ECAL-E Performance

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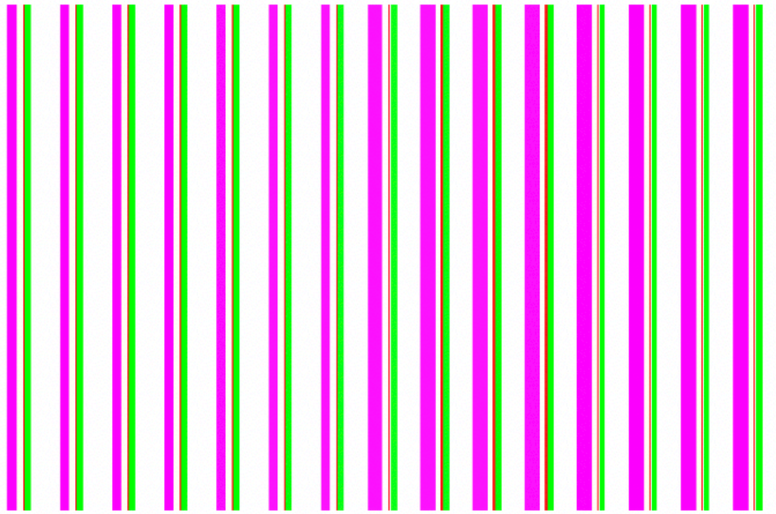
ECAL-E

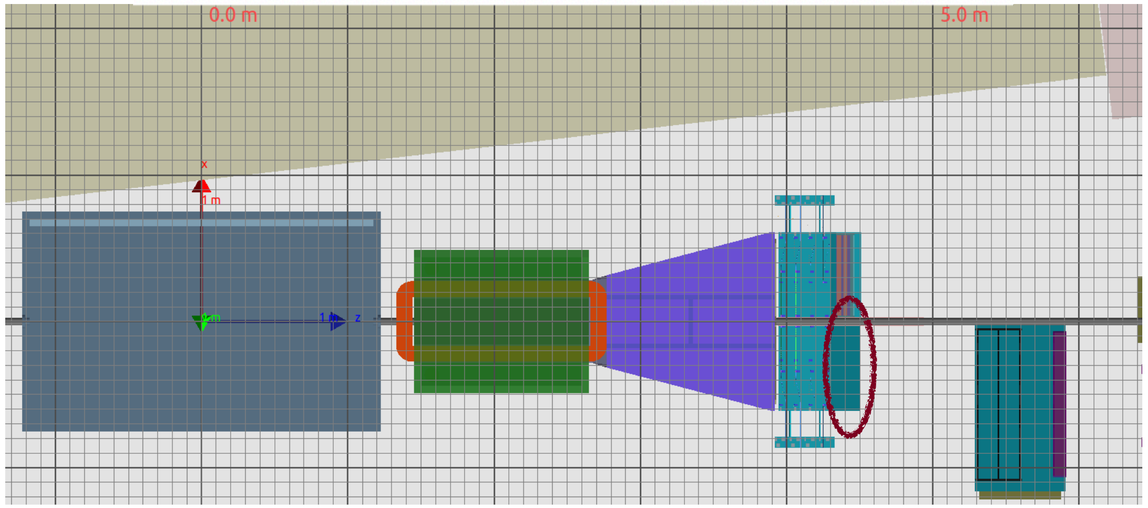
Electromagnetic calorimeter on the electron arm

- Provided by the CALICE Collaboration
- Put only in g-laser setup in the CDR
- Possibly will be used in e-laser as well



Characteristics

- Variable thickness for both W and Si plates
  - 4/5 or 6/5 X_0 for W (instead of $1X_0$)
  - 0.32/0.50/0.65 mm for Si (instead of 0.32 mm)
- Large gap between layers (on board electronics)
  - 15 mm instead of 4.5 mm
- Shorter on x and longer on y directions
  - ECAL-E: 360 x 180 mm^2
  - ECAL-P: 550 x 55 mm^2



ECAL-E

Comparable E_{dep} modification ratio

- Use ECAL-P as “standard”,

  1 * $(\text{Si thickness})_{\text{CALICE}}$ / $(\text{W thickness})_{\text{CALICE}}$

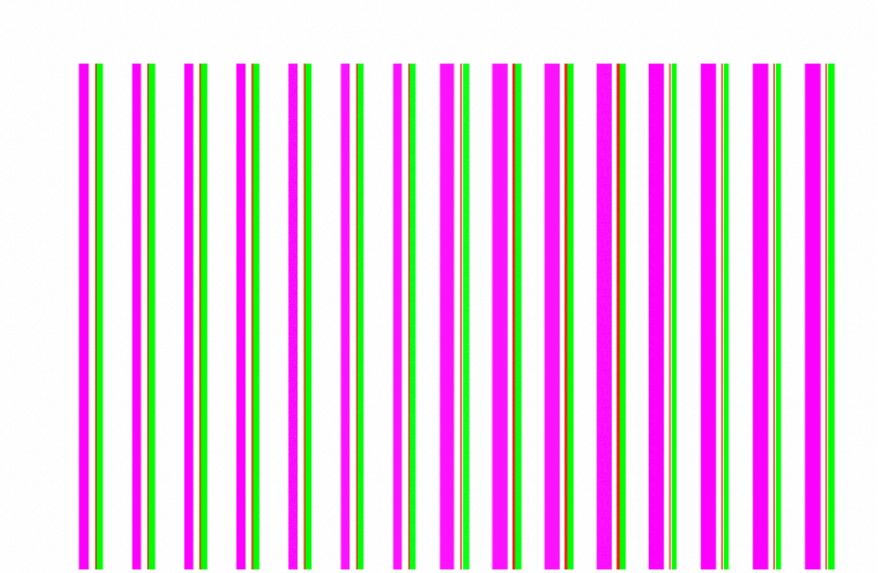
0.8: Layers 0, 1, 4

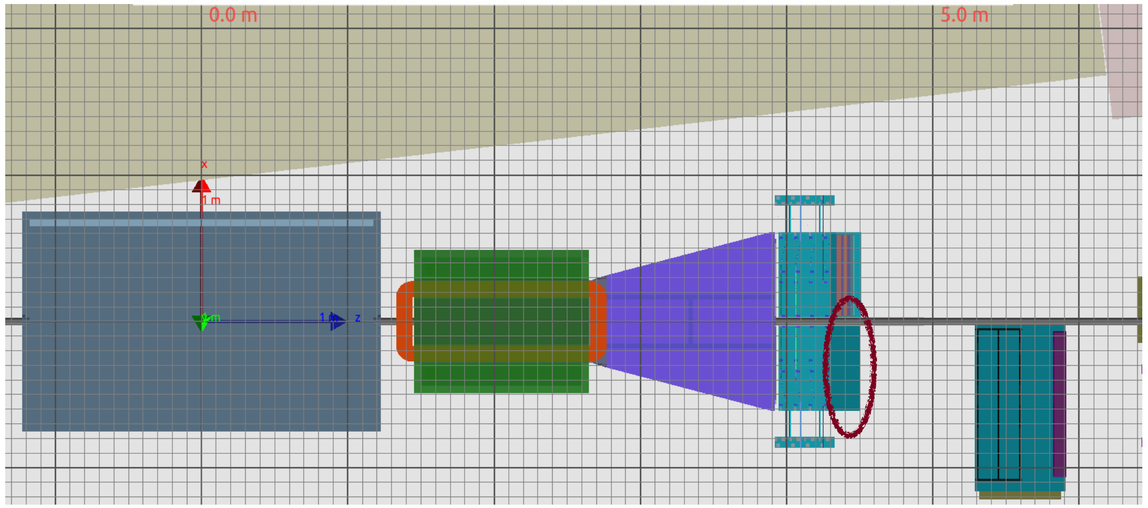
0.394: Layers 2, 3

0.512: Layers 5, 6

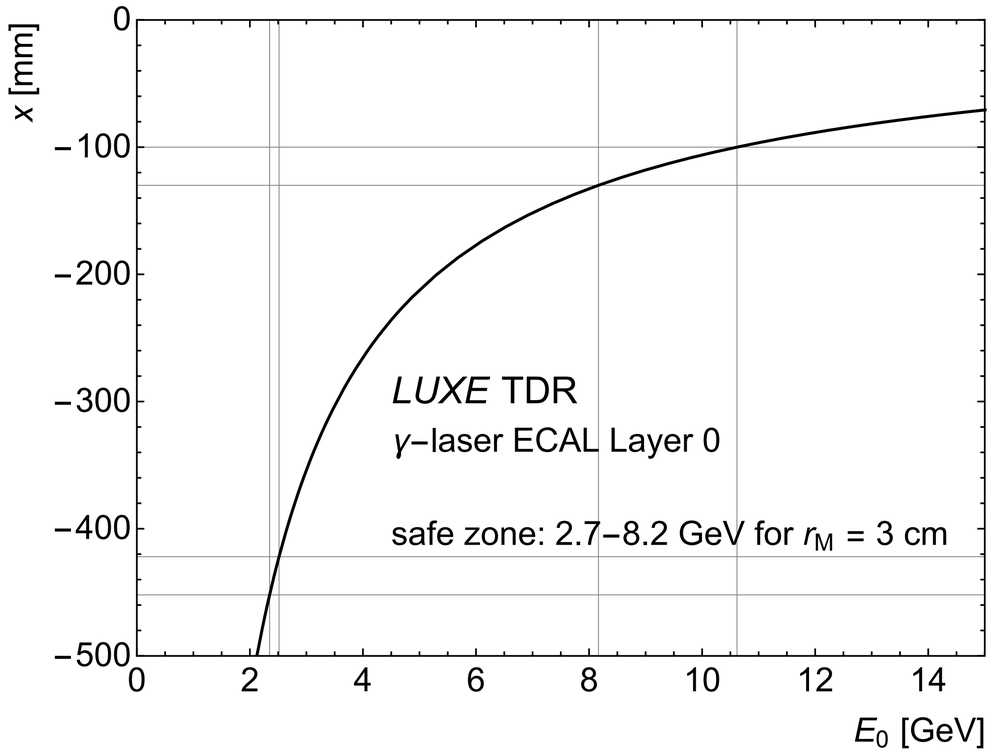
0.768: Layers 7 - 10

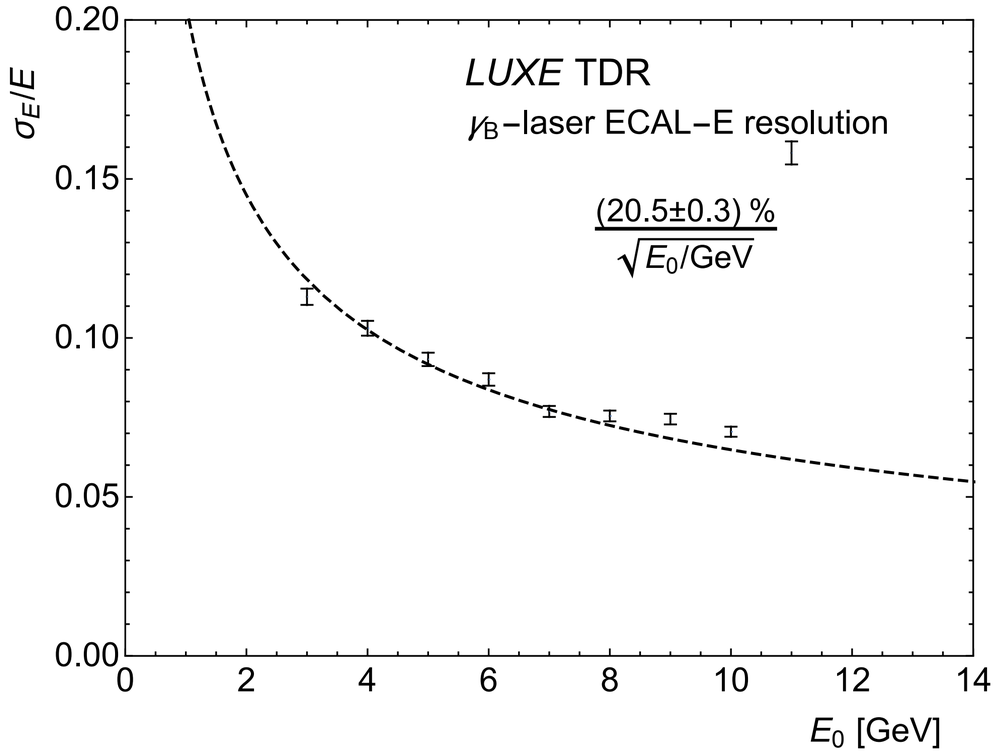
1.2: Layers 11 - 14





Leakage and energy resolution

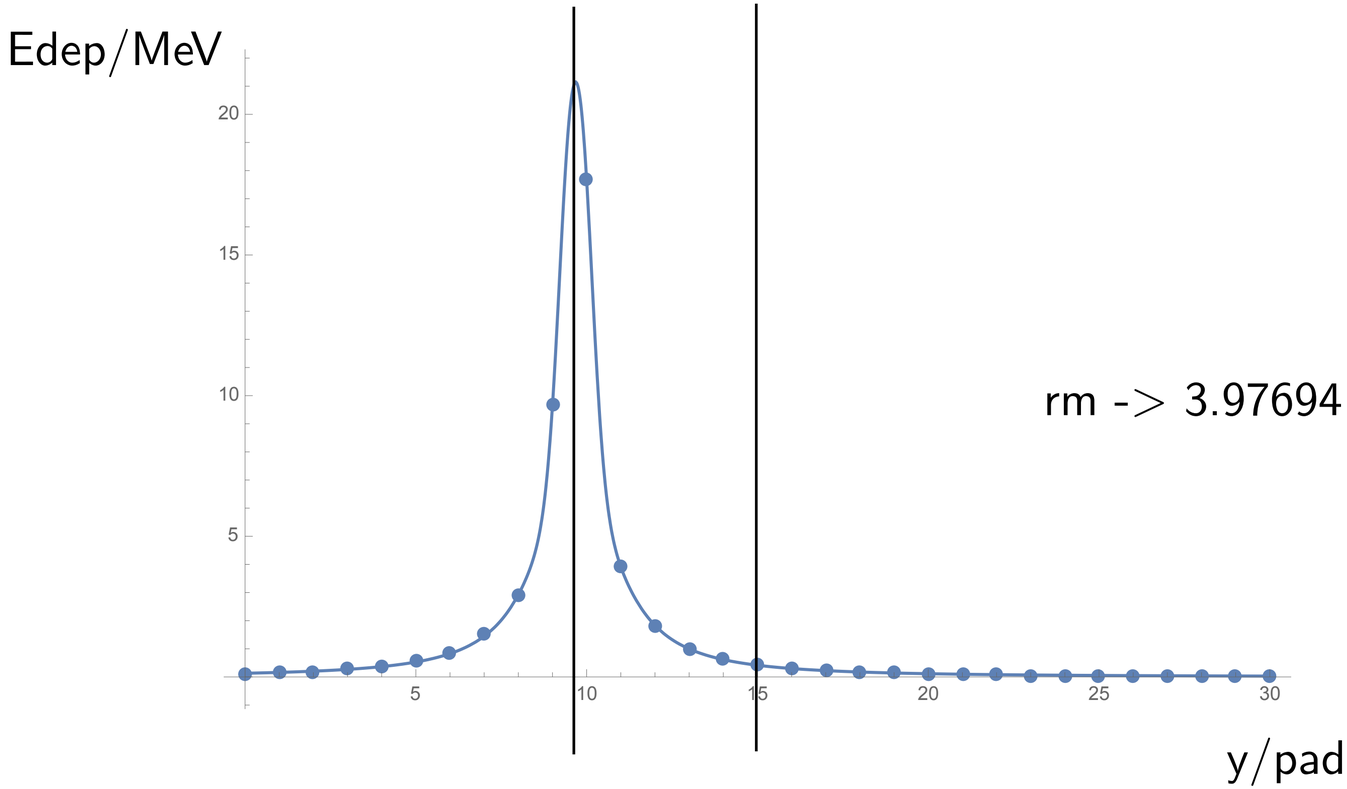




- Former failure due to longitudinal leakage
- Only has $10X_0$ at that time -> 15X0

- Extra transverse leakage due to long interval between ECAL-E and the trackers
  - ECAL-P: 4254 mm; ECAL-E: 4410 mm

Molière radius



rm -> 3.97694 * 5.5 mm = 2.2 cm (90%)