Plans -

from edouard

Mechanical design

- mechanical design of the prototype
  - Don Lynch to give it a try
  - need - exact dimensions of the existing plates
  - we will discuss locally how to keep things together
  - mail the drawings to Seoul, then proceed from there;

Carrier boards

- carrier boards for pad-readout
- GERBER files for the board carrying 2x2 matrix of sensors is ready in Dubna
- Dubna also expects actual boards for 2x7 matrix of sensors from production and stuffing next week
- BNL will order boards (25 boards, we need 20 for prototype) and stuff them
- Couple of those boards will be sent to Korea (probably in a month if funding available);

Stacking

- I distributed .ppt file explaining pad stack design ideas (prepared by A.Baskakov, Dubna) to everyone in the last two weeks. Most expensive part is the so called "cover" which is Cu/Au plated polyimid. We need cheaper solution. One such solution would be to use piece of Au plated Cu foil (say 100mkm) solded to interconnect and glued with conductive glue to Si. To insure the coductivity it will also need to be bonded to Si around edges. To protect bonds it is worth considering covering the sensor with a square piece of selfadhesive polyimid (no idea if commercial adhesive can be dangerous to the bonds or Si - we need to test it or find about other people experience). I attach some colorful comments on how such things were made in the past from Greg Sellberg (FNAL). Dubna will get samples of interconnect boards, covers (as designed) and ceramic spacers again probably next week (ordered end of April). Again due to the difficulties with customs it is difficult to distribute those samples so we are planning to order some from BNL (planning is that before order is processed Dubna will test samples and will tell us if any modifications needed). I suggest Korean group to look critically into design files and decide either to follow or to implement modifications based upon their experience. It will be good to test more then one option. For the whole prototype we need 80 pad structured stacks. We expect at least 28 of those stacks to come from Dubna (first EM segment), we are beginning to work on assembling pad stacks at BNL and hope to get at least similar number of stacks built at BNL, the proposal would be for Korean group to aim for something similar;

Sensor to preamp cable

- Dubna already ordered FPC cables and we hope to get enough of those to connect sensors to preamps. If they are found good - we will ask Dubna group to order extra cables immediately.

pre-amp hybrids

- We expect price-quote for preamps today and will order preamp hybrids immediately.

pre-amp board

- Mother board for preamps (small for the test at Dubna and final for the test at CERN) are in layout (GERBER for small is available, Dubna group is planning to use it for preamp testing). Large mother boards (we will need 6 for the test beam even if they will be only 30% populated) will be ordered from BNL as soon as GERBER's are available.

crate for preamps

- mechanical crate for preamps is ~designed and will be built by BNL technicians.

cable – preamp crate to ADC

- HardMetric cables from preamp crate to ADC crate are to be purchased by Chi (NEVIS). We will have at most 192 channels.

ADC crate

- We will use HBD ADC crate - we need someone to learn how to work with it (crate is available);

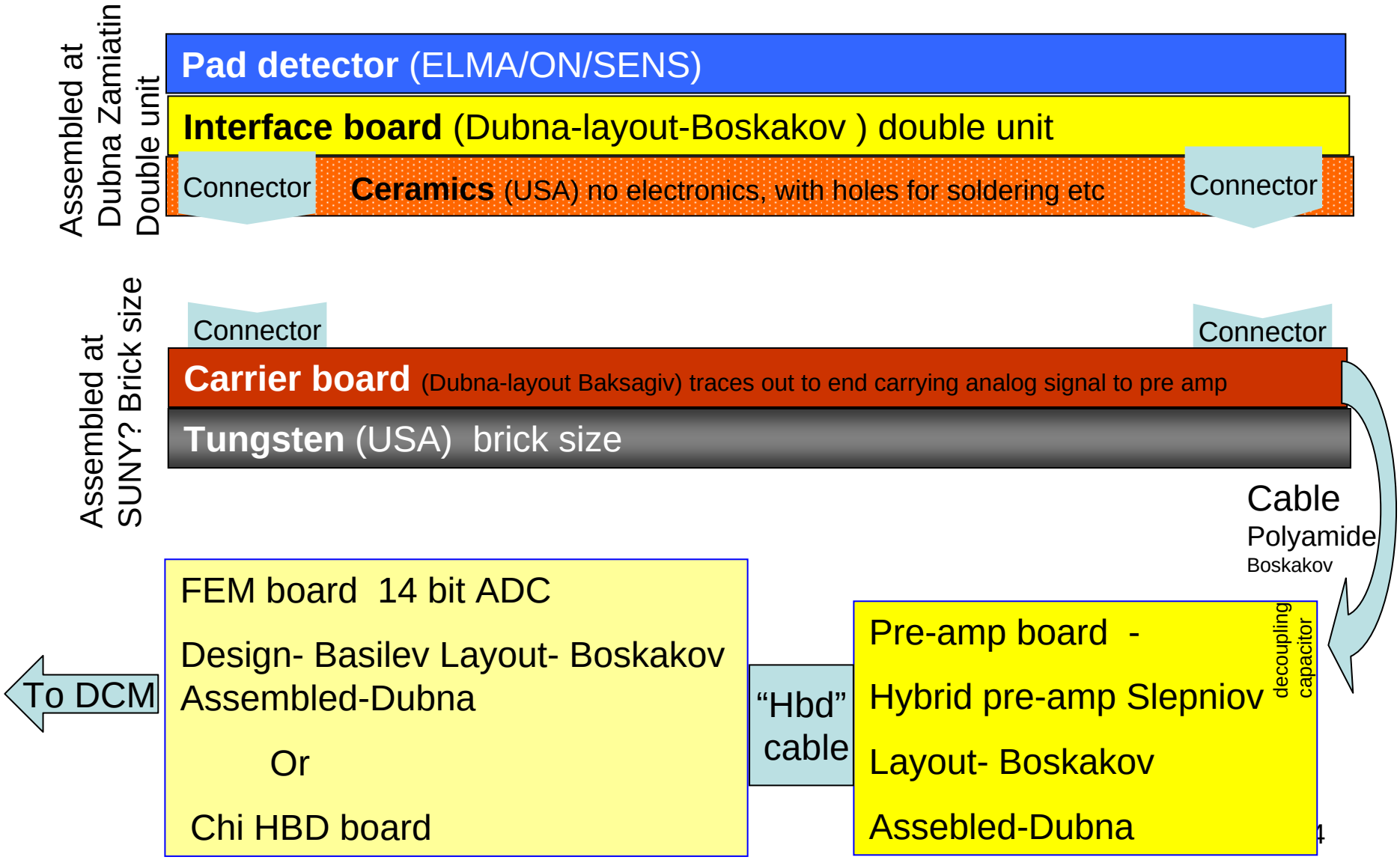
DAQ?

Stripixels

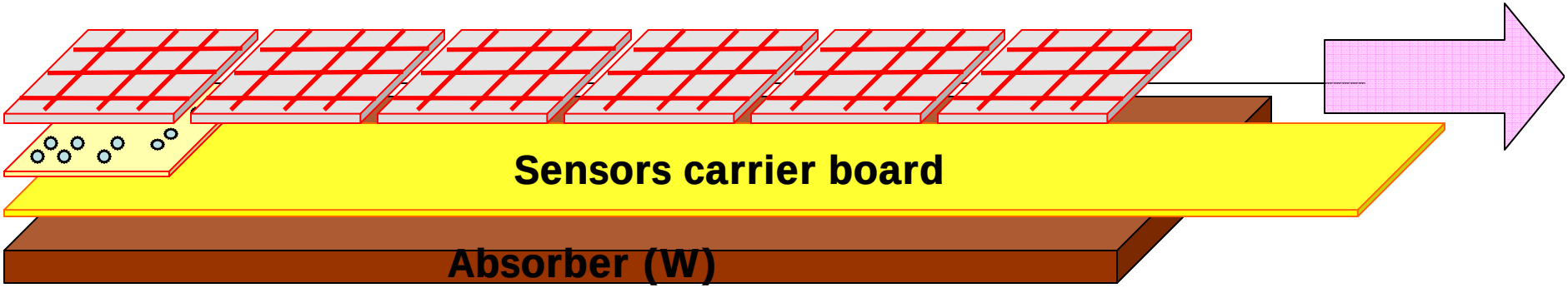
Local support at CERN

- From Our Czech friends

Pad detector



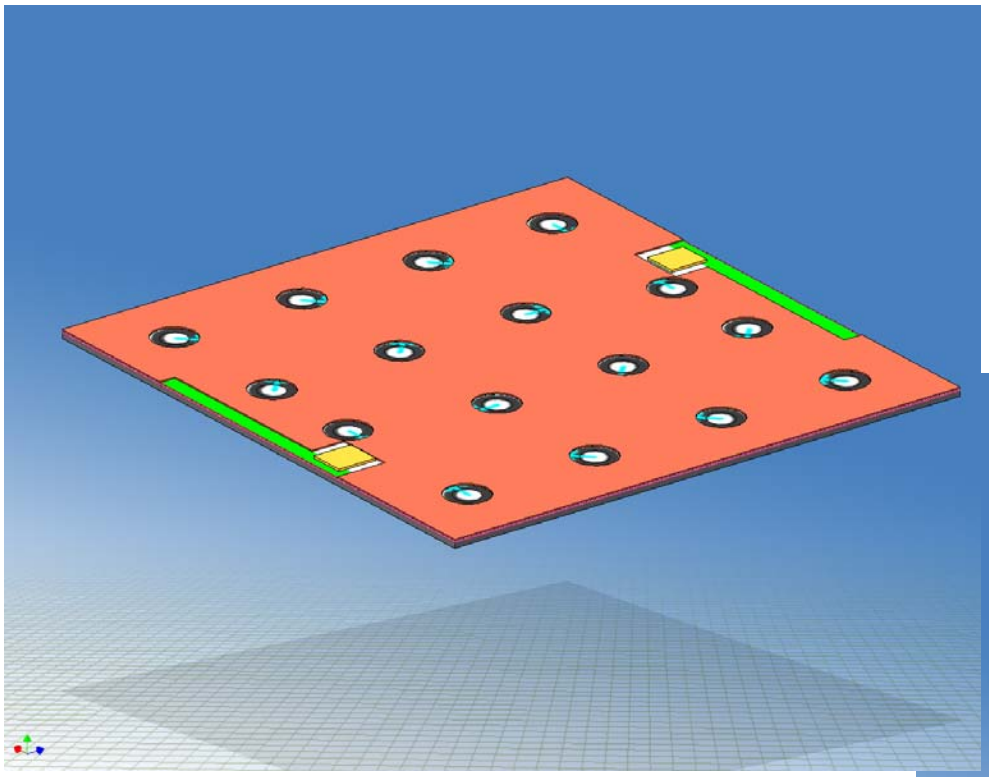
Sensors+carrier board+W

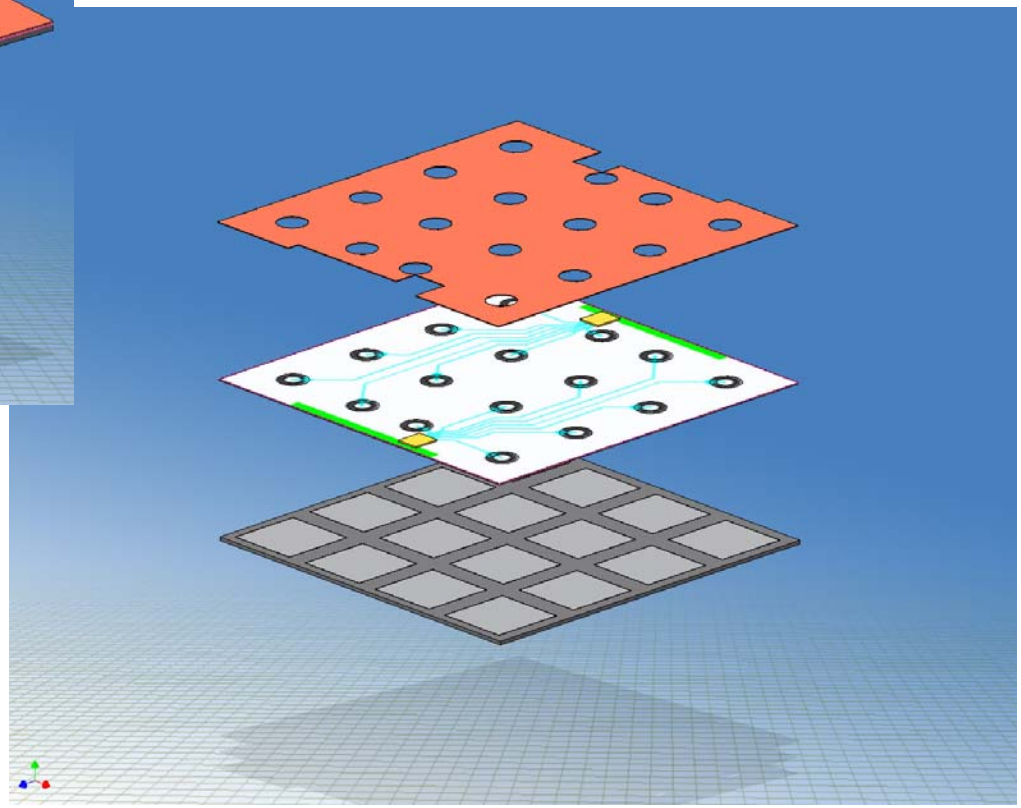


Layout: BNL/MSU

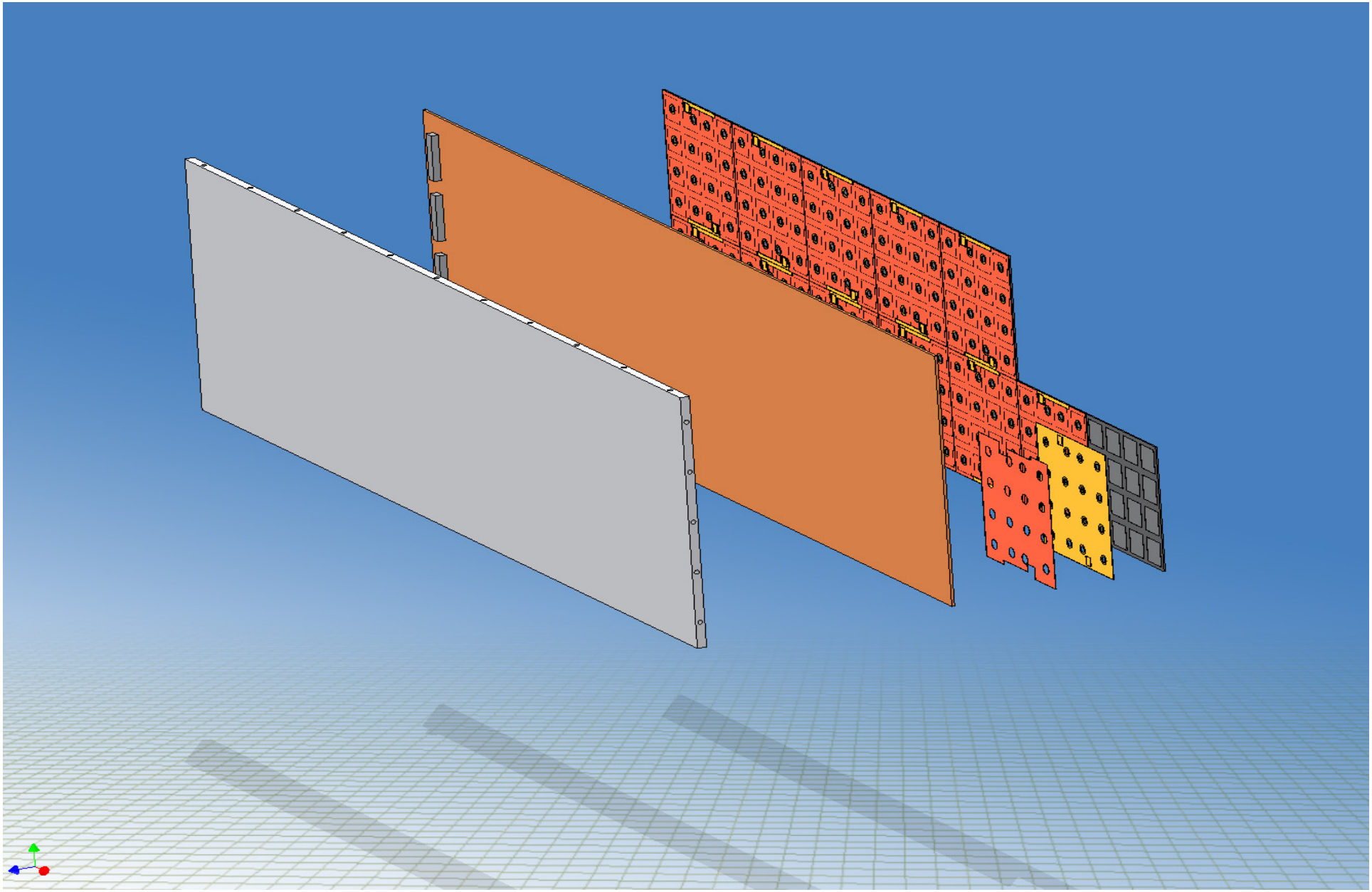
Implementation: BNL/Komposit (Ekaterinbourg, Russia)

Pad ReadOut Unit

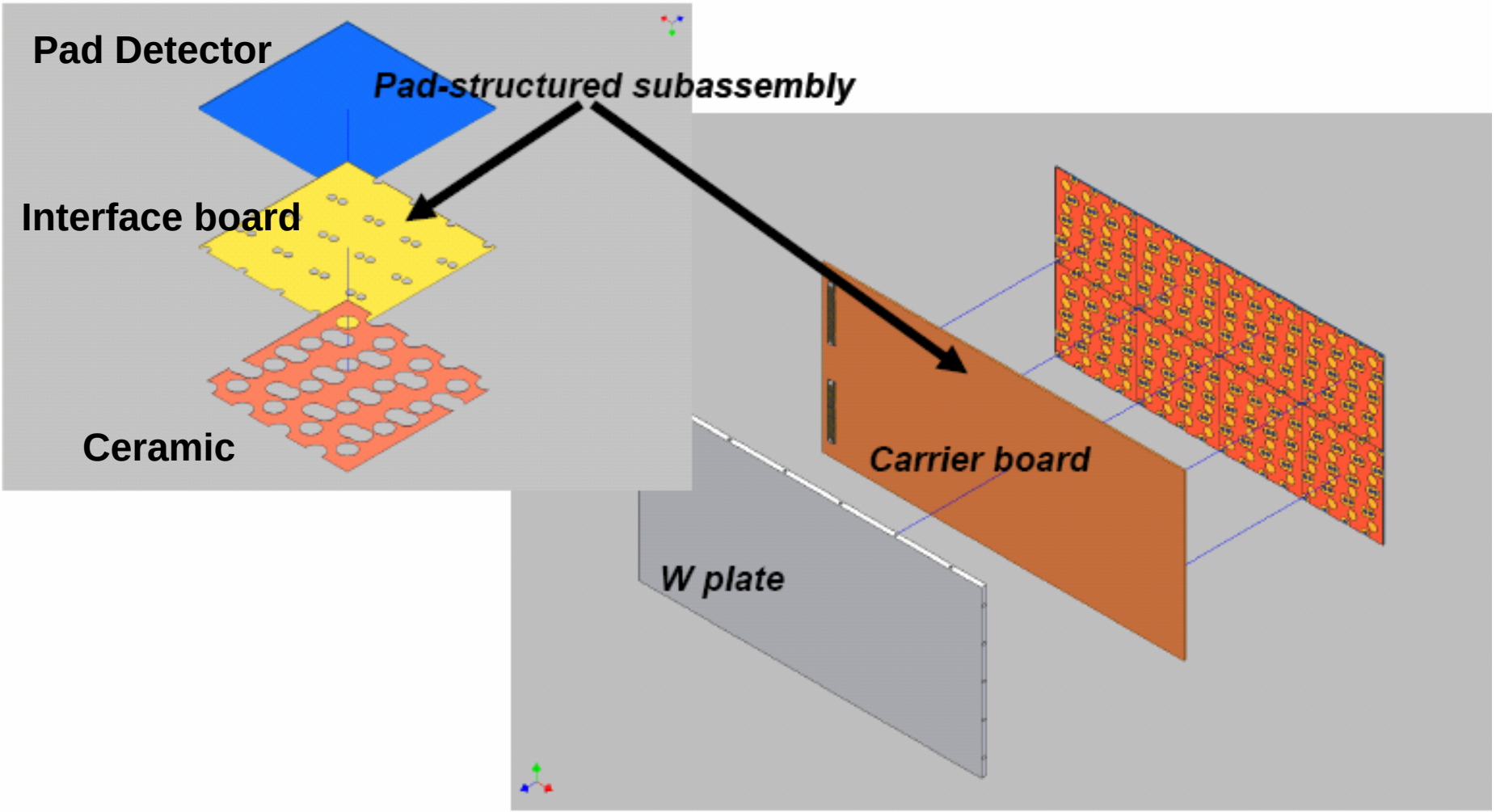




Pad ReadOut Unit

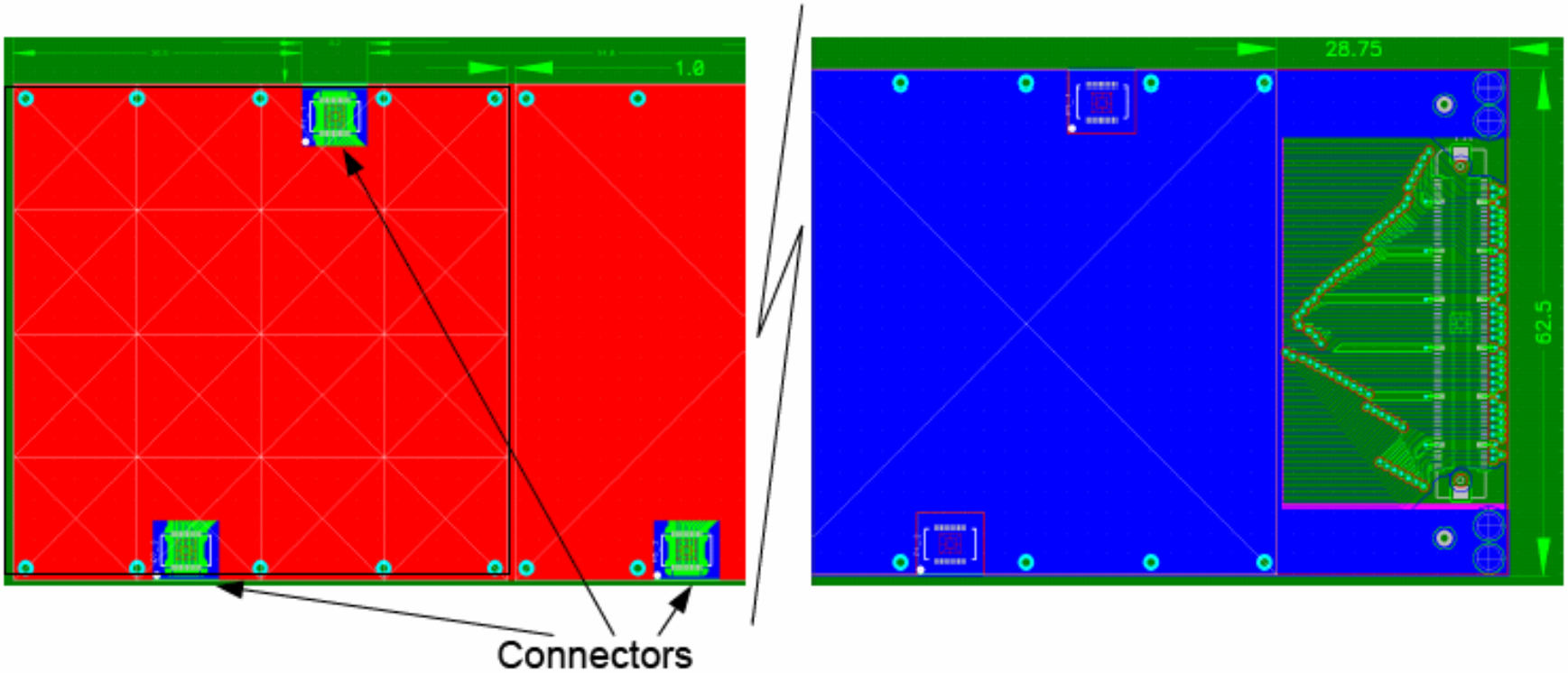


Pad-Structured ROU's



R&D project on pad-sensor development is completed. The decision is made to use DC sensors built of bulk n-type Si with p+ implants built following design generated by M.Merkin and initially prototyped at ELMA;

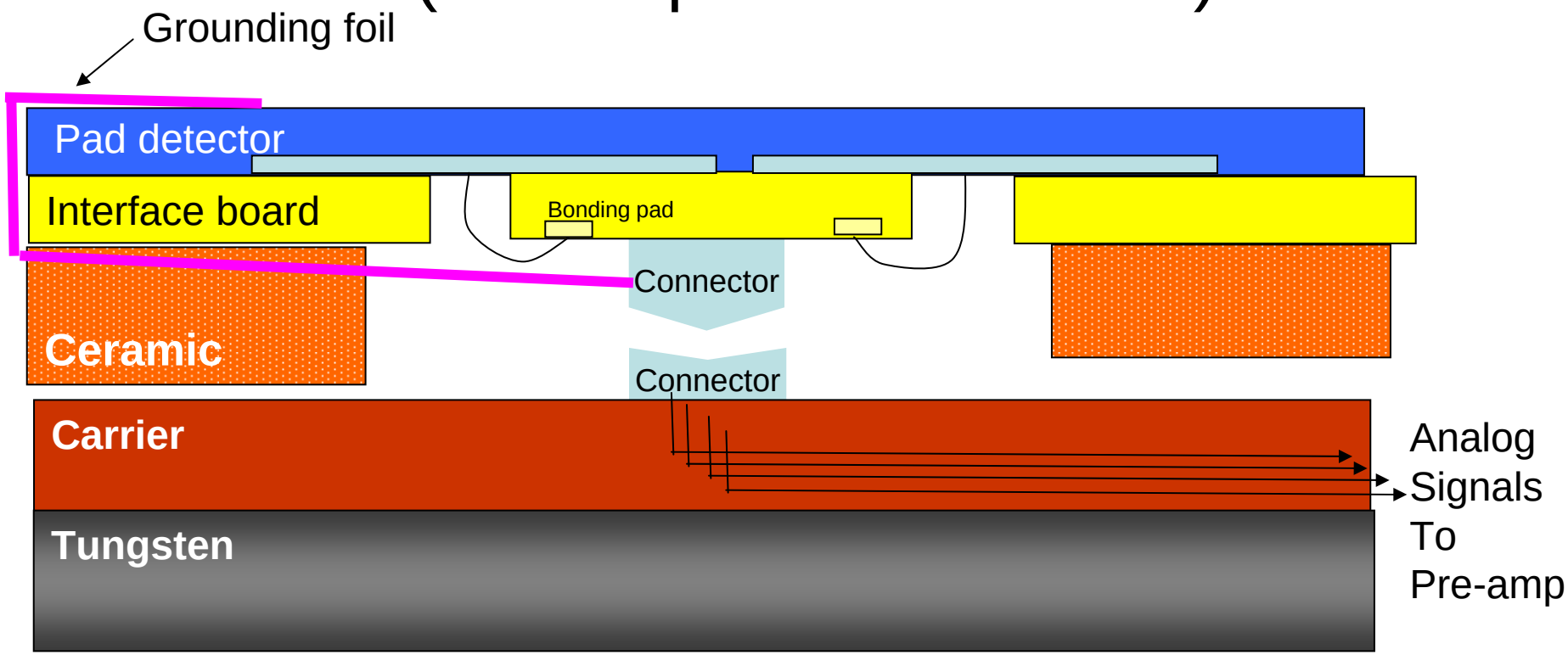
New Carrier Board Design



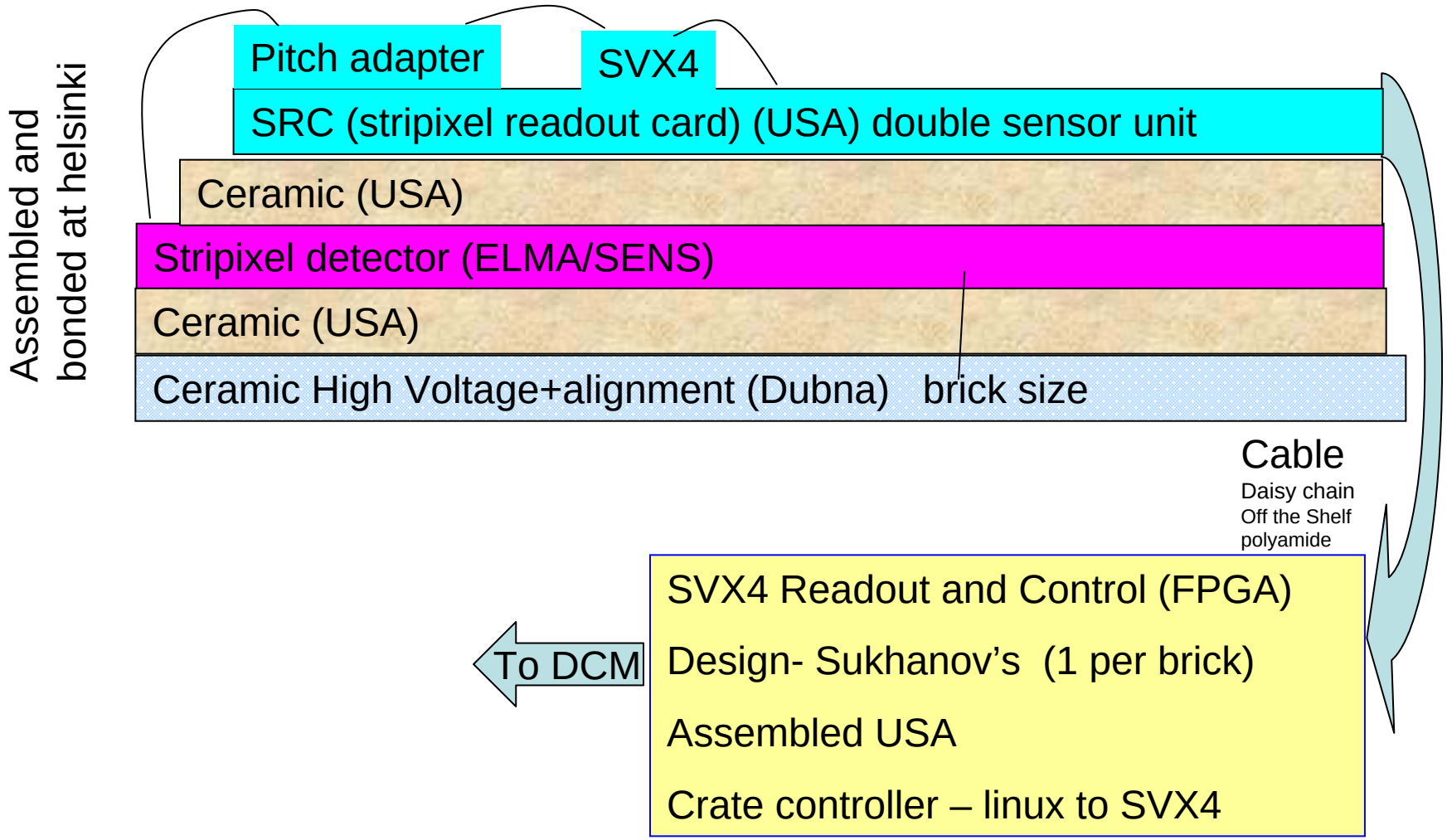
Technological breakthrough in pad sensors assembly: instead of wirebonding or low temperature soldering we will use **connectors**.

Pad detector unit

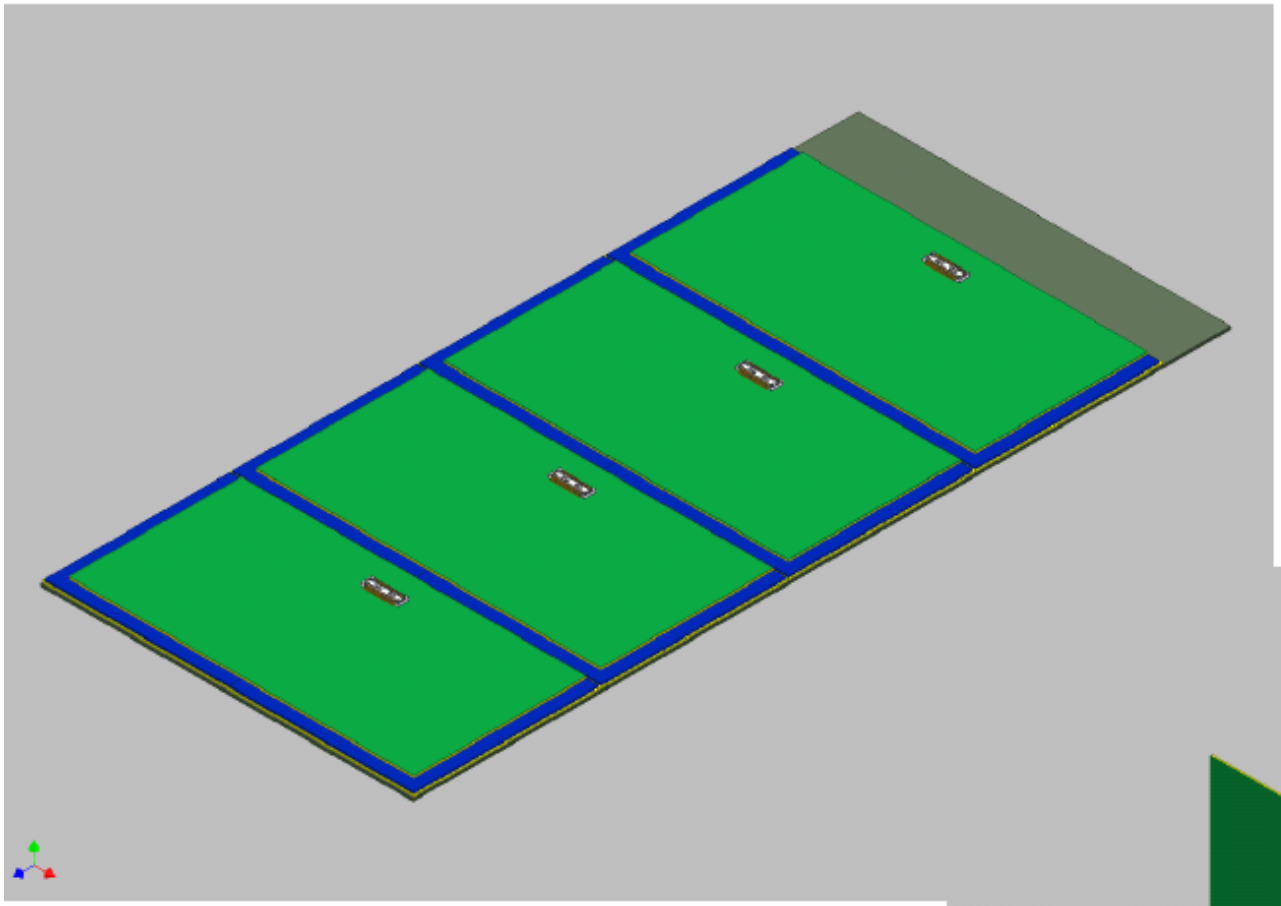
(close up of connections)

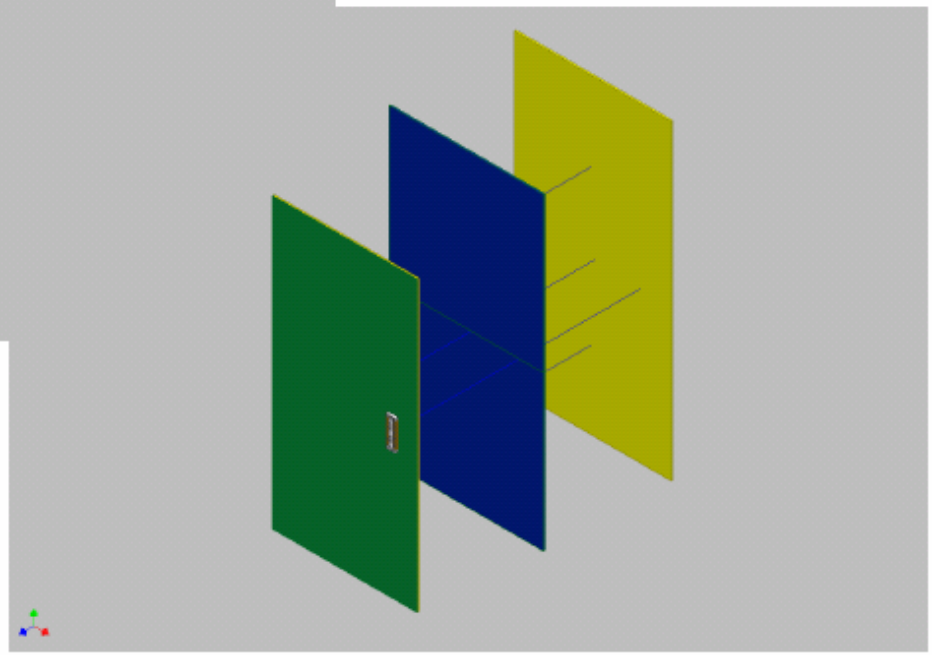


Stripixel unit

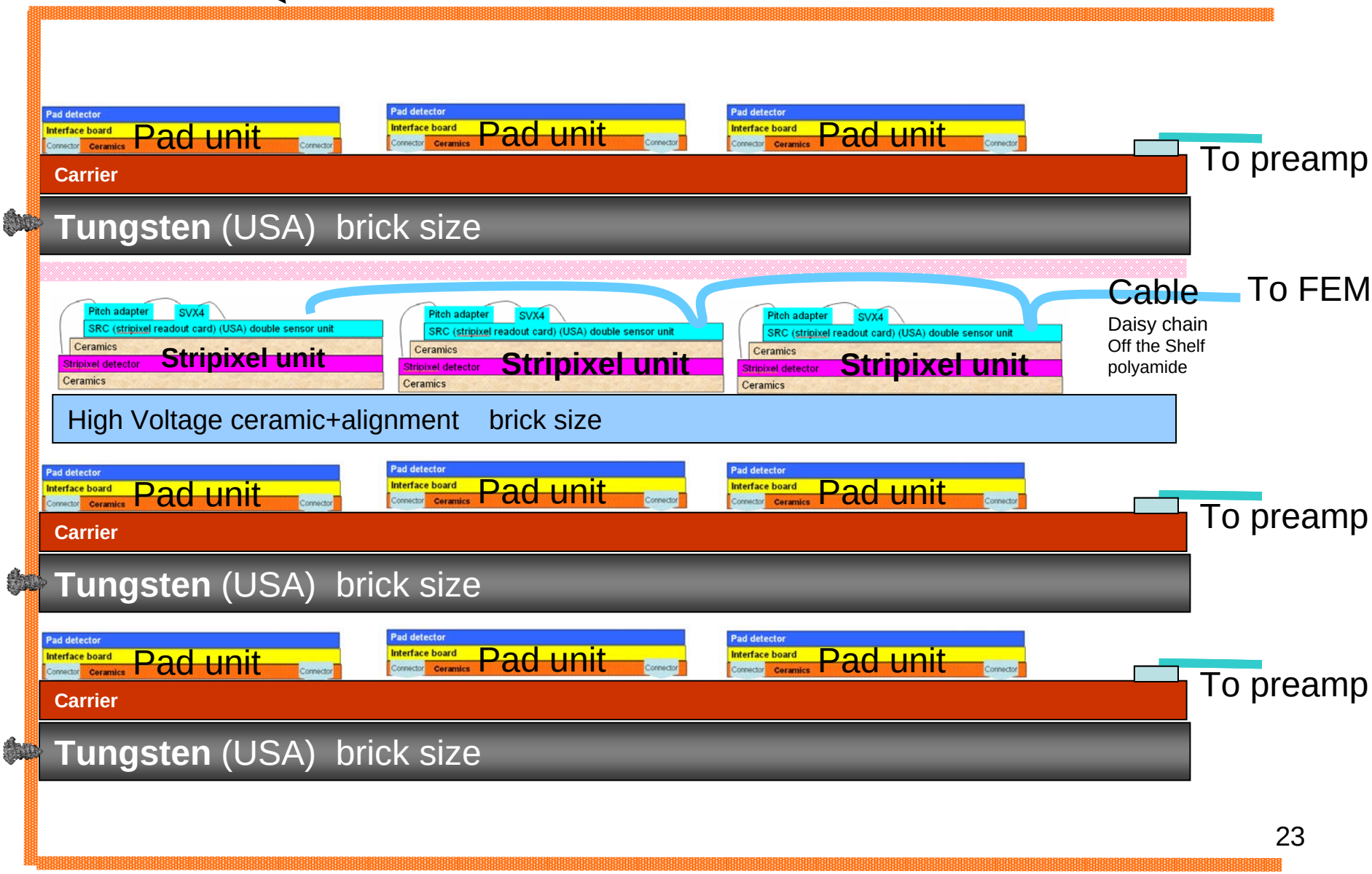


Stripixel ROU's

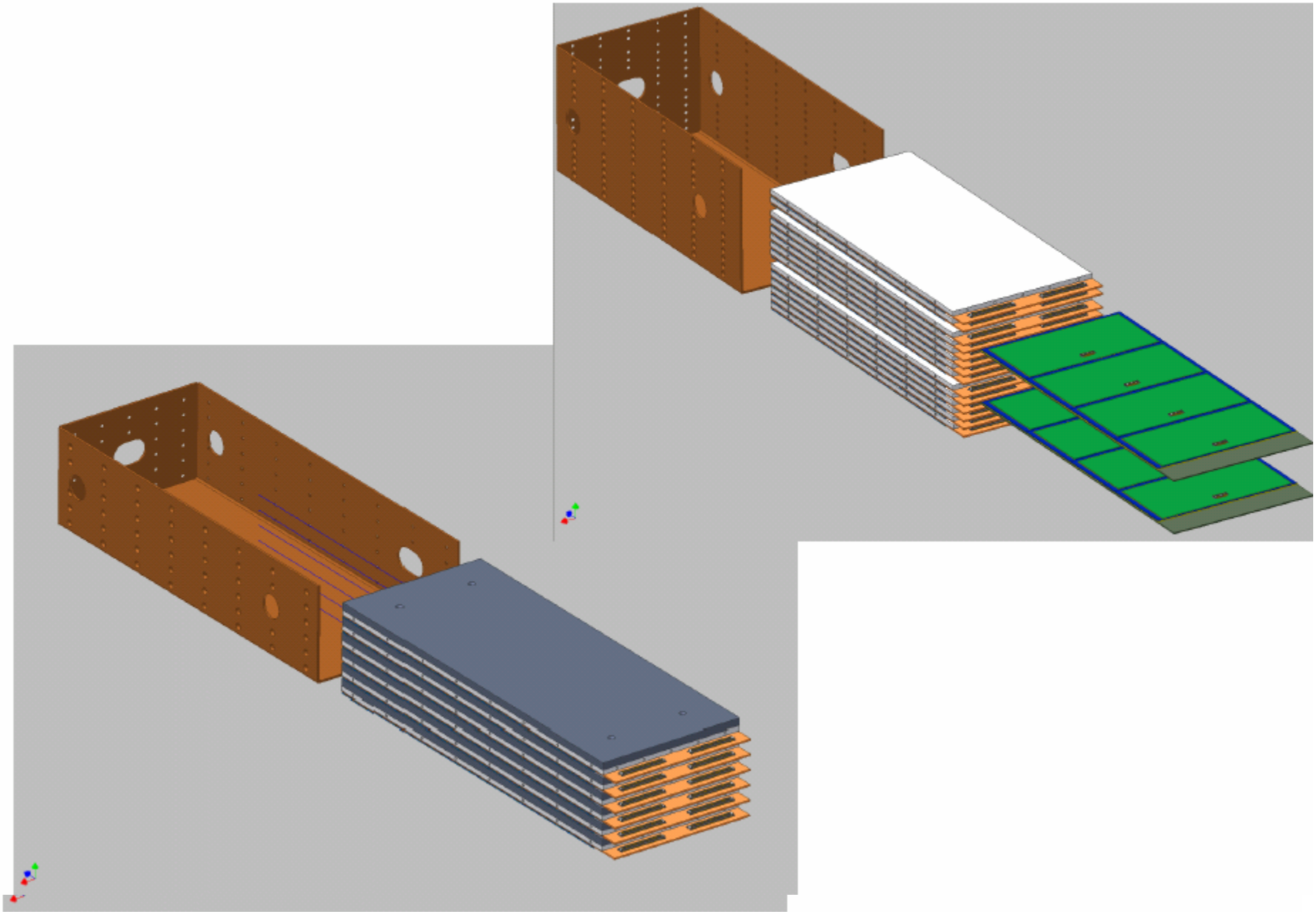




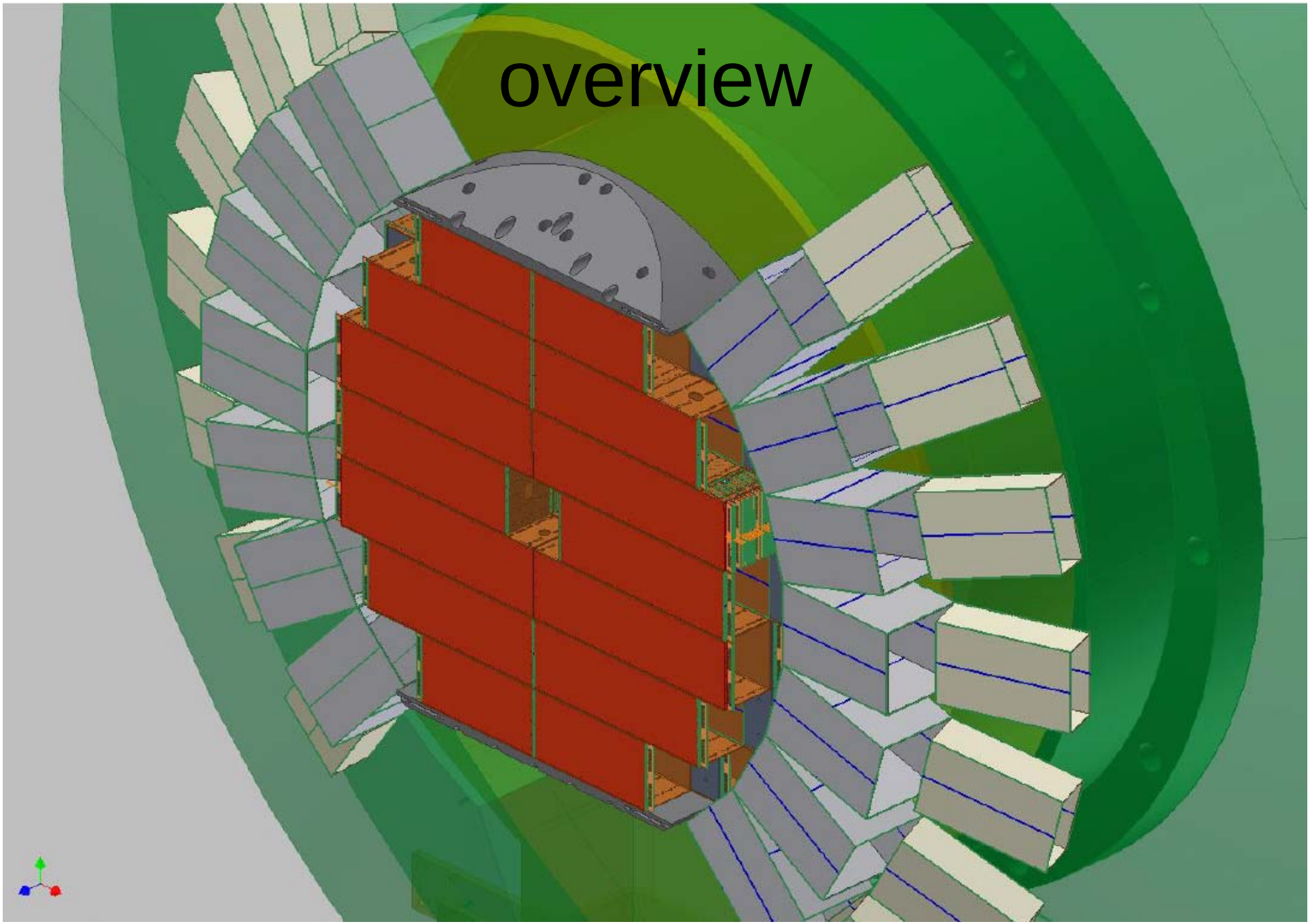
Brick

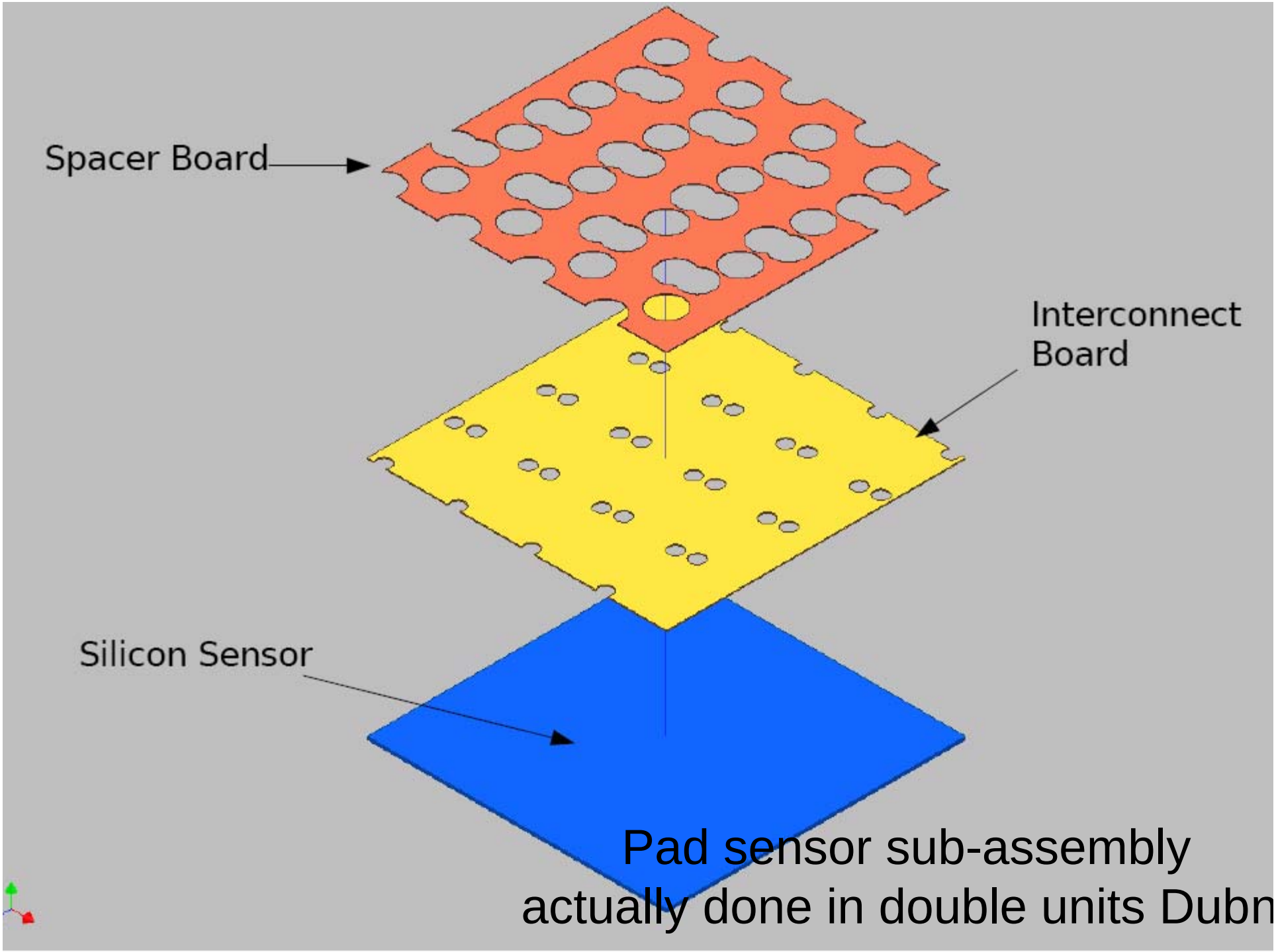

Copper "box"
Pad detector
Interface board
Connector
Ceramics
Pad unit
Carrier
Tungsten (USA) brick size
To preamp
Pitch adapter
SVX4
SRC (stripixel readout card) (USA) double sensor unit
Ceramics
Stripixel detector
Stripixel unit
Cable
To FEM
Daisy chain
Off the Shelf
polyamide
High Voltage ceramic+alignment brick size

Calorimeter Bricks

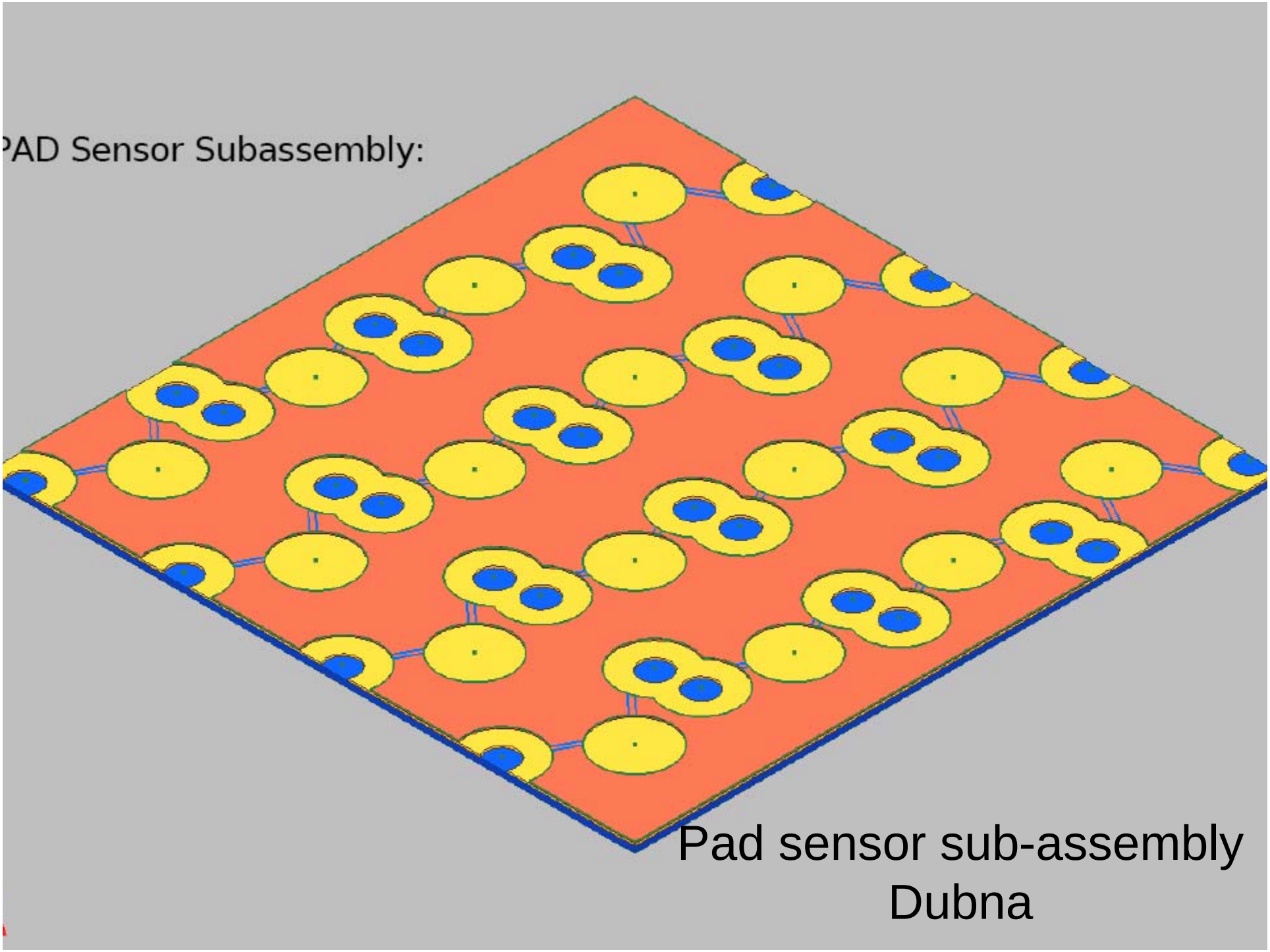


overview

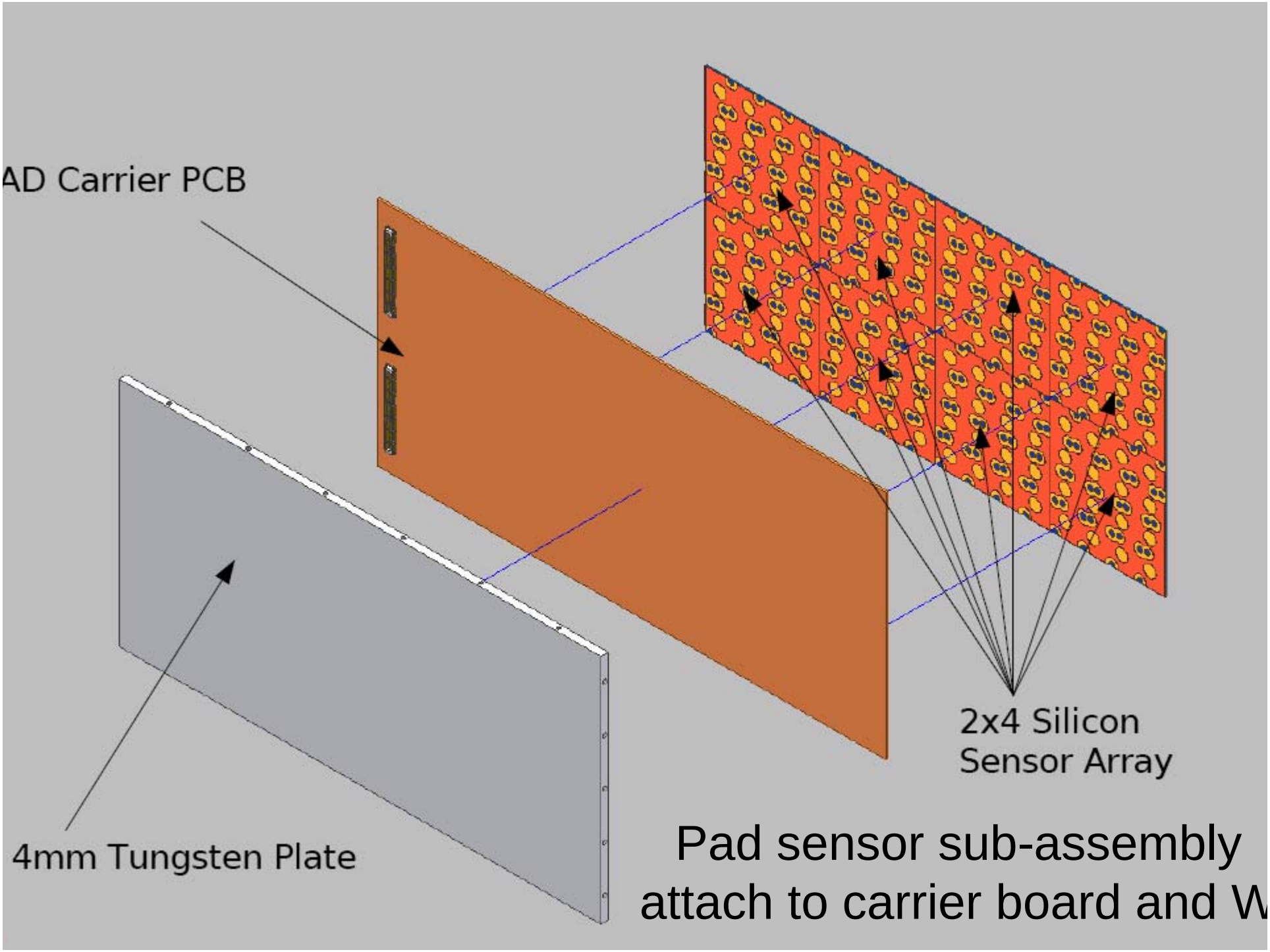




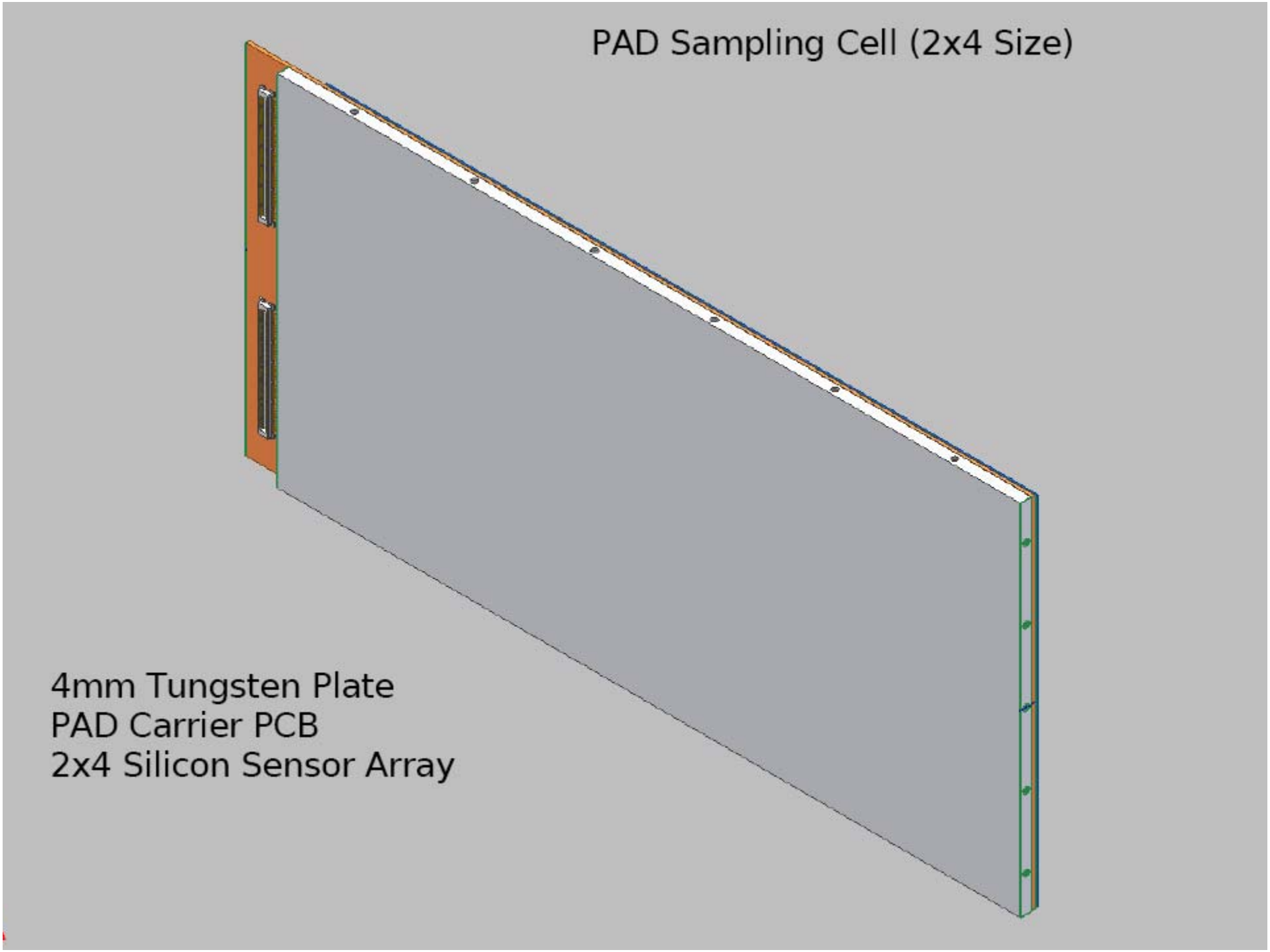
Pad sensor sub-assembly
actually done in double units Dubn

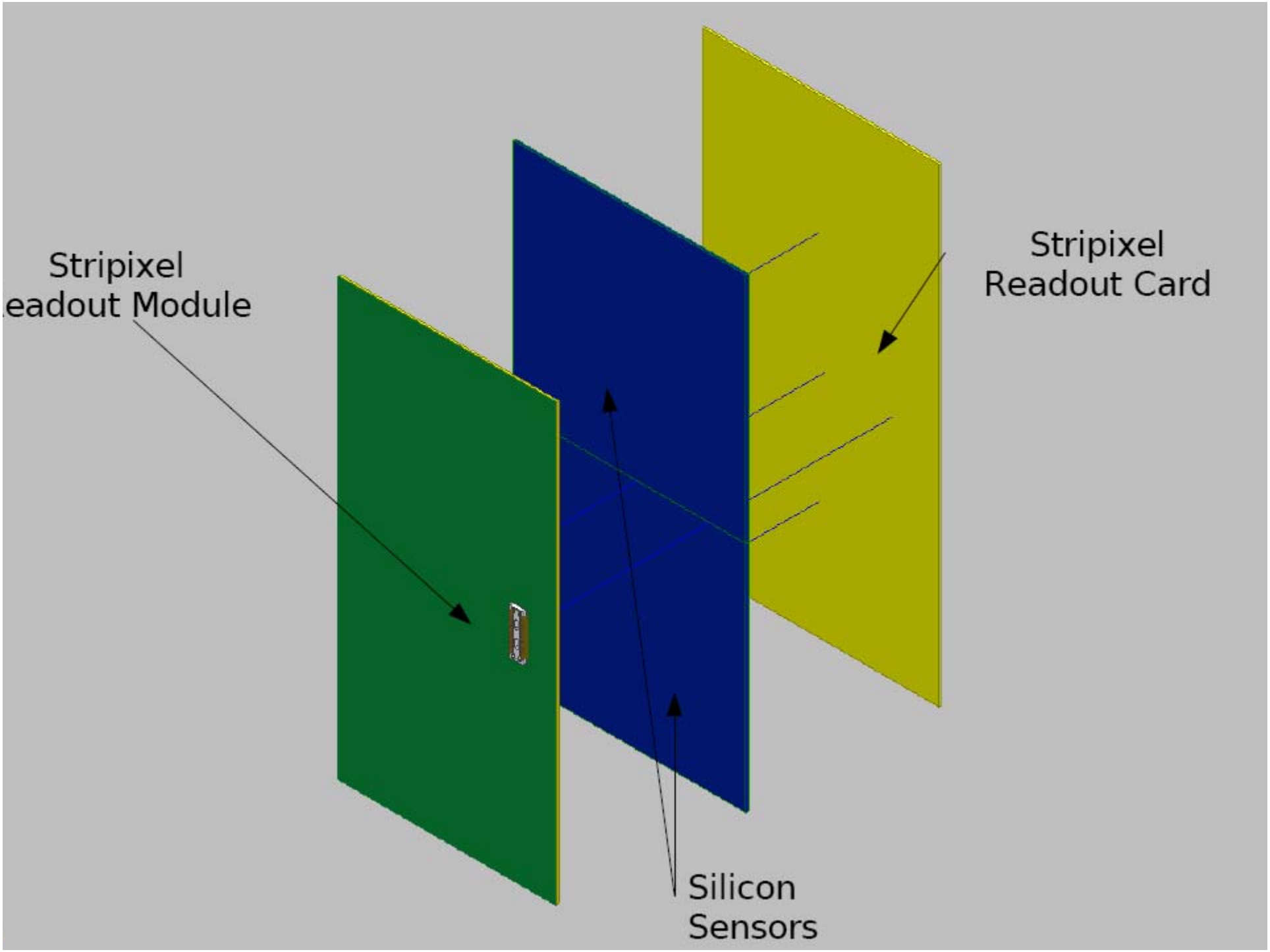


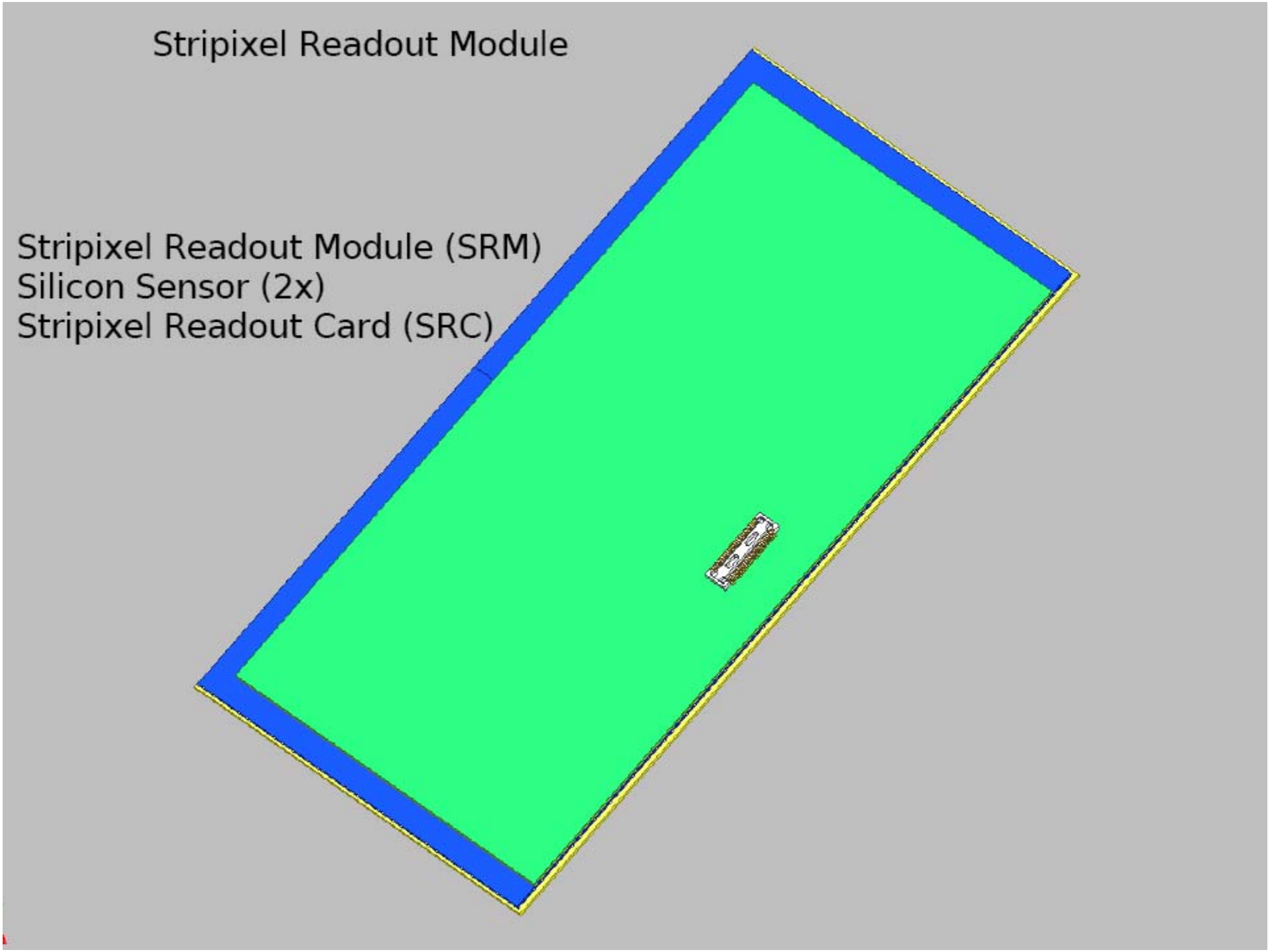
Pad sensor sub-assembly
Dubna

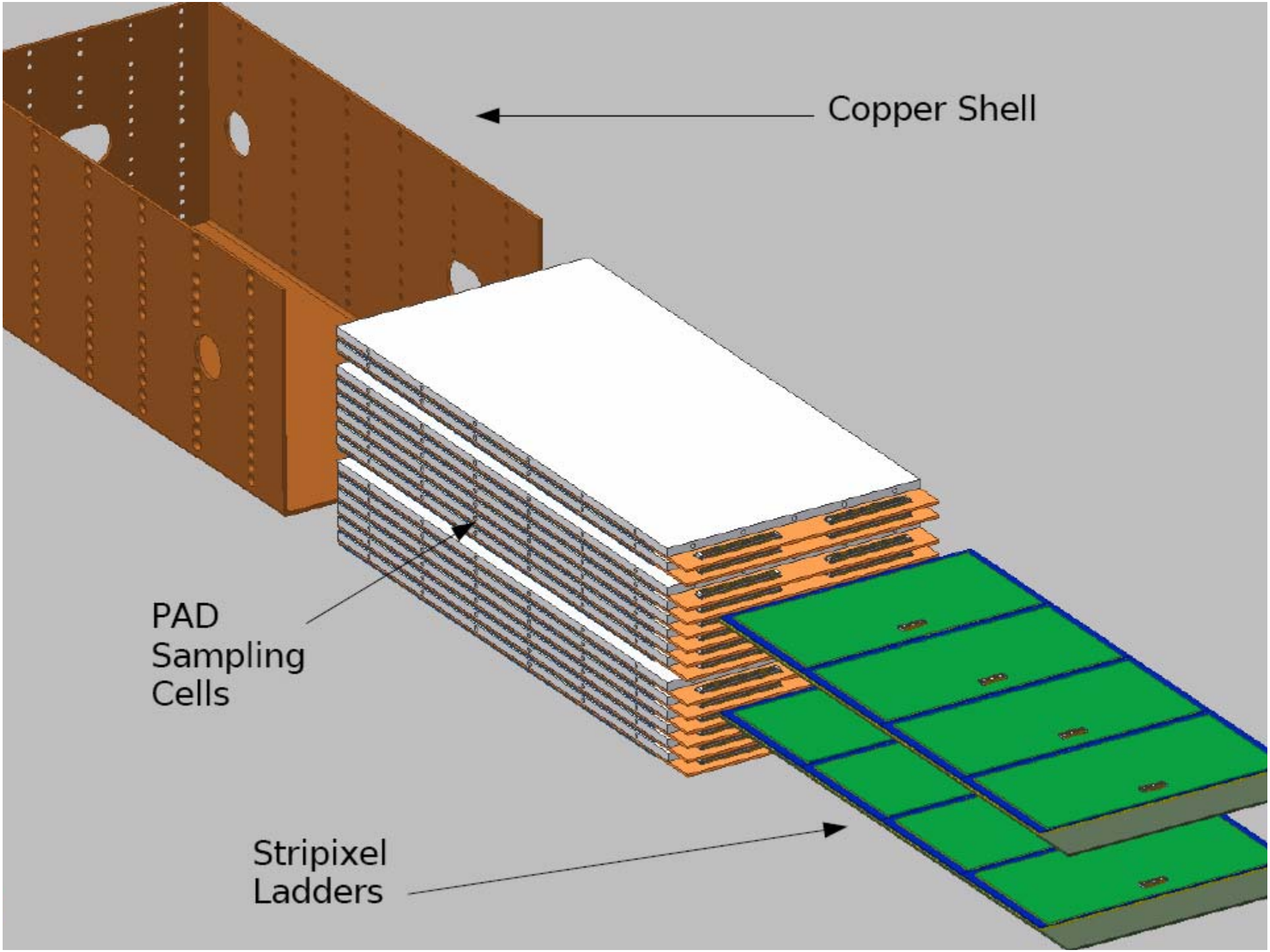


Pad sensor sub-assembly
attach to carrier board and W

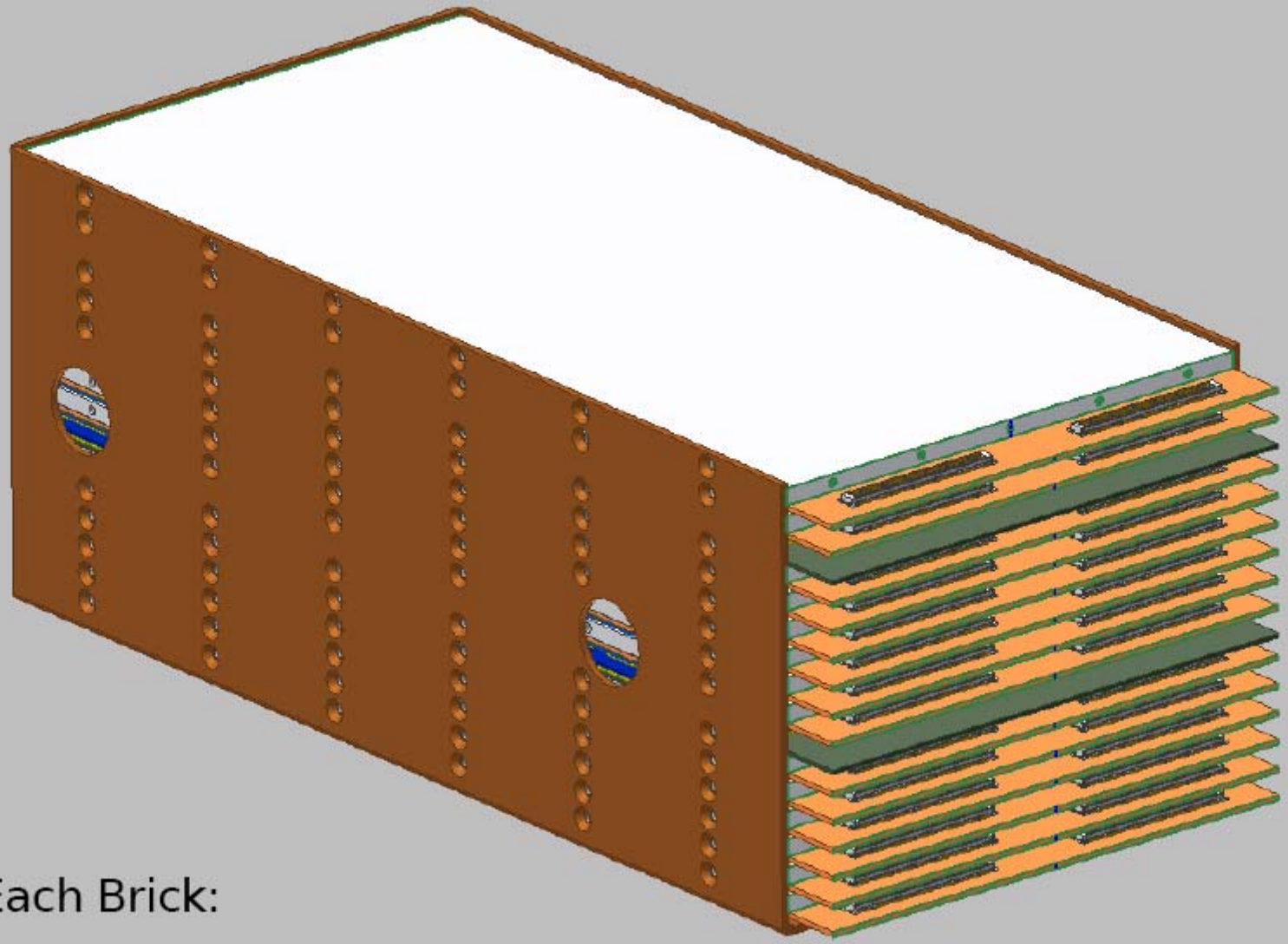

PAD Sampling Cell (2x4 Size)
4mm Tungsten Plate
PAD Carrier PCB
2x4 Silicon Sensor Array


Stripixel
eadout Module
Stripixel
Readout Card
Silicon
Sensors


Stripixel Readout Module
Stripixel Readout Module (SRM)
Silicon Sensor (2x)
Stripixel Readout Card (SRC)

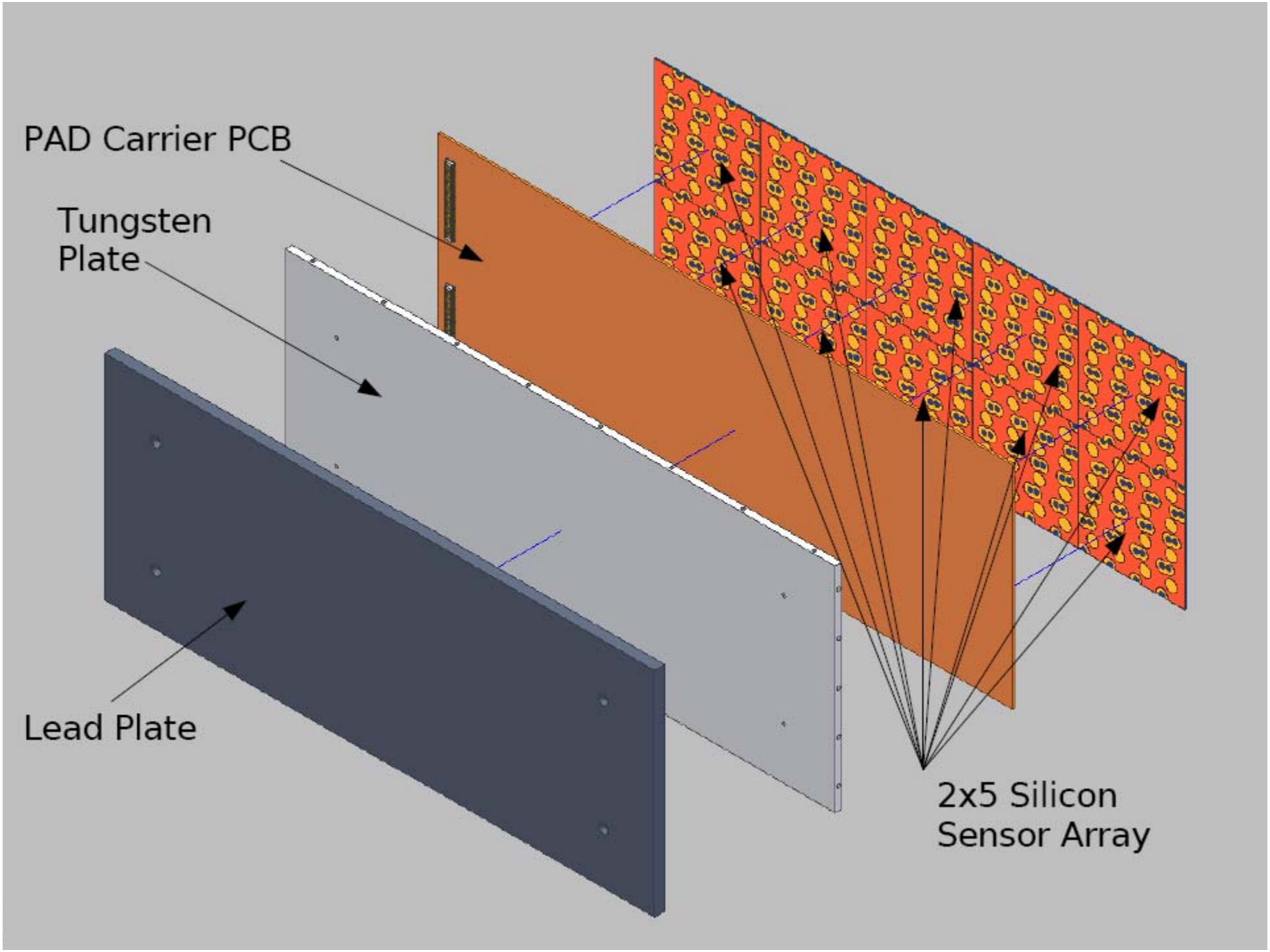

Copper Shell
PAD
Sampling
Cells
Stripixel
Ladders

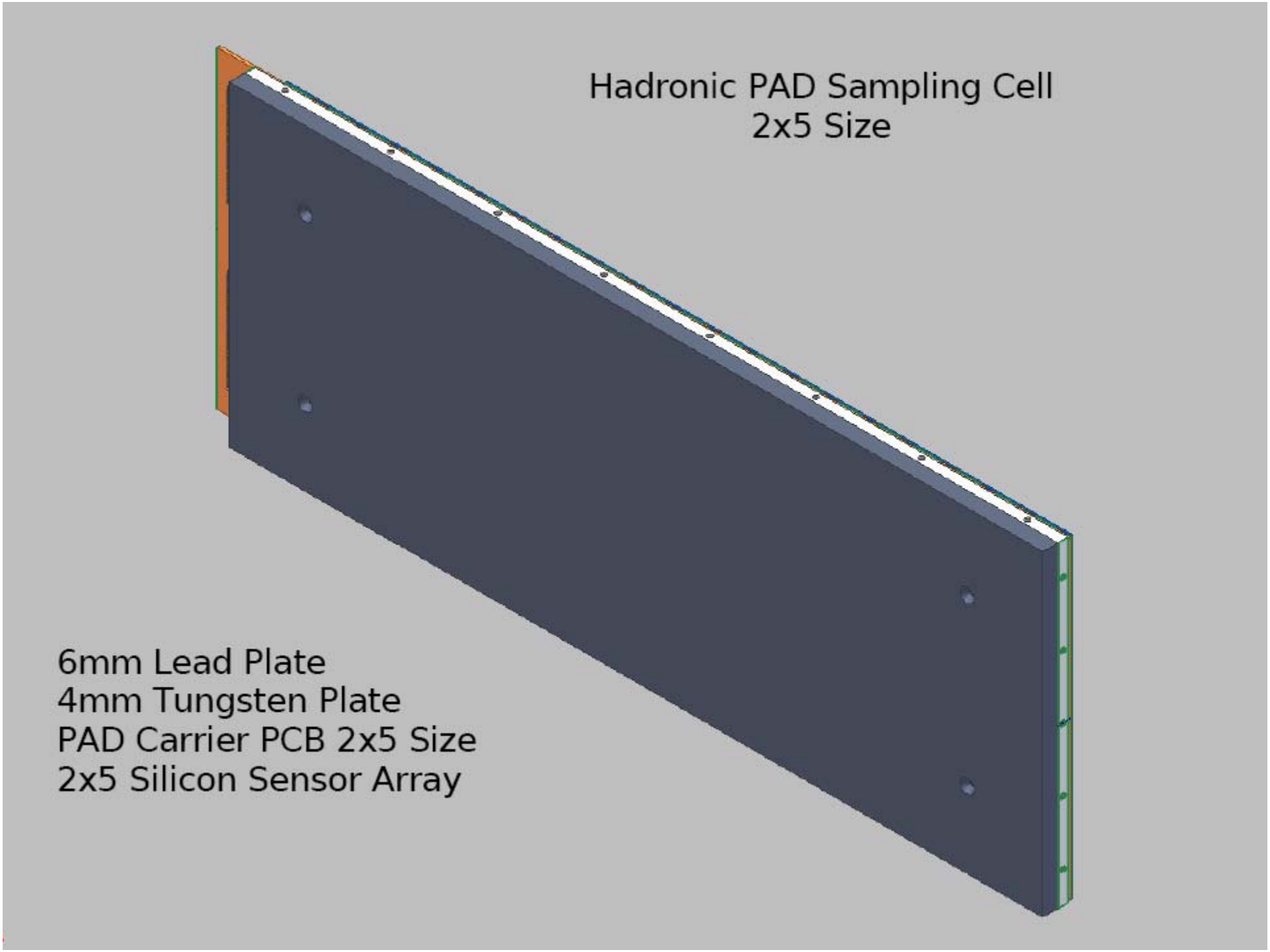
E.M. Brick (2x4 Sensor Size)

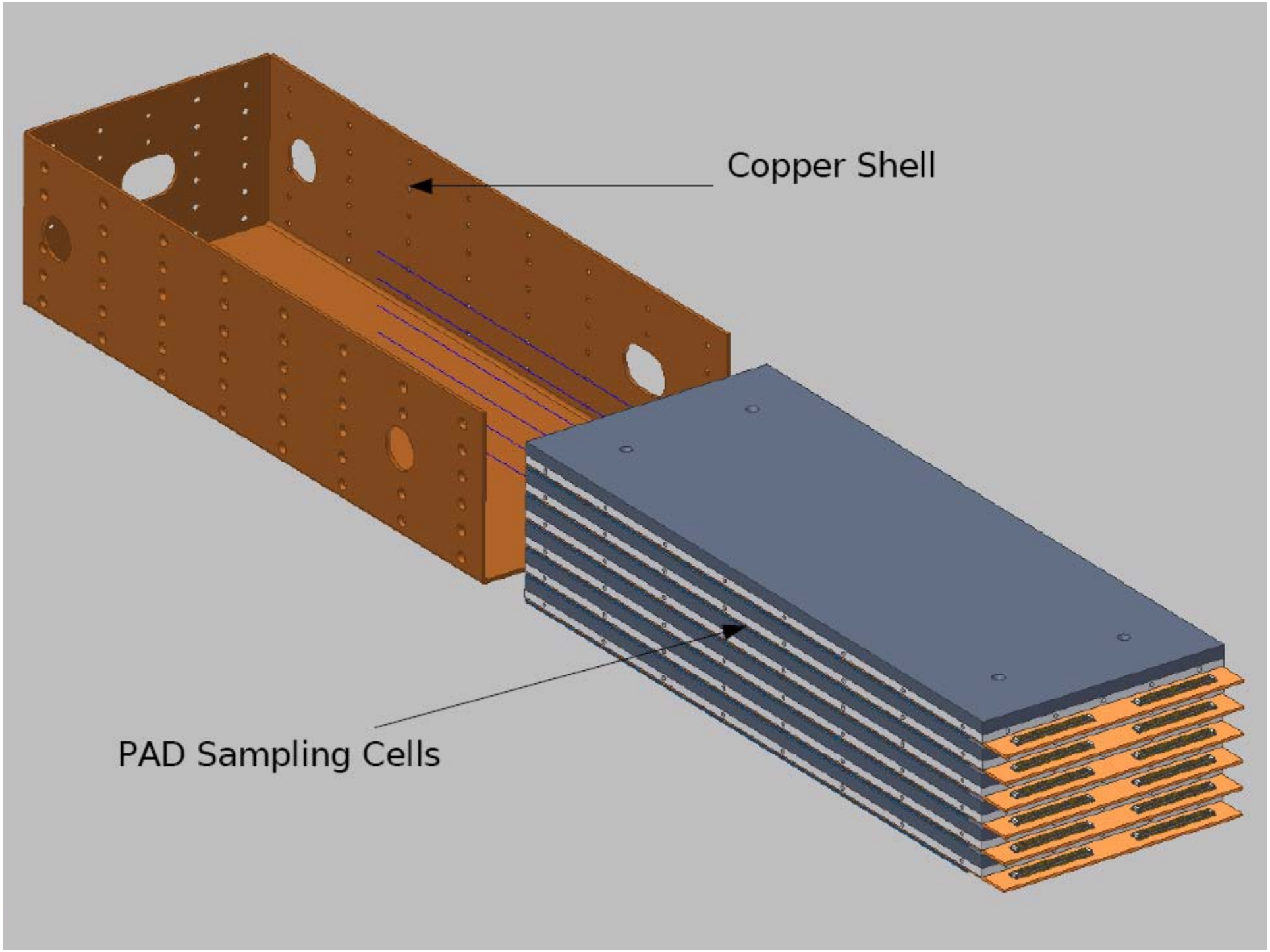


Each Brick:

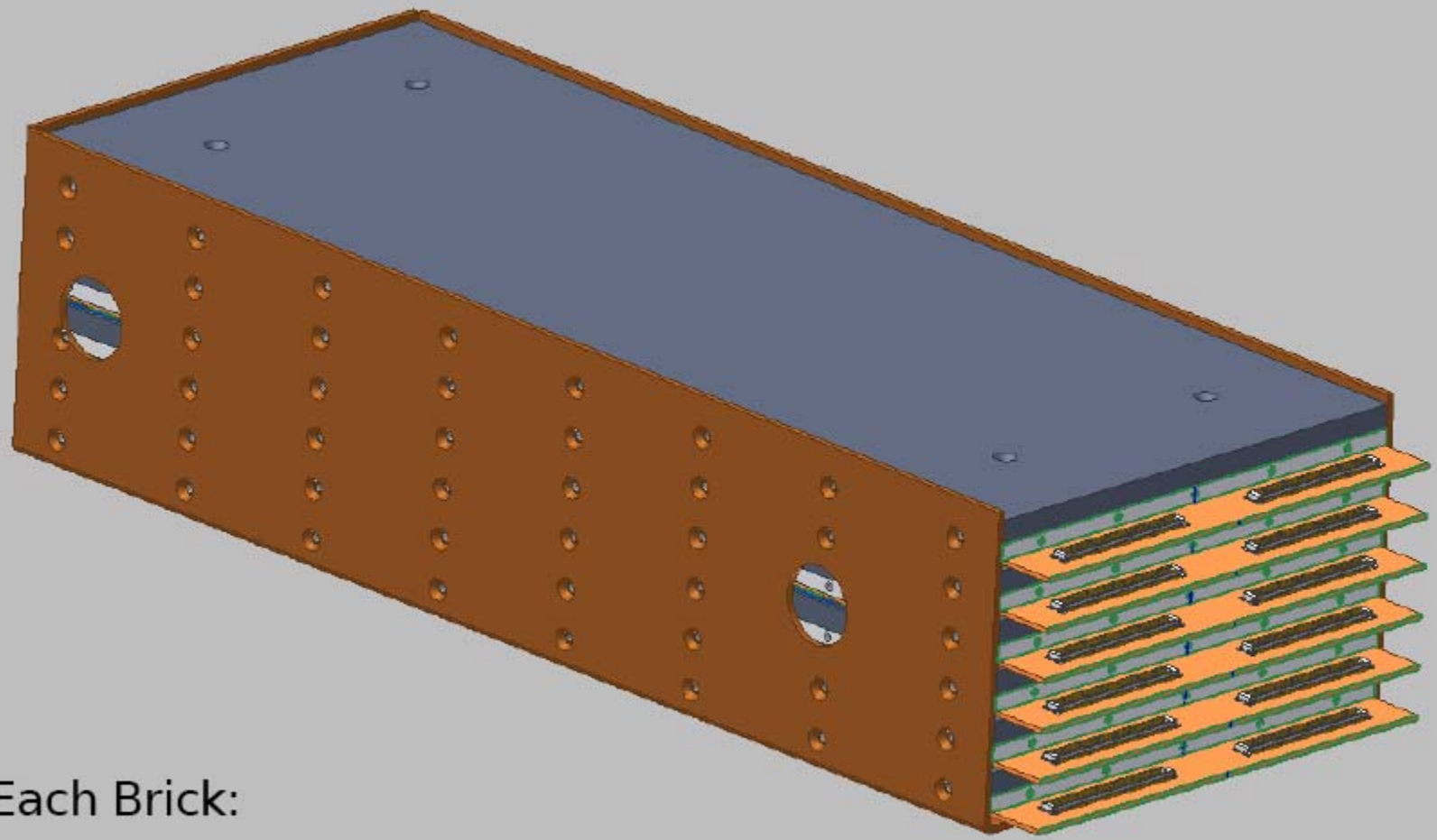
14 PAD Sampling Cells
2 Stripixel Ladders


PAD Carrier PCB
Tungsten Plate
Lead Plate
2x5 Silicon Sensor Array


Hadronic PAD Sampling Cell
2x5 Size
6mm Lead Plate
4mm Tungsten Plate
PAD Carrier PCB 2x5 Size
2x5 Silicon Sensor Array

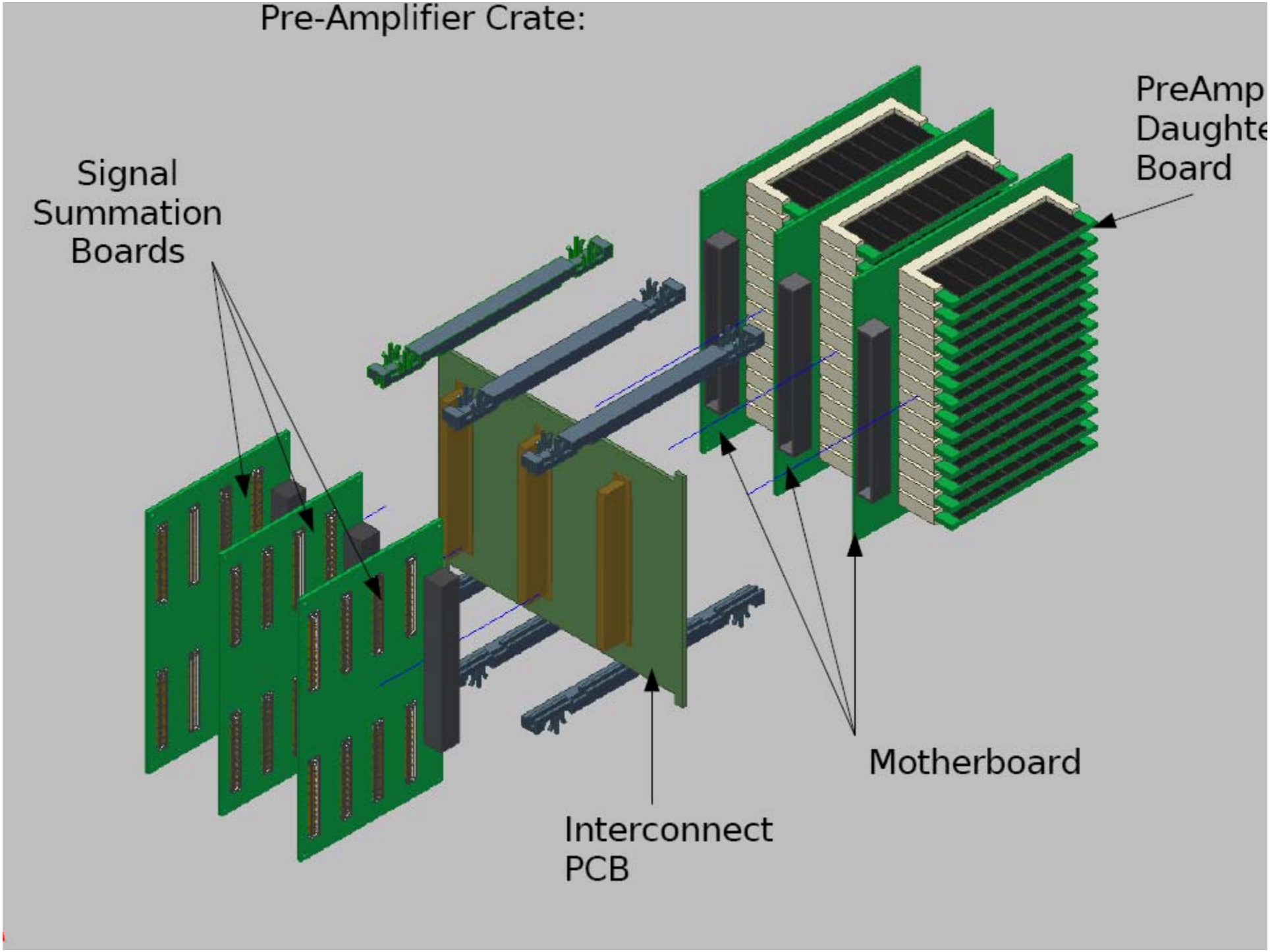

Copper Shell
PAD Sampling Cells

Hadronic Brick 2x5 Sensor Size

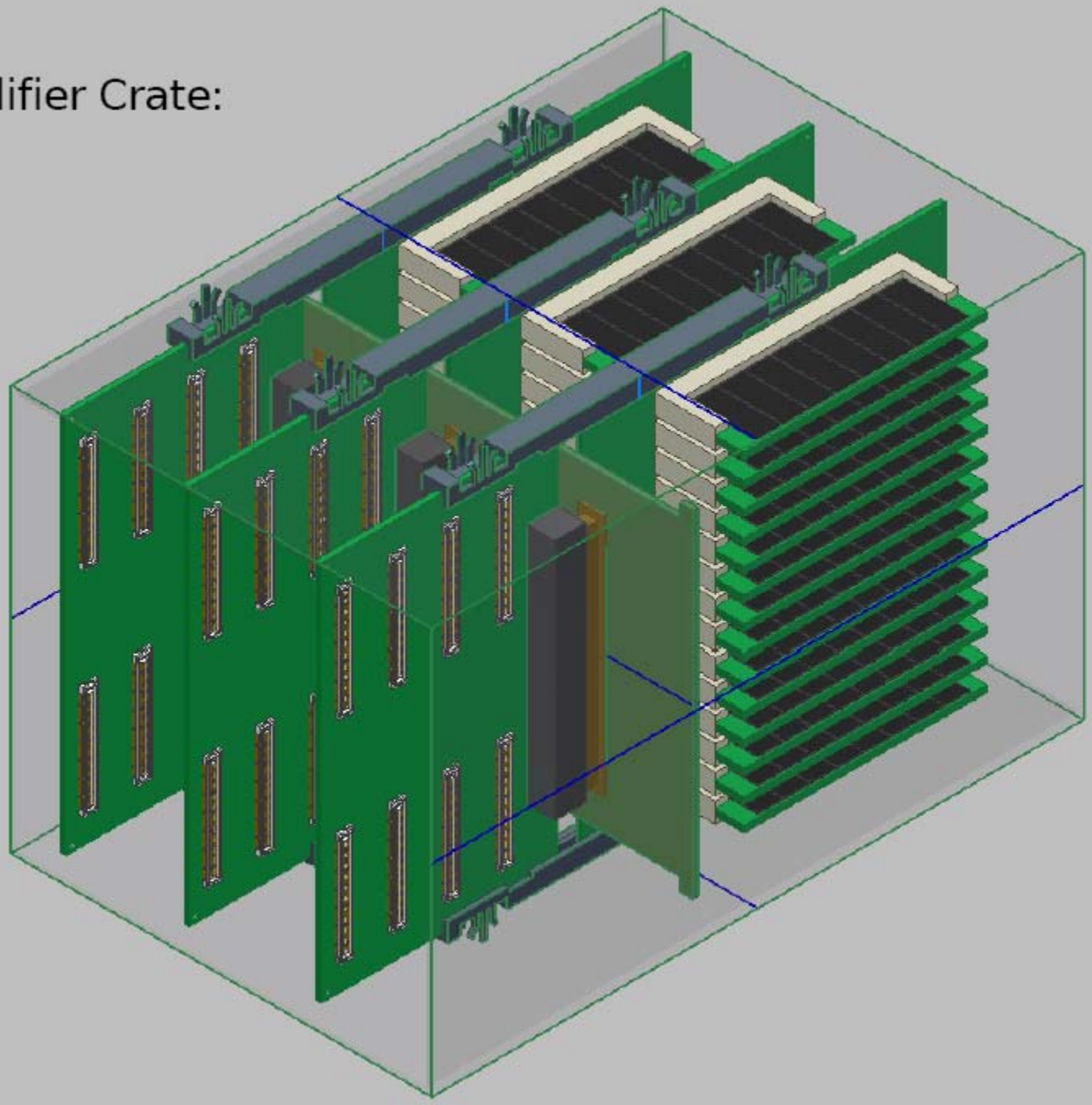


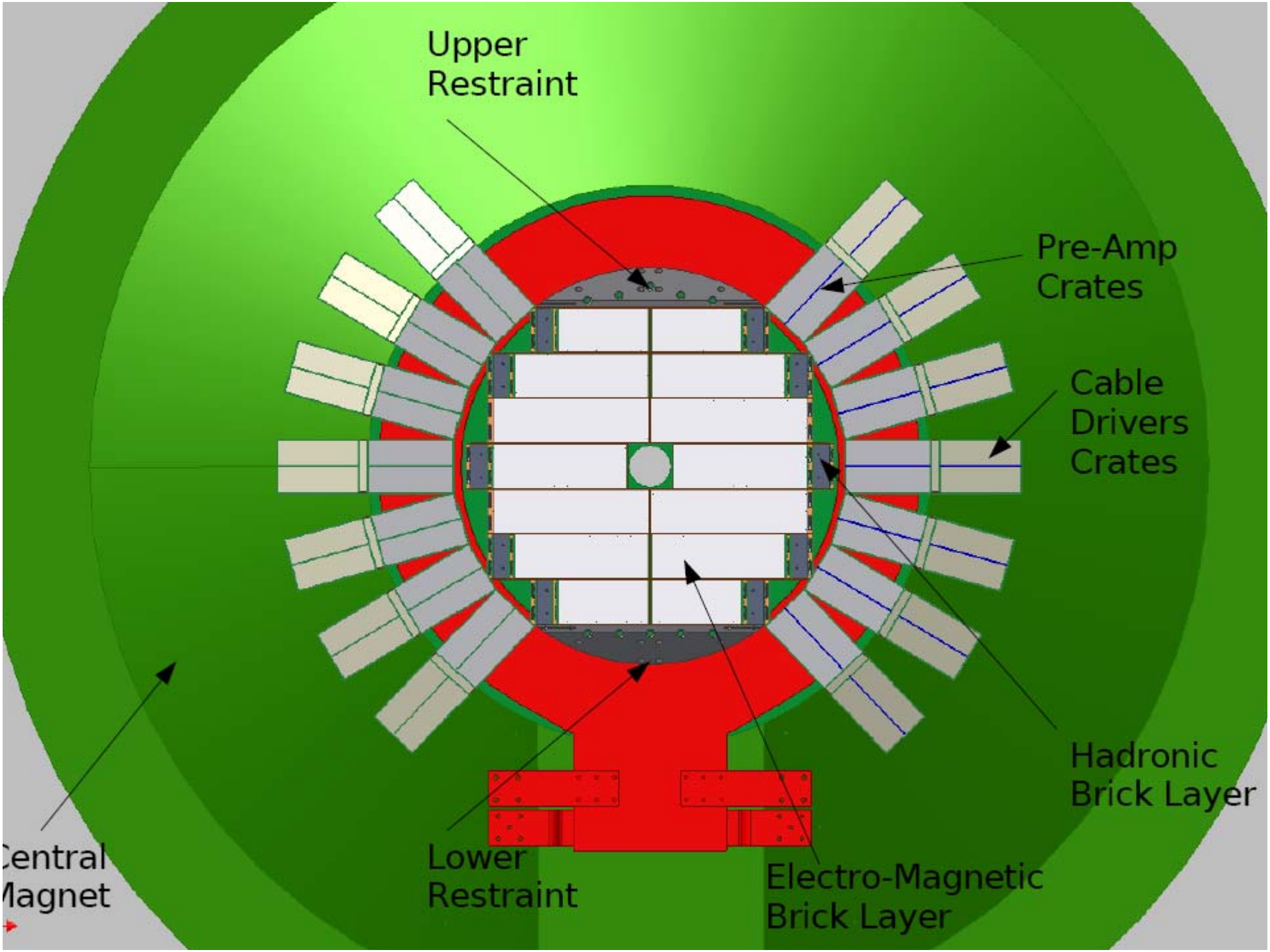
Each Brick:

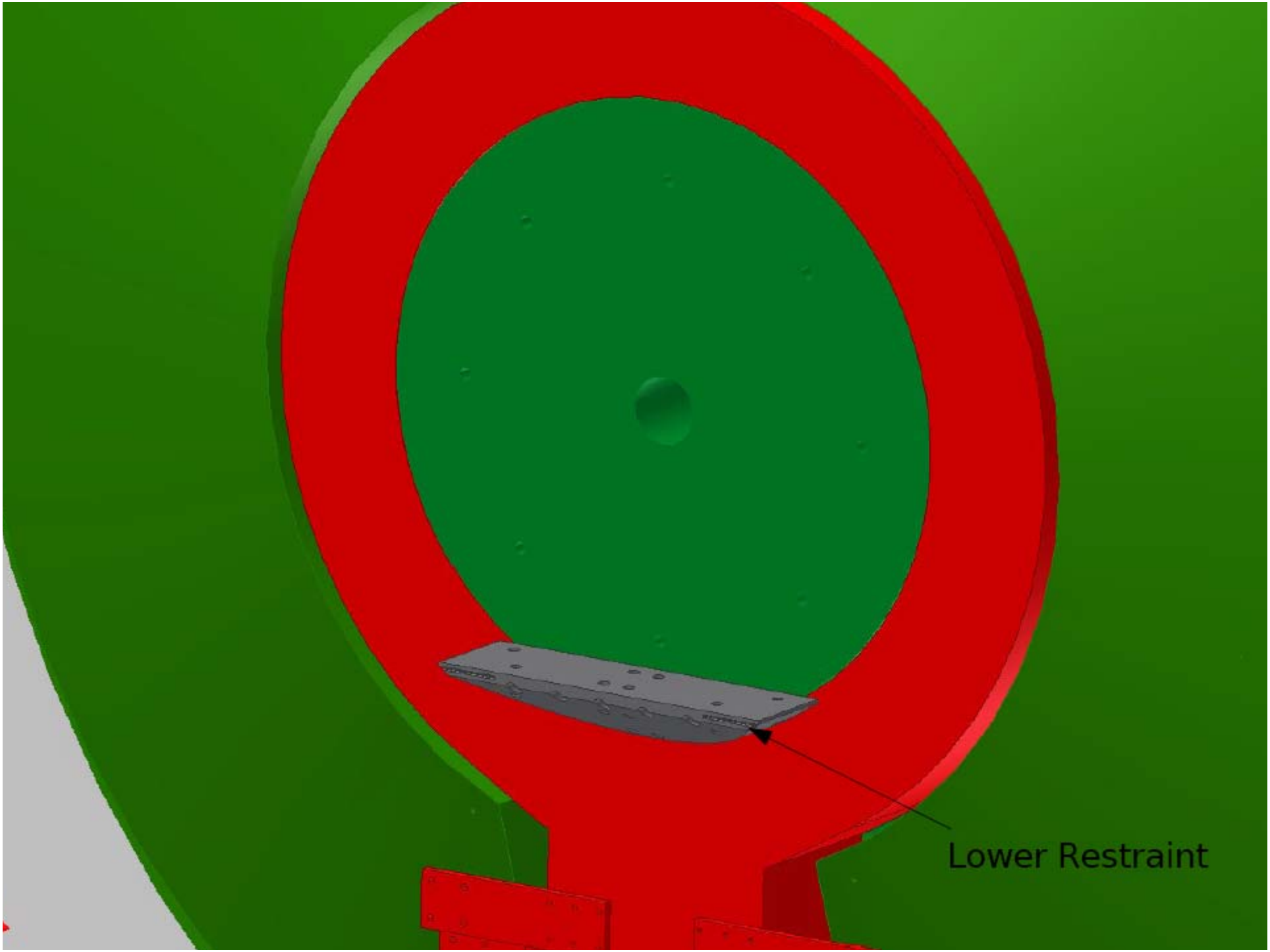
6 PAD Sampling Cells

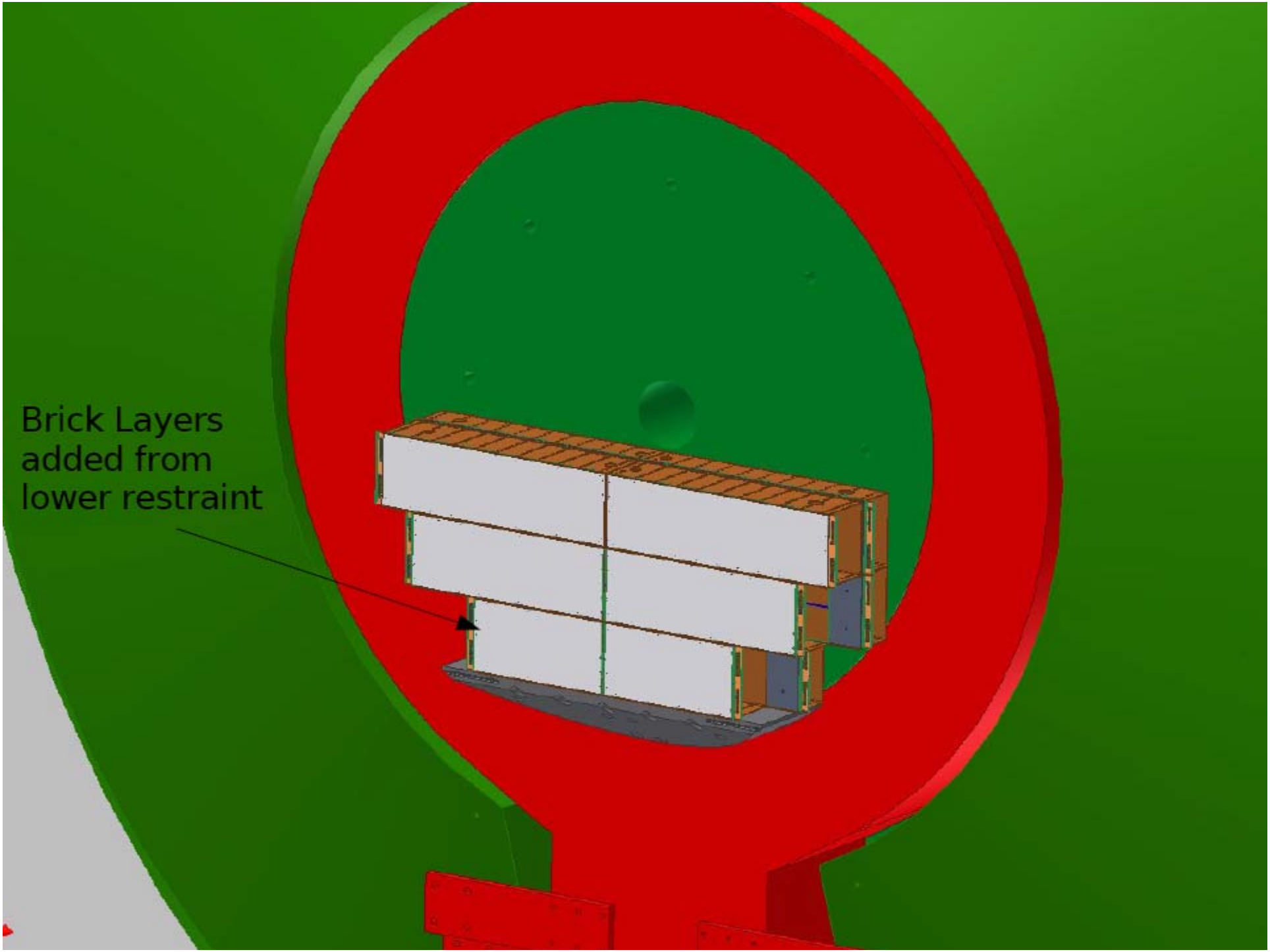

Pre-Amplifier Crate:
Signal Summation Boards
PreAmp Daughte Board
Motherboard
Interconnect PCB

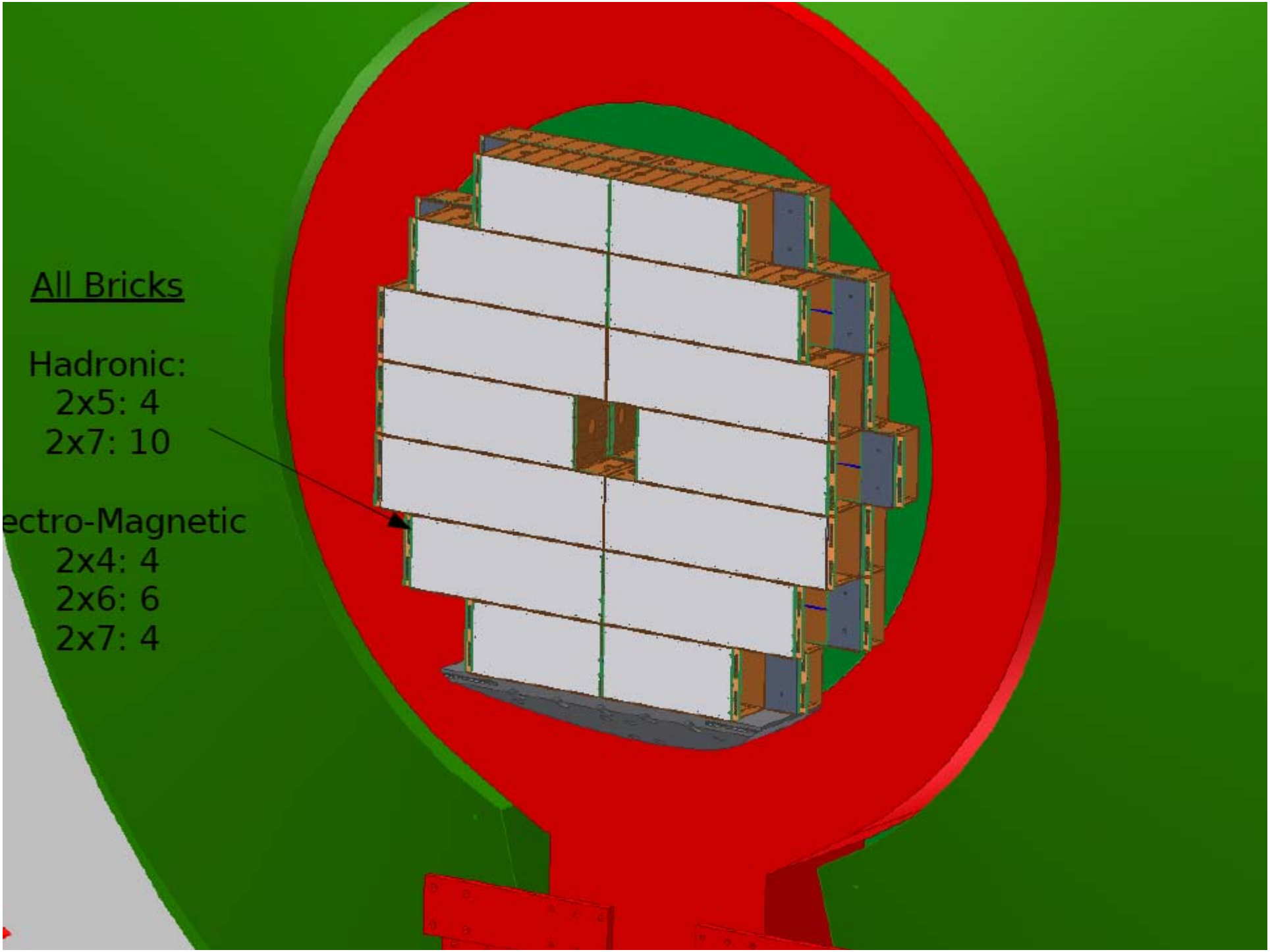
Pre-Amplifier Crate:

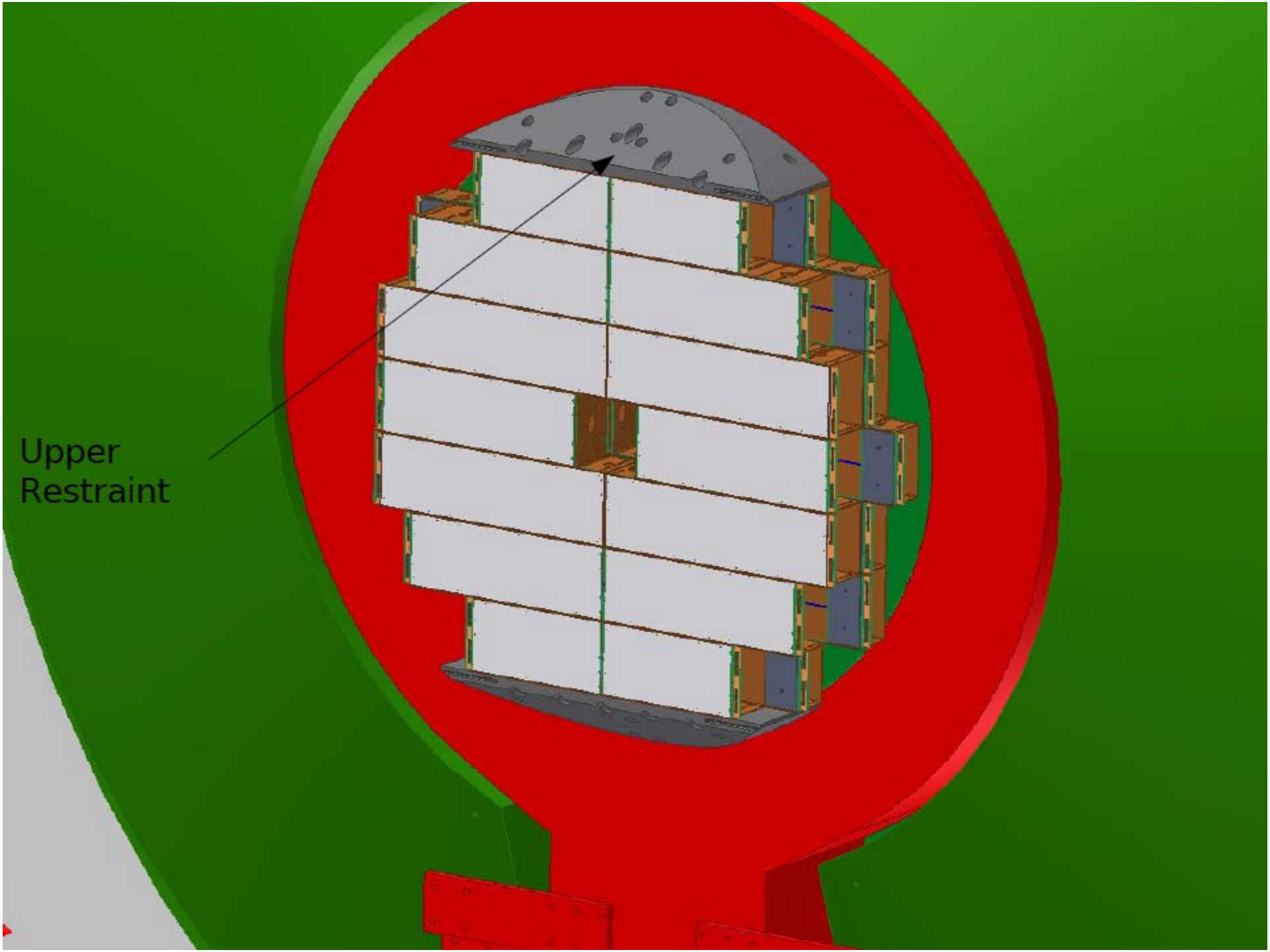


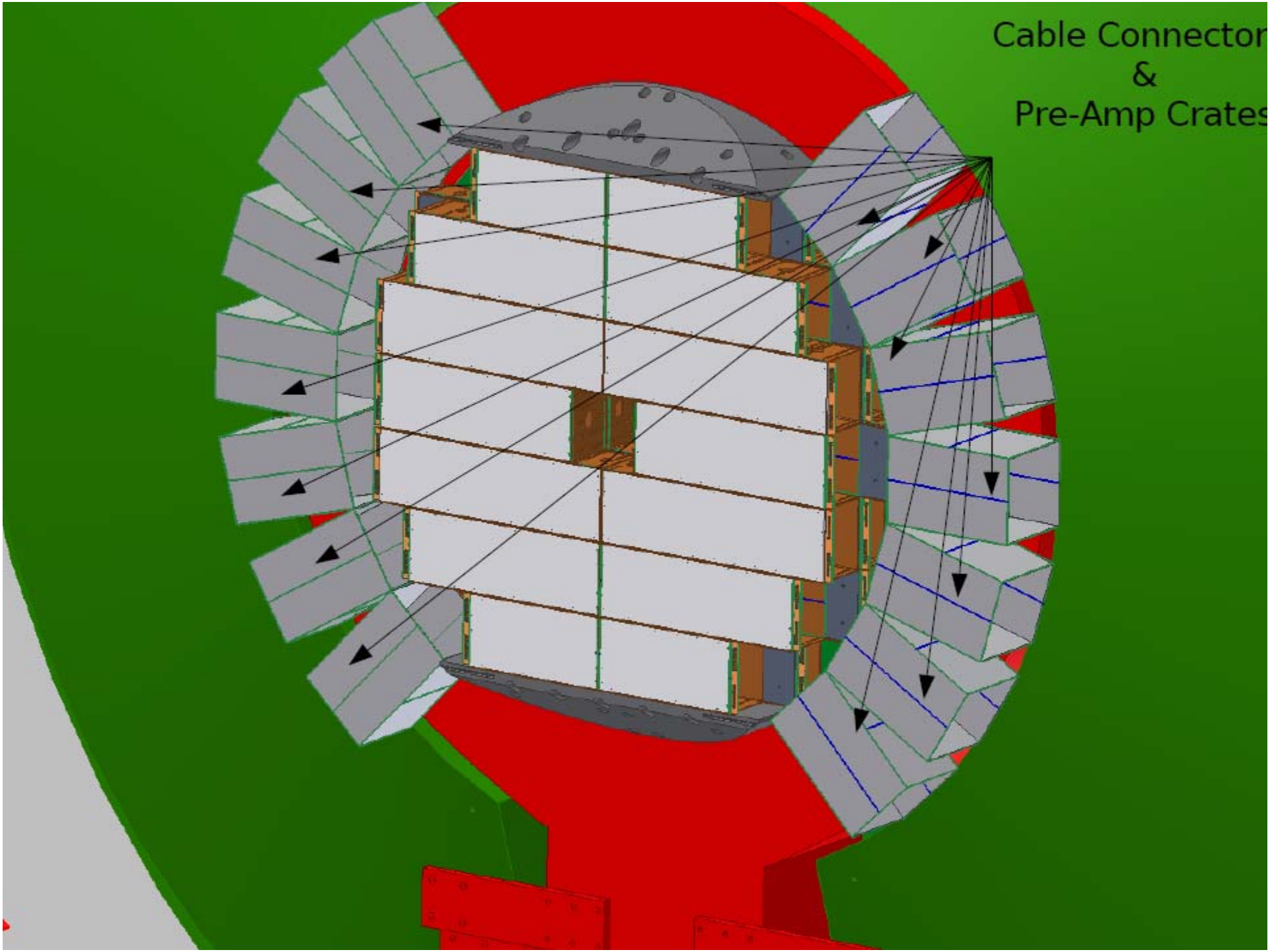

Upper
Restraint
Pre-Amp
Crates
Cable
Drivers
Crates
Hadronic
Brick Layer
Central
Magnet
Lower
Restraint
Electro-Magnetic
Brick Layer

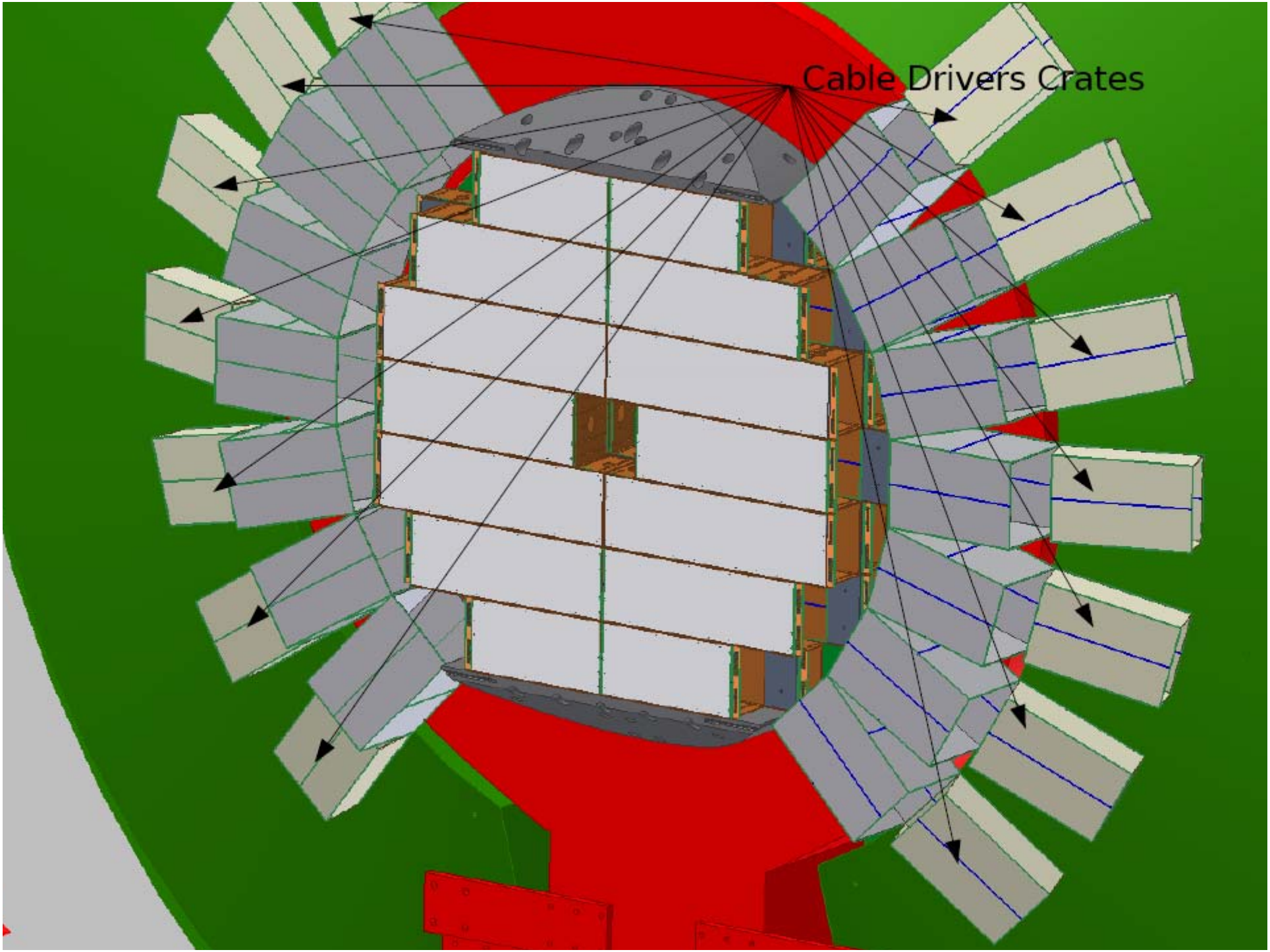

Lower Restraint


Brick Layers
added from
lower restraint


All Bricks
Hadronic:
2x5: 4
2x7: 10
ectro-Magnetic
2x4: 4
2x6: 6
2x7: 4


Upper
Restraint


Cable Connector
&
Pre-Amp Crates


Cable Drivers Crates