Report on KOTO EMCal Study

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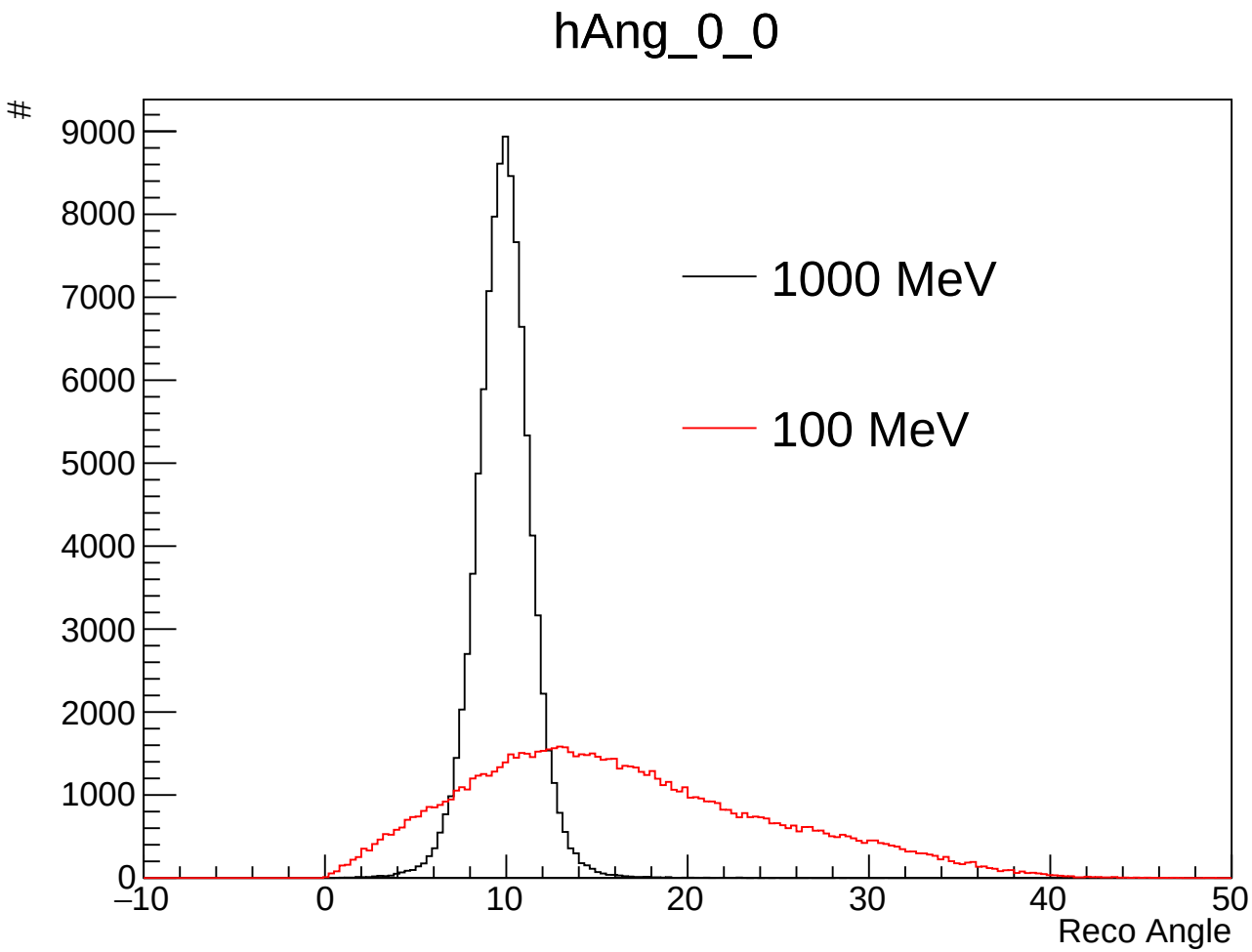
Contents

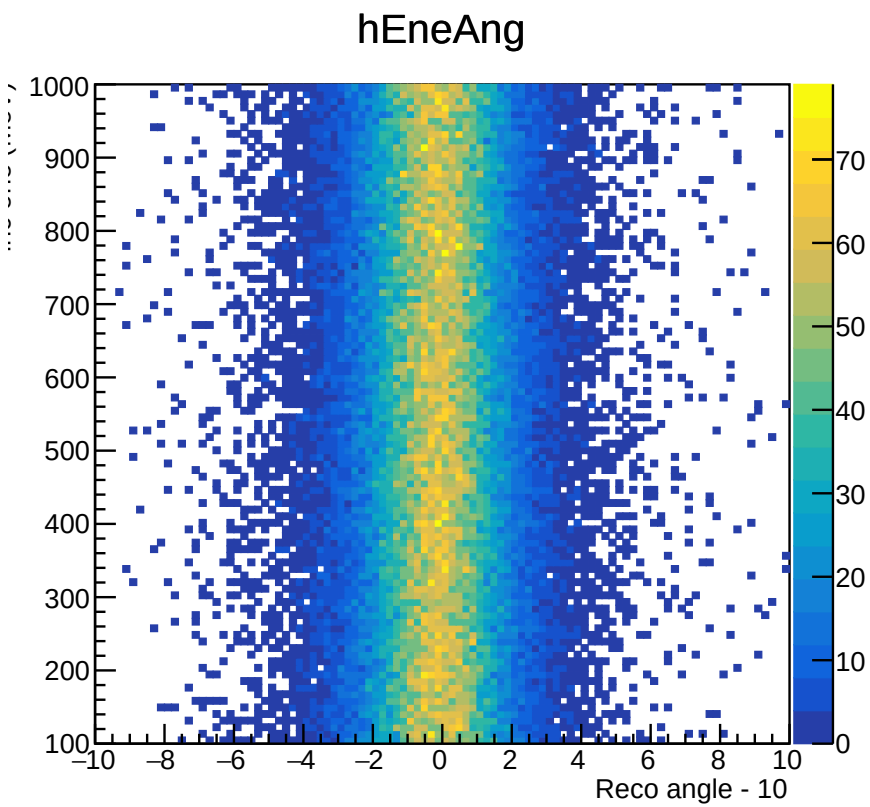
- x, y direction, x, y position, and energy reconstruction at the same time.
- energy reconstruction with visible ratio?
  - Test samples with the same angle and different energies
- x, y position with COE?
  - Clustering need to be preceded.
  - Test samples with limited x and y ranges (e.g. $|x_{\mathrm{ch}}| < 10$ cm...) to decide cluster size

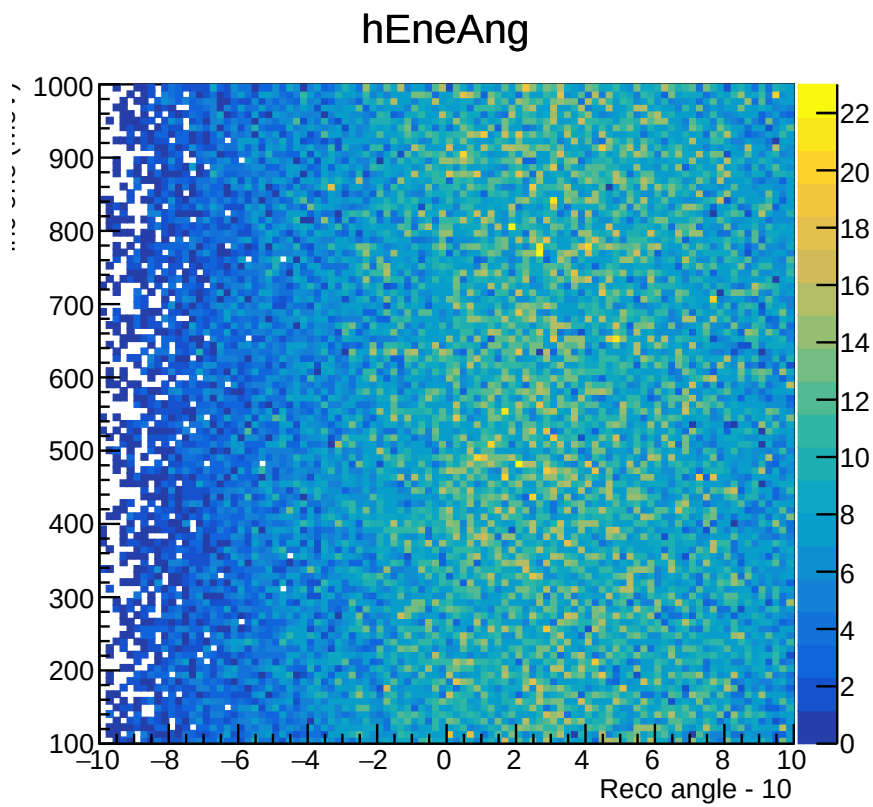
Angle reconstruction for different energies



- Training with $0 < \theta < 50$, $0 < \varphi < 360$, $E = 1(0.1)$ GeV
- Test with θ=10, $0 < \varphi < 360$, 0.1< E <1 GeV

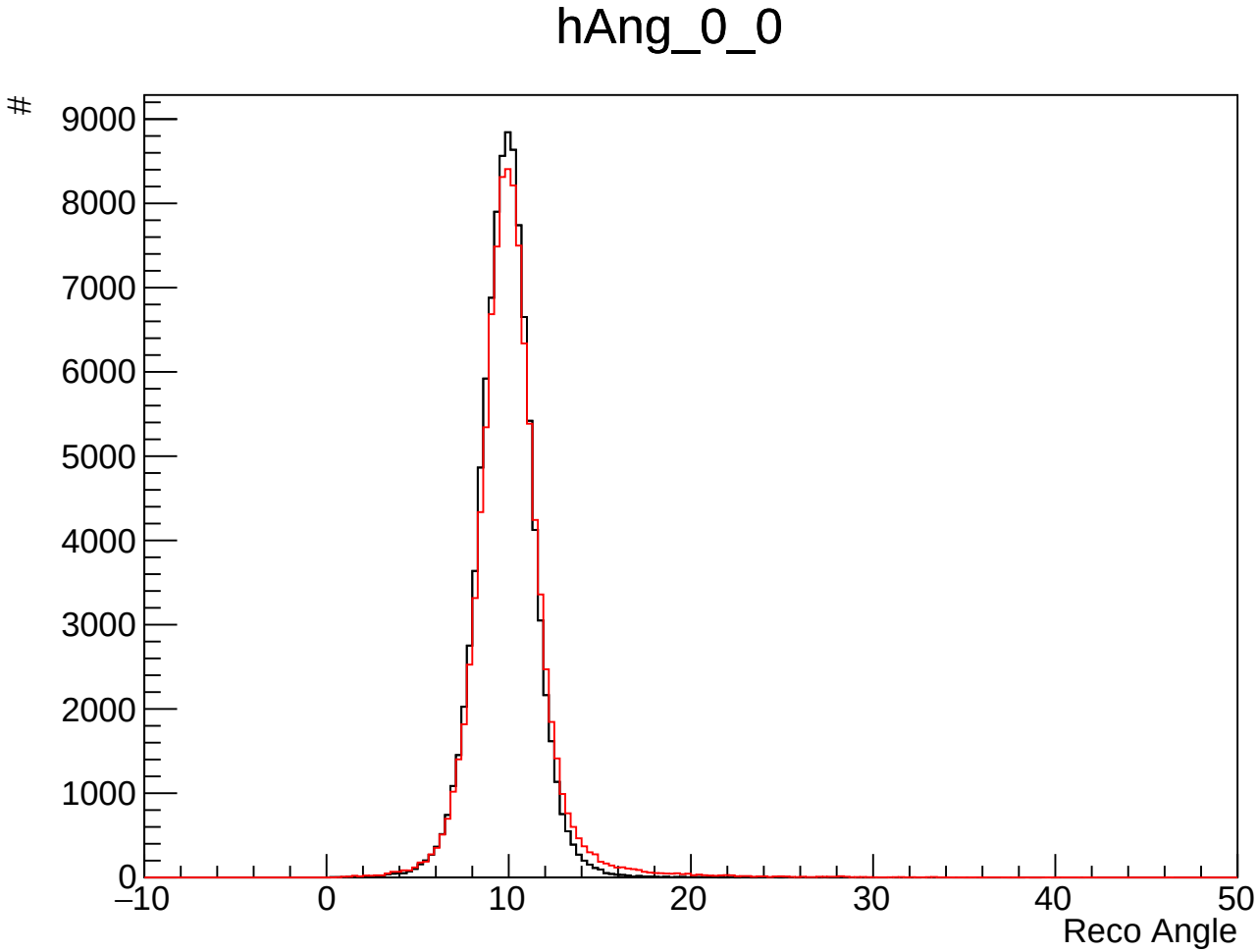
Angle reconstruction for different energies





- Left for 1 GeV training and right for 0.1 GeV training
- Angle resolution from training samples?

Cluster size study

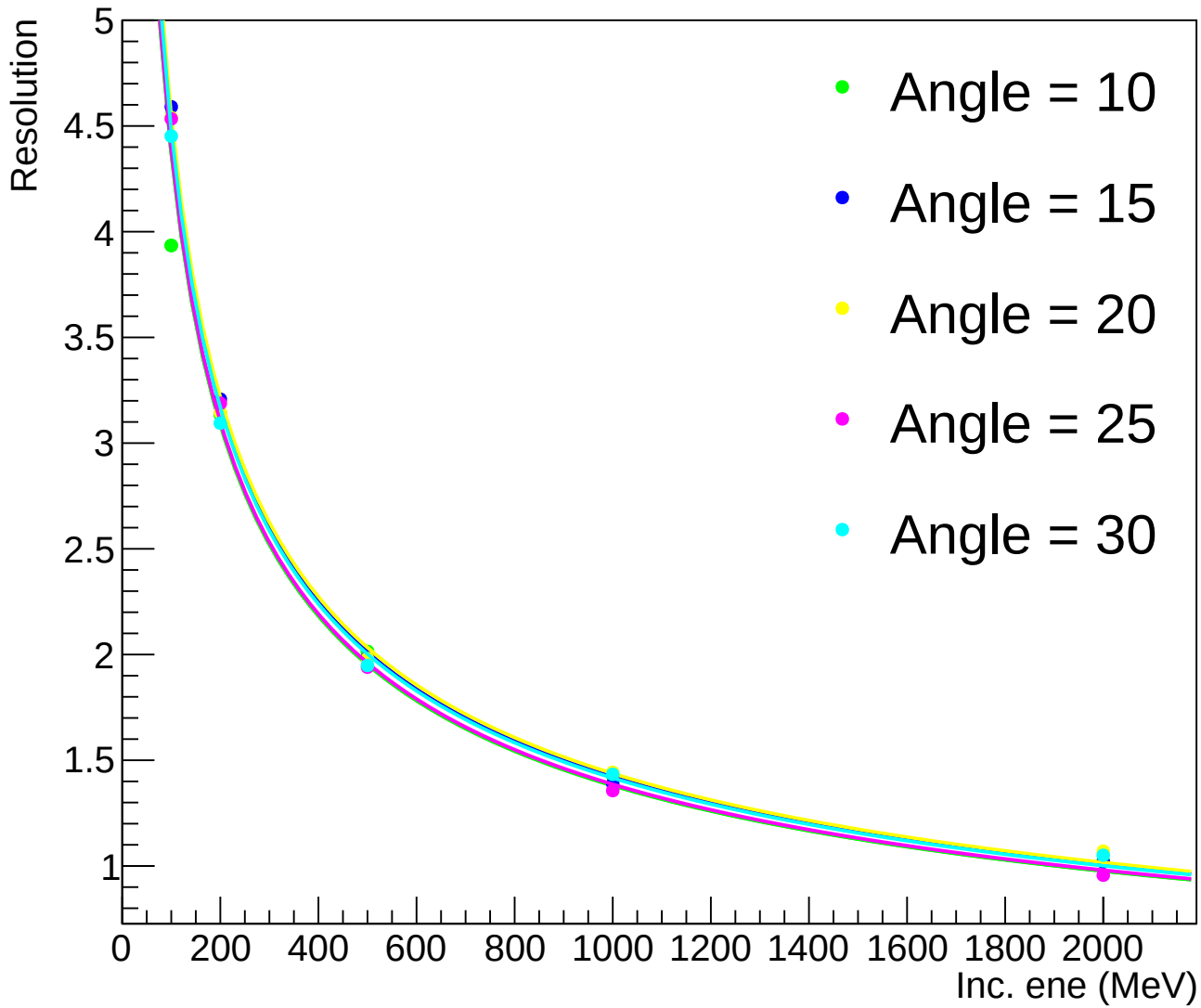


- Black for no selection (full geometry) and red for $|x|$ and $|y|$ ¡ 100 mm
- No significant difference so far

Status

- Cluster size study
- Realistic simulation?
  - γ reconstruction using $\pi^0 \to \gamma\gamma$ events

energy / angle dependence



- Function as $f(e) = p_0/\sqrt{e}$, $p_0 = \sim 1.45$