Status of Strip Clustering

K. Kotera, Shinshu university

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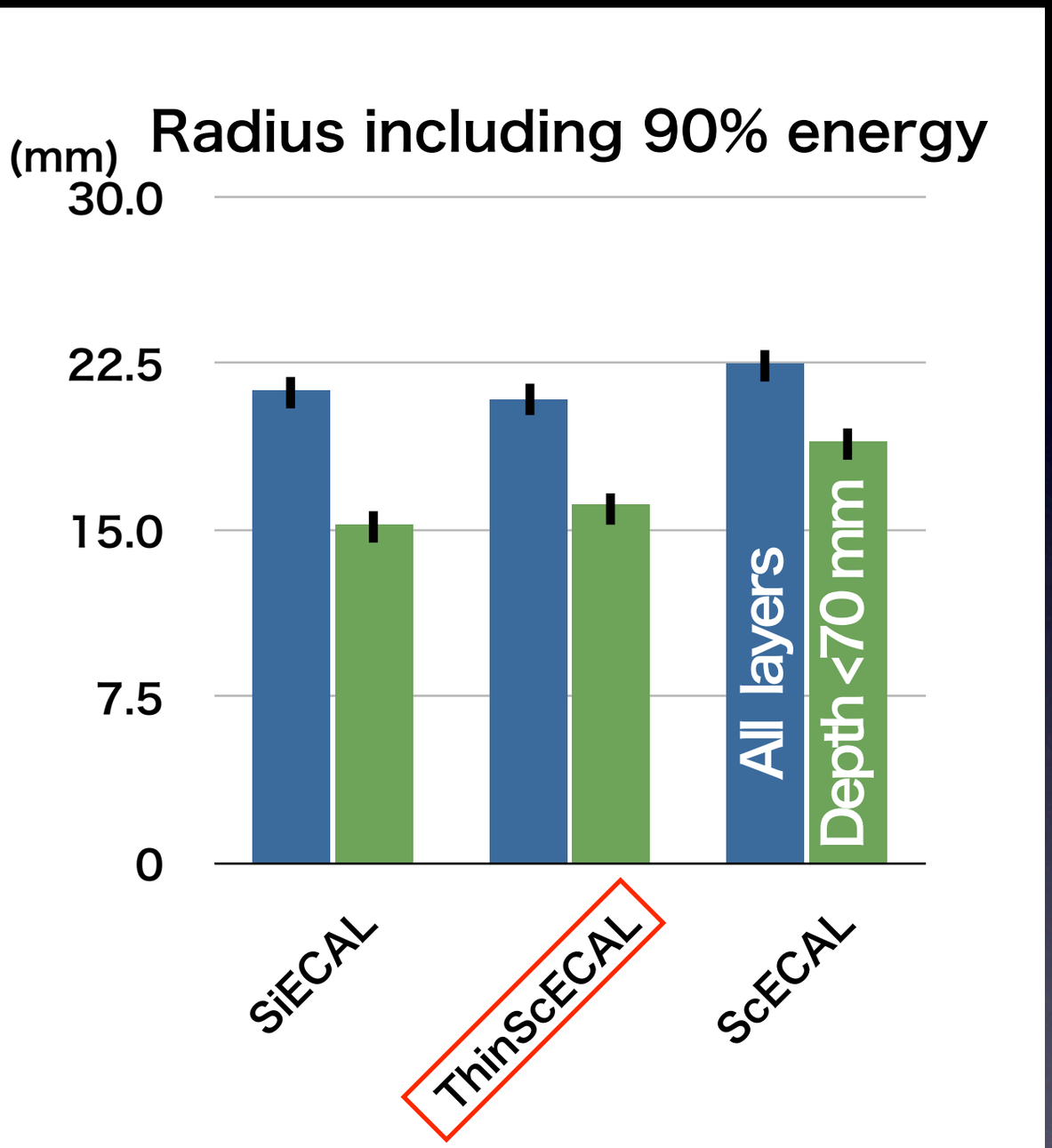
Today's talk

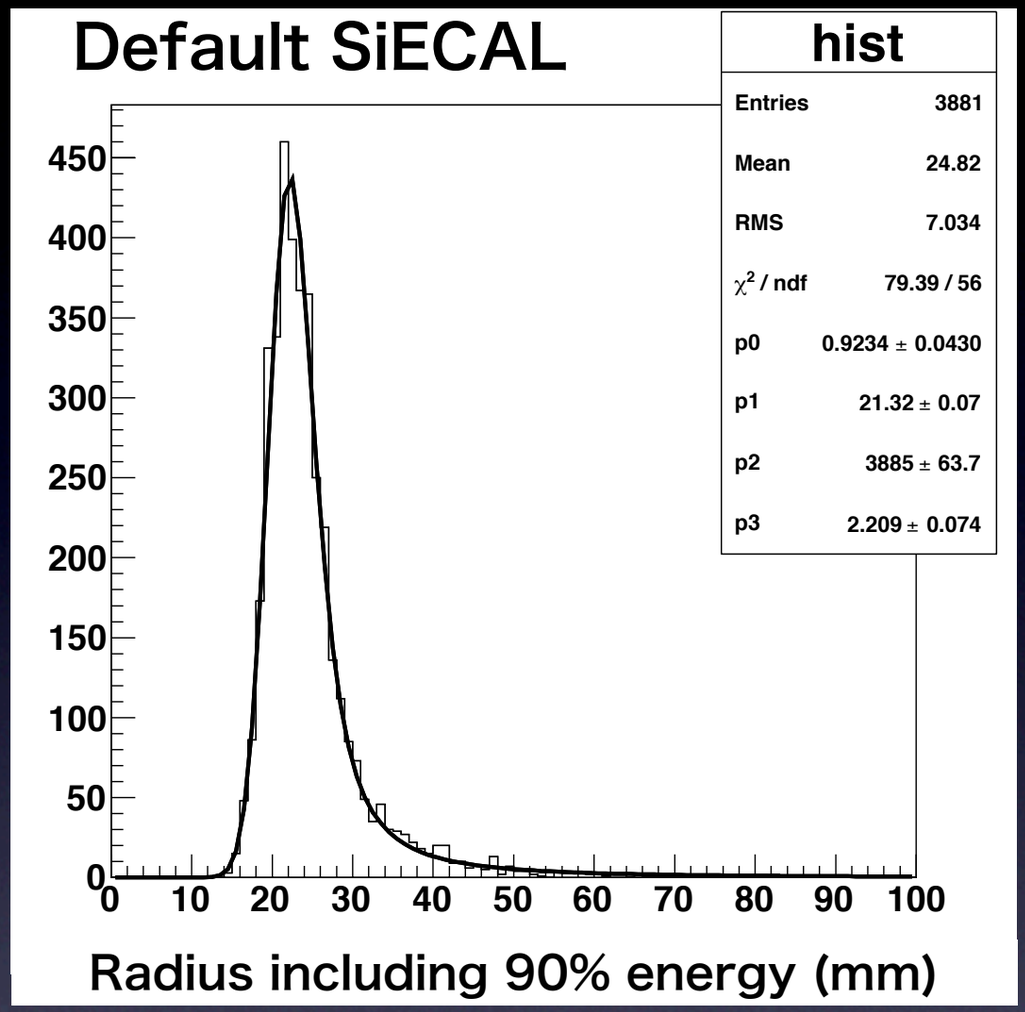
To investigate cause of difference of JER between ScECAL and SiECAL:

- Performance of ScECAL module with 20 thin absorbers (2.1 mm) and 9 thick absorbers (4.2 mm) is investigated.
- This module has similar layer structure to SiECAL.
  - Scintillator thickness is kept to 2.0 mm
  - To keep total module thickness
    - no PCB,
    - no glue gap,
    - no copper plate,
    - means this is very ideal detector.
- I call this Thin-layer-ScECAL in this talk.

Radius of 10 GeV photons in Thin-layer-ScECAL



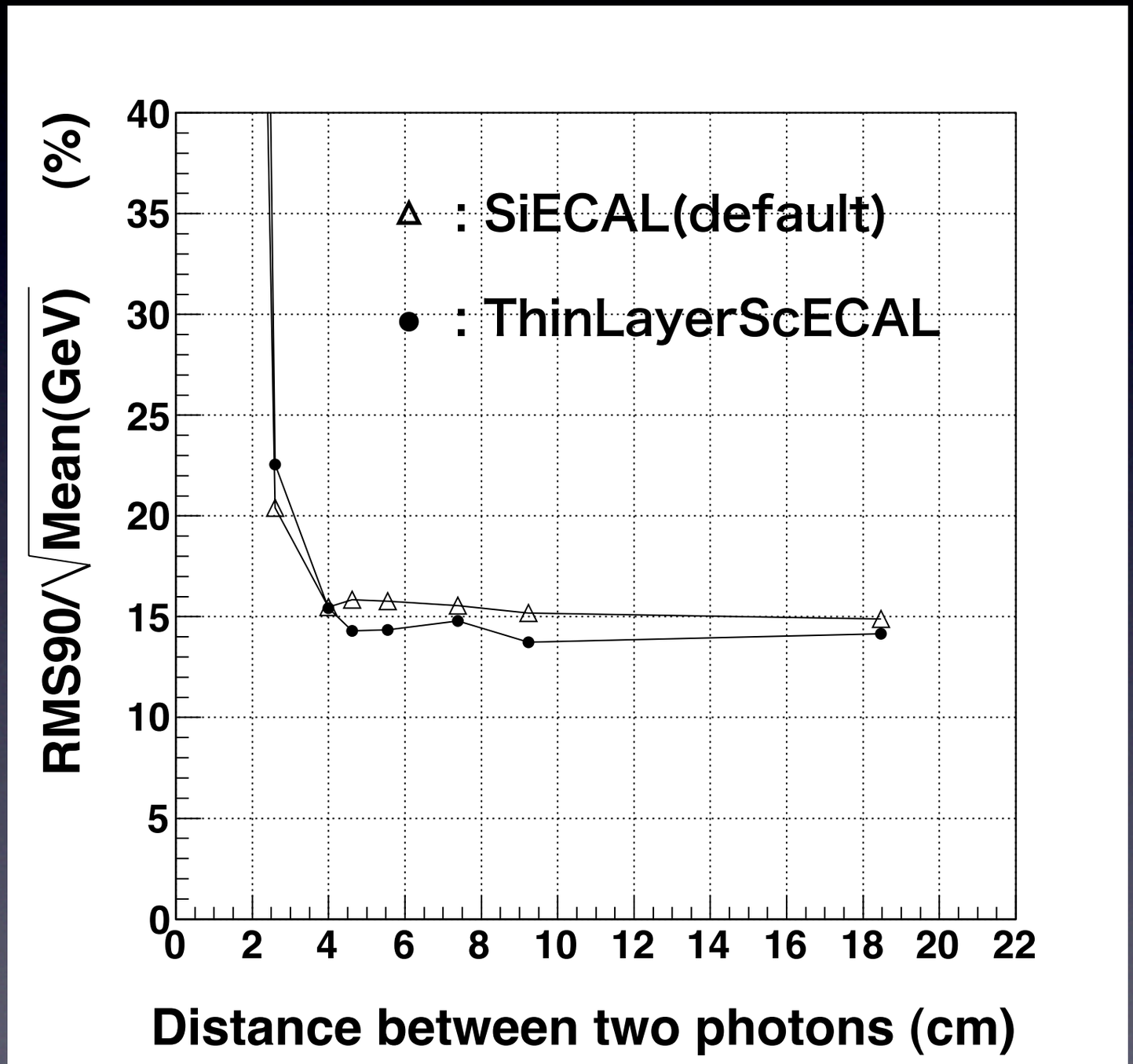
Radii of thin layer-ScECAL become similar to SiECAL



Typical distribution of radius. Shape is similar for all conditions.

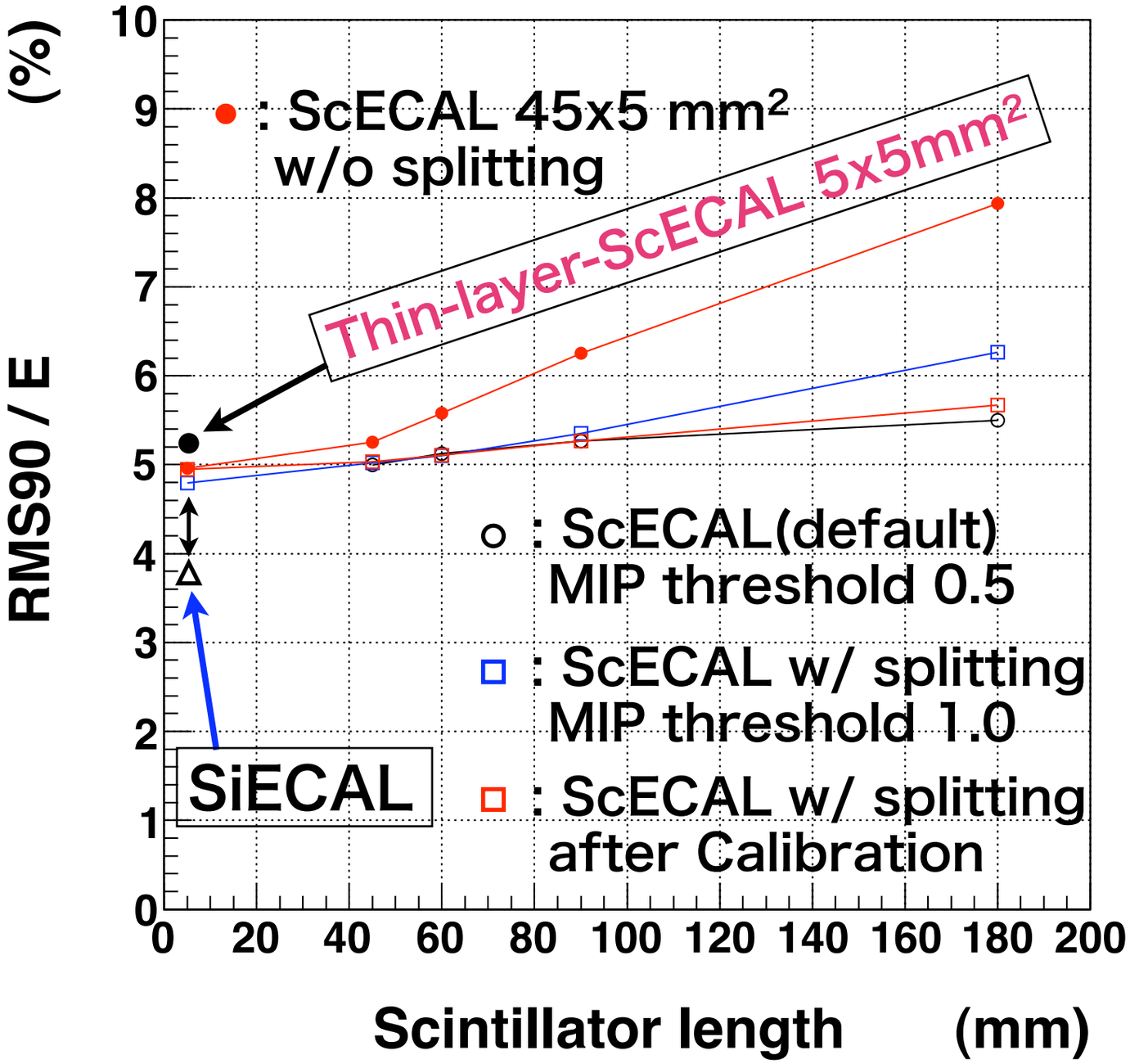
Thin-layer-ScECAL has similar cluster radii to SiECAL, whilst nominal ScECAL has a bit larger radii of cluster.

Energy resolution of a 10 GeV photon in two photon events



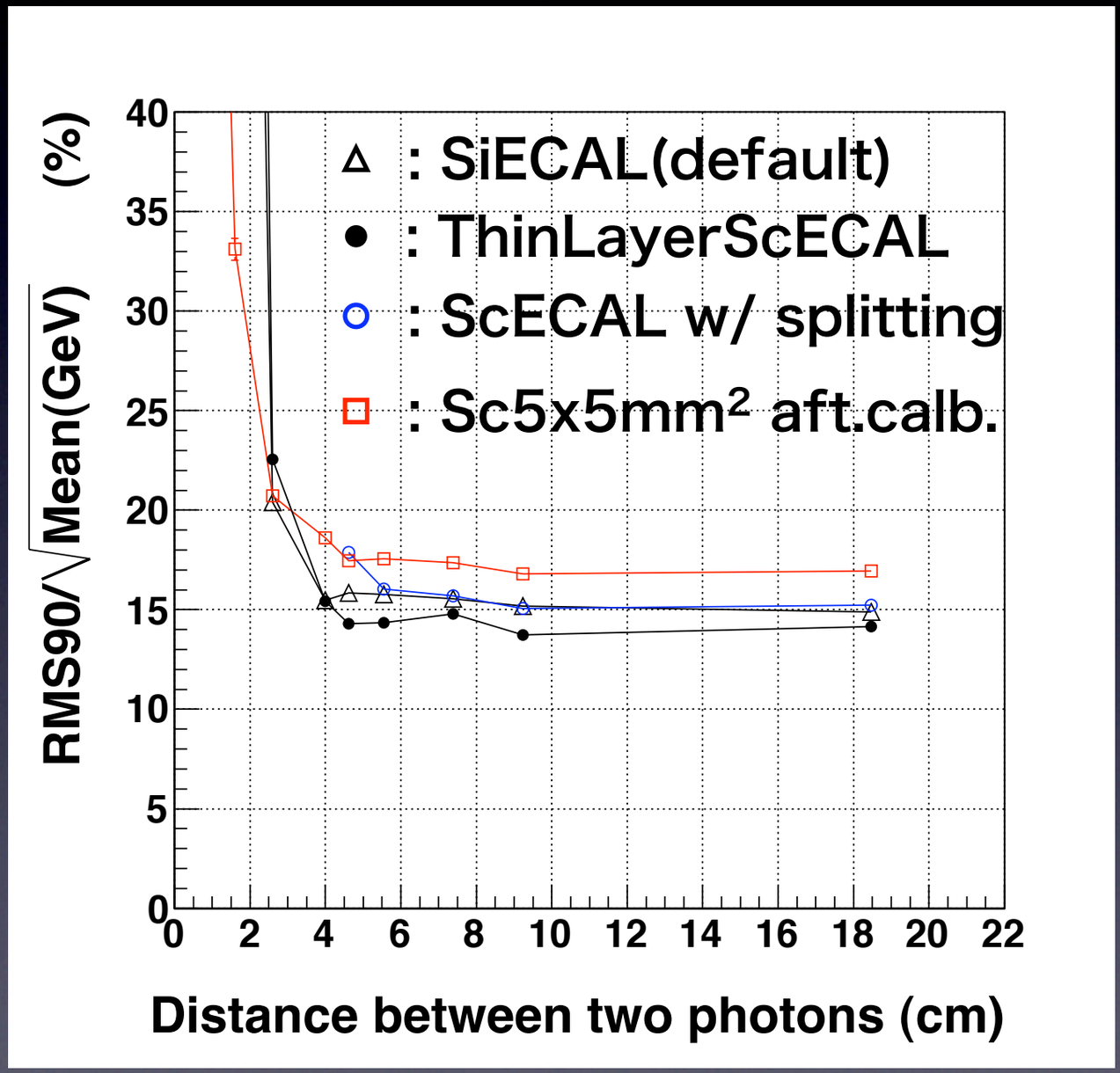
Thin-layer-ScECAL has rather better energy resolution than SiECAL has.

JER of 91 GeV uds



- Sc5x5mm²Ecal with similar thickness structure to SiECAL does not have similar JER to SiECAL has.... rather worse

Energy resolution of 10 GeV photon in various conditions



This level of difference of photon energy resolution does not make the difference of JER between SiECAL and ScECAL like in our problem...

Summary

- Performance of ScECAL with 20 thin absorbers (2.1 mm) and 9 thick absorbers (4.2 mm), which has similar layer structure to SiECAL is investigated.
- Cluster radius in ScECAL becomes similar to SiECAL.
- Photon energy resolution in ScECAL also becomes similar or rather better than SiECAL
- Difference of JER between SiECAL and ScECAL is not solved.
- SiECAL events were generated using ILD_00 (default) so far, whilst ScECAL evens were generated using ILD_00_EcalSc02. Since ILD_00_EcalSc02 is for hybrid, we can generate both pure ScECAL and pure SiECAL with this model. I will compare between SiECAL events and ScECAL events generated with ILD_00_EcalSc02.