Status of Strip Clustering

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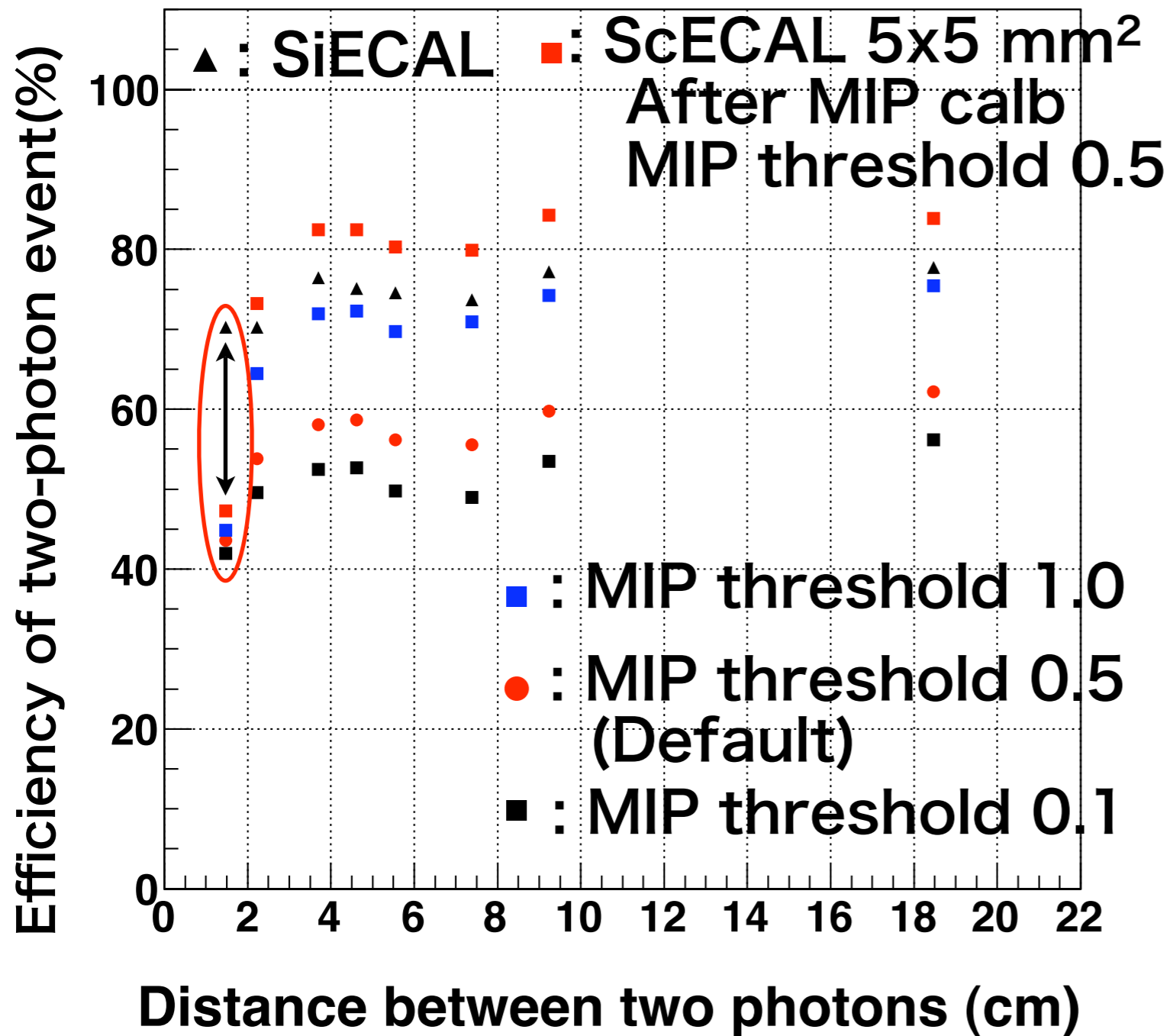Physics software meeting of ILDAsia

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This talk

- In previous meeting I showed two-cluster event efficiency depending on photon-photon distance > 4 cm, only for SiECAL I showed it for ph-ph distance > 1.5 cm.

- I found that data has problem (mismatching gear file), and I then made plots again but in more detail.

- This time I made plots with some MIP threshold value.

- I achieved Pandora calibration according to "readme" in the directory of "pandoracalibrator" (I should do this before investigation about MIP threshold, but I did not do so. Therefore, absolute values of MIP threshold do not have mean but relative correlation is available).

Efficiency of two-cluster events dep.on photon-photon distance changing MIP threshold

▲ : SiECAL   ■ : ScECAL 5x5 mm^2 After MIP calb MIP threshold 0.5

■ : MIP threshold 1.0

● : MIP threshold 0.5 (Default)

■ : MIP threshold 0.1

Efficiency of two-photon event(%)

Distance between two photons (cm)

- Three MIP threshold 1.0, 0.5 and 0.1 were tested.
- MIP threshold changes the values of efficiency of two cluster events, but not shape of dependence on ph-ph distance.
- After Calibration (Energy to ADC, MIP constant) ScECAL has larger efficiency than SiECAL
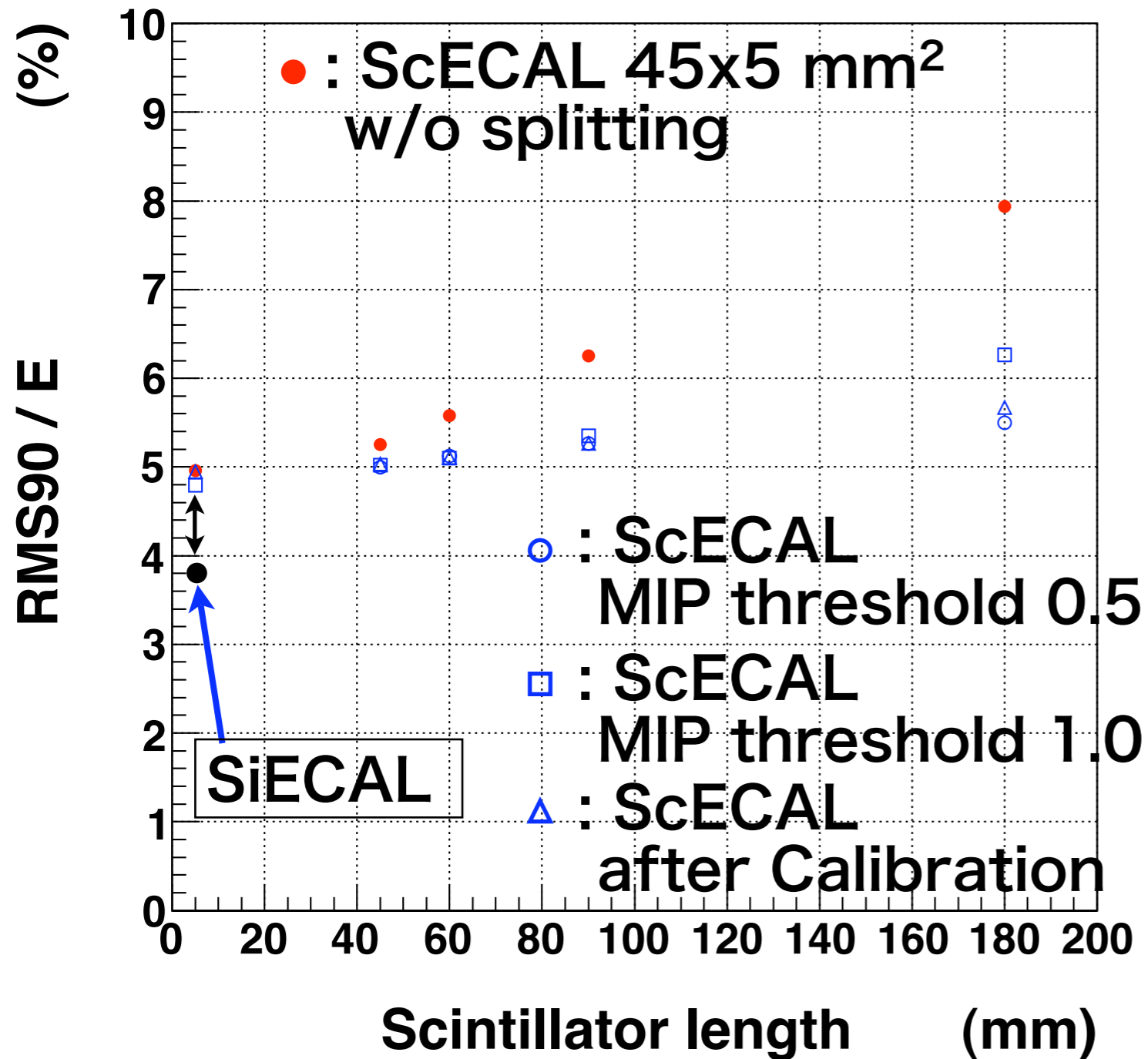-For 1.5 cm of ph-ph distance Sc all conditions make clearly lower efficiency than SiECAL

Efficiency of events/clusters ≧ 2
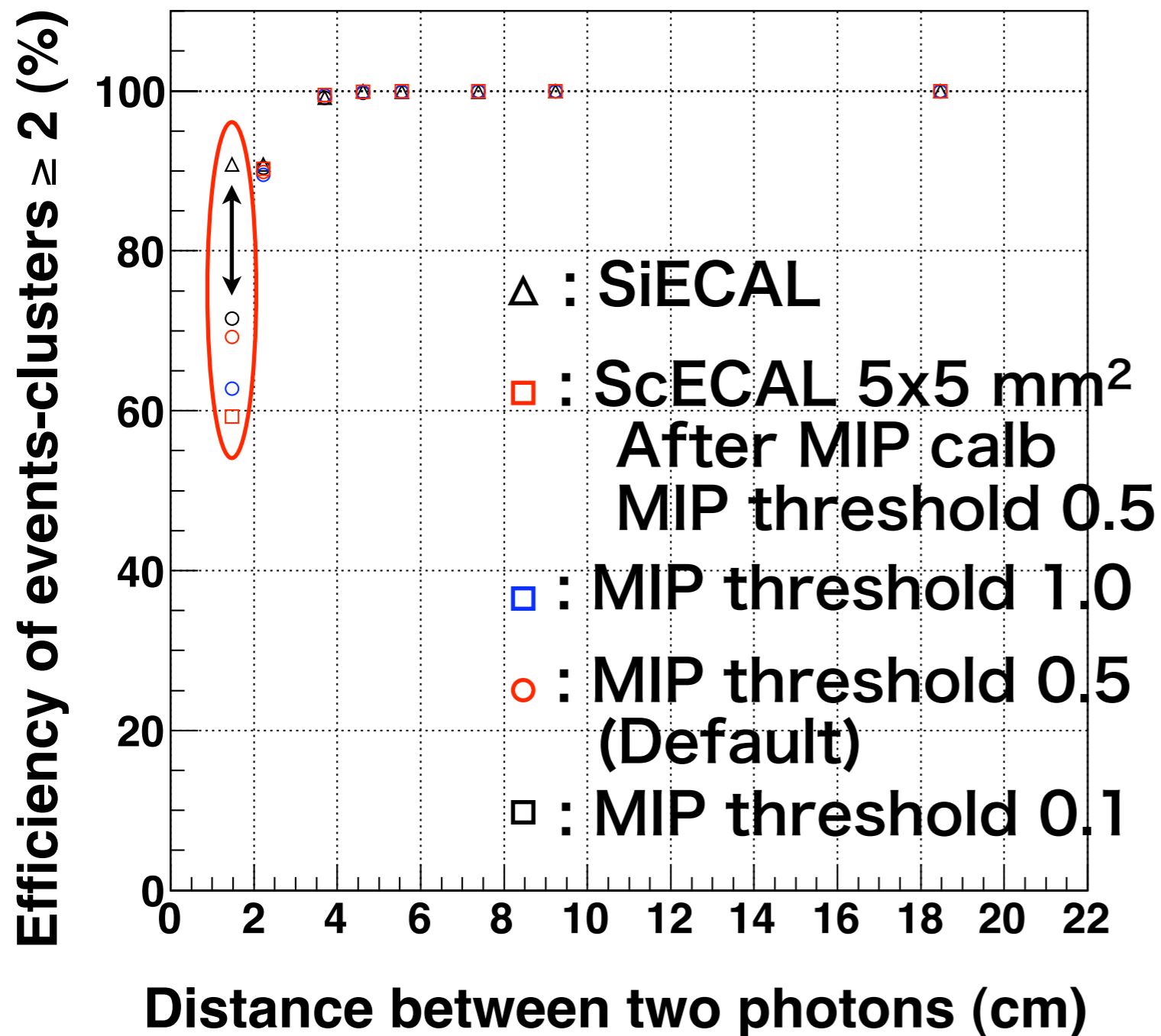
-with ph-ph distance > 2 cm closer, one cluster event ratio (100% - #events ≧ 2 cluster) is common for all conditions.
-For 1.5 cm distance, one cluster events are smaller,10%, in only SiECAL.

JER of 91 GeV uds

-Whilst tuning of MIP threshold improves cluster separation as in previous slides, JER of Sc5x5cm²ECAL is not improved with both tuning of MIP threshold and calibration for ScECAL.
- Remaining difference between Si and Sc ECAL is separation efficiency at 1.5 cm of ph-ph distance. Can this make such large JER difference between SiECAL and ScECAL?

Summary

- With tune of MIP threshold and ScECAL calibration (energy to ADC like value and MIP calibration constant), cluster separation ability can be let it similar to SiECAL for ph-ph distance > 2 cm

- With ph-ph distance 1.5 cm, cluster separation ability of ScECAL degrades than SiECAL with any MIP threshold.

- remaining difference of separation ability for 1.5 cm distance, but with similar or more separation ability for distance > 2 cm, SiECAL still have 1% better JER than Sc5x5mm^{2}ECAL ▶ I prepared to sent letter to ask Mark.