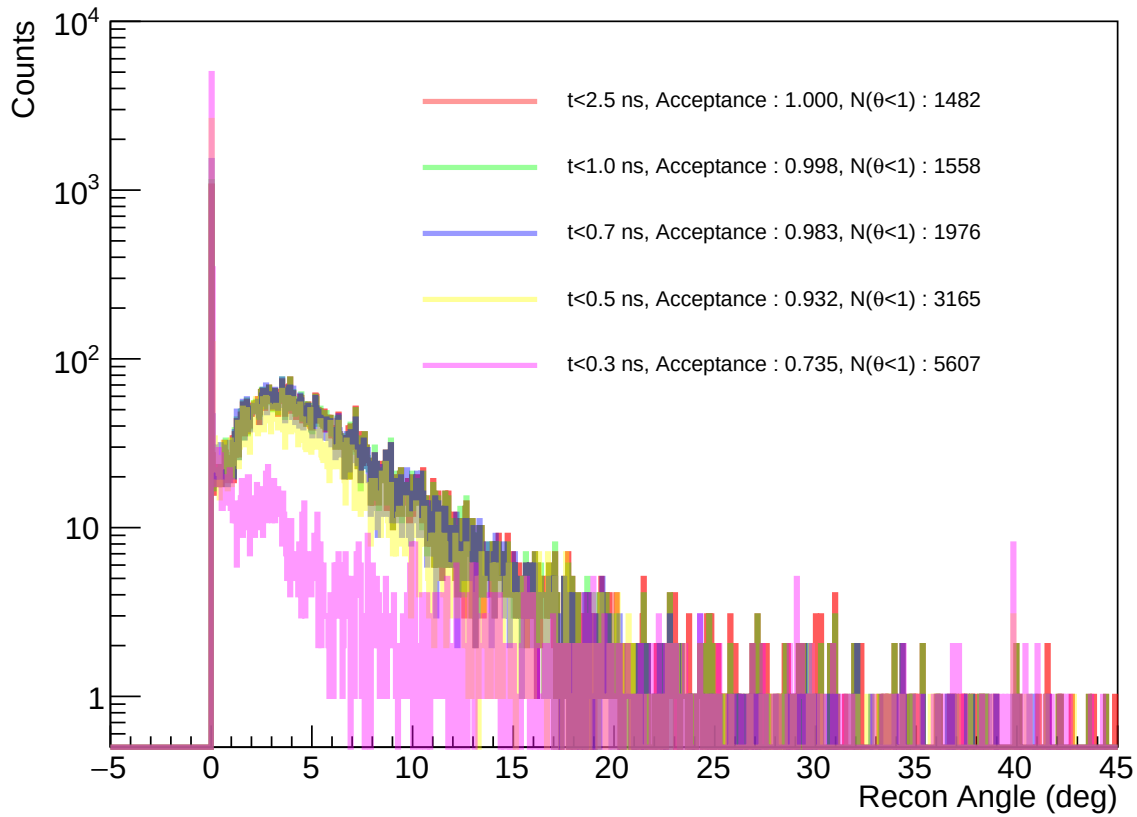
Energy and z for Pb



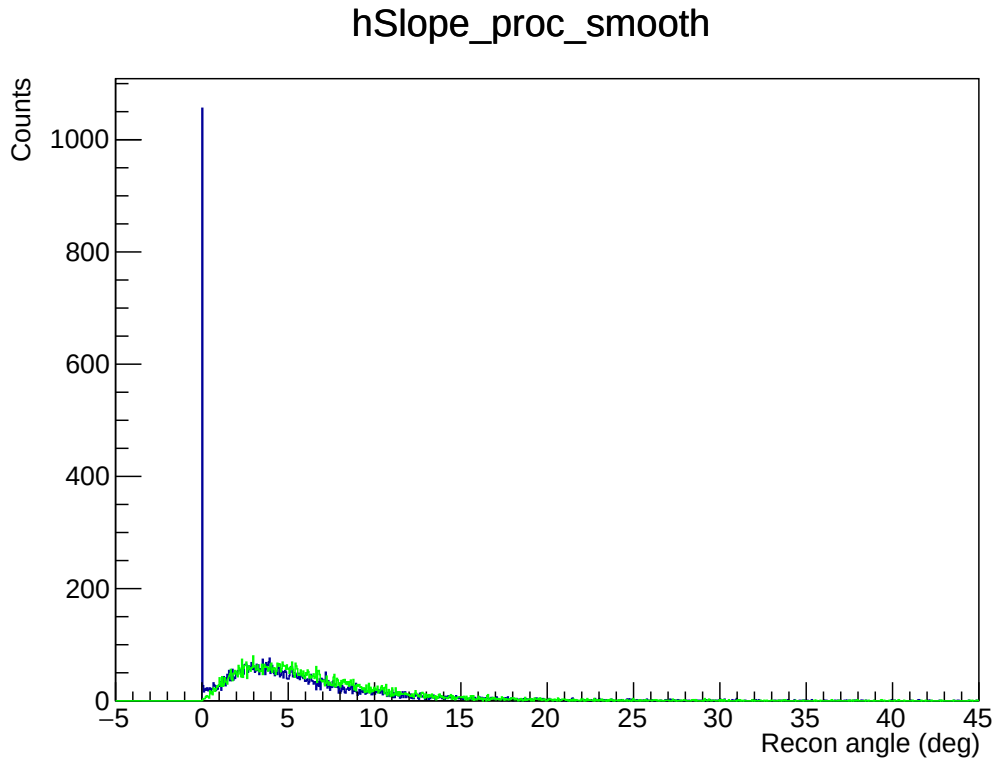


- Left for $t < 0.5$ ns, right for $t > 0.5$ ns, z is rebinned.
- Hits on the $z < 100$ mm after $t > 0.5$ ns still can be seen with low energy deposit.
- Timing cut study has been done.
  - Timing cut for each segment with `(2.5, 1.0, 0.7, 0.5, 0.3) ns`
  - Essential to understand the relation between timing cut and incident angle.

Angle distribution with timing cut



step position instead detector level



- Blue for detector level, green for step level