

scintillator ECAL

current activities

2009

2010

2011

2012

PFA : strip clustering algorithms dev. & improv.

layer elex. dev.

layer elex, implem.

5mm scinti. dev.

test of 5mm scinti.

MPPC dev. increase # of pixels

EBU & related activities for sceecal



T.Takeshita (Shinshu)

EBU: ECAL Base board Unit

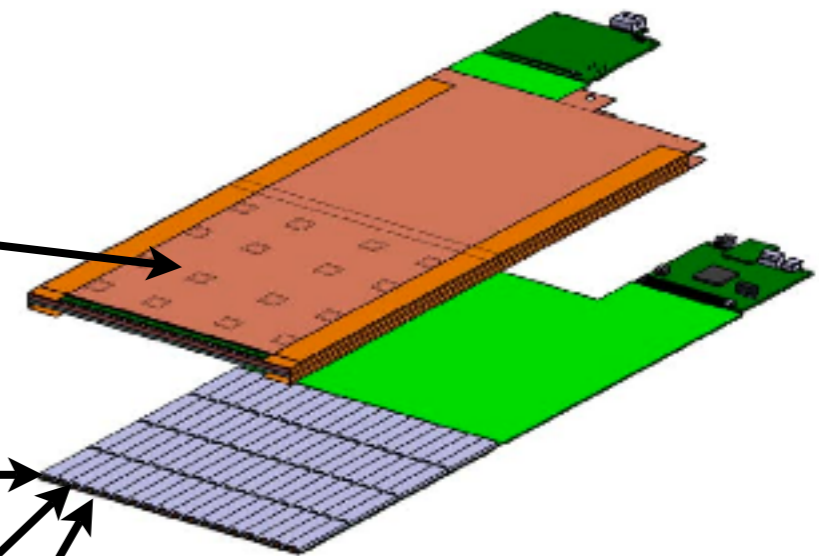


EBU and its design
thickness

scintillator : 5mm wide

how to mount the photosensor

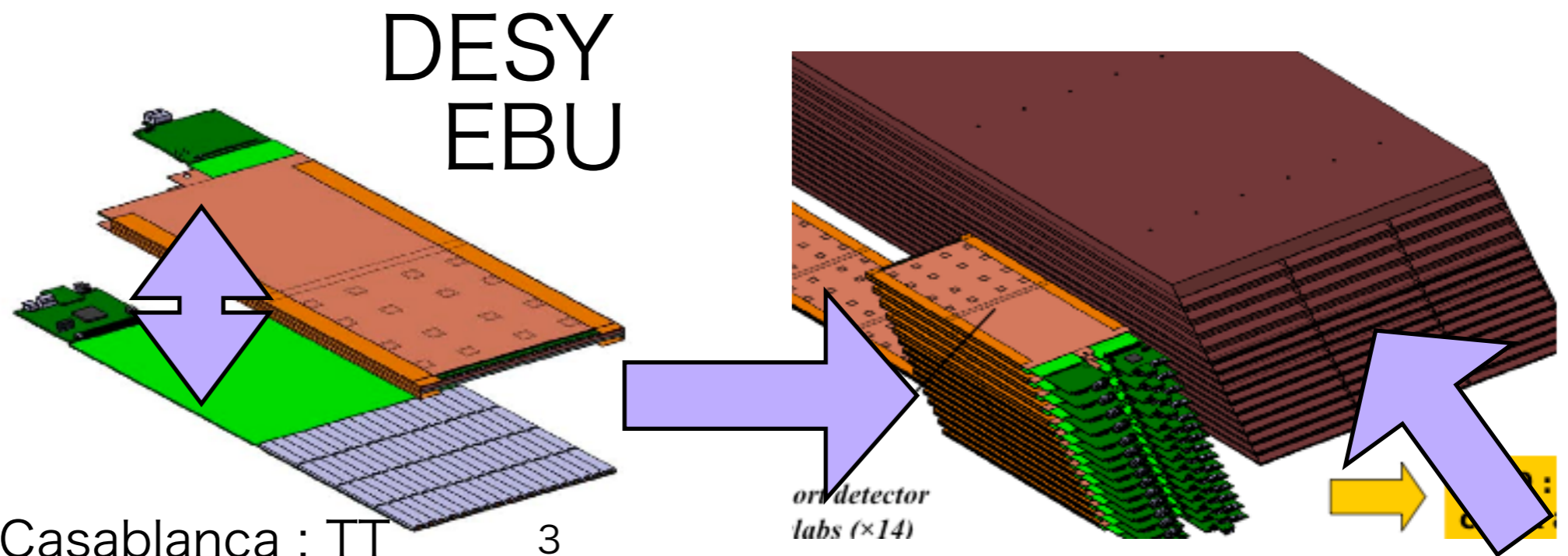
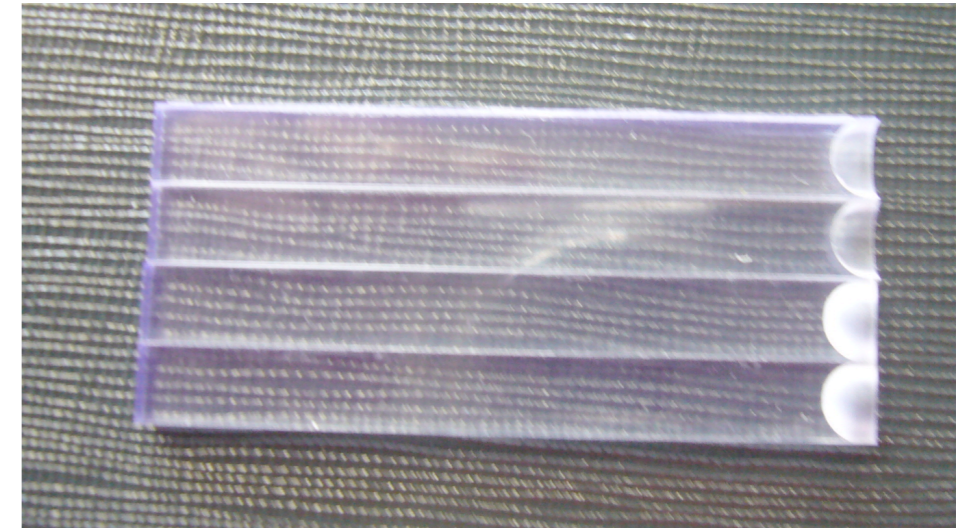
new sensor : **MPPC 2500** pixels



combined module

- G • electronics : DESY
- J • scintillator layer : Shinshu
- K • 5mm wide 2mm thick
- 3mm thick by KNU
- F • combine : France LLR+LAL

5x45x2 mm³ w dimple



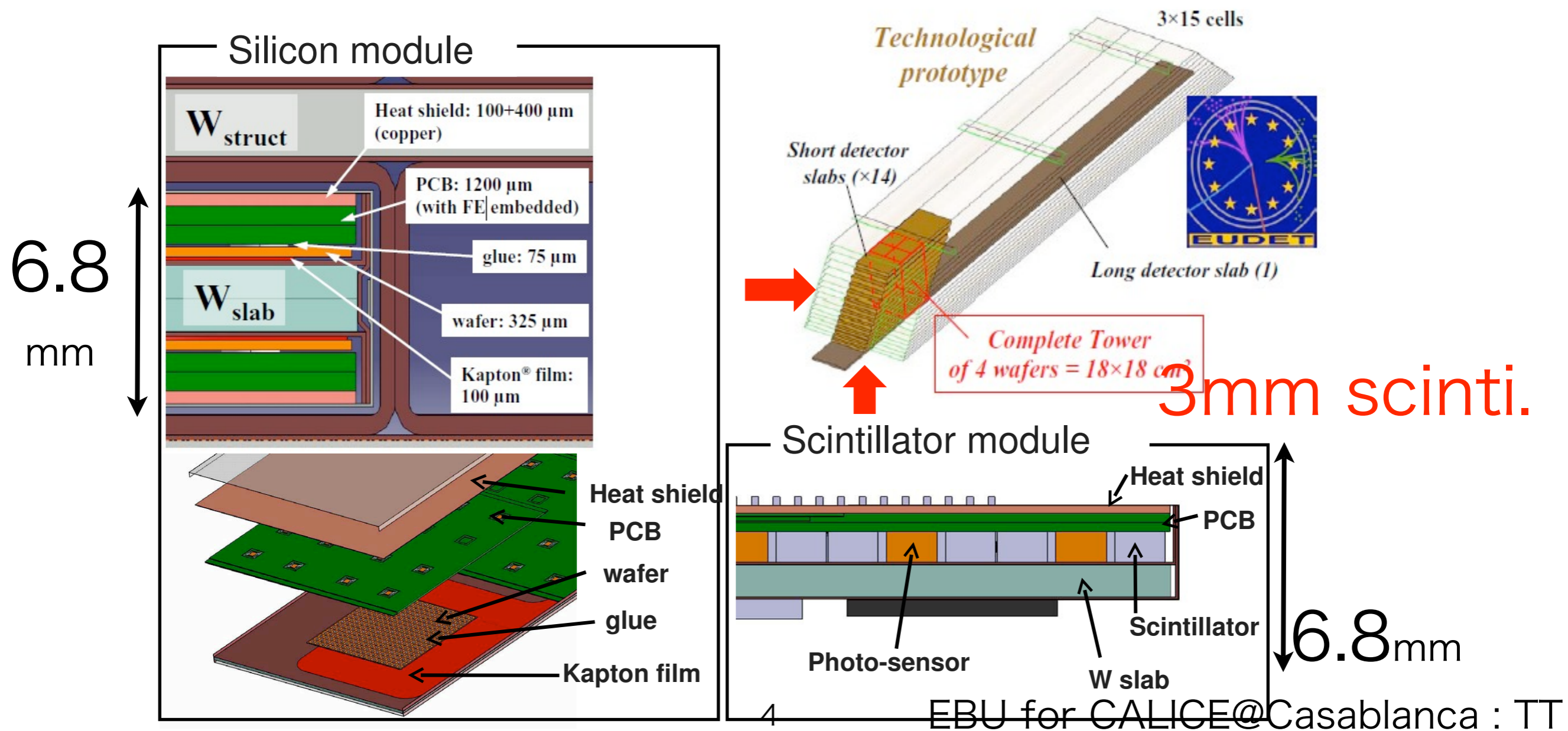
EBU for CALICE@Casablanca : TT

3

combined module cont.

- EUDET project : module exists
- design fixed

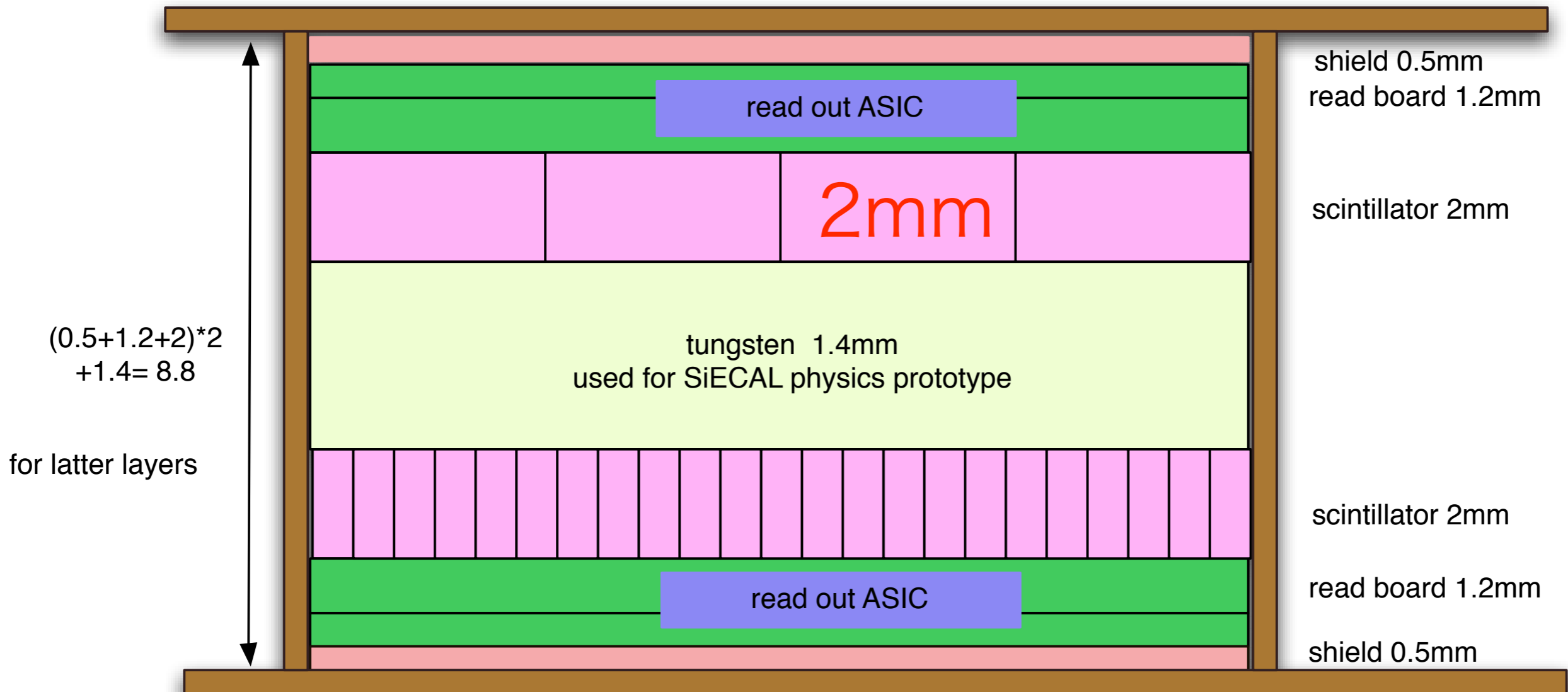
The EUDET prototype



yet another design

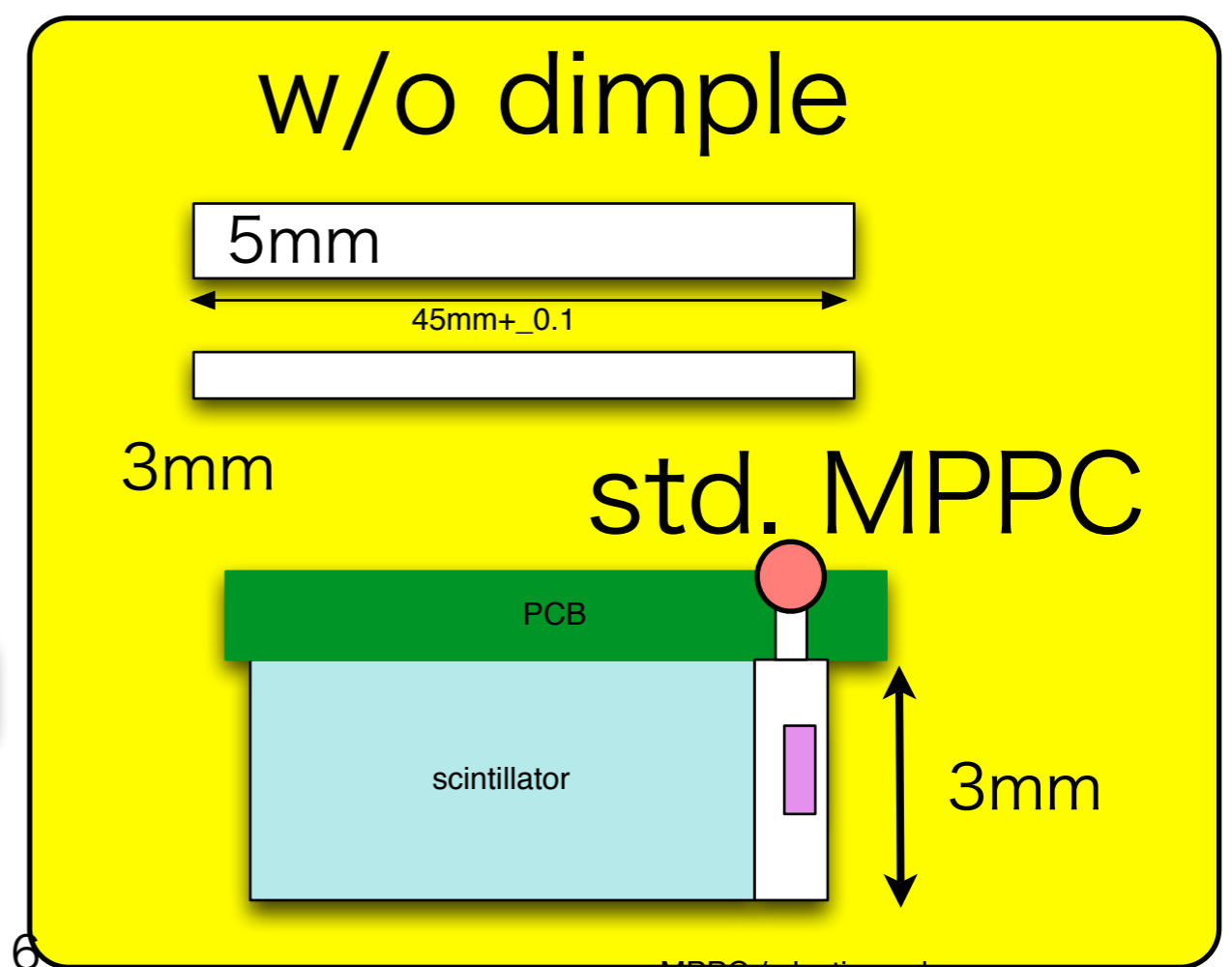
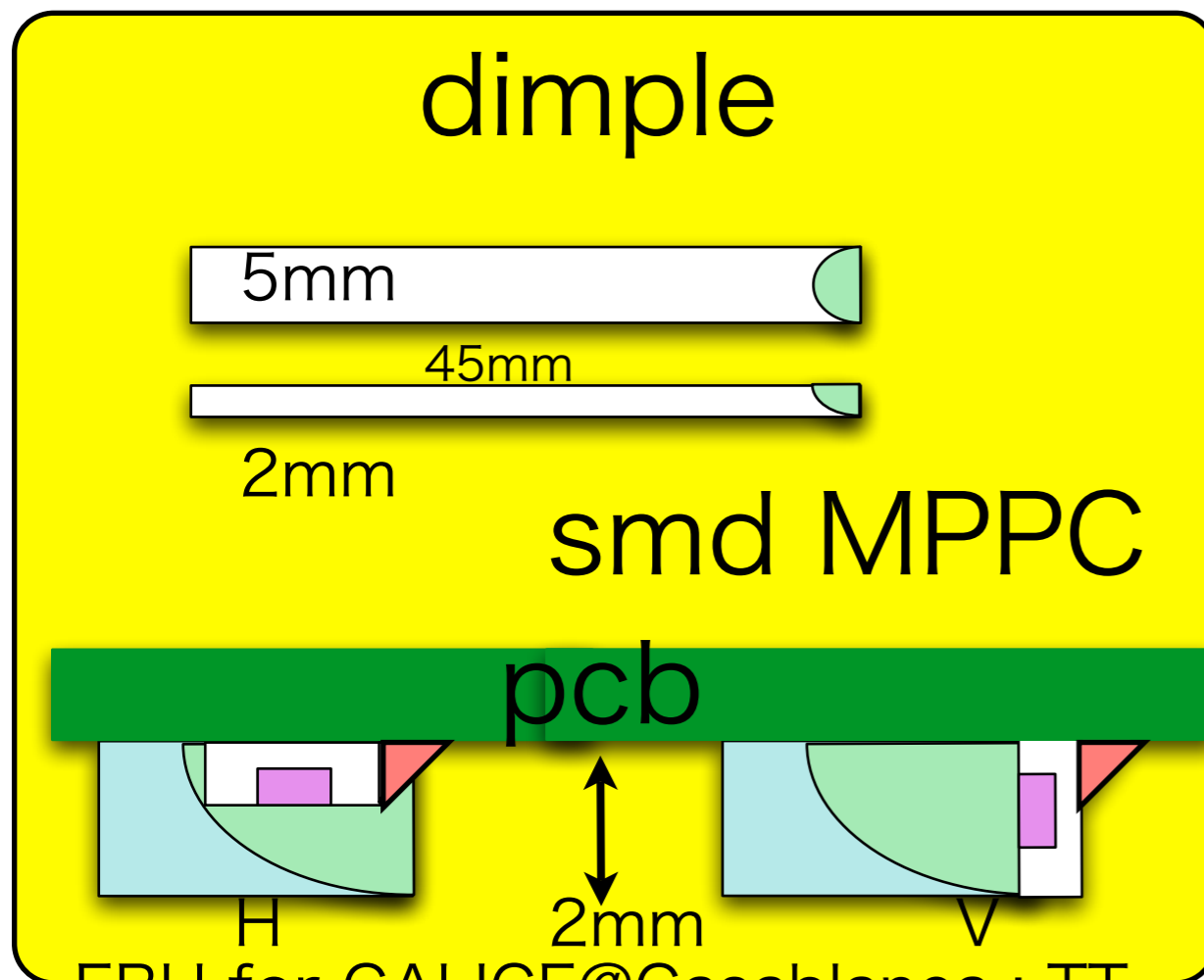
- if the read out board =EBU is 1.2 mm thick
- && W thickness < 1.5mm
for eudet upper layer

thickness of 8.9mm



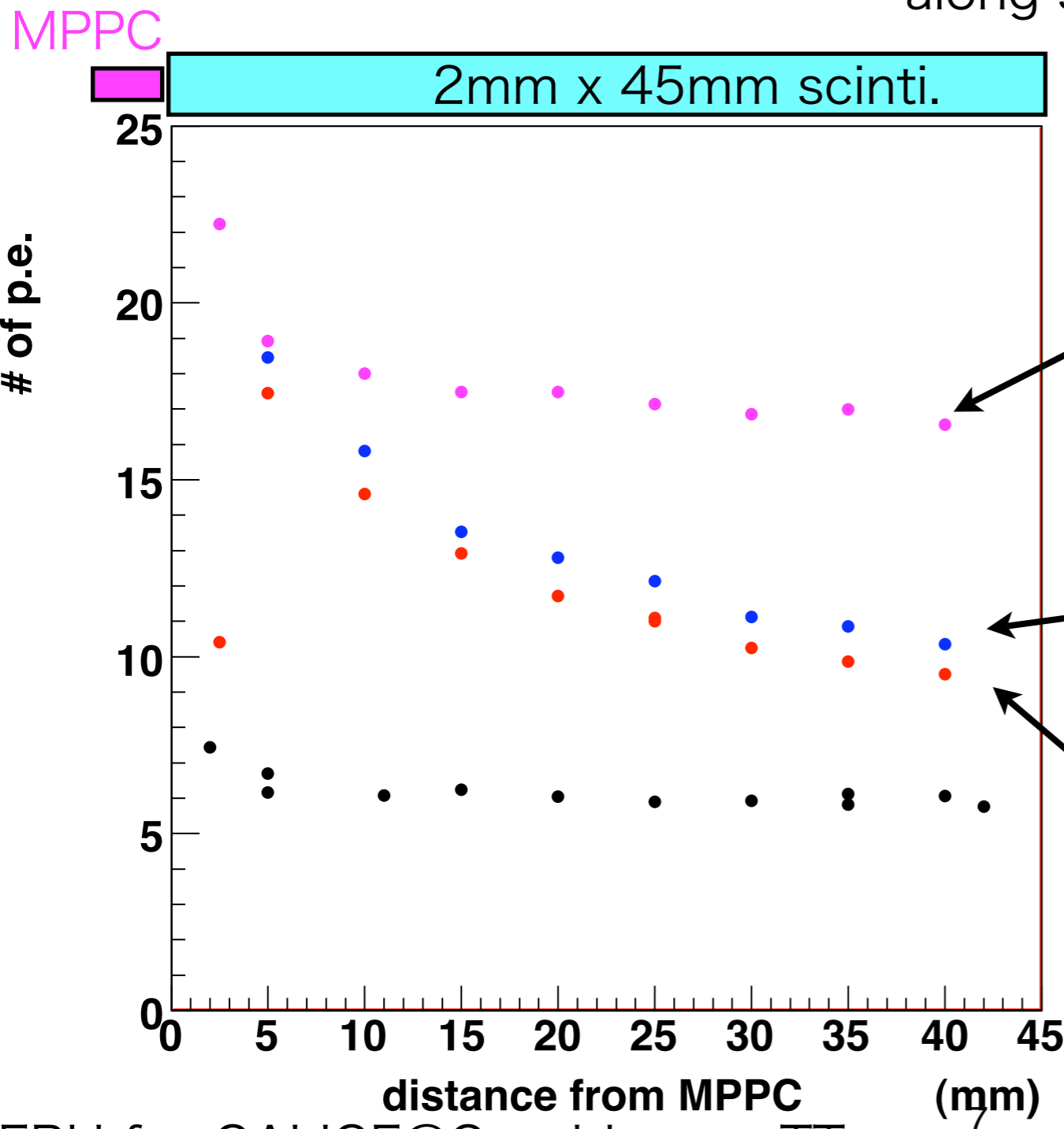
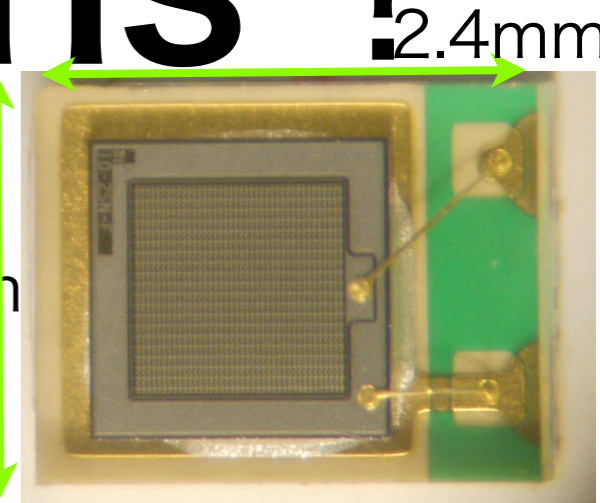
how to mount sensor

- EUDET module exists, this gap height is already determined
- two designs > 3 ideas for the sensor

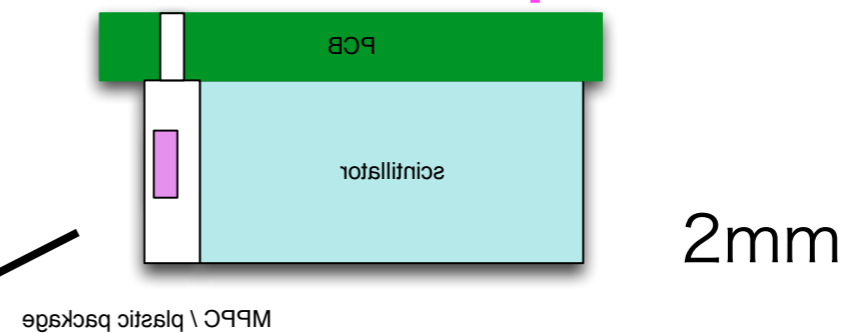


how many photons ?

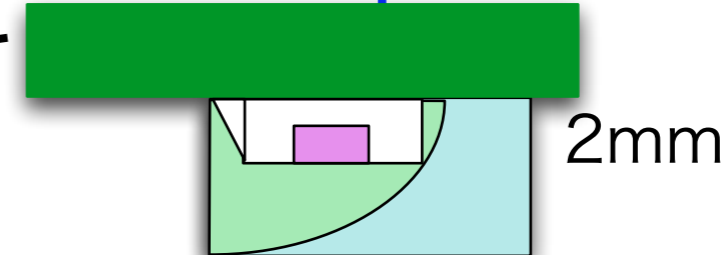
- 5mm wide x 2mm thick strip
- dimples make non-uniformity along strip



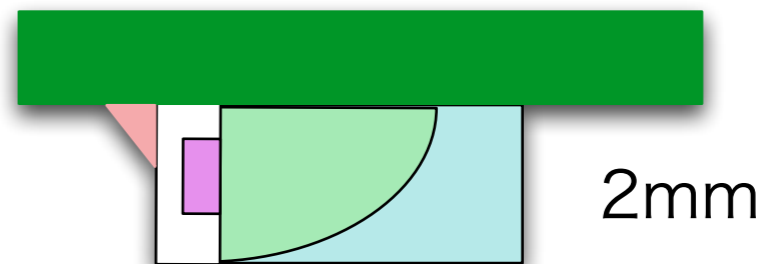
w/o dimple + smd V



w dimple + smd H

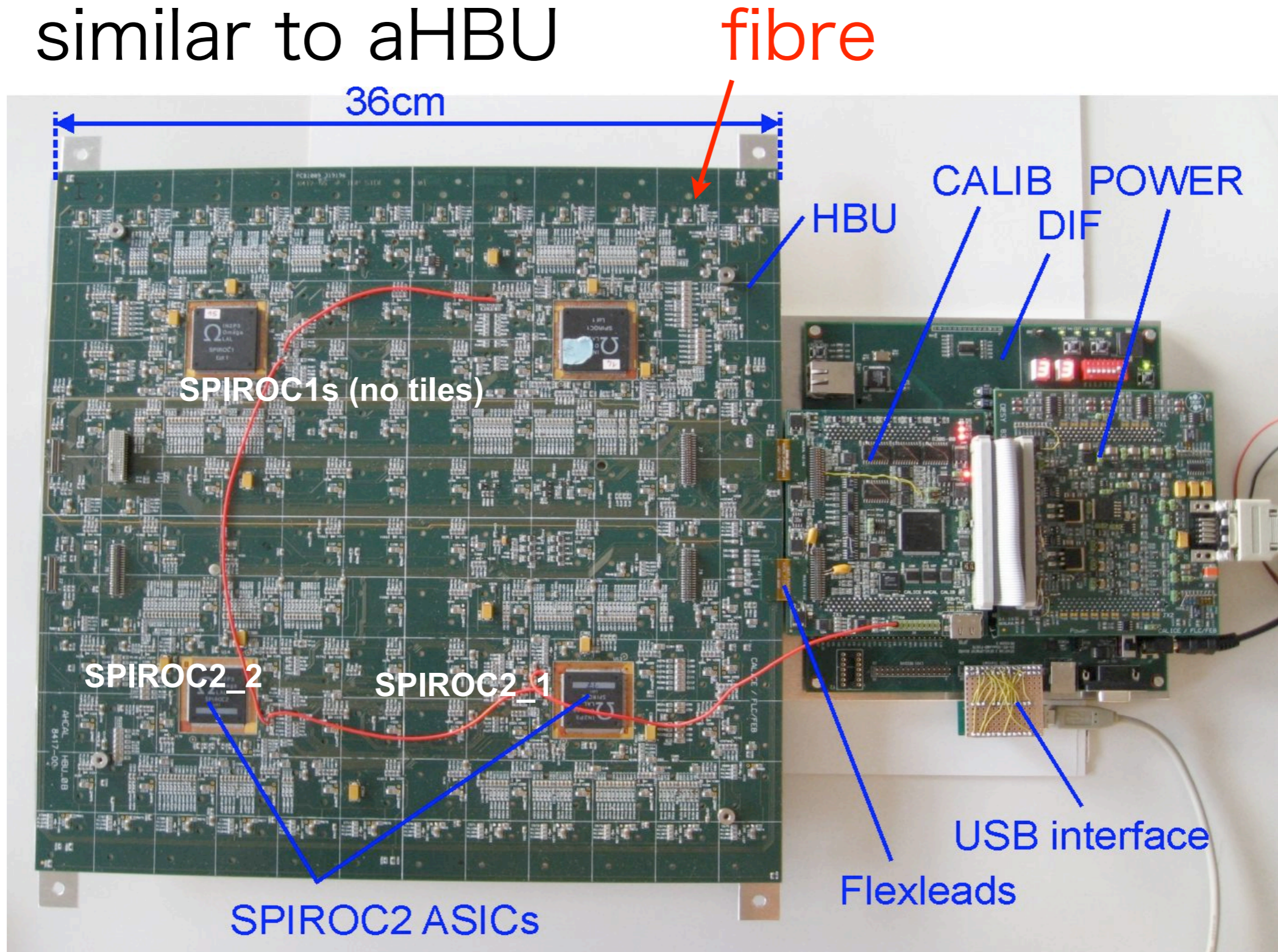


w dimple + smd V



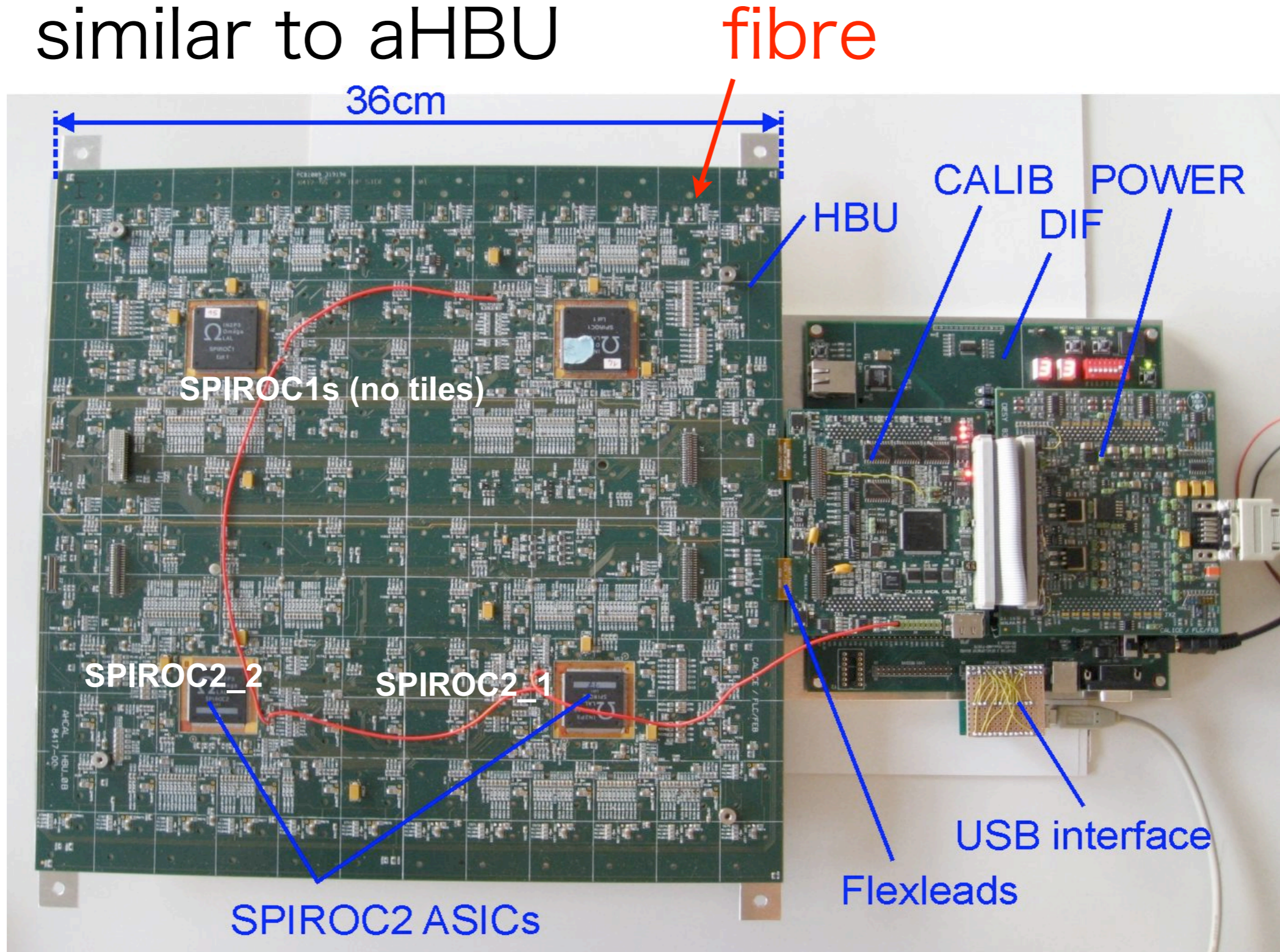
HBU view

- similar to aHBU



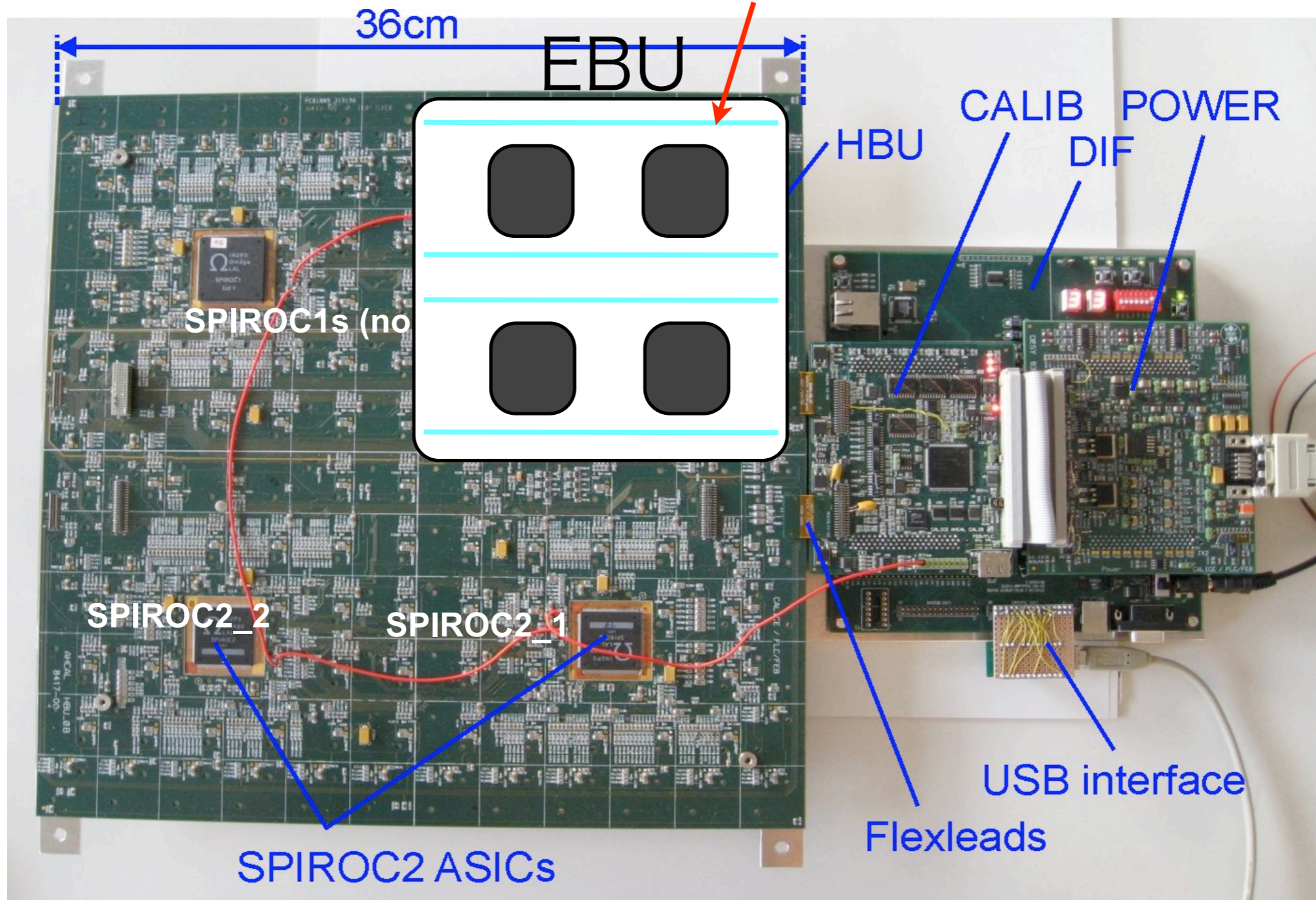
EBU view

- similar to aHBU



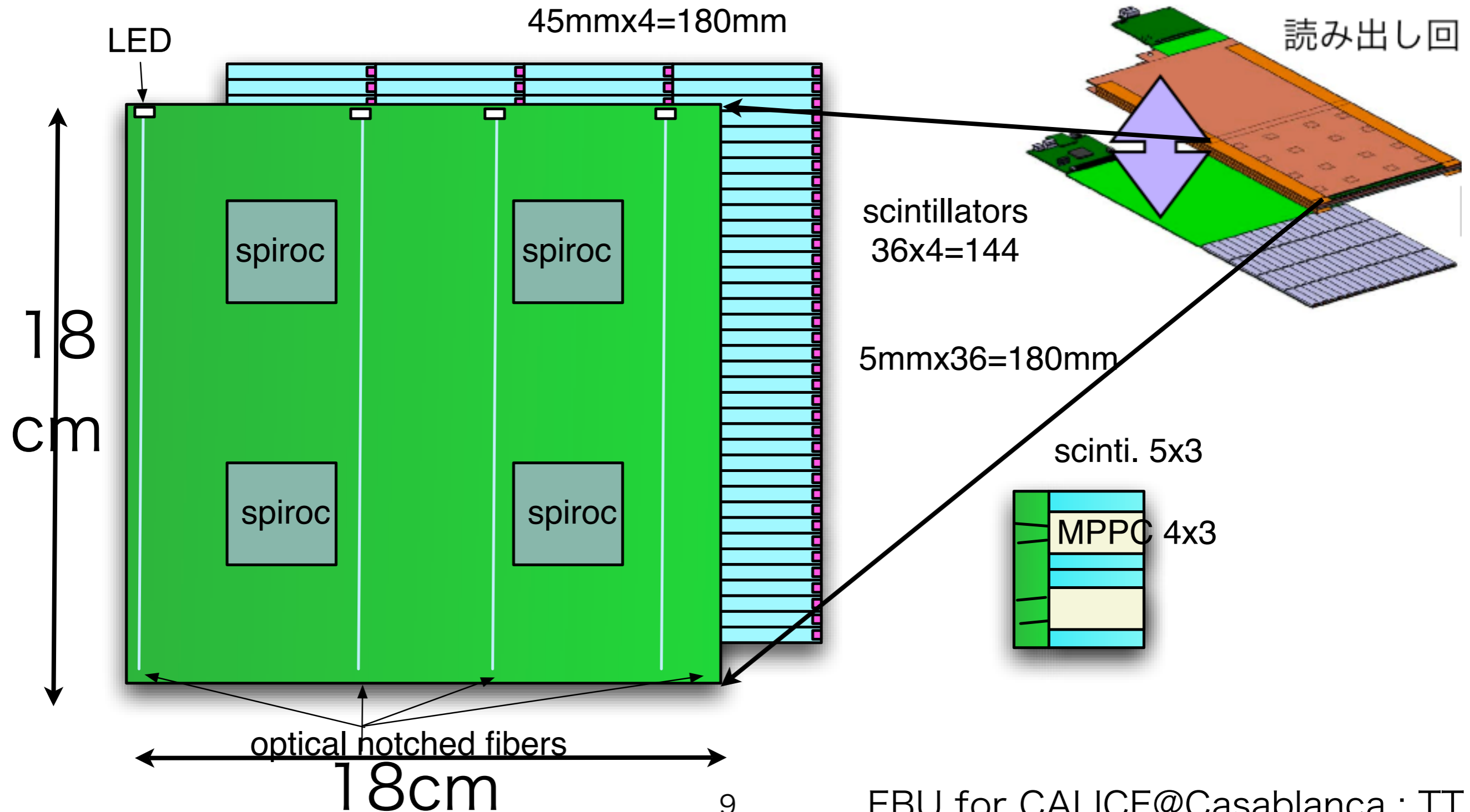
EBU view

- similar to aHBU



EBU design

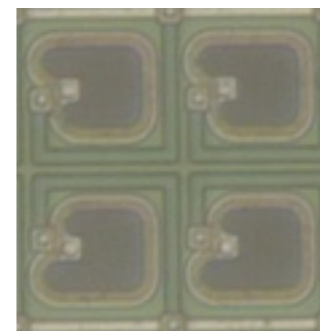
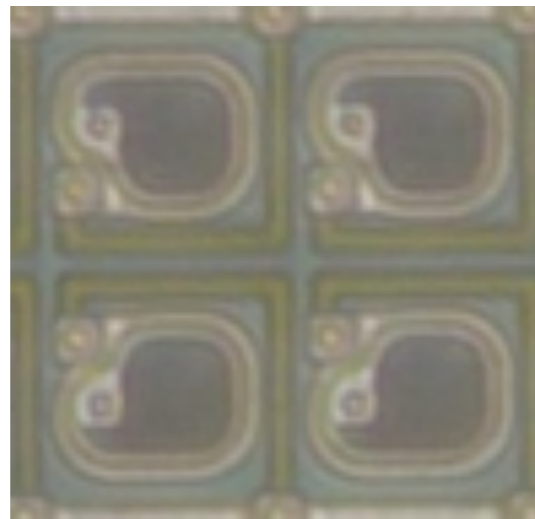
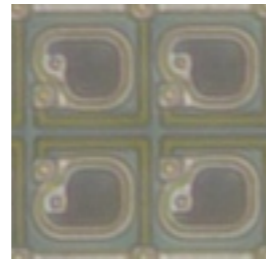
- under discussion with DESY engineer



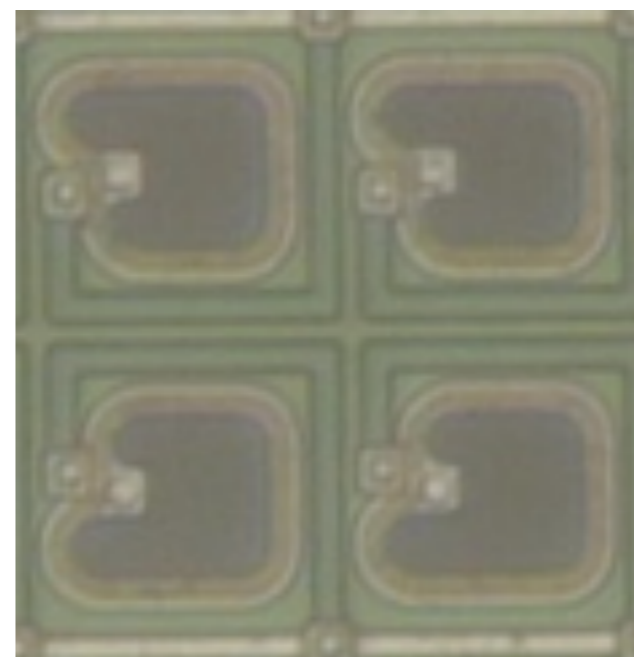
new MPPPC 2500pix

- 20 μm pitch pixel > 2500 pixel in 1x1 mm²
2500 vs 1600pix with same magnification

20 μm



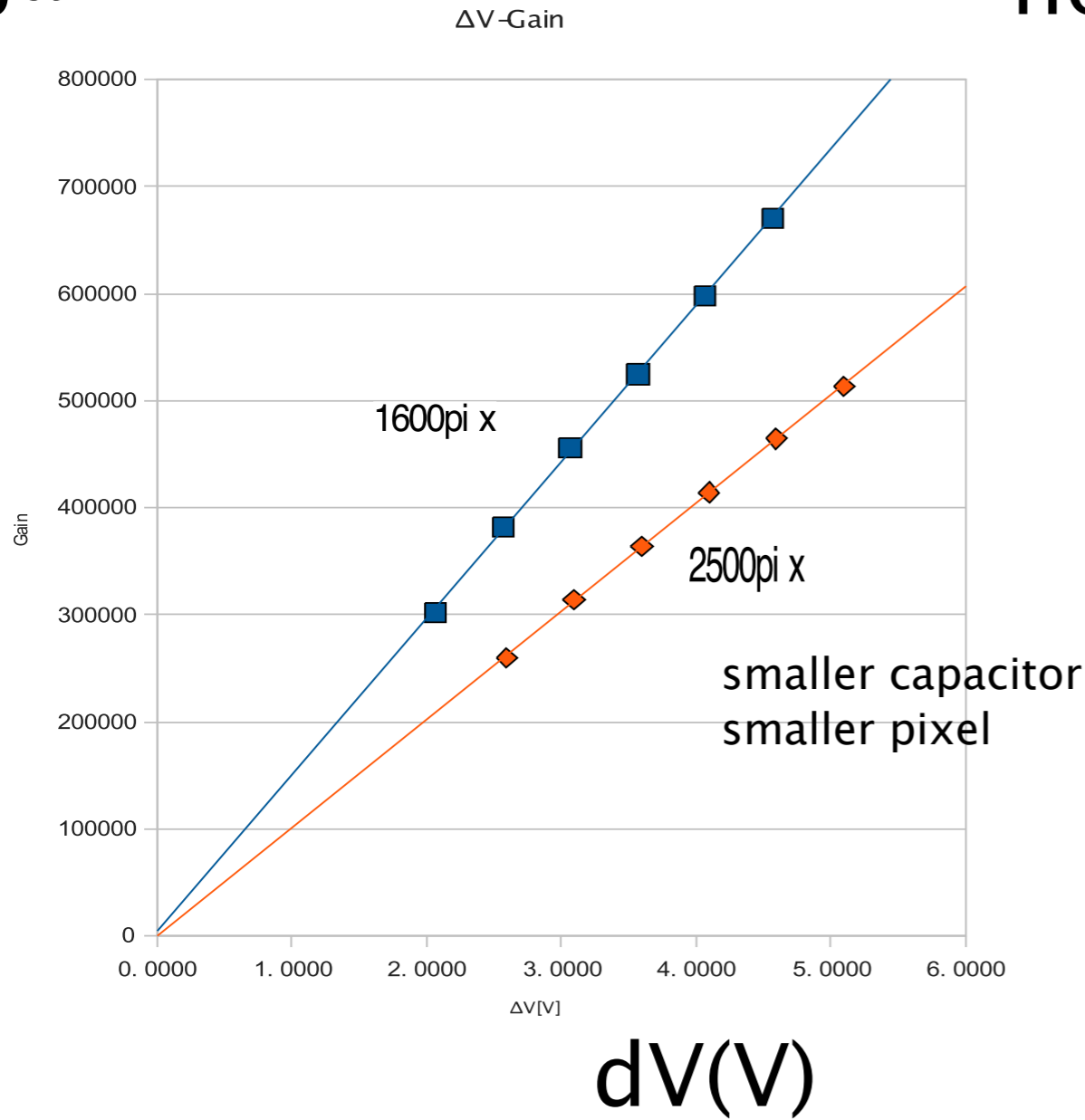
25 μm



performance ?

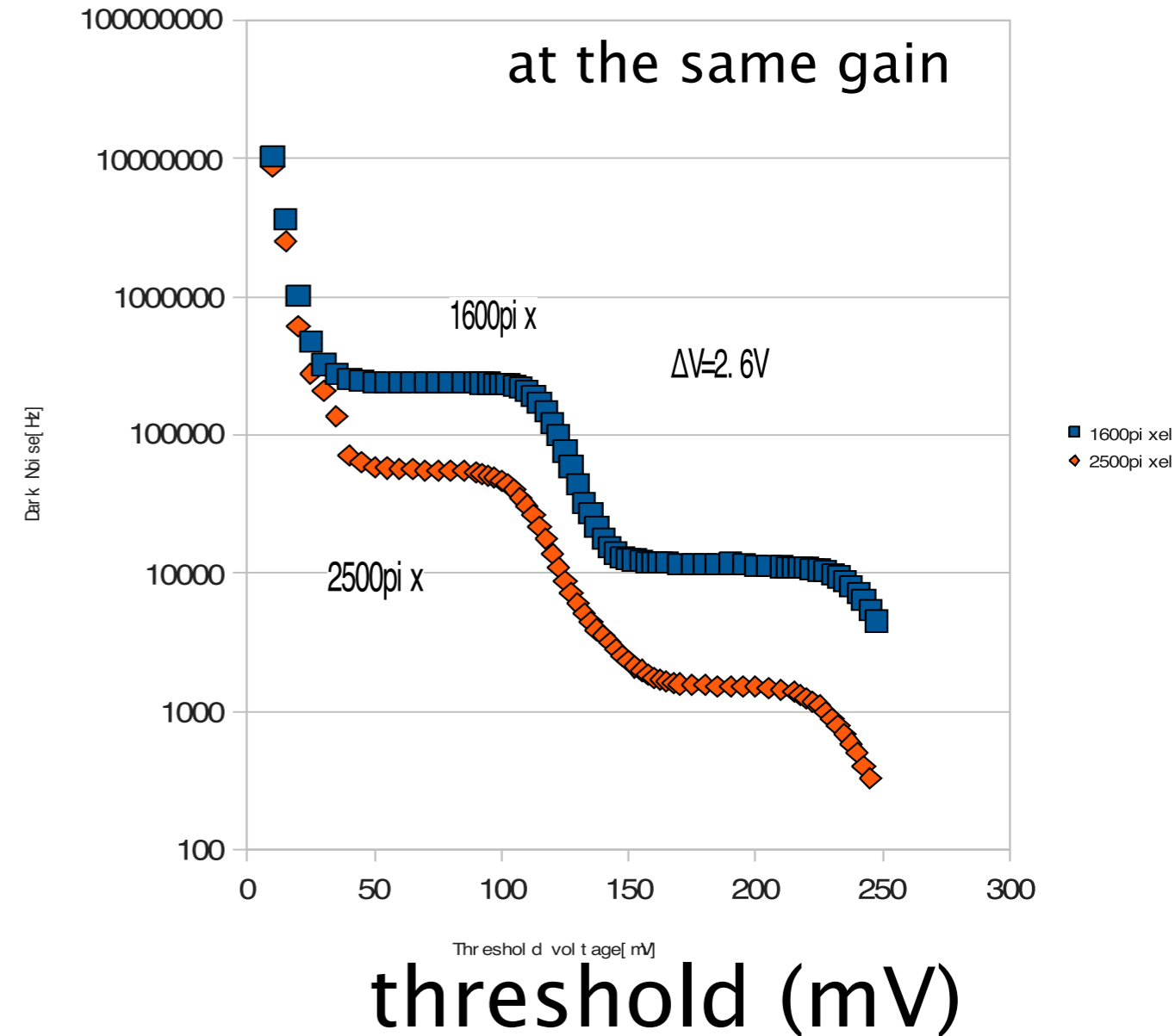
- new 2500 pix MPPC compared with 1600

gain



capacitance OK

noise rate (Hz)



less noisy !

scintillator ECAL

activities

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PFA : strip clustering algorithms dev. & improv.

Kiyotomo Kawagoe

layer elex. dev.

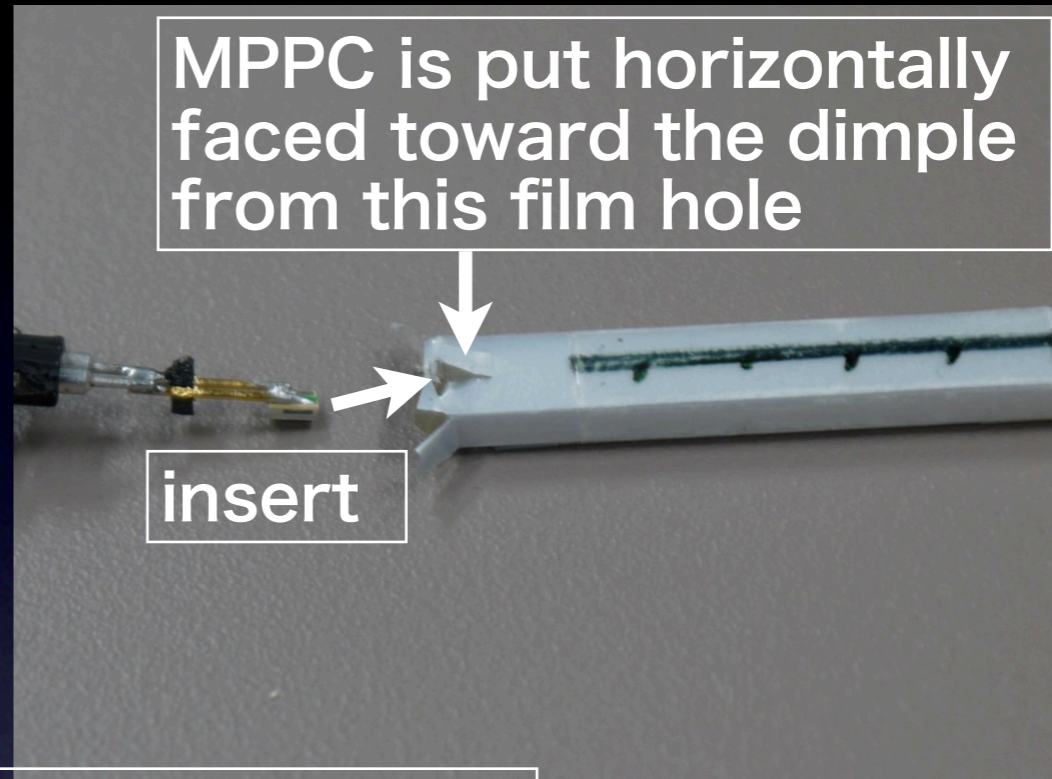
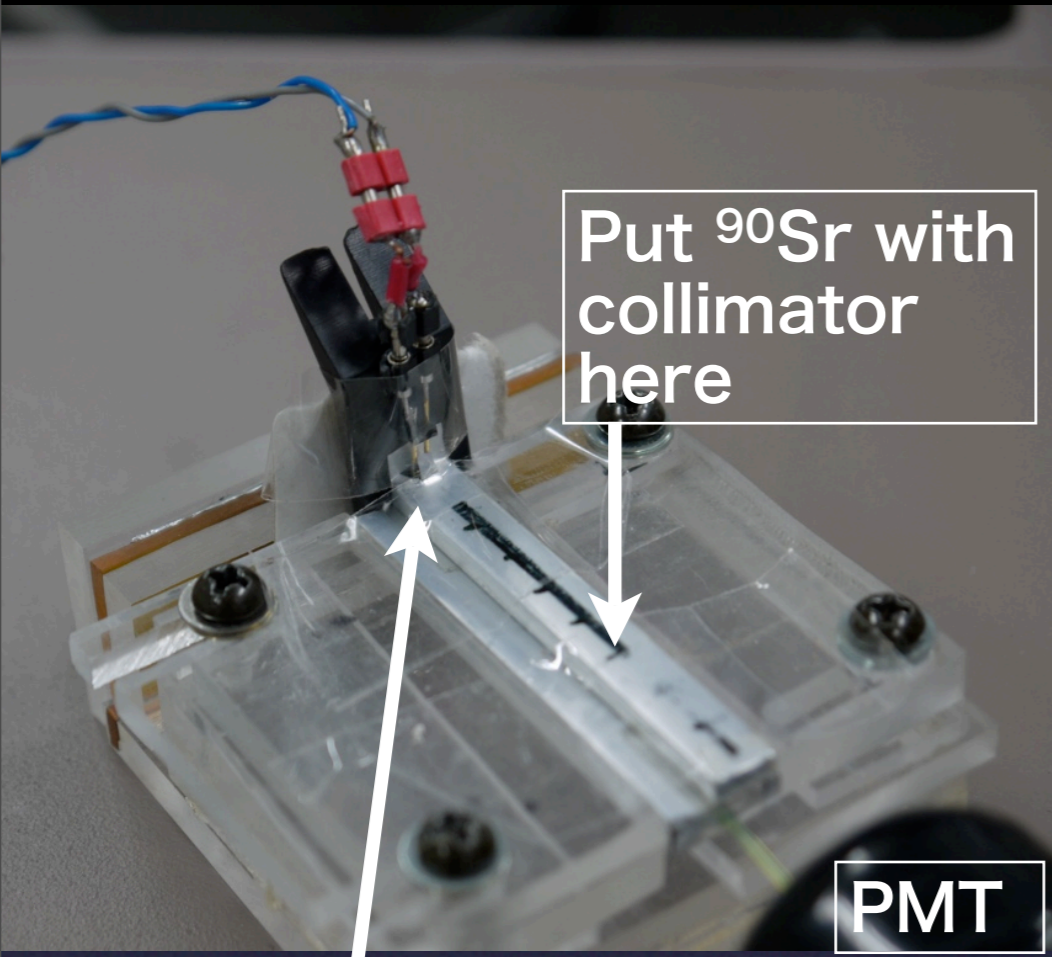
layer elex, implem.

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test of 5mm scinti.

MPPC dev. increase # of pixels

Three type of photon collection method



2. Horizontal put

MPPC is put vertically faced toward the dimple

1. Vertical put

3. Pin hole

with 45 mm x 5 mm x 2 mm Scintillator

