SVT-IB support update

(+ a short extra)

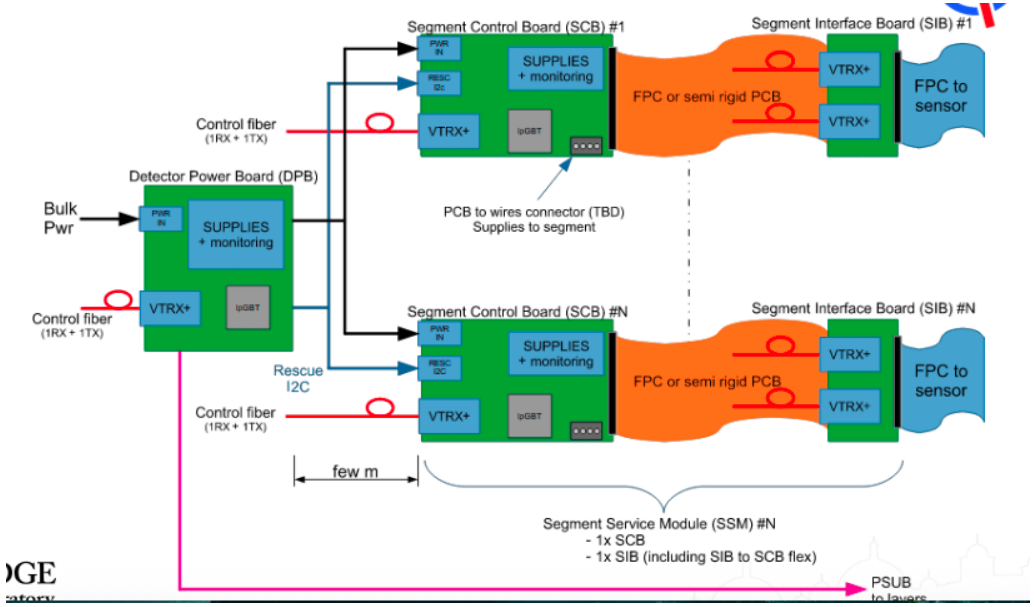
Rosario Turrisi

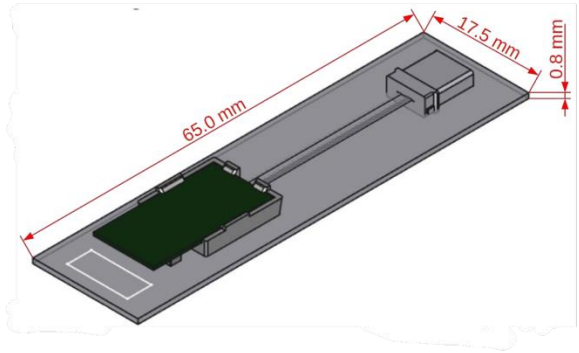
Status of the IB support design

- IB L0-L1 support has a rather stable design – after a few updates the last version will be ‘’material-budget checked’’ and sent to Ben Denos/BNL
- IB L2: preliminary layout, next step will be to tangle details of the support arms/cone thinking of the assembly procedure and of the integration with L0+L1 – at the moment the two supports are separated, connection between the two is still an open question
- Focus on L2 will grow soon, tests with mock-ups will start next year
- We are facing the definition of details about L0+L1 (but L2 is also concerned) which are dependent on services (cooling, powering, RO)
- …what brings me to next slides…

NB not requests, but questions we are facing…

Size and position of SIB/FIB, SCB



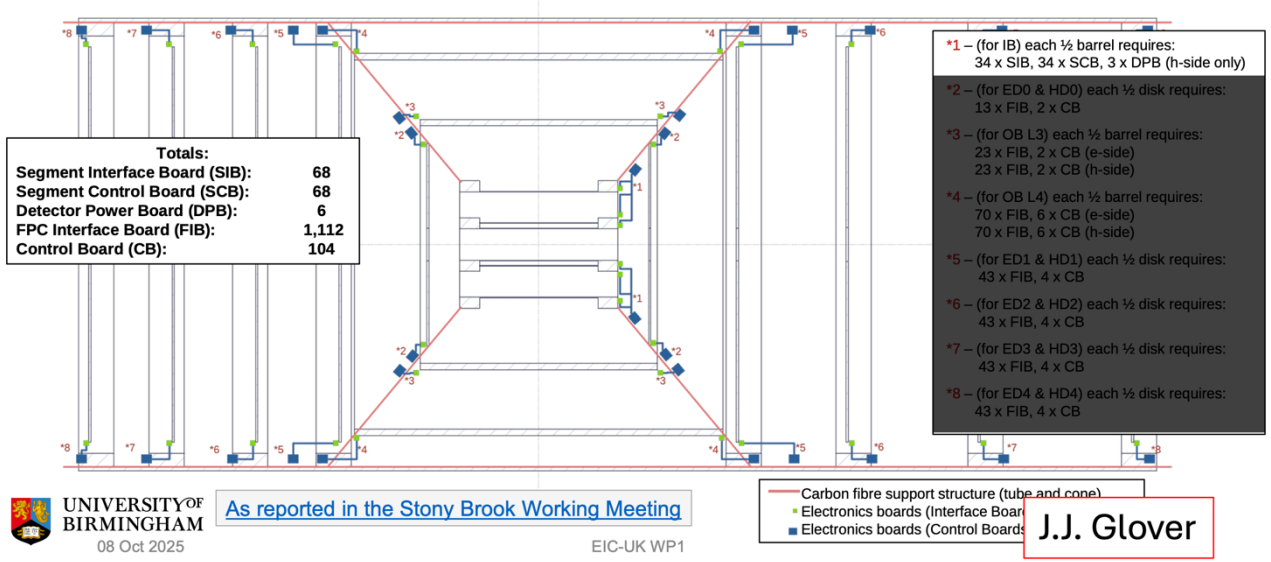


Few images taken from last messages from James (thank you) :

- May I assume each FPC from sensor will be plugged to a single board?
- The board (bottom left picture) is bare support (may we think of holes in it?)
- Design of SCBs and their position still evolving, not many details to allow a preliminary position and connection…→
- Limits on the length of cables constrained by specs on the V-drop (0.1%), 25 cm assumed to be fine, SIB-SCB flex should be on the same standard?

Approx SVT RDO board locations

Work in progress



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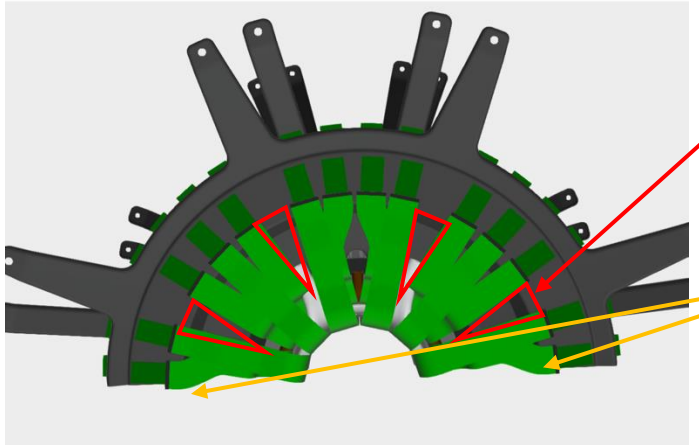
As reported in the Stony Brook Working Meeting

J.J. Glover

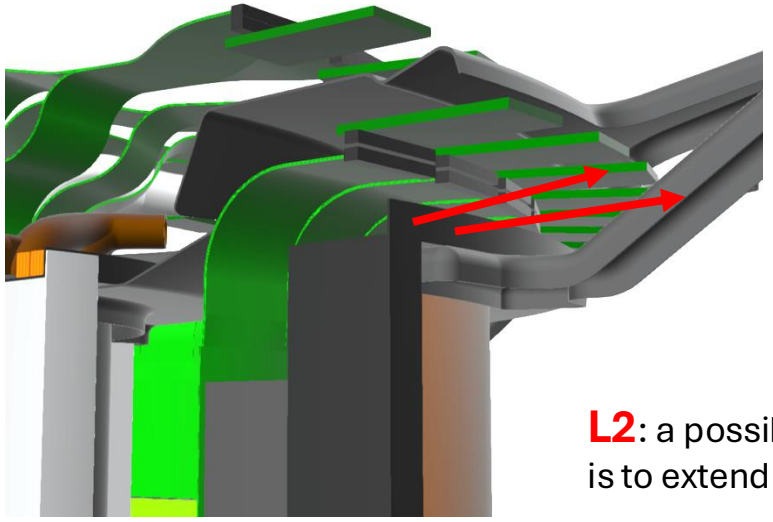
Current FPCs layout and boards position

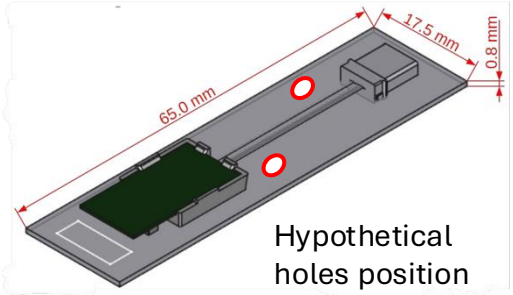


L0+L1: These openings between FPCs are intended for air pipes routing

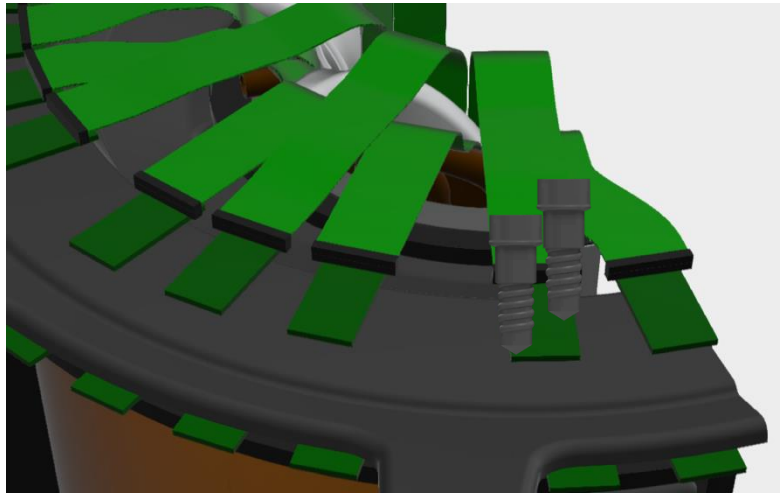
These FPCs have an ‘S’ shaped design – or must be twisted. Completely different routing needs a rethinking of the support.
NB twisting means torque on the connector, a clip or similar should be inserted for mechanical stiffness.
Also, tests needed to verify that twisting does not push the FPC out of the SVT envelope

Board
Gasket
CFC



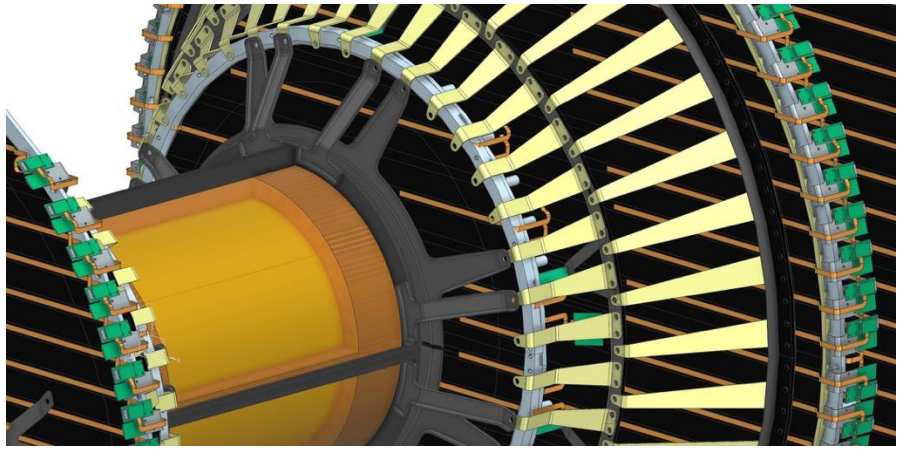


Hypothetical holes position

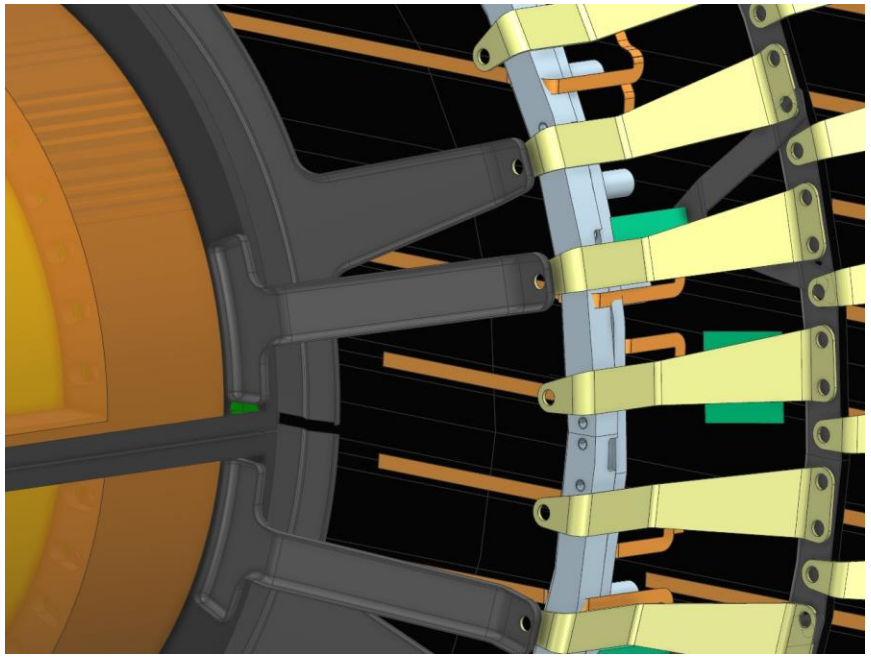


L2: a possibility to fix the boards is to extend the support border

Connection SVT-IB – rest of the world

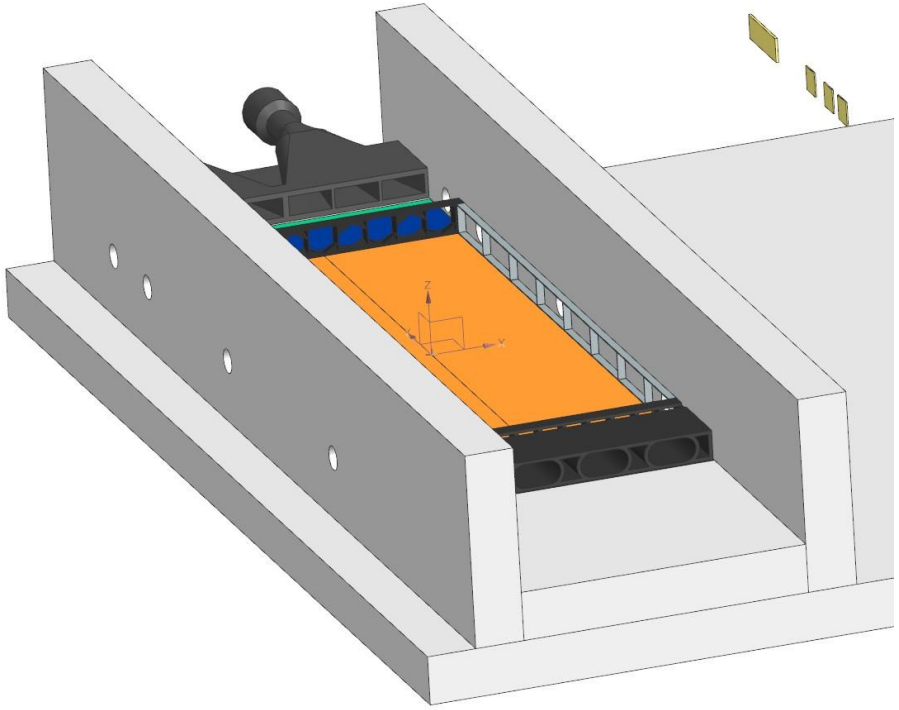


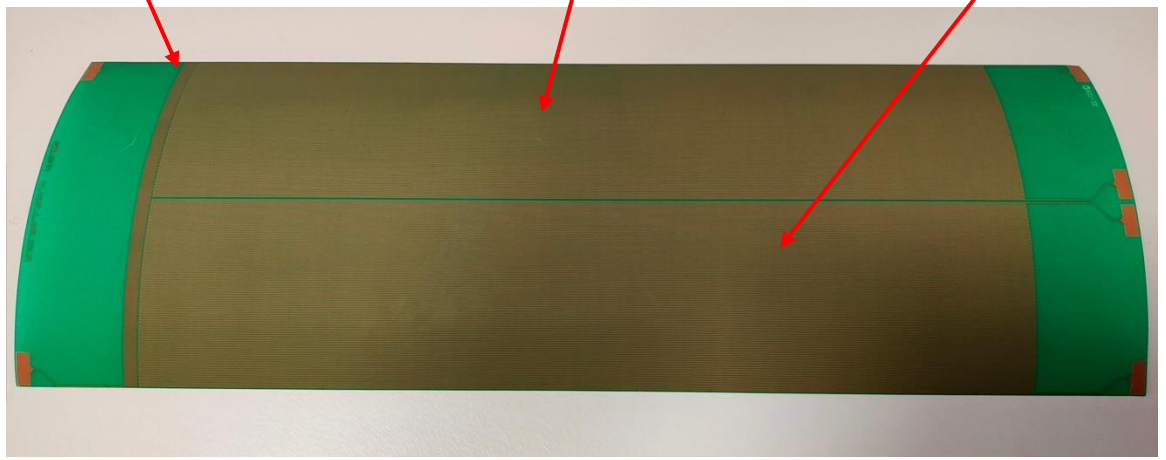
In the current design, few ‘’arms’’ connect the IB support, we would like to evaluate the possibility of more ‘’arms’’ (at the cost of material budget) to improve mechanical stability – here detector alignment is at stakes…



Simplified thermal mock-up

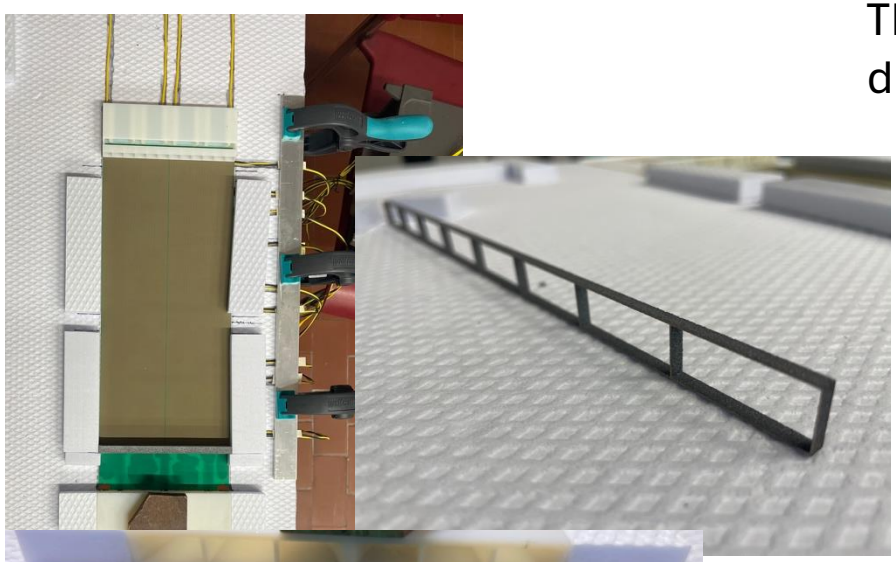
- Glass epoxy pcb with copper trace
- Simulation of LEC (1.6 W/cm^2) and sensor (0.04 W/cm^2)
- Air flow from compressed air
- Heat dissipators (Al), air distributors (PLA) 3D printed
- Goal: air cooling test with high dissipation from the LEC and material (Al) alternative to carbon foam)

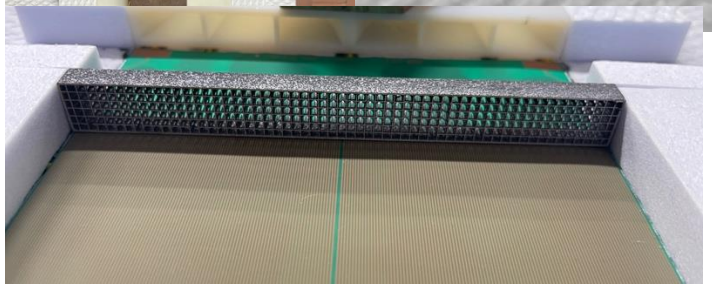




L0-sized heat dissipator

Simplified thermal mock-up





The setup is nearly ready, we have a few dissipators to be tested. Update next moth.