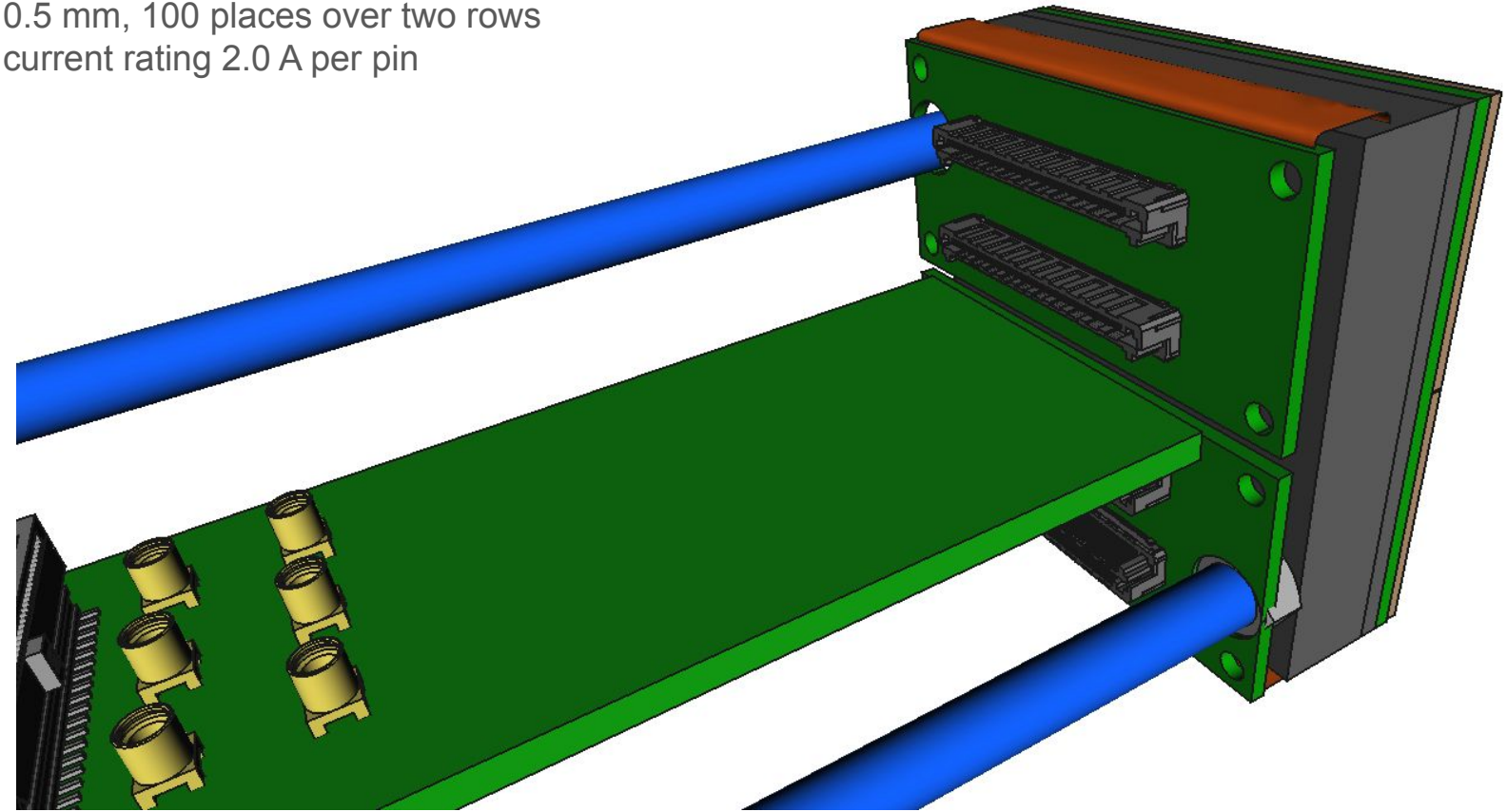
PDU integration

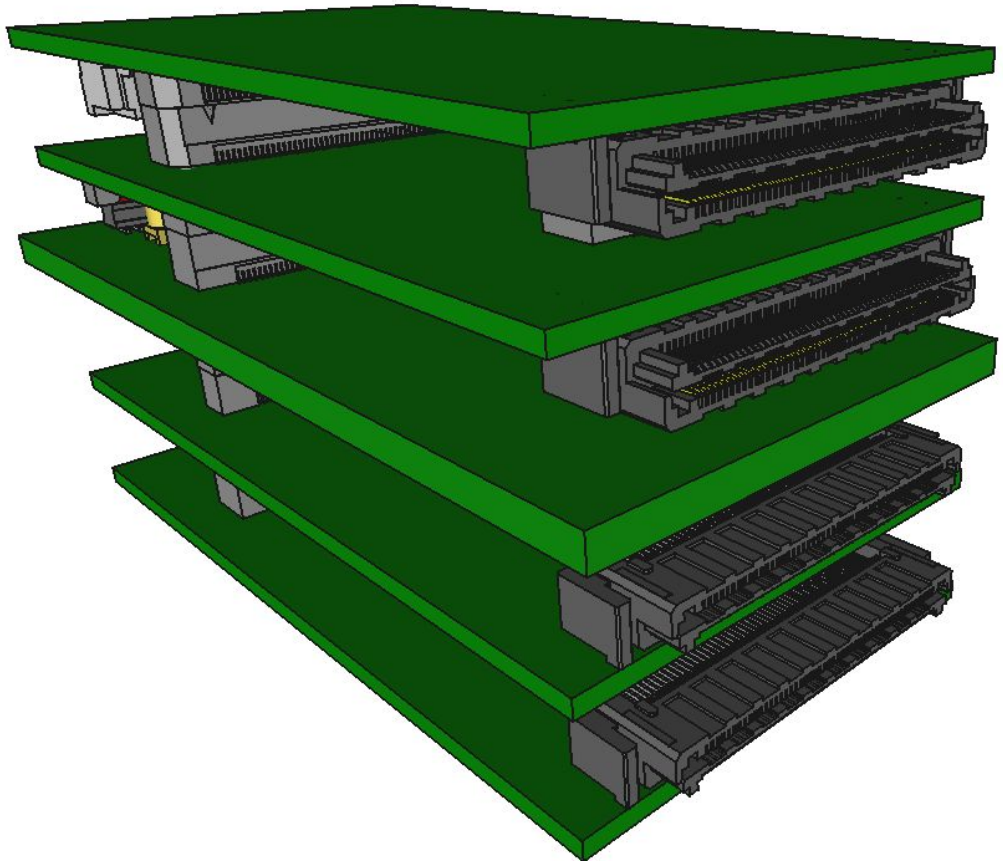
new proposal for FEB-Carrier connector

LSHM-150-03.0-L-DV-A-N-K-TR (Carrier side)
0.5 mm, 100 places over two rows
current rating 2.0 A per pin

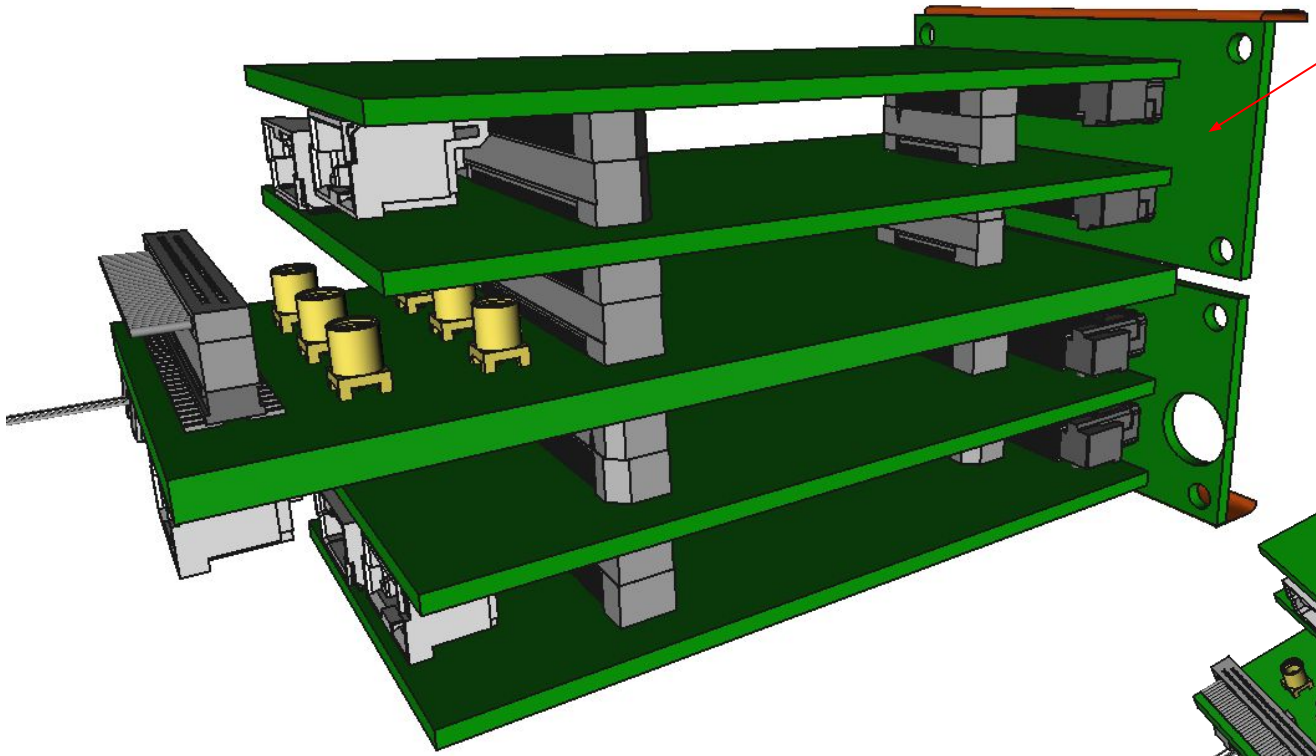


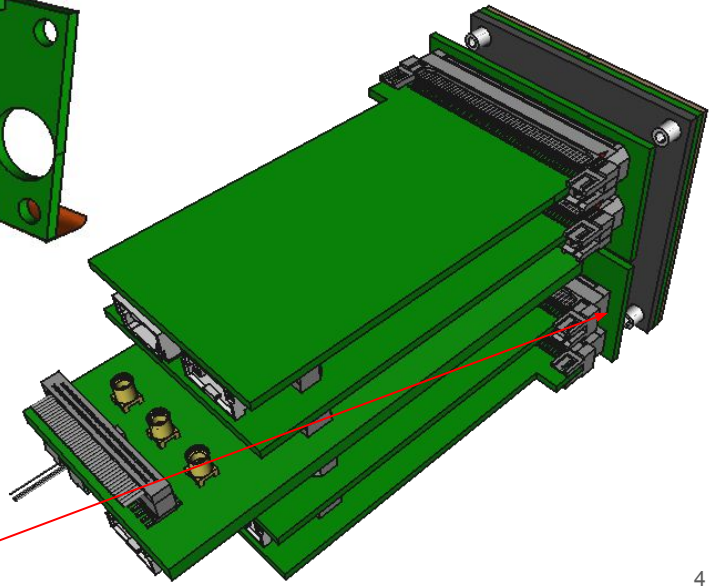
new proposal for FEB-Carrier connector

LSHM-150-01-L-RH-A-N-K-TR (FEB side)
0.5 mm, 100 places over two rows
current rating 2.0 A per pin



improves a lot space for mounting holes and for cooling pipes





cf. with edge connector
shown last week

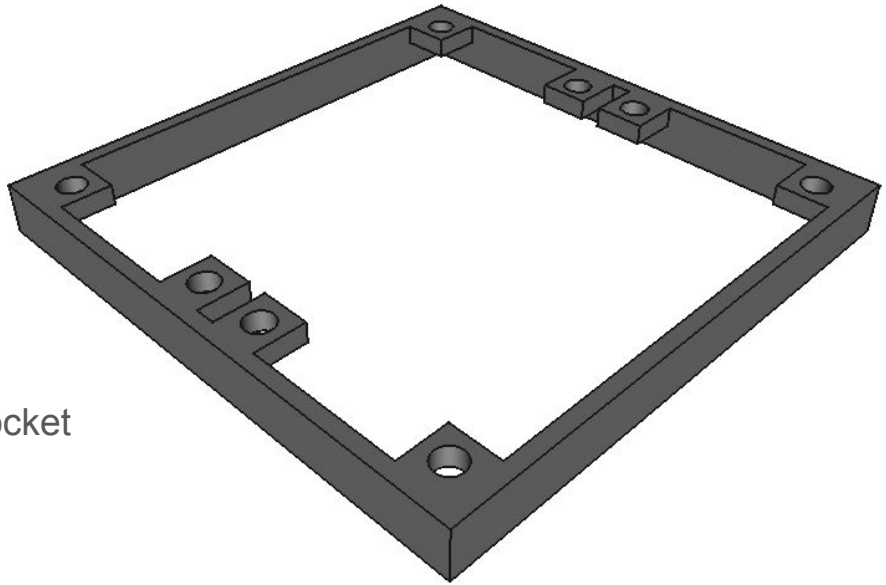
PDU socket

idea for basic PDU supporting structure in the readout box

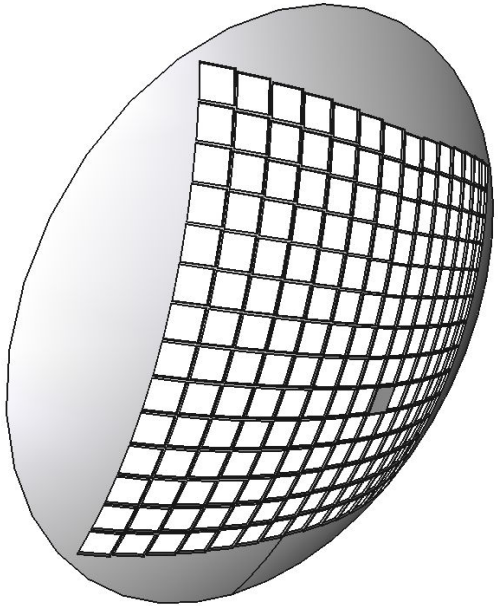
unit to be replicated for each PDU to create a continuous net of sockets

ideally holes machined in a thick aluminium foil (stronger)

otherwise small pieces to be screwed together (weaker)



PDU socket

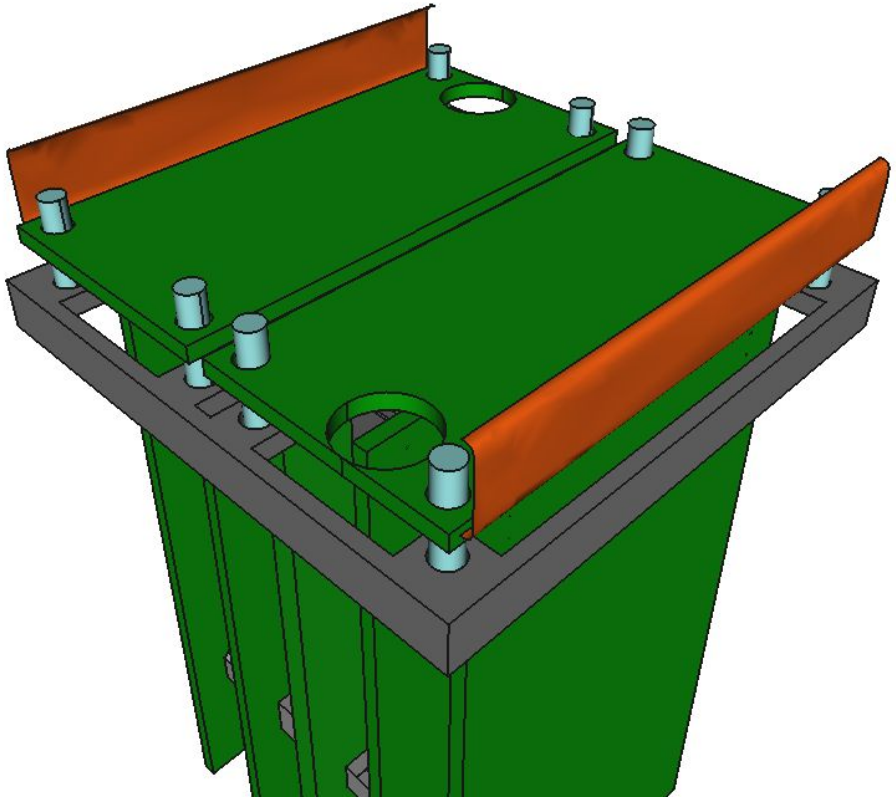


readout frame

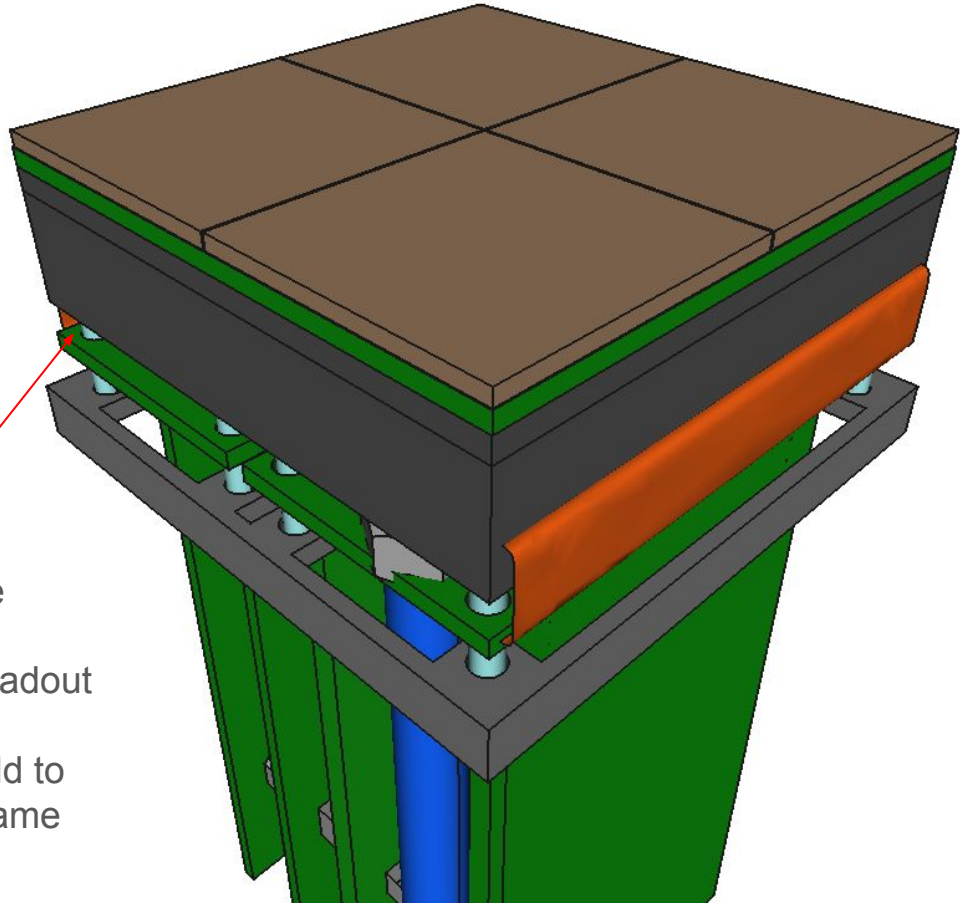
PDU socket

idea for basic PDU supporting structure in the readout box
unit to be replicated for each PDU to create a continuous net of sockets

mounting screws



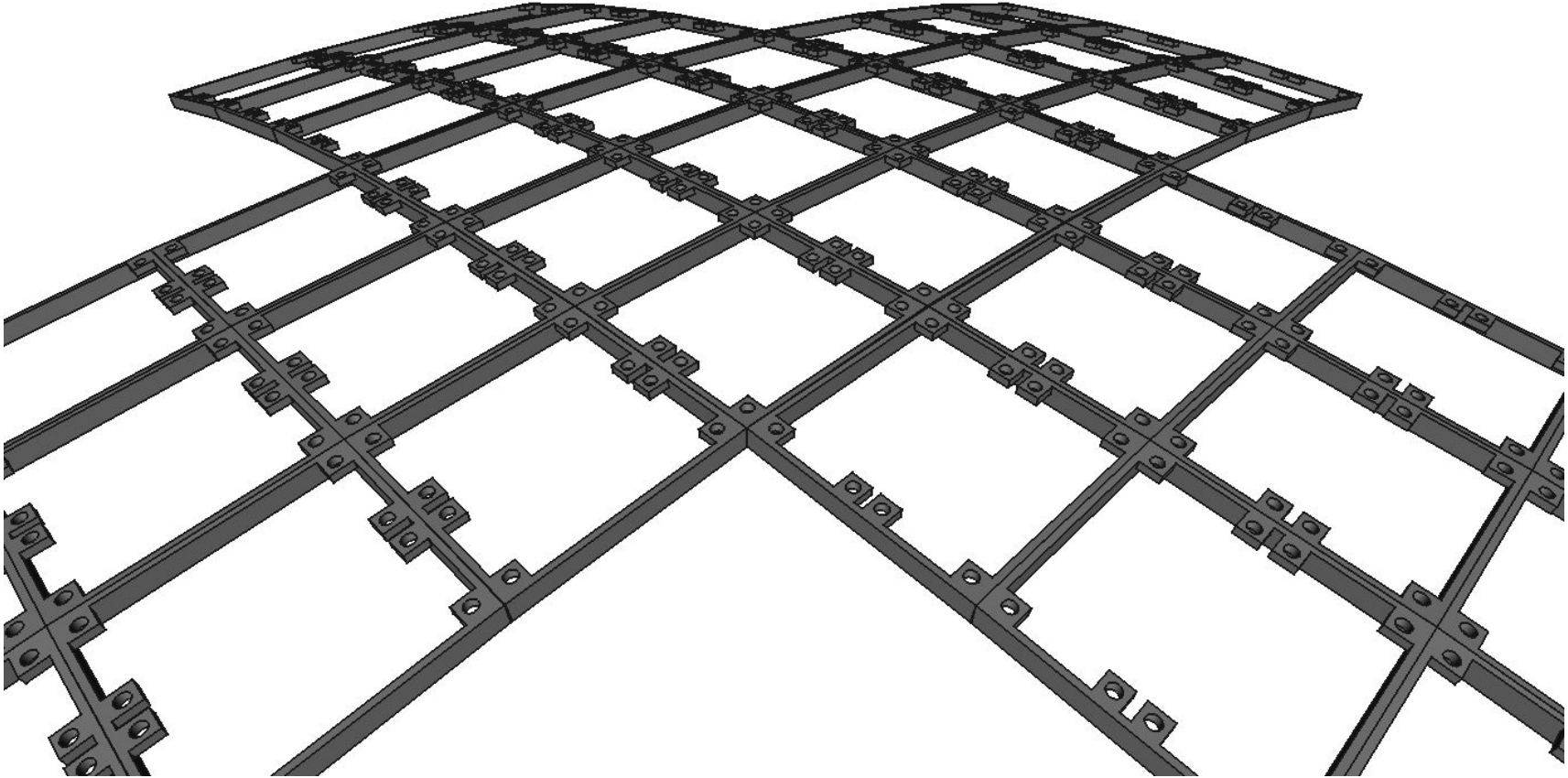
PDU socket



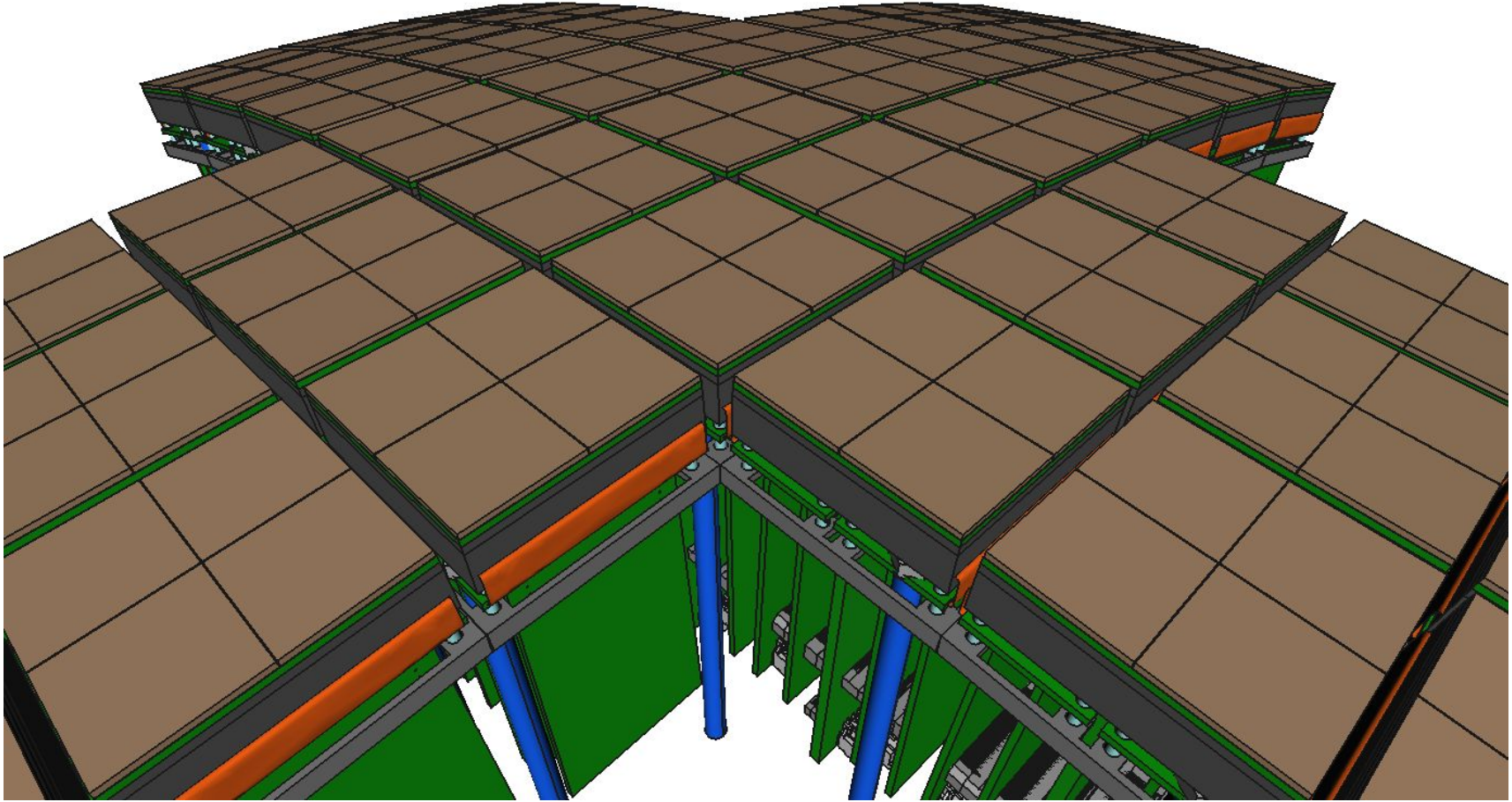
keep cooling plate separated from electronics and readout frame
do not transfer cold to electronics and frame

PDU can be inserted and extracted from the socket (once connectors are unplugged)

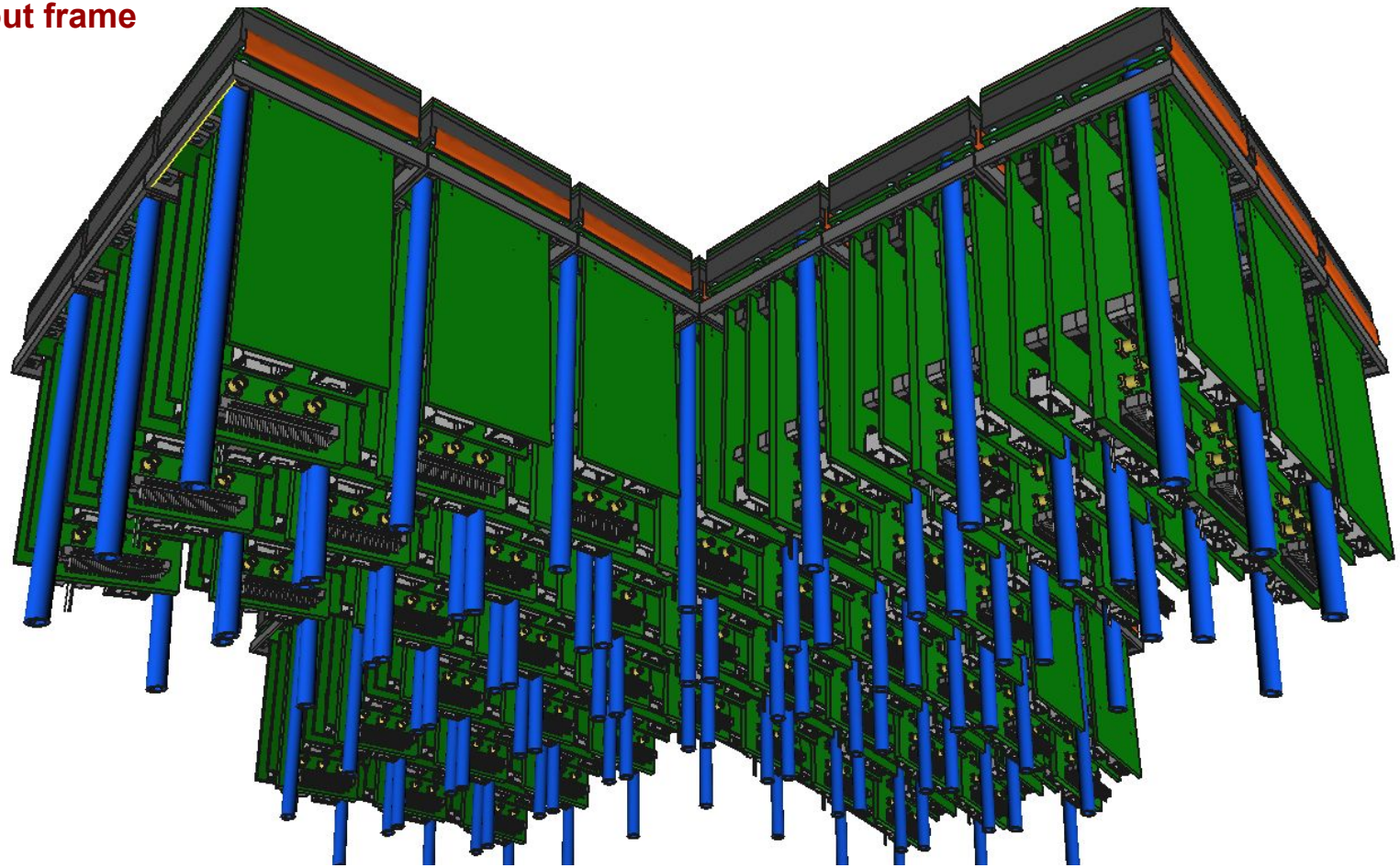
Readout frame



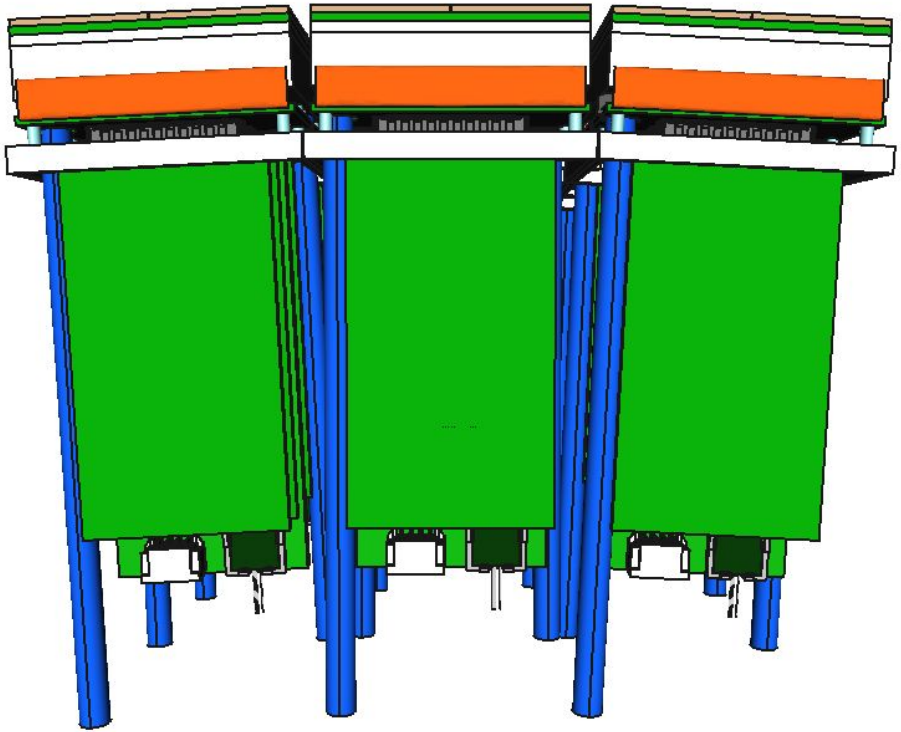
Readout frame



Readout frame

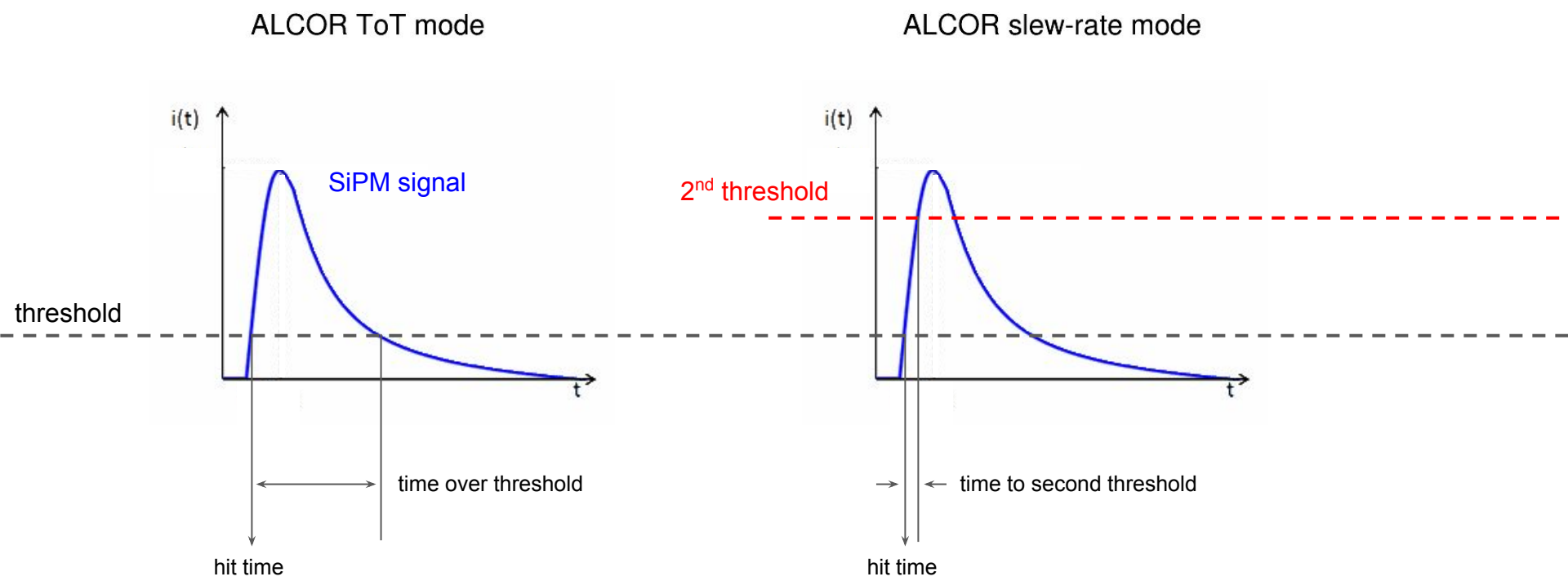


crowded but likely doable
PDU rotations to approximate a 110 cm radius sphere
~ 50 mrad rotation between adjacent PDUs



slew rate mode

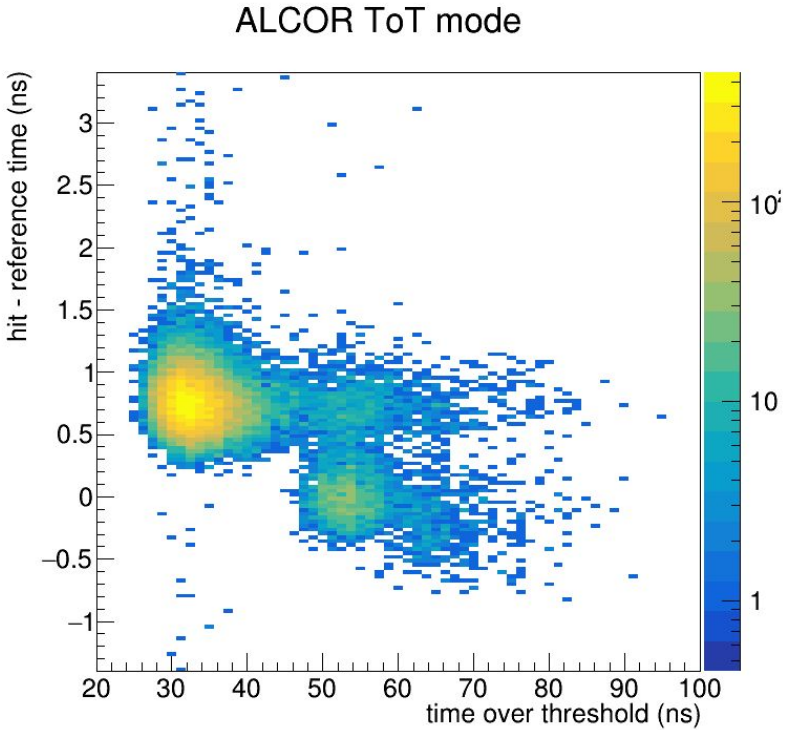
Working with fixed-threshold electronics

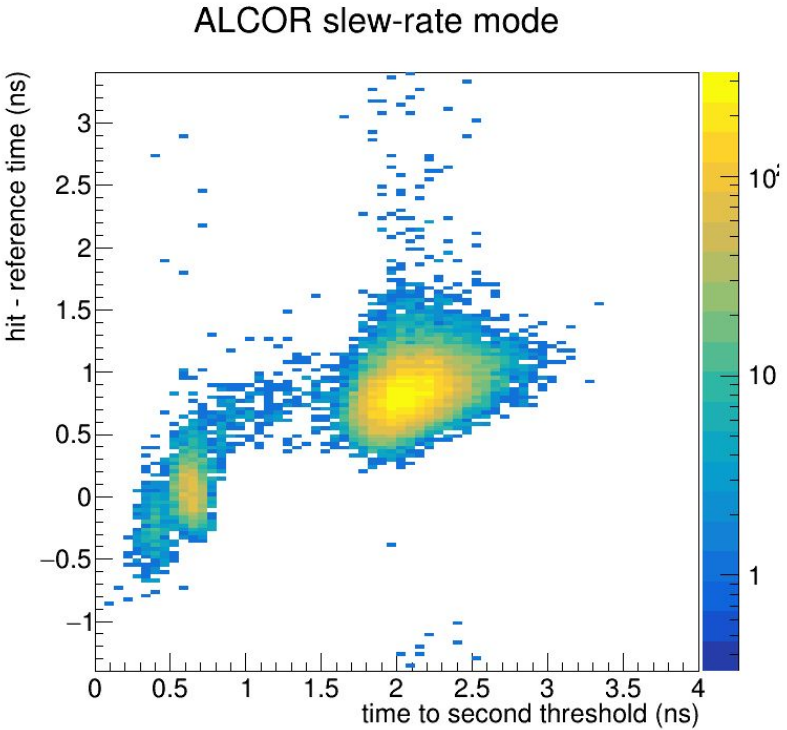


you need to correct the measured time to account for the time it takes to the signal to go above threshold

Slew-rate vs. ToT mode

working with fixed threshold electronics

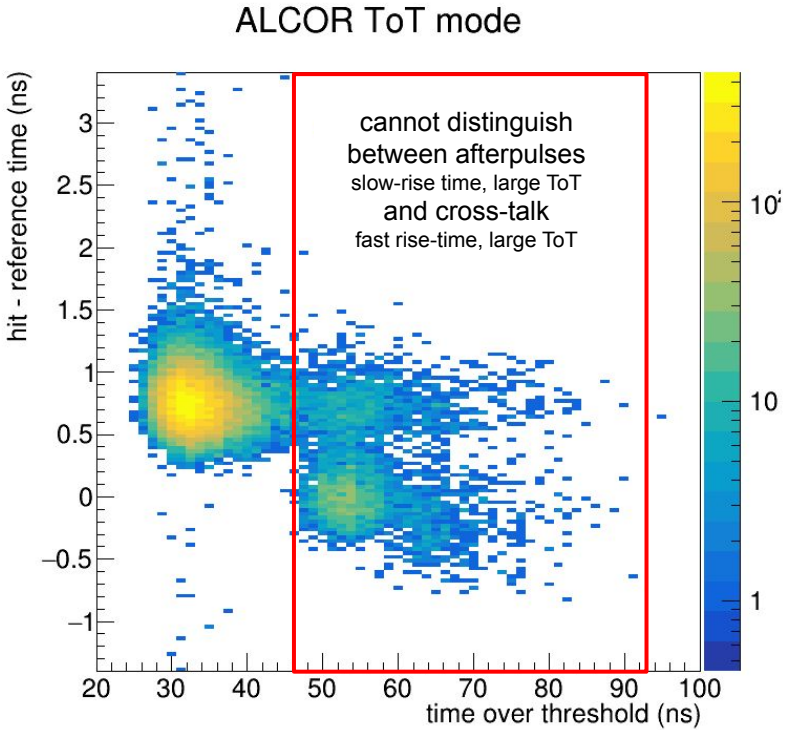


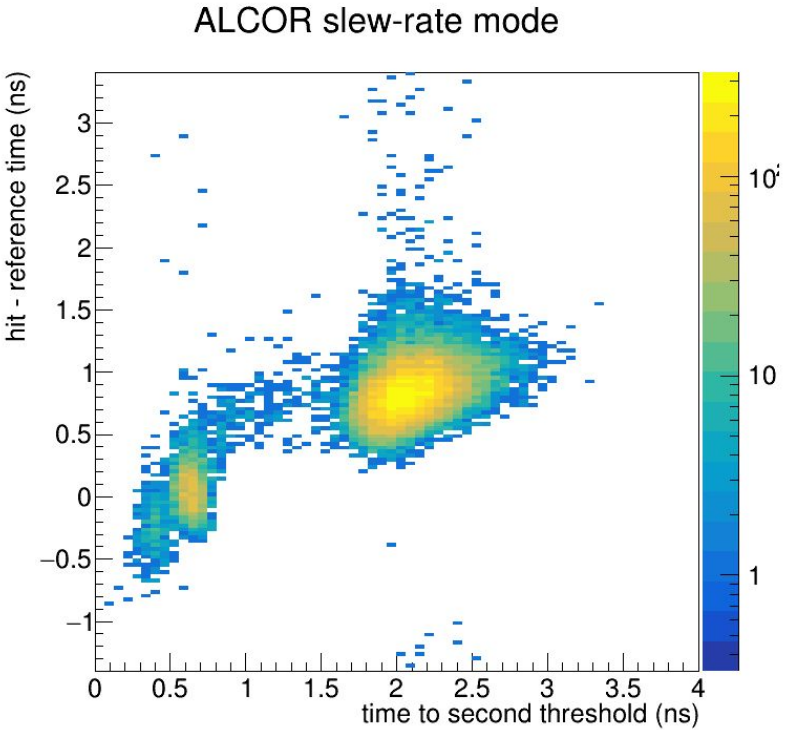


blablabla

Slew-rate vs. ToT mode

working with fixed threshold electronics

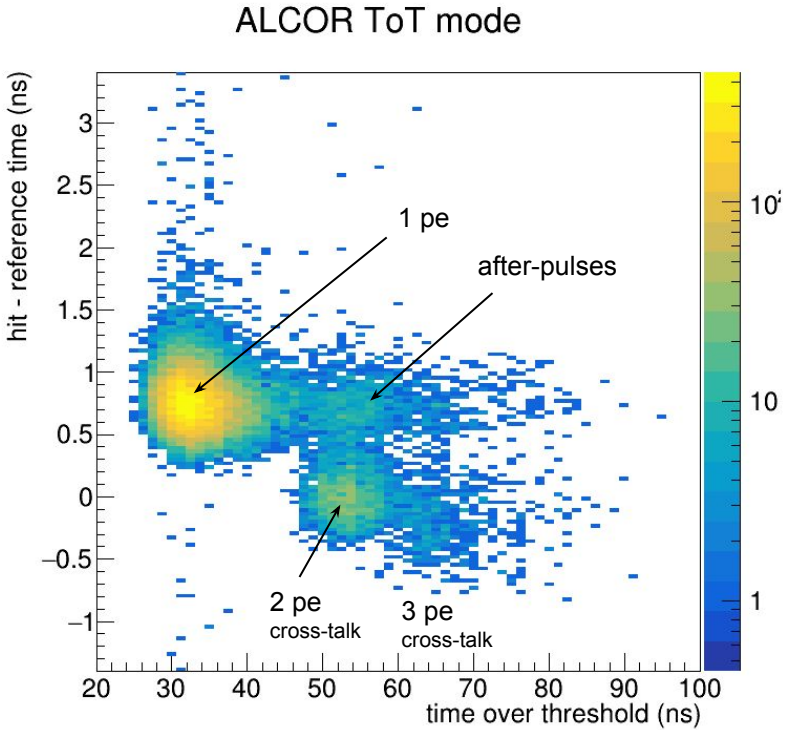


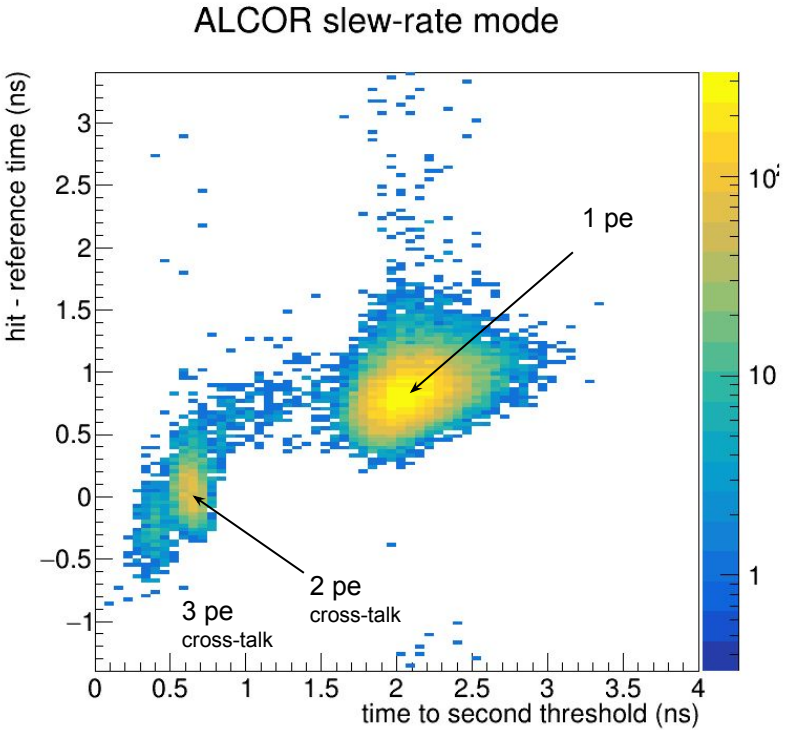


blablabla

Slew-rate vs. ToT mode

several measurements repeated on the same NEW sensor





blablabla

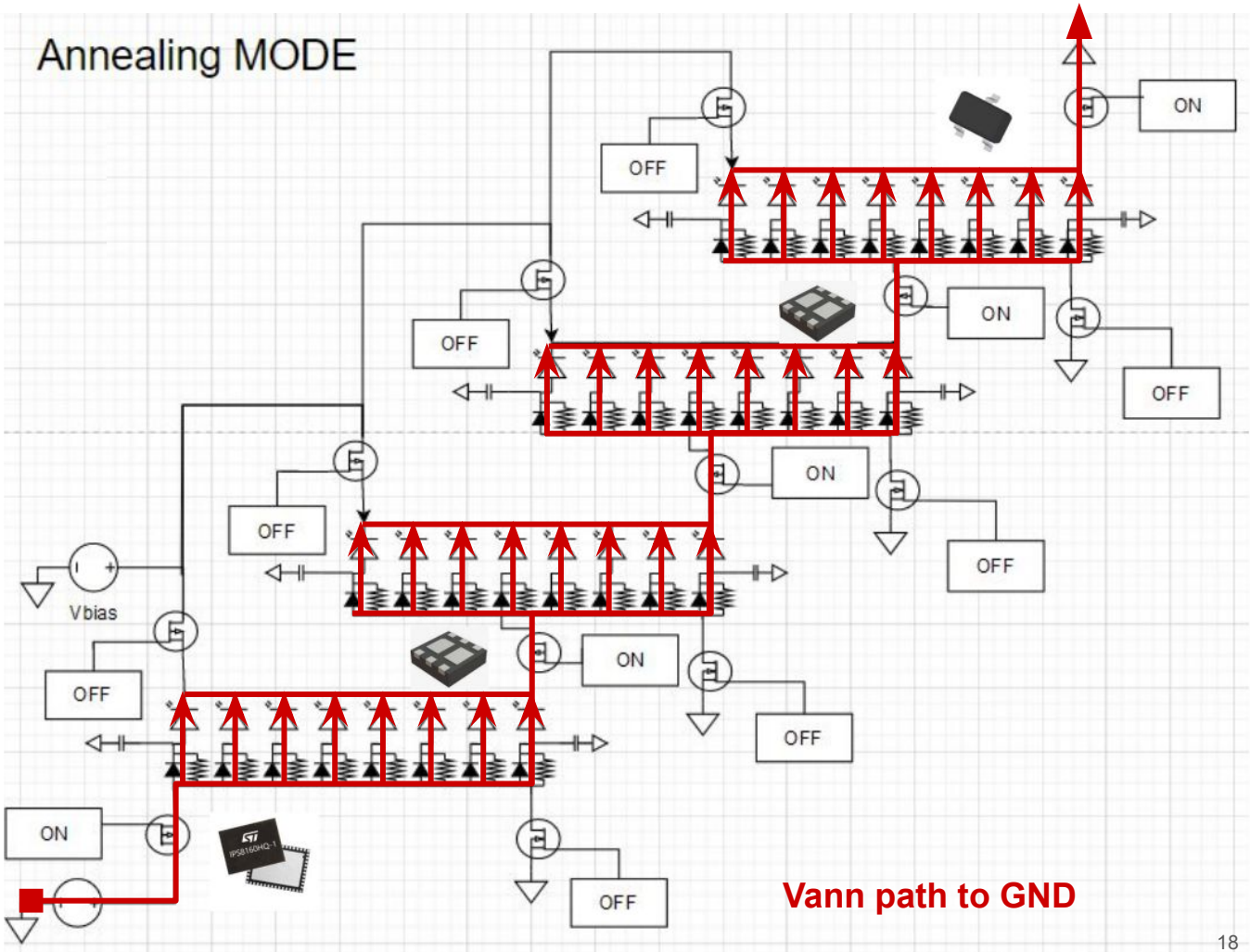
series annealing

Vann distribution

slide presented at DAQ meeting on Vbias distribution

forward-bias annealing current for each sensor can reach up to 100 mA
to keep annealing current low we foresee to forward-bias the SiPM in series of 4 SiPM strings

note: this approach should work but has to be tested to prove its performance



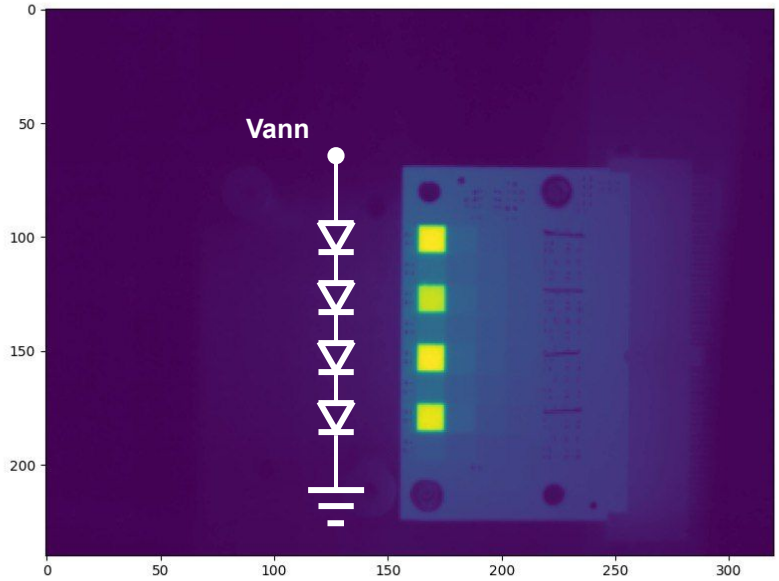
Simplified series annealing circuit

based on carrier and adapter IV
simply put 4 SiPM of the same type in series
4 Hamamatsu S13360-3050

it works!

T = 175 C with ~ 110 mA at 30 V

less than 10% difference between highest (177 C) and lowest (167 C)



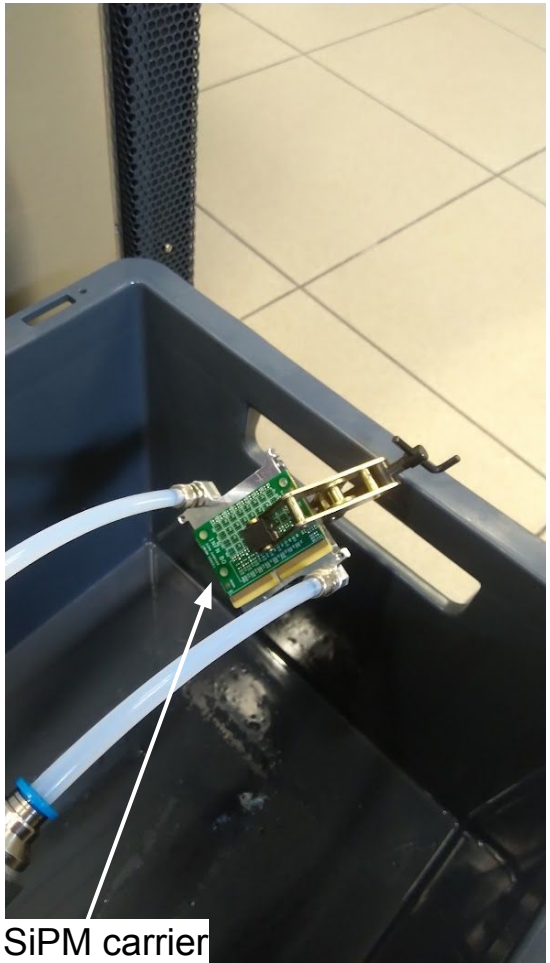
next:

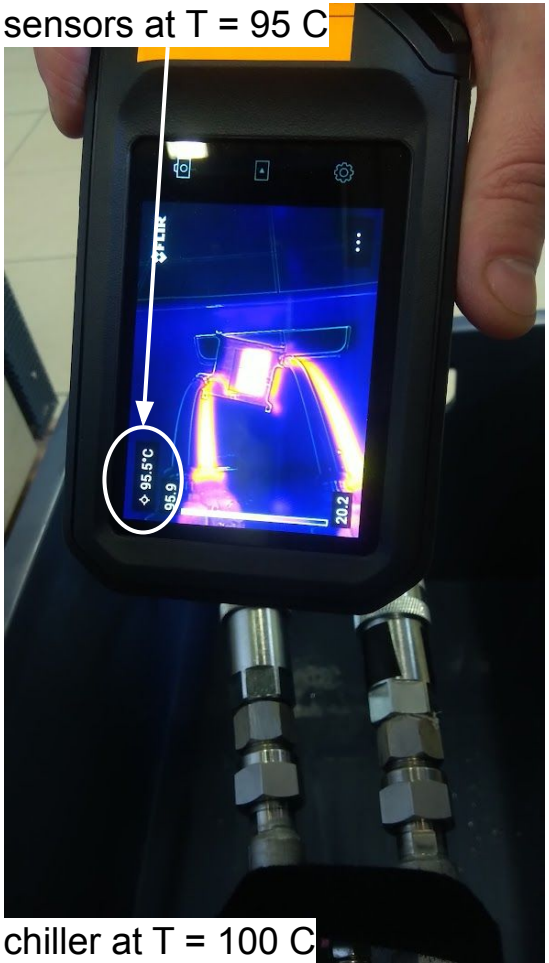
realistic circuit prototype with all electronics

chiller annealing

Chiller annealing: bring heat with fluid

SilOil can be used in the range from -60 °C to **+115 °C** for open systems, still good not to risk melting electronics





Chiller annealing: bring heat with fluid

SilOil can be used in the range from -60 °C to **+115 °C** for open systems, still good not to risk melting electronics