Study Air vs. Vacuum (before Target)
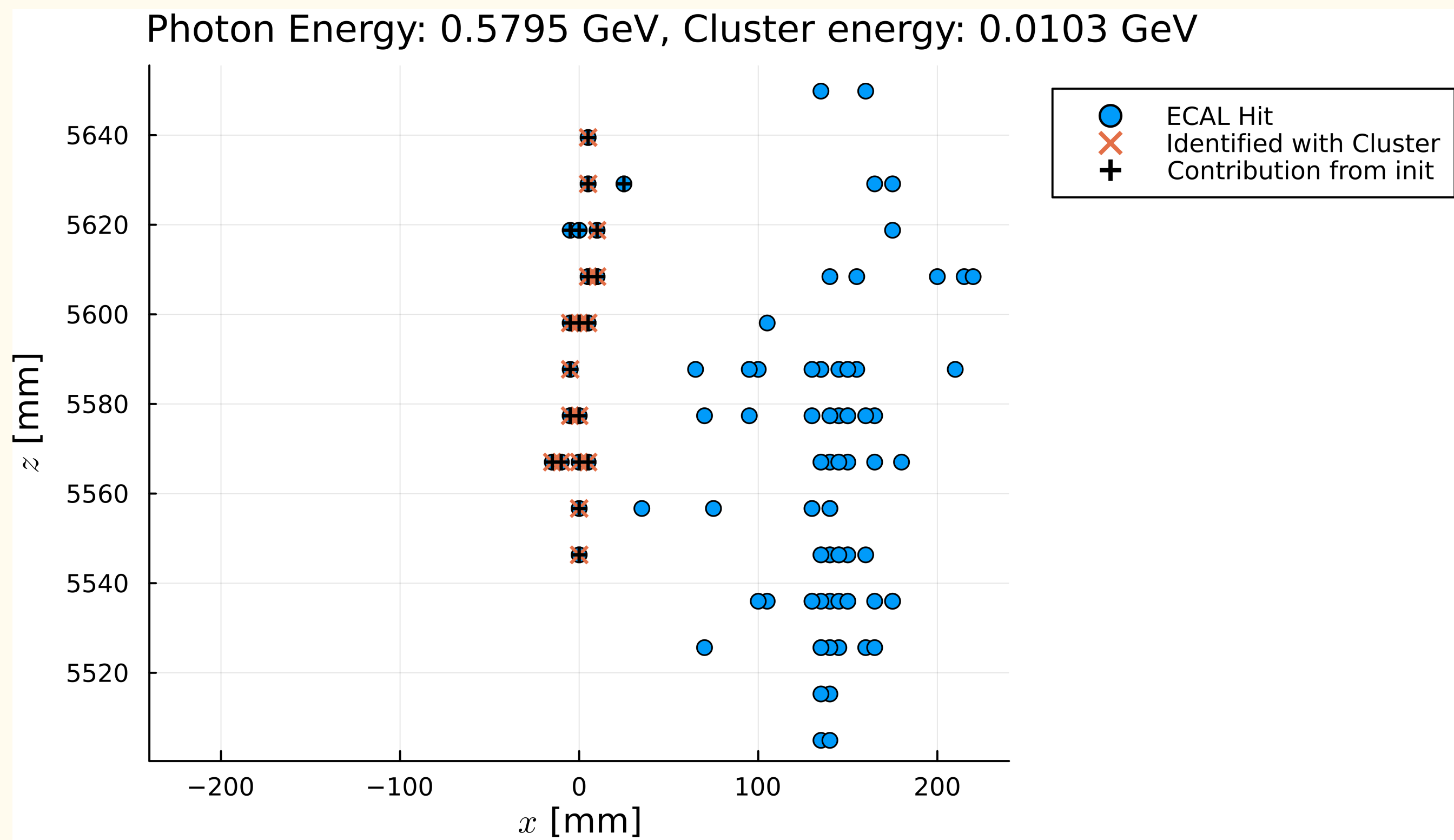
- Beam: 3.2 GeV with 0.08 ‰ Energy Spread; World in Air and in ELSA Vacuum (10^{-7} mbar)

Study	Vertex (GeV)	Permille Width	Endpoint (GeV)	Permille Width
Baseline (Everything in ELSA Vacuum, 10^{-7}mbar)	3.2000 ± 0.0026	0.8006	3.2000 ± 0.0028	0.8625
Everything in Air (Extraction 2m before target)	3.2000 ± 0.0026	0.8006	3.18 ± 0.18	54.18

- Theory: Air $X_0 = 303.9\,\mathrm{m} \Rightarrow E(2\,\mathrm{m}) = 3.179\,\mathrm{GeV}$
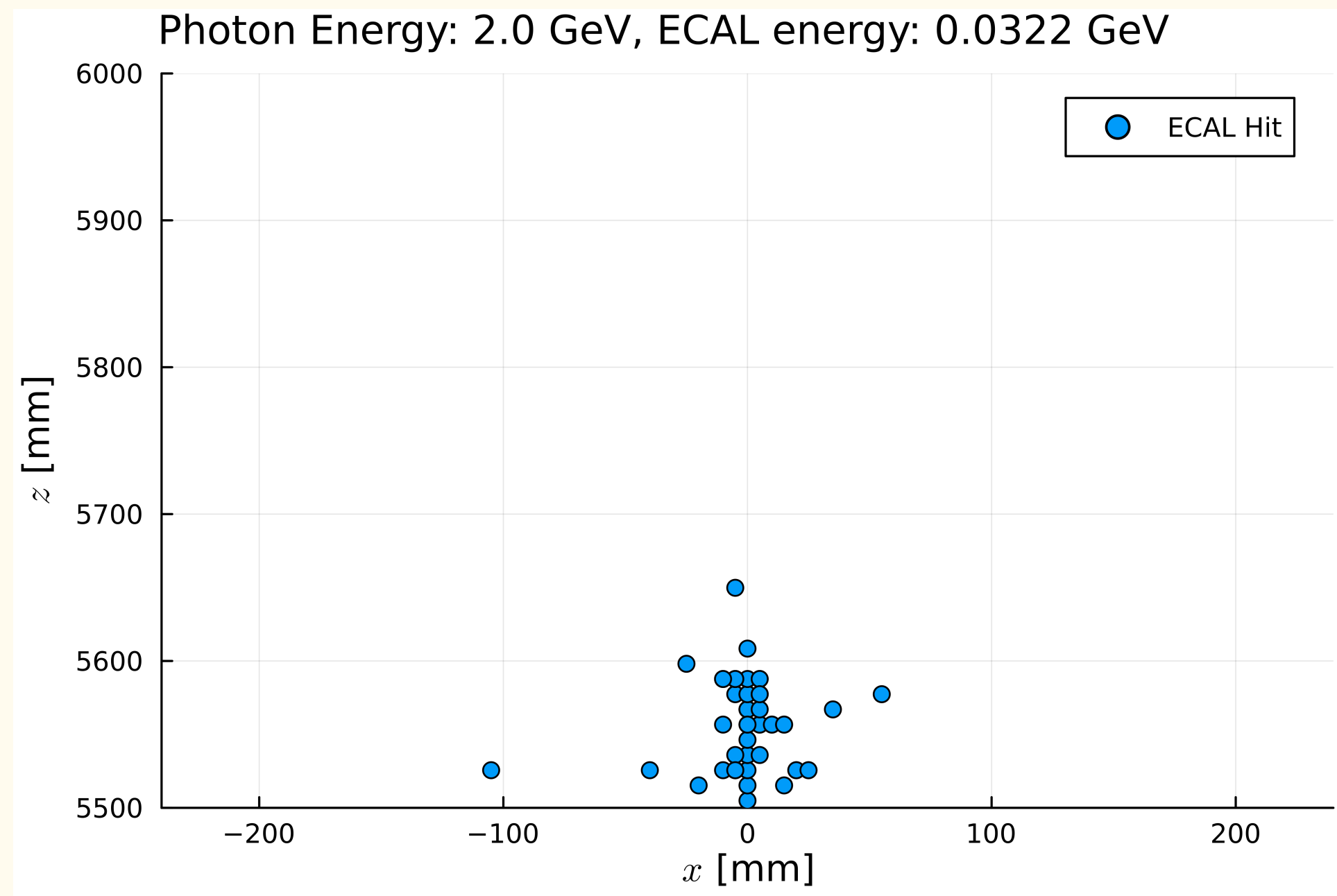
Target Position and ECAL Clustering

- Very simple clustering algorithm (still uses MC information for seed)

  - As presented some weeks ago

  - Example: target at 2.5m

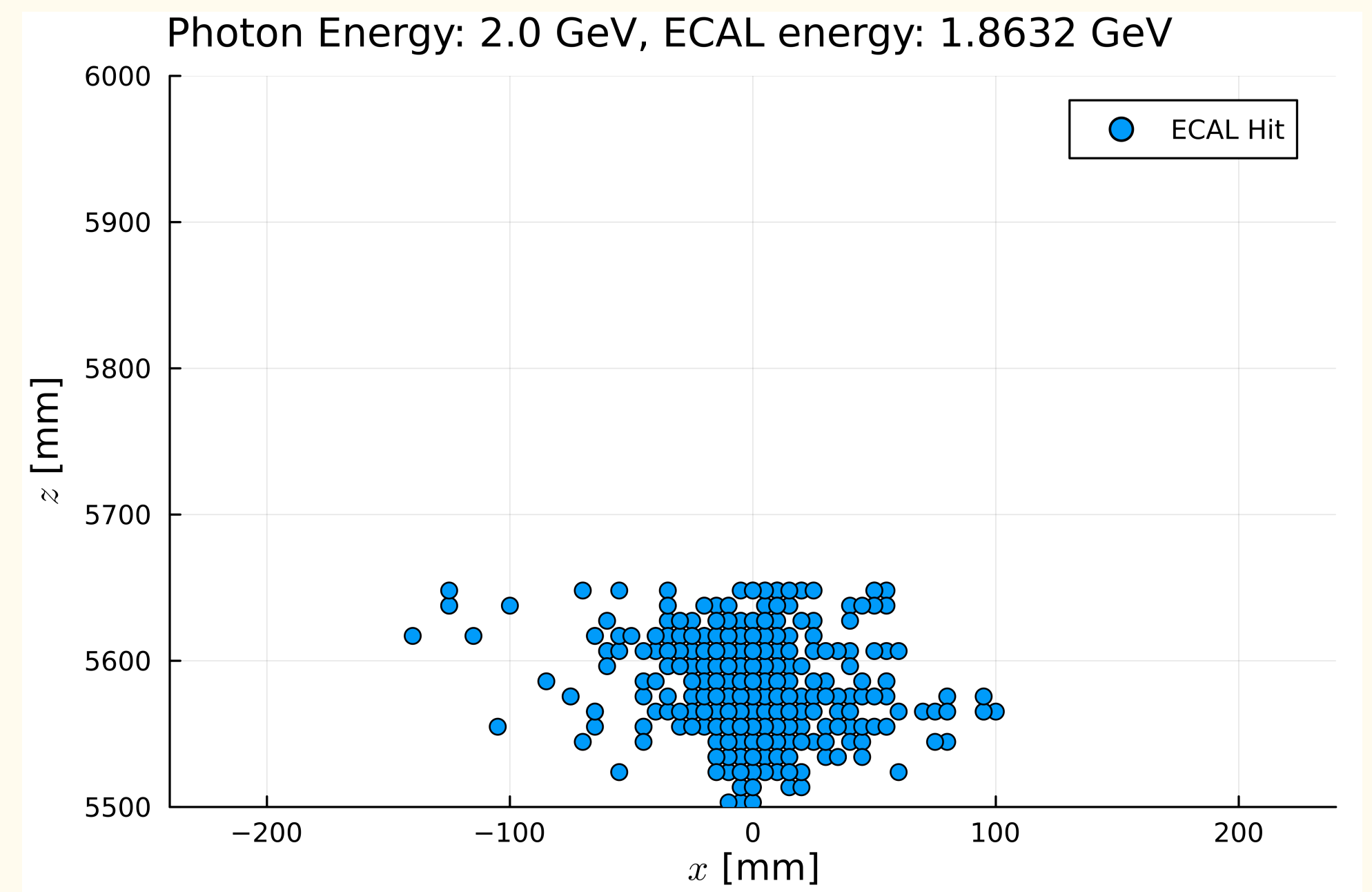Photon Energy: 0.5795 GeV, Cluster energy: 0.0103 GeV

Where is the missing energy

- Implementation: Silicon part of detector is sensitive

- Most energy in absorber which is not sensitive

- Simple simulation: shoot electrons straight on ECAL (without anything else)

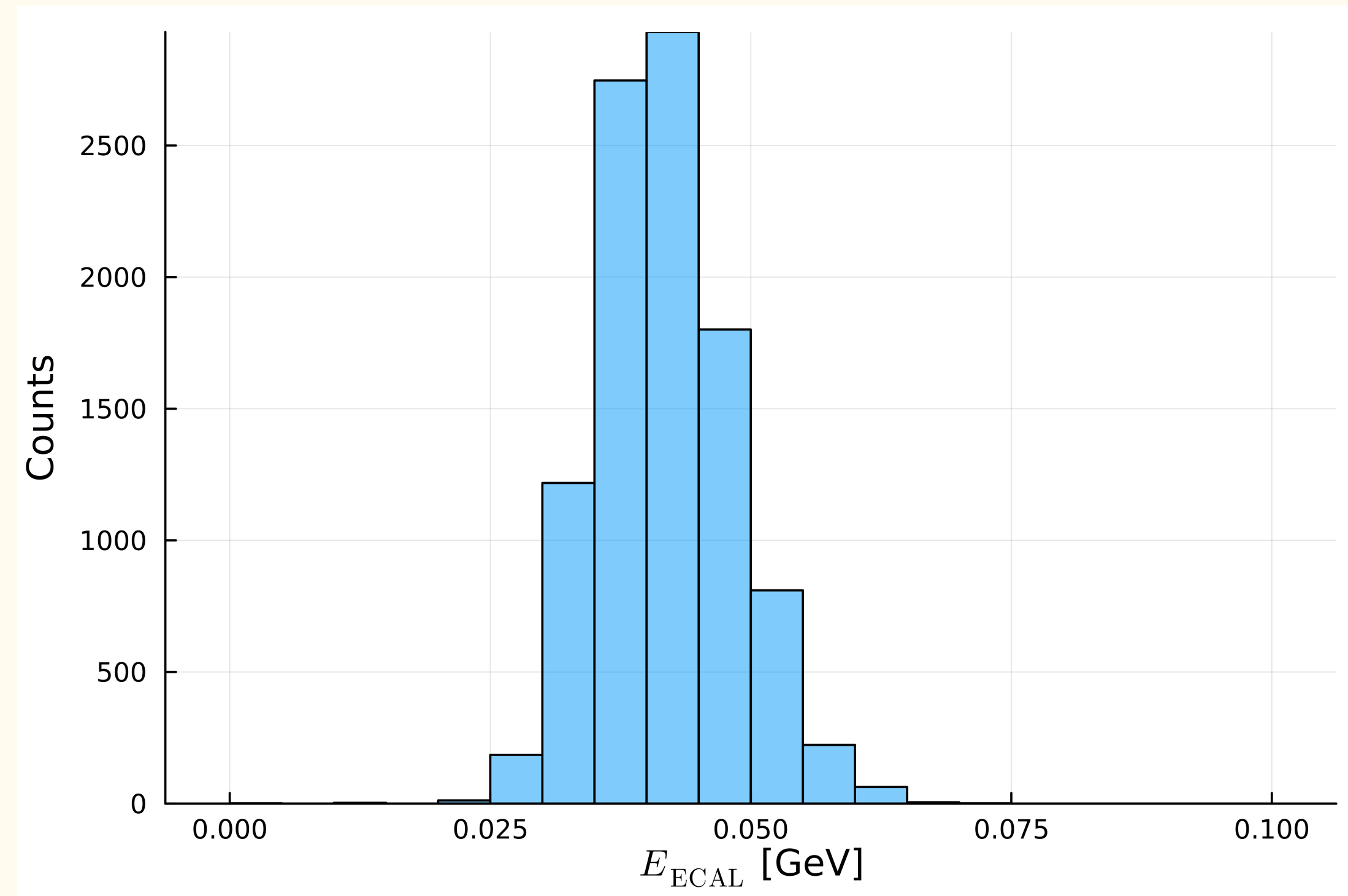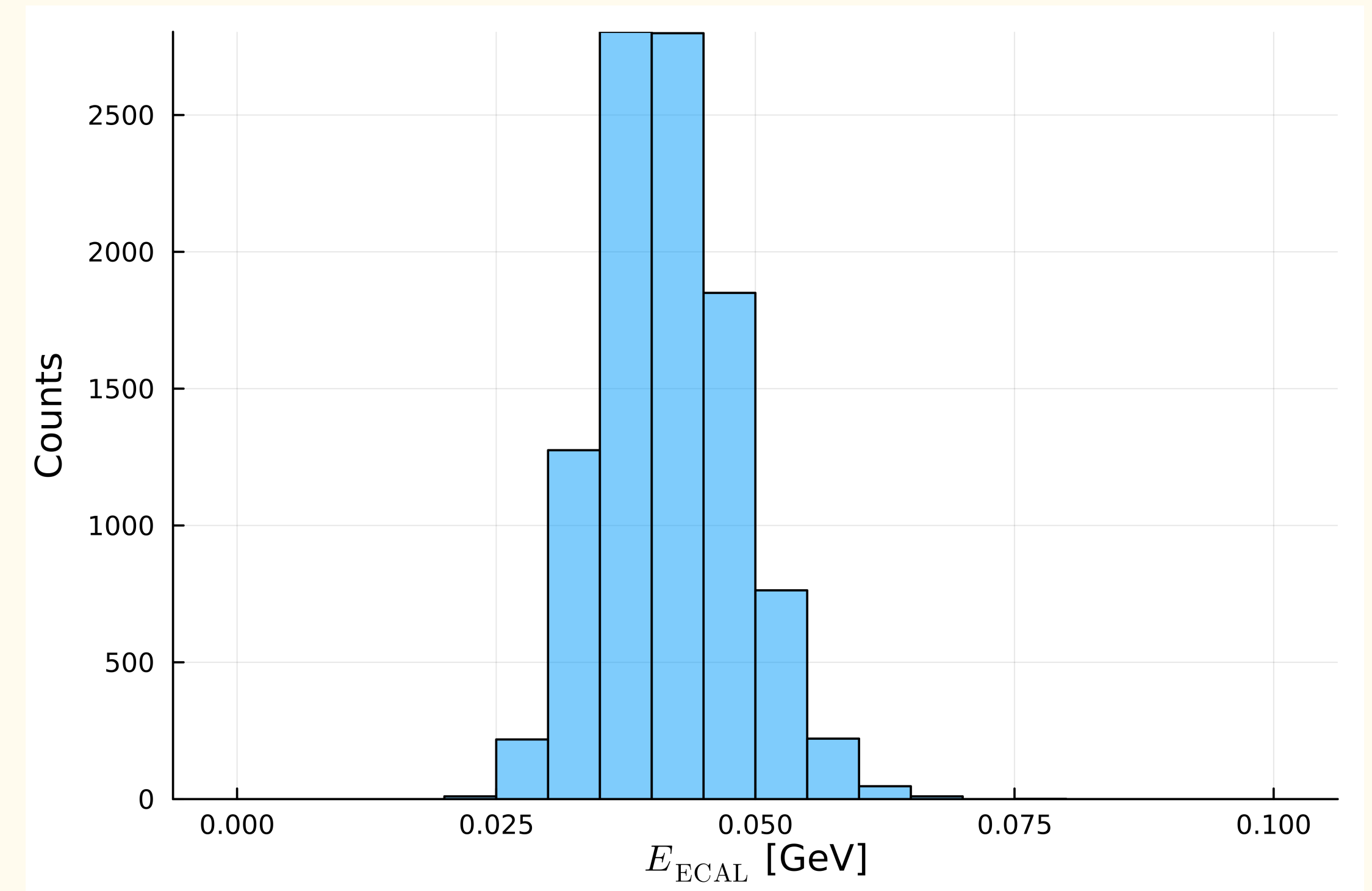 - *(not the same events but all similar)*

Silicon Sensitive

Photon Energy: 2.0 GeV, ECAL energy: 0.0322 GeV

Absorber Sensitive

Photon Energy: 2.0 GeV, ECAL energy: 1.8632 GeV

More looks at the energies

2 GeV Photons onto ECAL

2 GeV Electrons onto ECAL

- $E_{\mathrm{ECAL}} = (0.042 \pm 0.007)\,\mathrm{GeV} \Rightarrow E_0/E_{\mathrm{ECAL}} = 48 \pm 8$

- (Same for both distributions)

- Apply constant factor on energy measurement?