Report on KOTO EMCal Study

Junlee Kim

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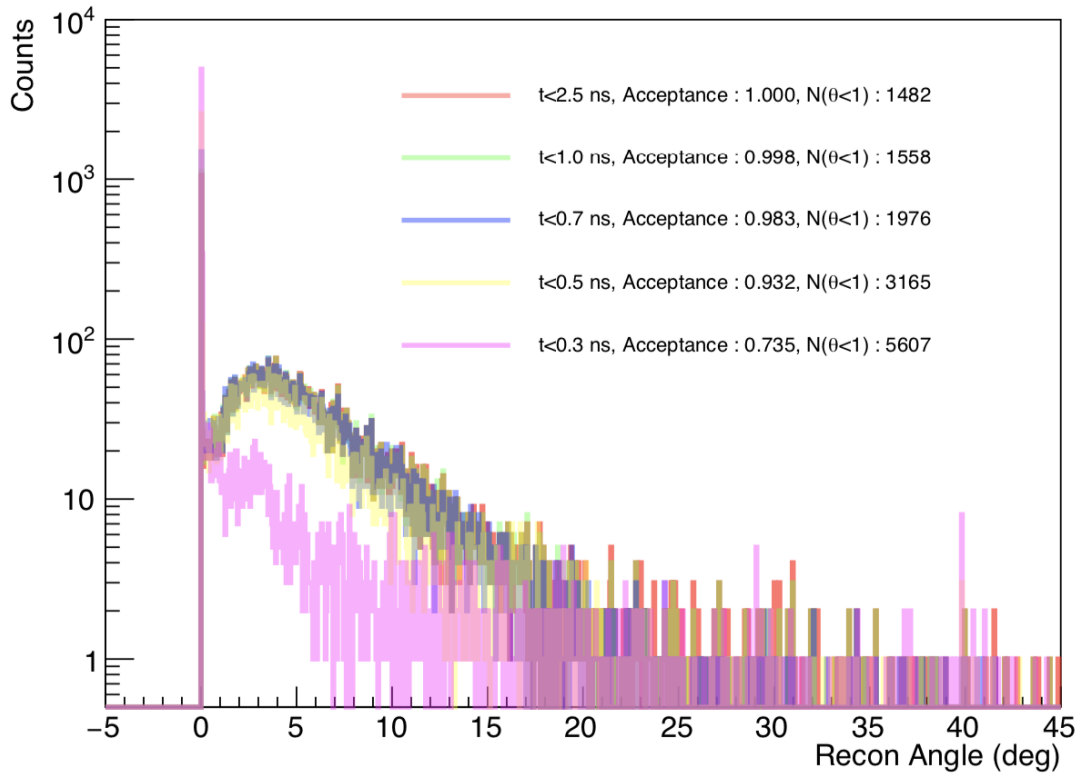
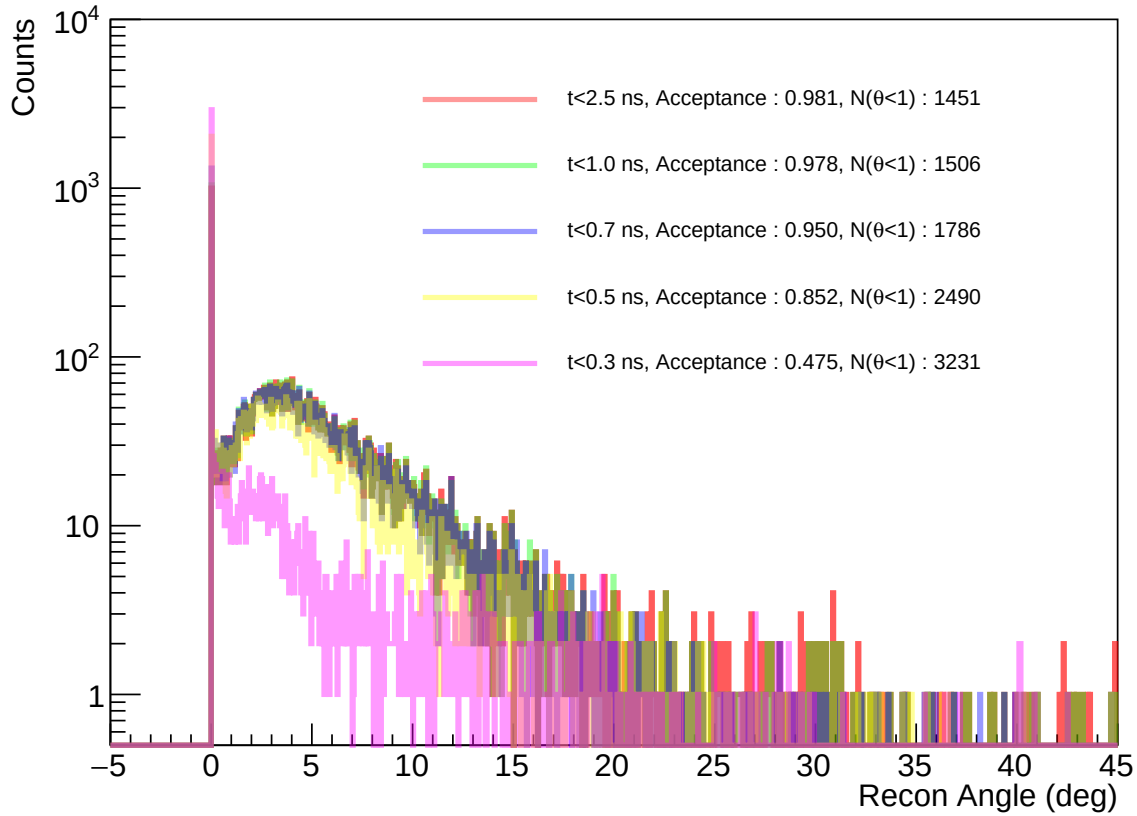
Updates from result in the last week



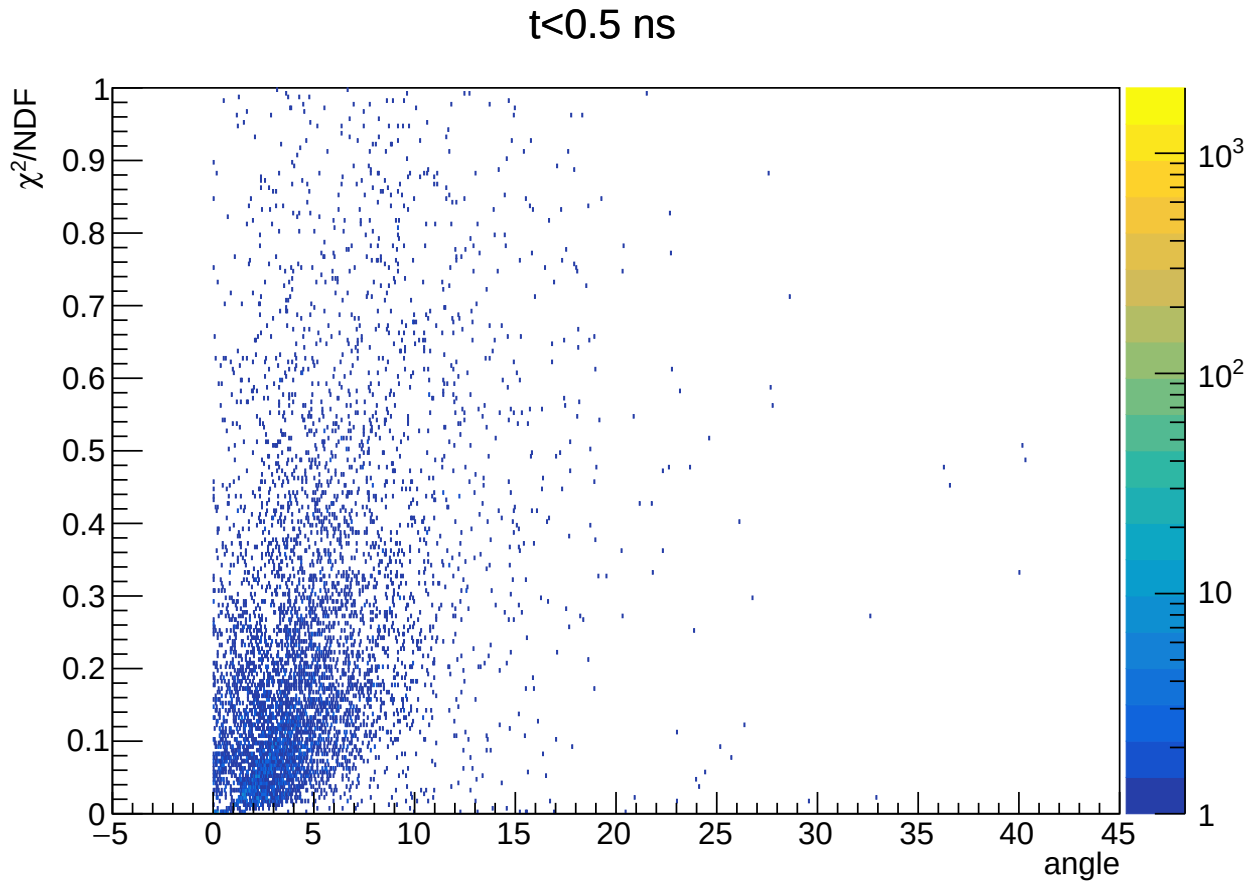
- There are many tracks with NDF=0, which are not properly reconstructed tracks.
- Energy cut as $E > 3$ MeV, Fit range as $l = 80$ mm.

Updated result



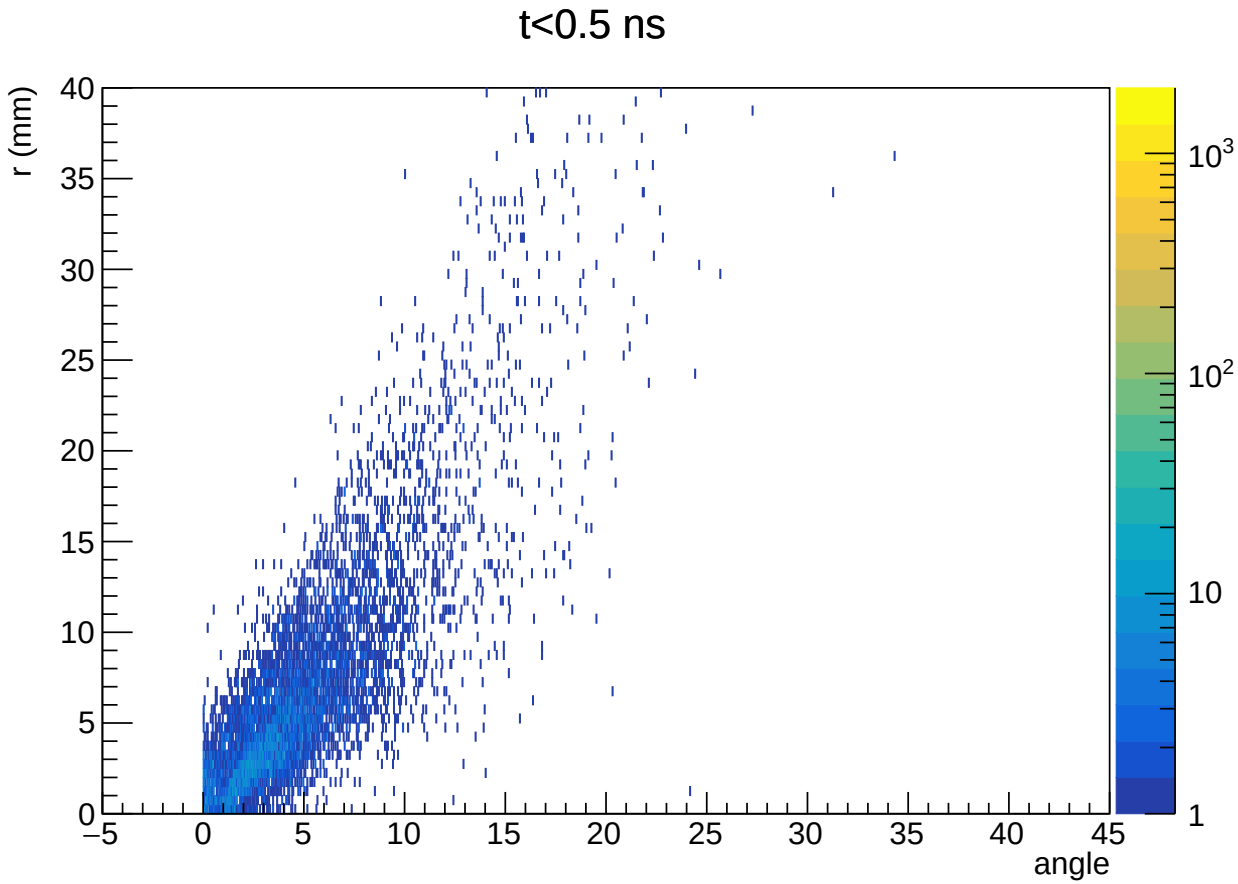
- Requirements for $\mathrm{NDF}_{x,y}$ >0 were applied.
- Estimated efficiency is similar as before
- Estimated acceptance is largely changed.

Correlation with chisquare



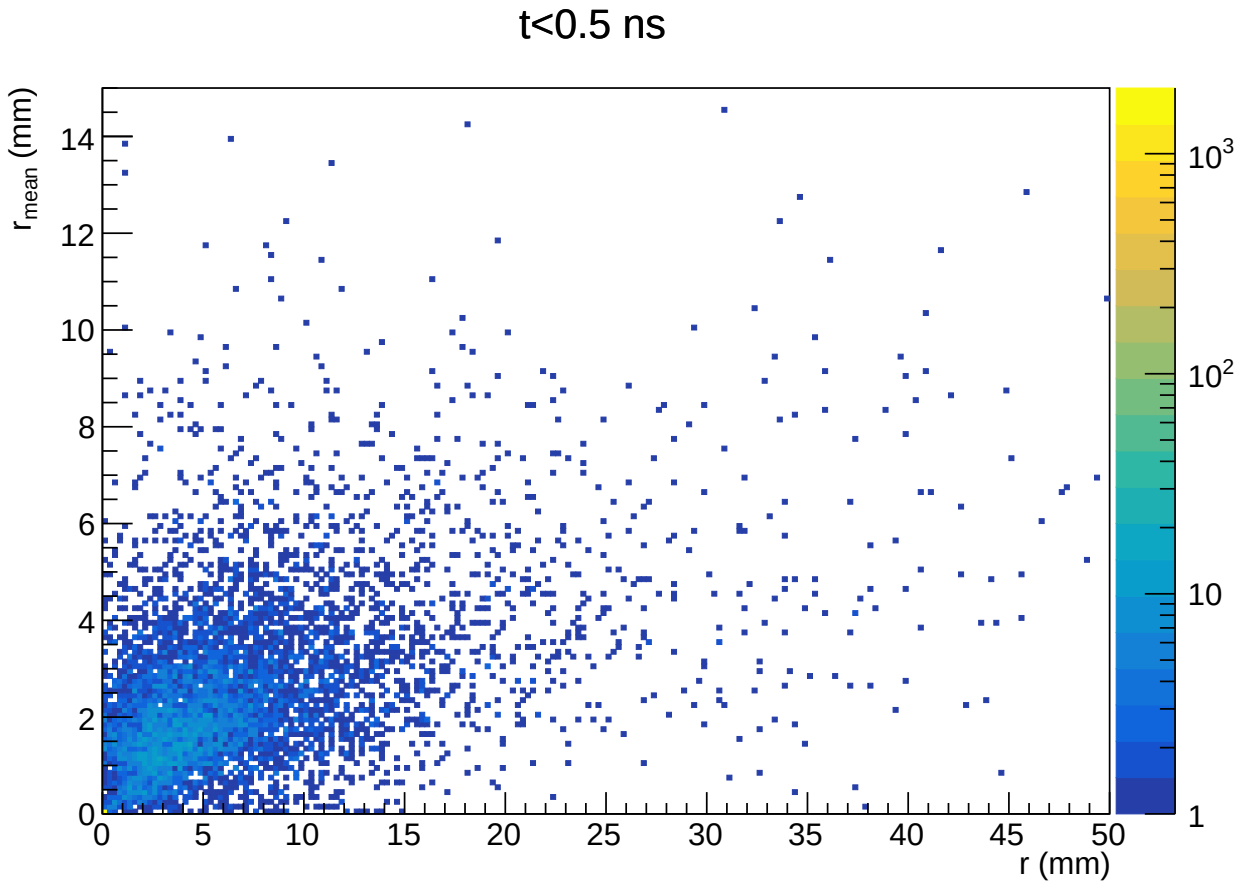
- $\chi^2 = \chi^2_x + \chi^2_y$, $\mathrm{NDF} = \mathrm{NDF}_x + \mathrm{NDF}_y$
- Increasing χ^2 with reconstructed angles.

Correlation with reconstructed origin



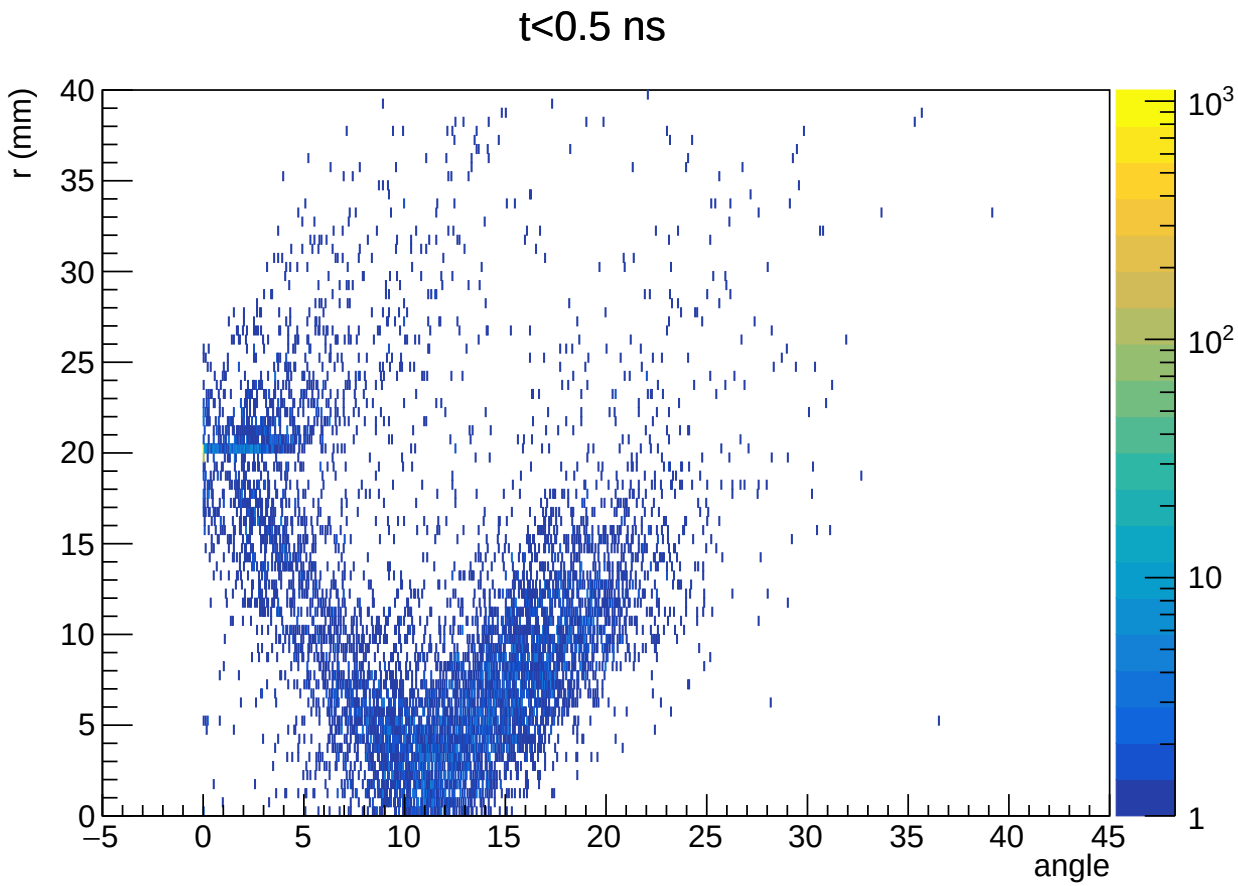
- $r = \sqrt{x^2_{z=0} + y^2_{z=0}}$
- Linearity can be seen.

Reconstructed origin with energy-weighted mean



- X-axis : reconstructed origin
- Y-axis : energy-weighted mean position
  - Average over data points used for fits.

Correlation with reconstructed origin for $\theta = 10°$

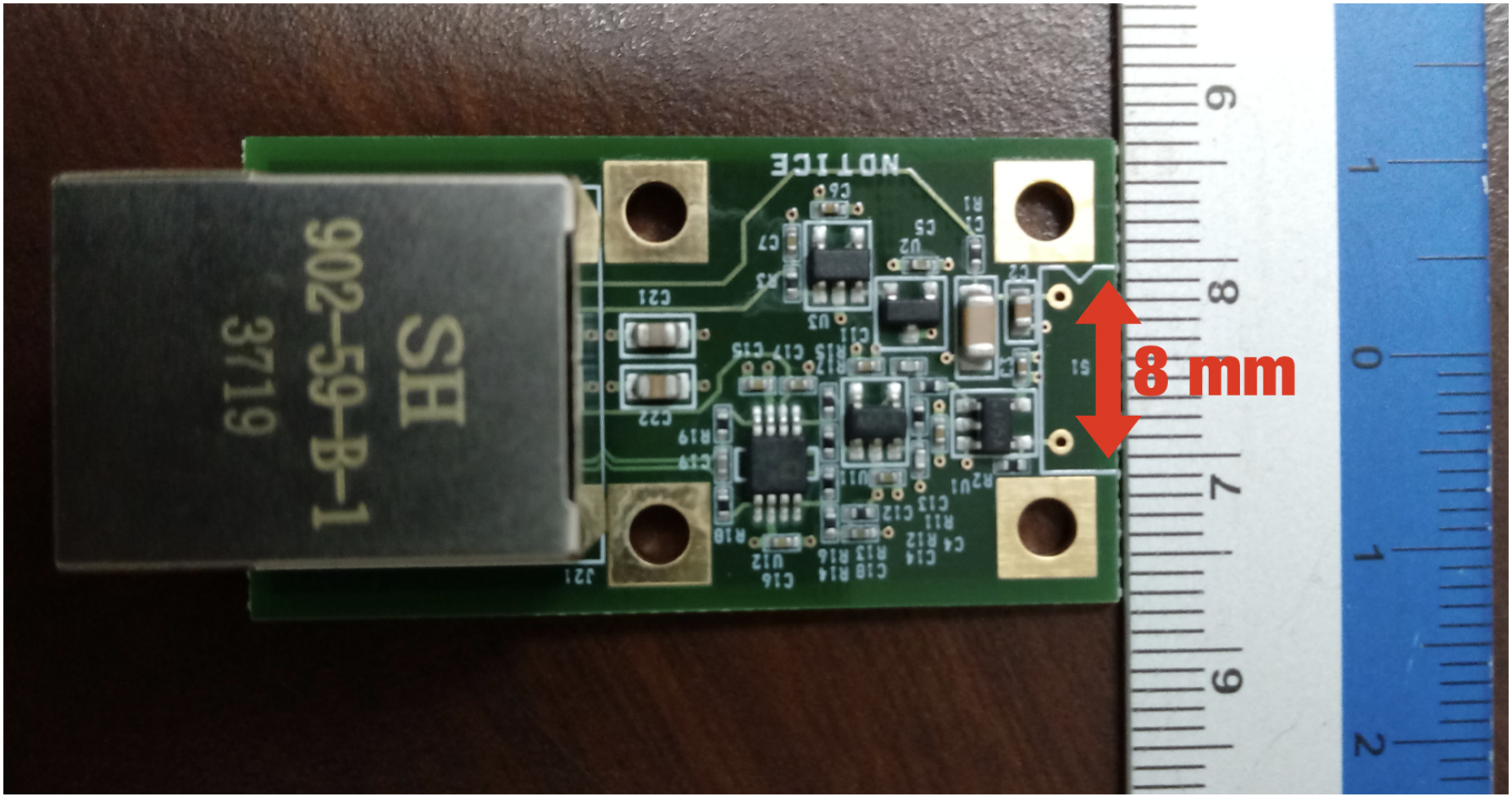


- atan(20.0/80.0) = $\sim$14° $\rightarrow$ smaller than intrinsic resolution

Outlook

- The origin reconstruction is highly related with direction reconstruction.
- Segments with smaller width?
  - only for front side of detector
  - Still preparing...

Preamp + shaper



- ADCs will be ready two weeks later.
- Nee to test ADC + Preamp before sending modules to KEK?