Thoughts on DHCAL slabs

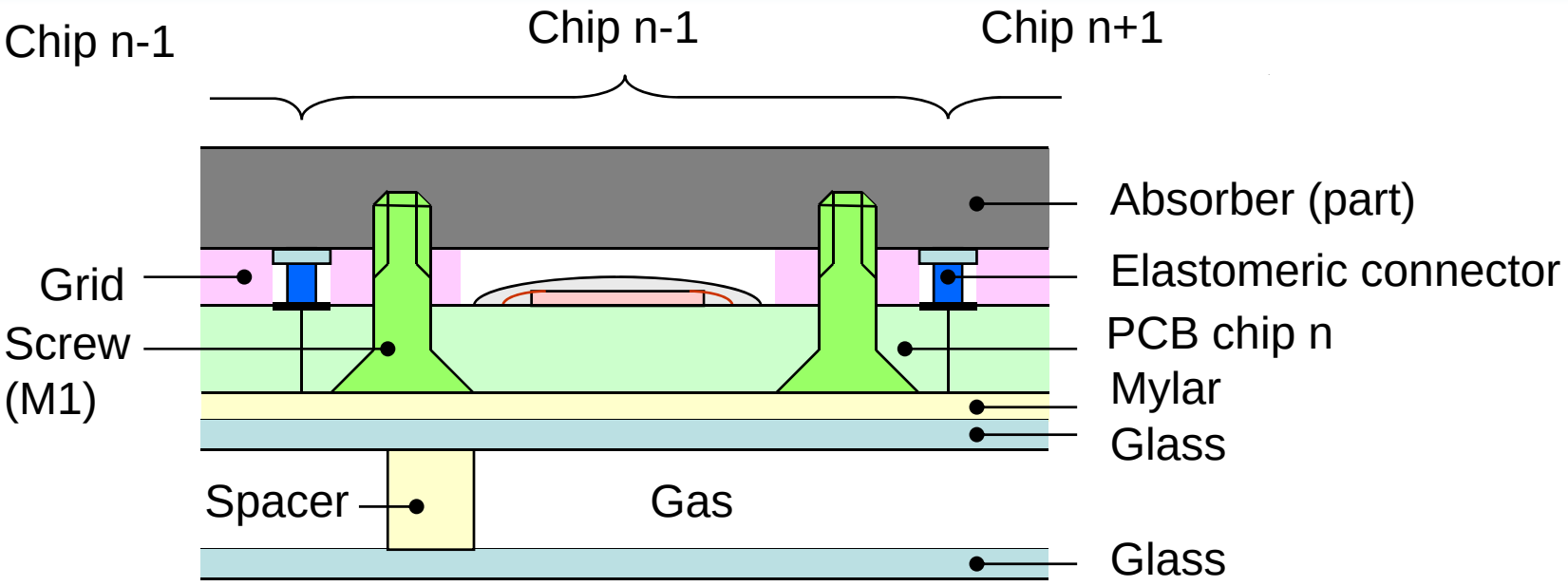
What we need :

Around 40 detector plans stacked in 1 meter
Large plans : around 2 m x 1 m (70cm x 70cm for prototype)
Each plan as homogenous as possible (as well in pads geometry as in flatness).

What constraints do we have :

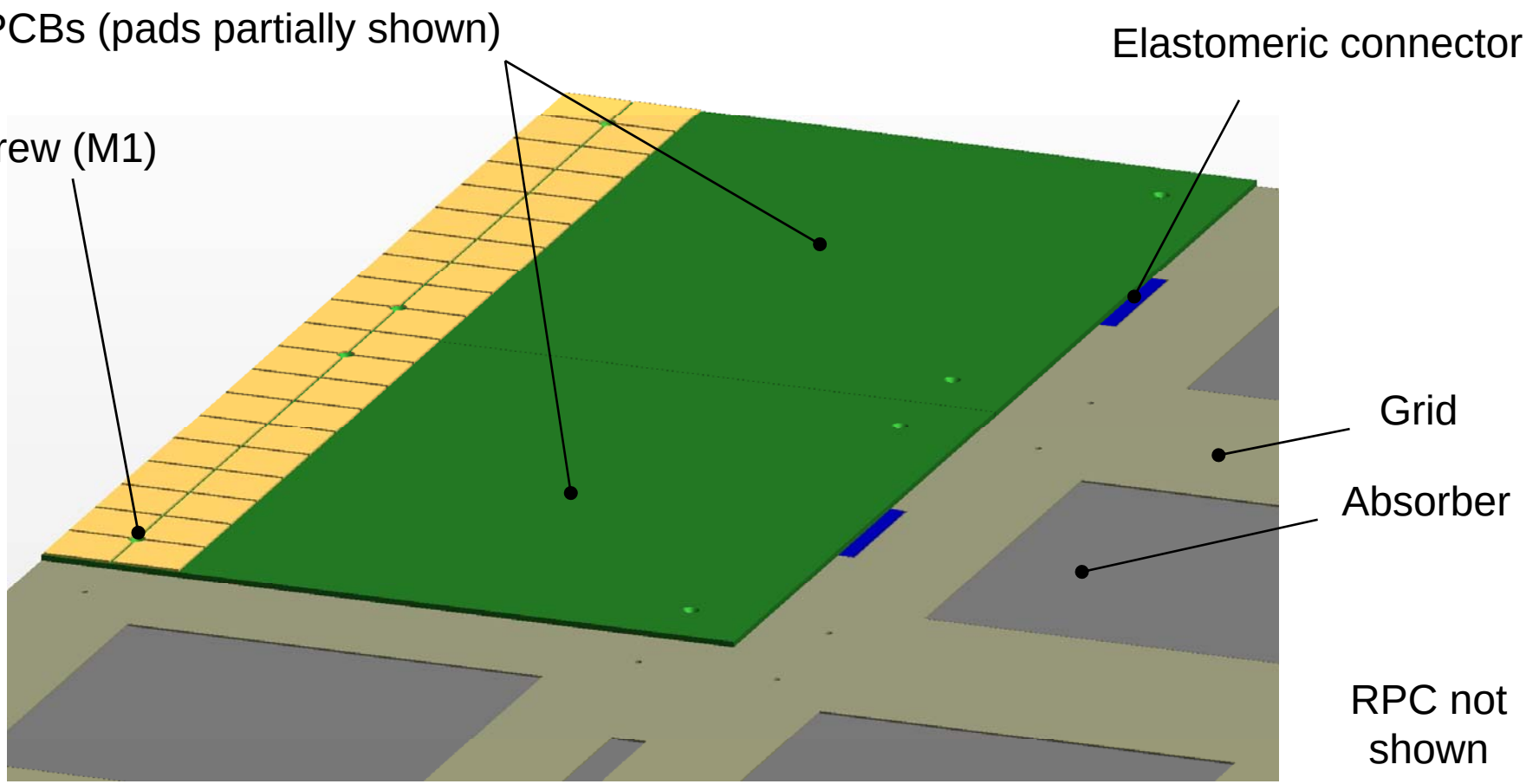
Testability and debug (at least for square meter prototype)
Thickness
Flatness
Power dissipation
Cost
Reliability

Slab construction idea (1)



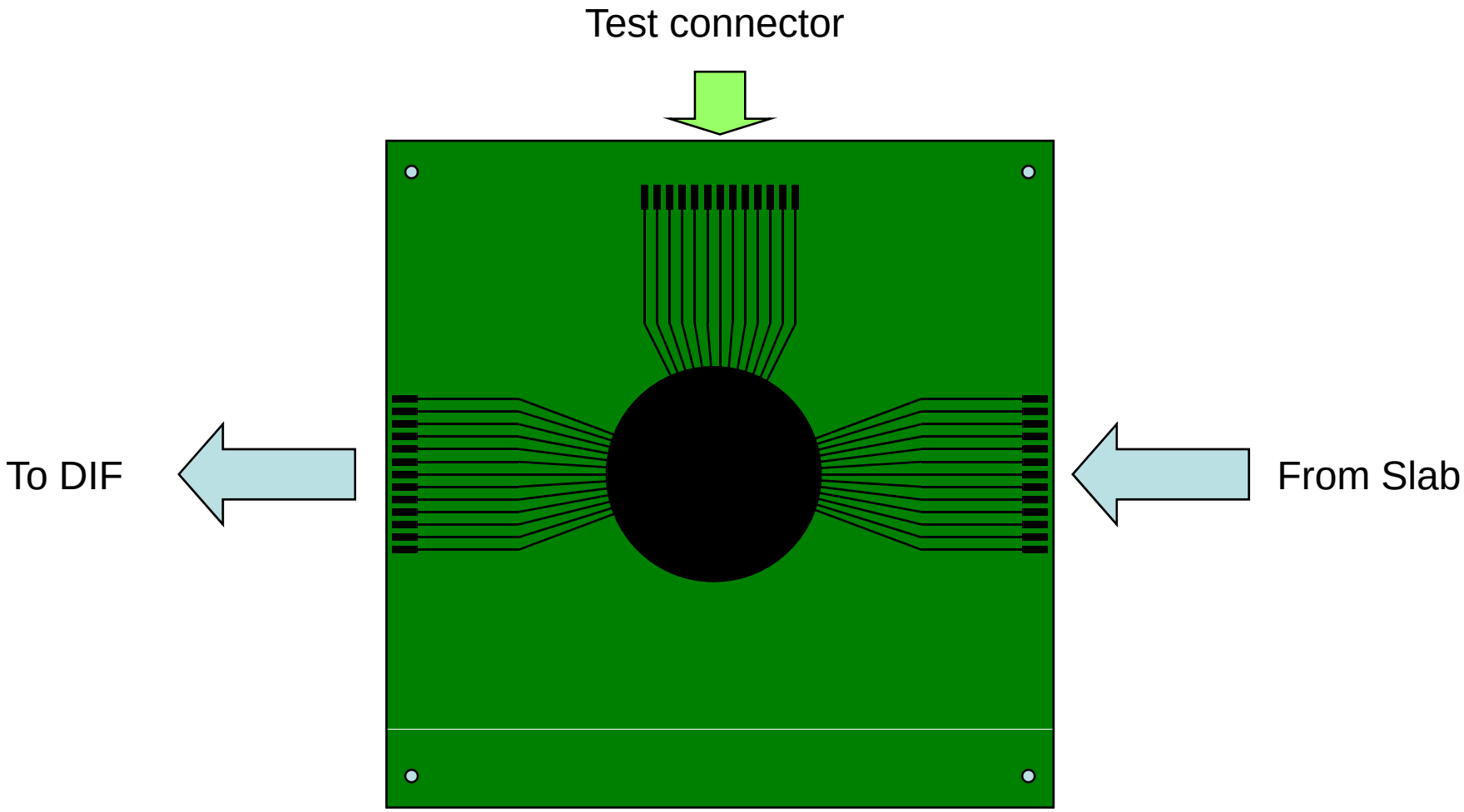
- 1 to 4 asics per PCB, bounded and protected with glop top
  → no need to test the asic before bounding, extensive tests can be performed after bounding on the PCB
- No glue, all mechanical connections screwed (M1, DIN965)
- Connections between cards made by eleastomeric connectors (or solded SMD straps)
- Grid is ~300 µm bare PCB (one for all the plane)
- Absorber (or part of the absorber) is used as mechanical reference

Slab construction idea (2)



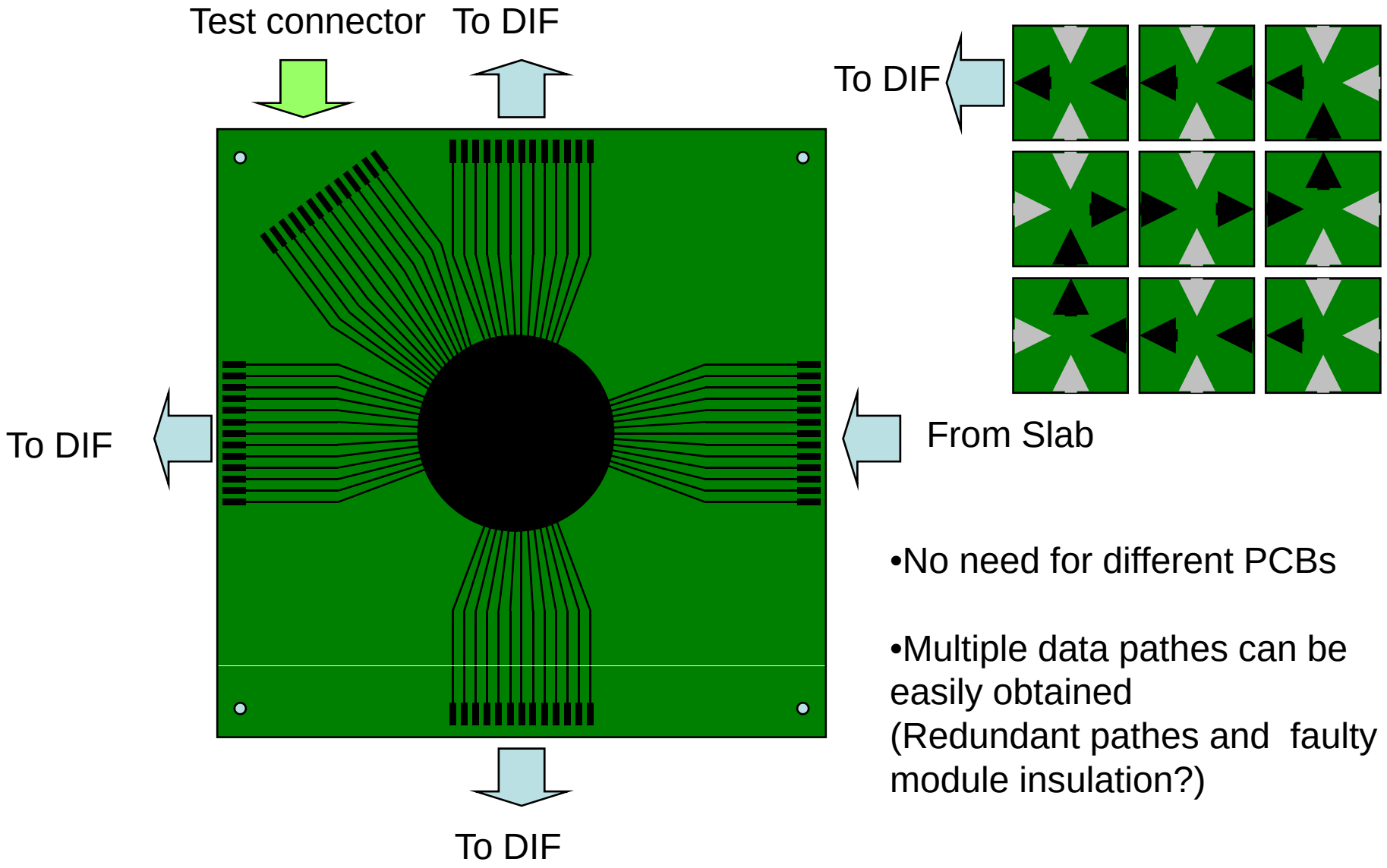
Space between pads = 500µm →screws reduce the pad surface of 0.7%
Space between pads = 1mm →screws reduce the pad surface of 0.3%

Slab construction idea (3)



- PCB becomes cheap → Can test asics when bounded ➔ extensive tests possible

Slab construction idea (4)



- No need for different PCBs
- Multiple data pathes can be easily obtained
(Redundant pathes and faulty module insulation?)

Conclusion

Prototyping and tests will be performed this fall…

So, please comment and criticize!