

pfRICH updates

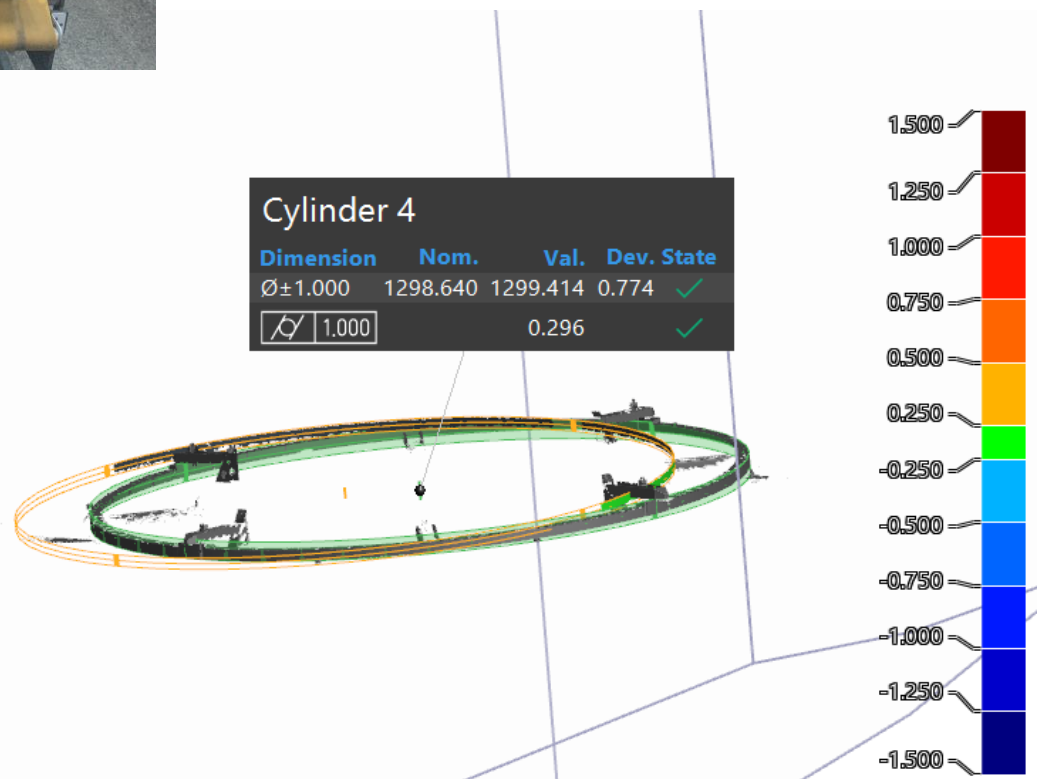
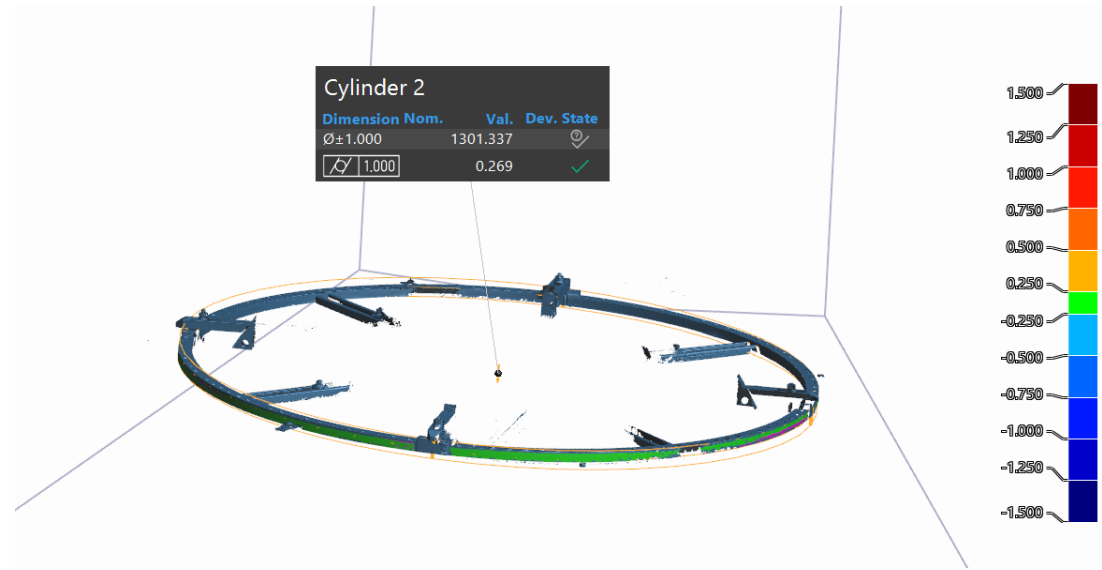
Simon SnyderSmith, Kevin Chang, Pau Simpson Crusafon, Sushrut Karmarkar,
FNU Archie, Andreas Jung

04 Nov 2024

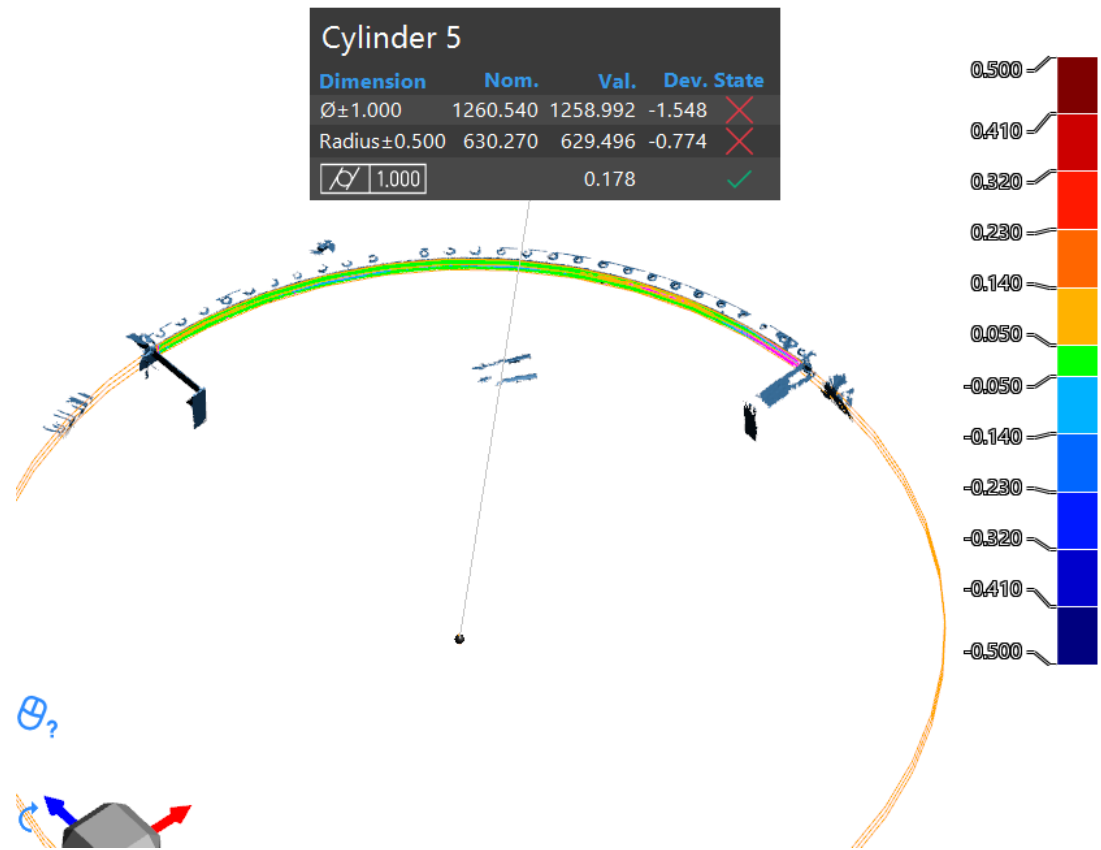
1mm offset metrology check



Final machined dimension



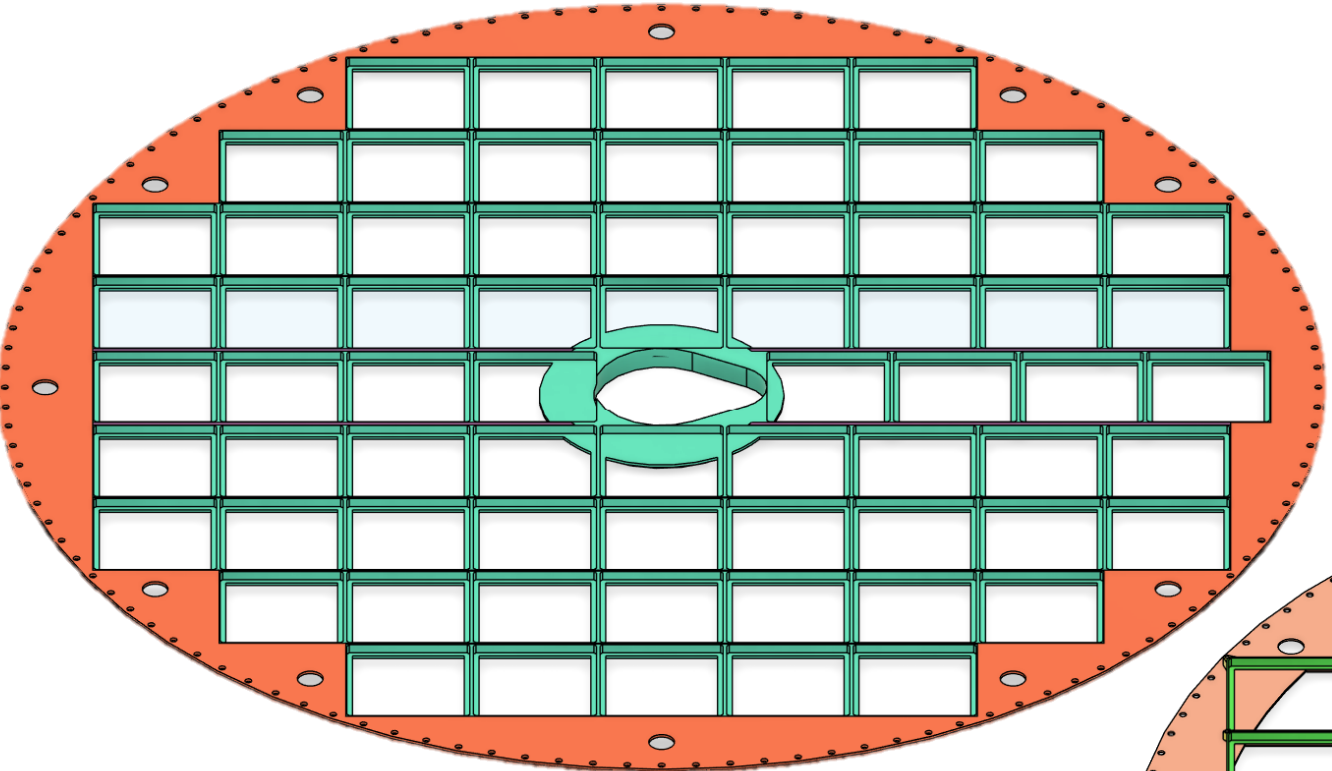
Offset and metrology check



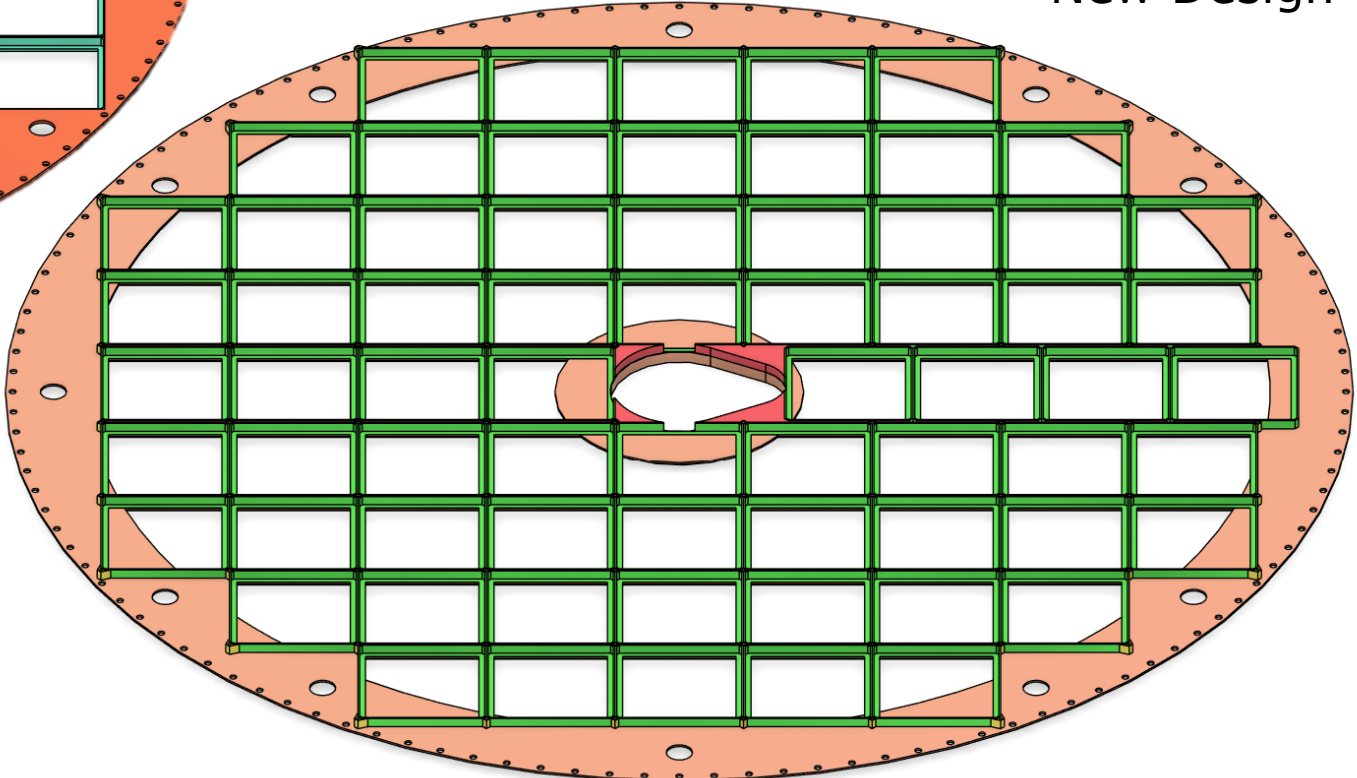
pfRICH Sensor Plane Structure CAD edit

Simon SnyderSmith, Sushrut Karmarkar, Andreas Jung

28 October 2024

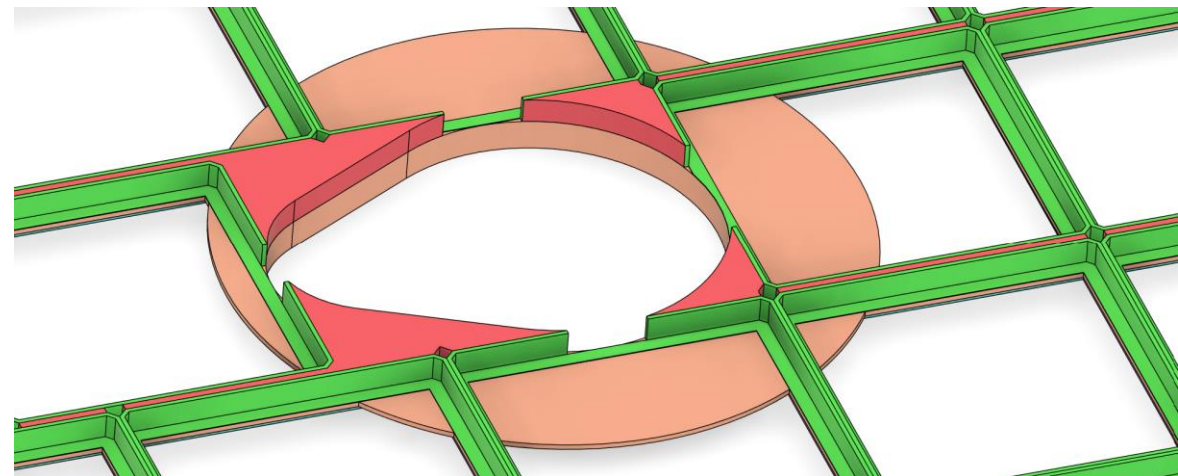
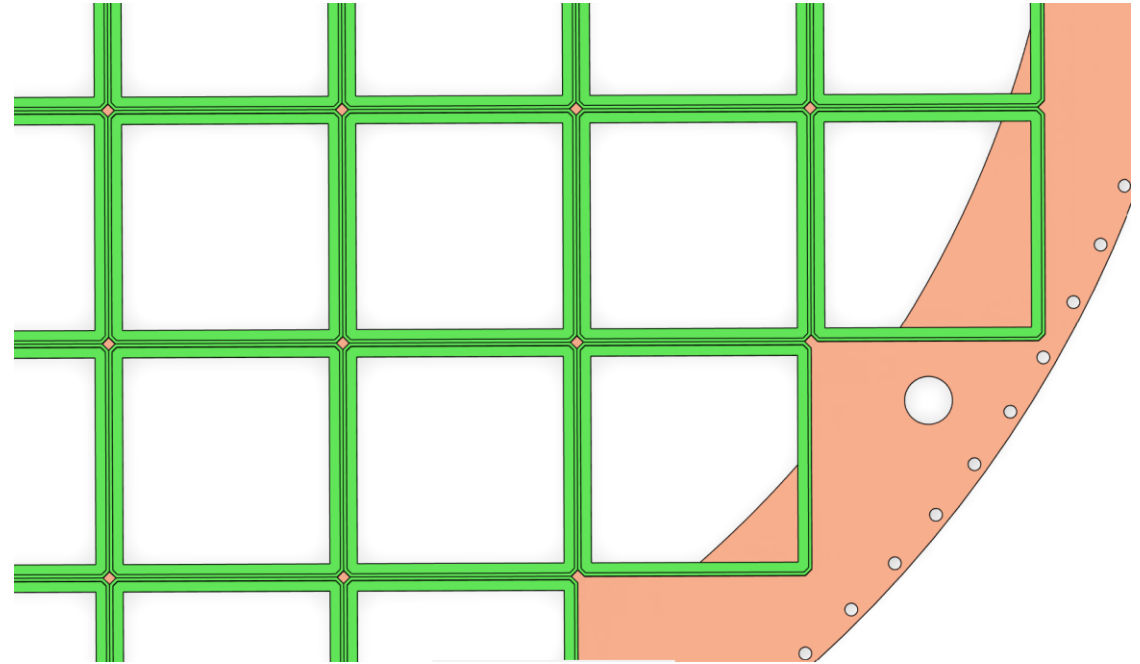


Old Design

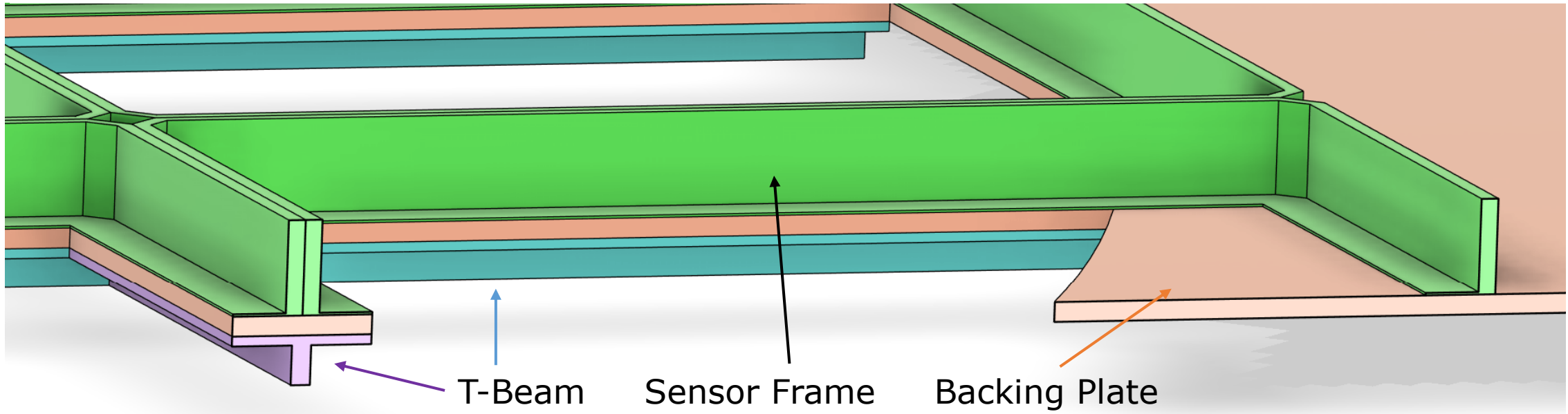
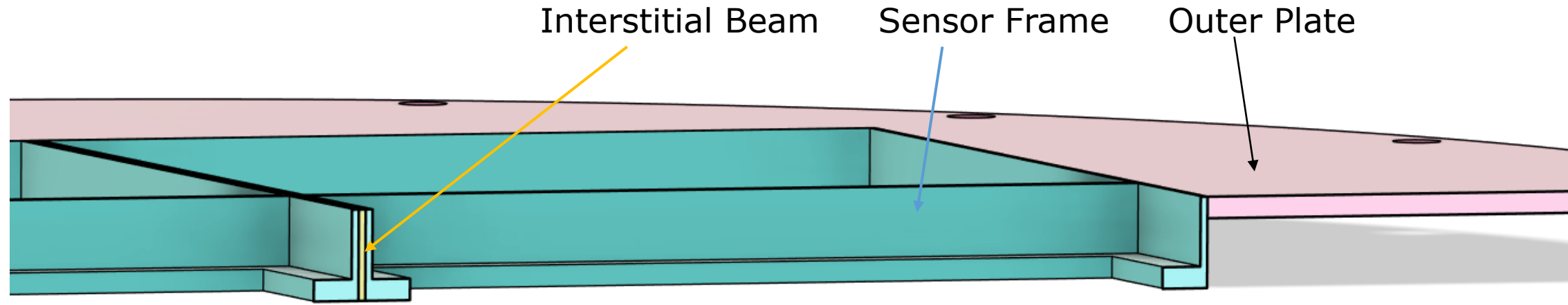


New Design

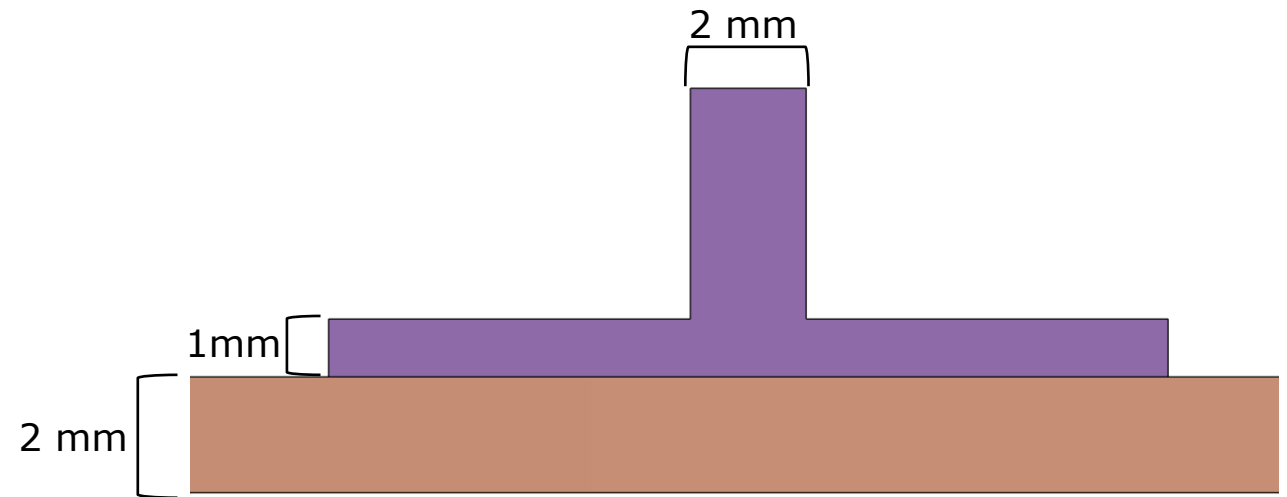
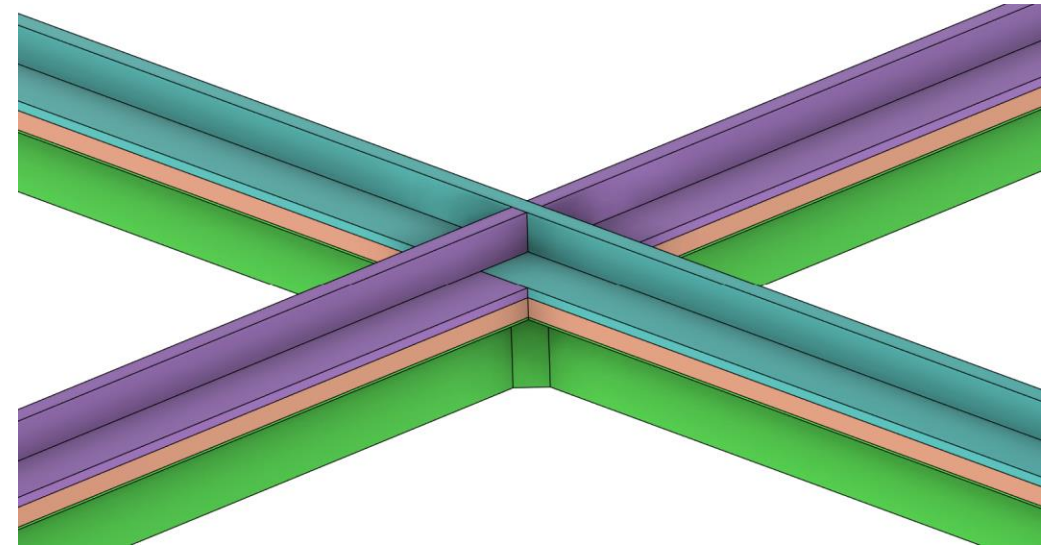
- ◈ Sensor frames now glued on top of backing plate instead of inside of and inset from plate
- ◈ Bottom face now only required for bonding; thickness reduced from 3 mm to 0.25 mm (1 ply)
- ◈ Continuous interstitial beams throughout grid removed to make space for improved threaded inserts
- ◈ Total through-plane thickness and wall thickness remain the same
- ◈ Interstitial beams and thickening plates added around beampipe hole to compensate for geometry irregularities



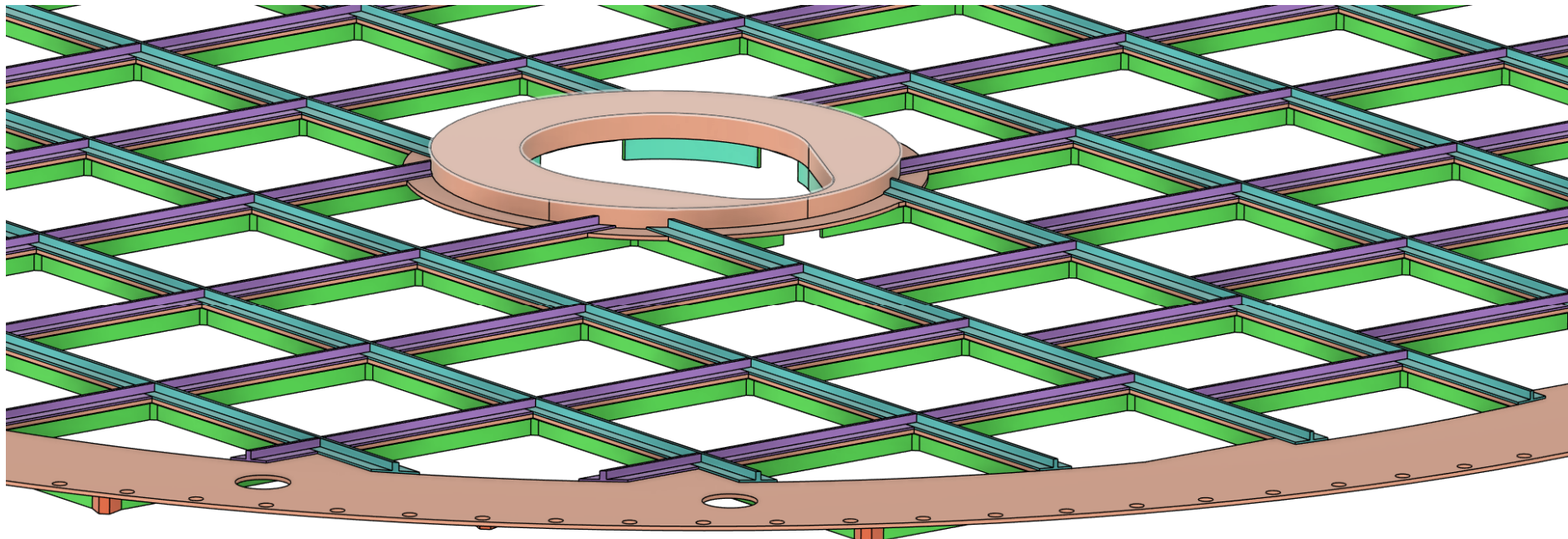
Sensor Frame Mounting – Old vs. New



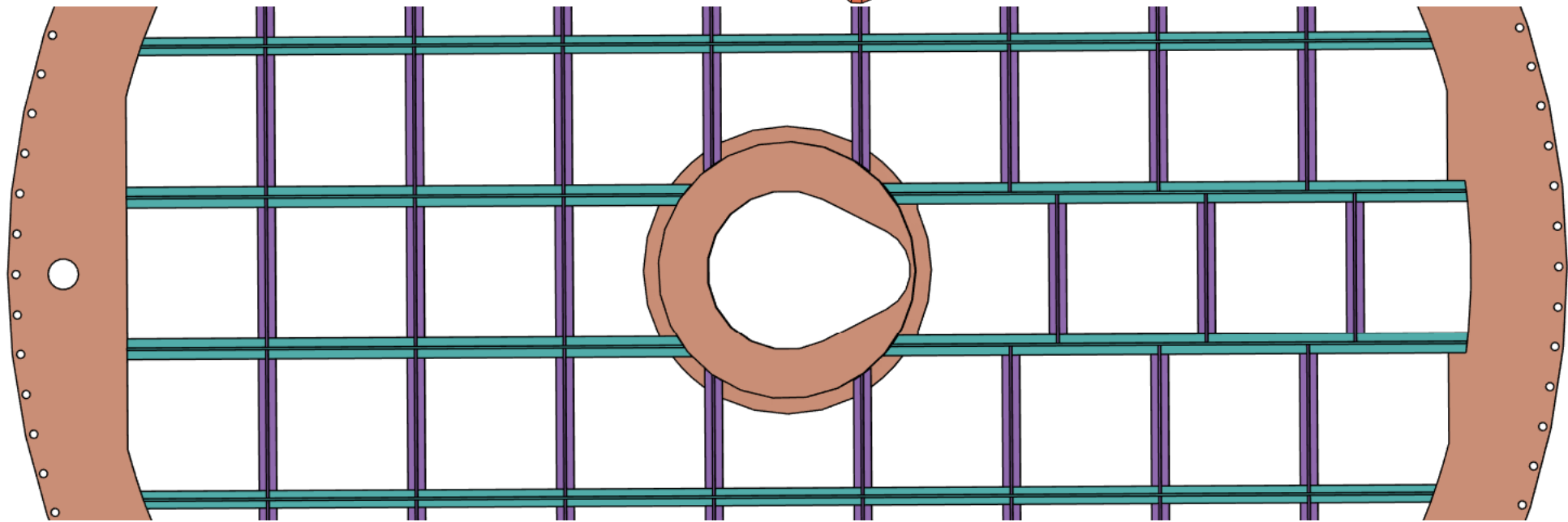
- Thickness of backing plate reduced from 3 to 2 mm
- T-Beams with 1 mm thick in plane face and 2 mm thick out of plane web glued to the backing plate along grid
- Added to increase stiffness of sensor plane
- Continuous beams across the horizontal, discontinuous along the vertical



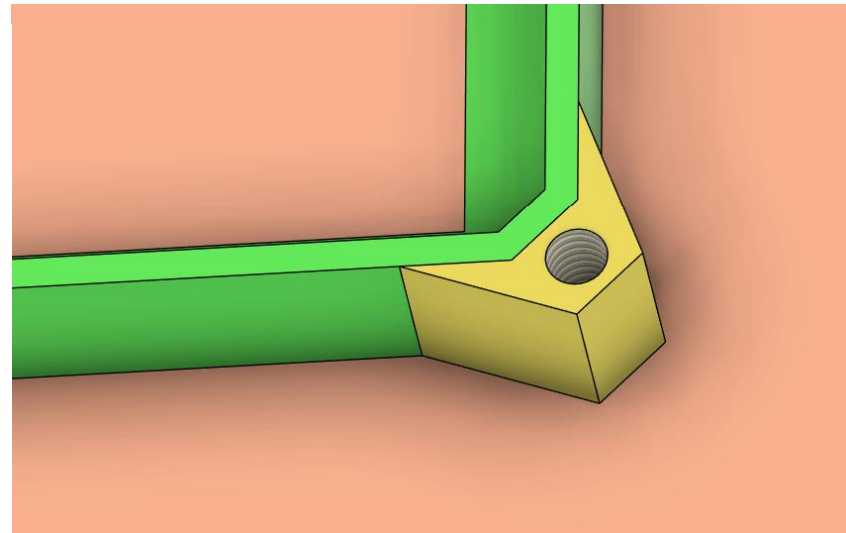
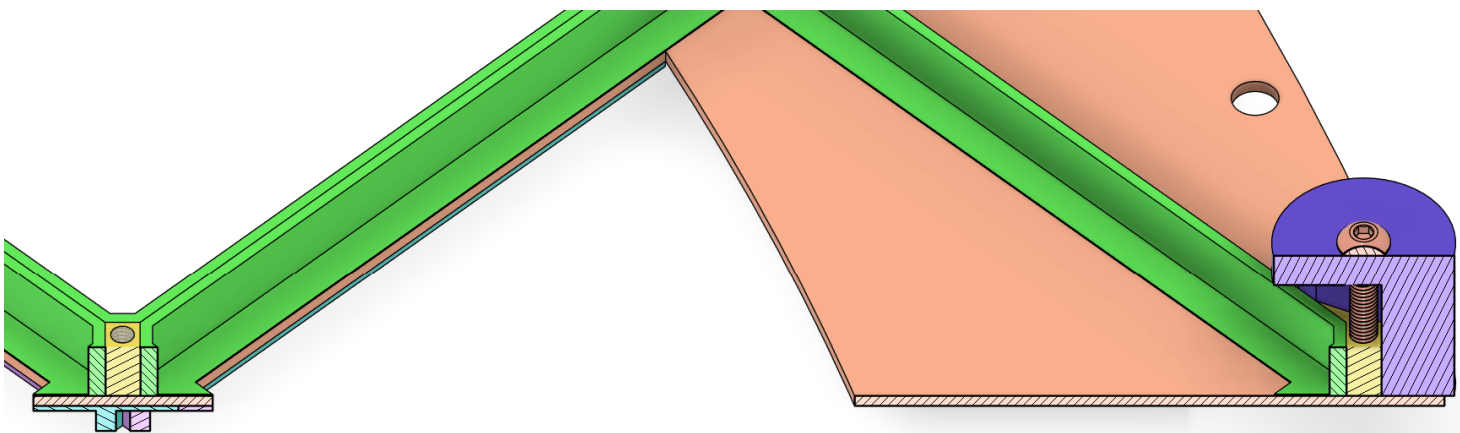
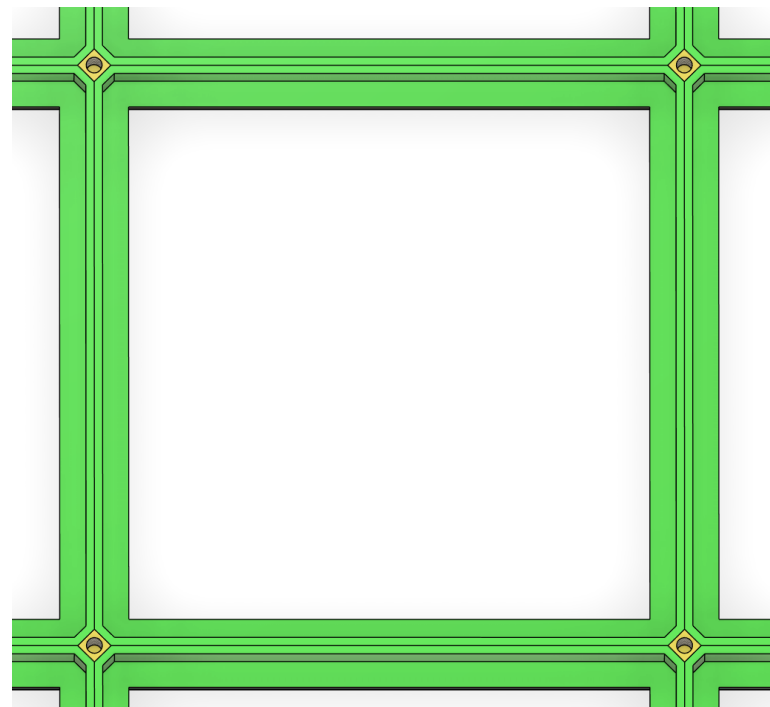
Inner Face T-Beams

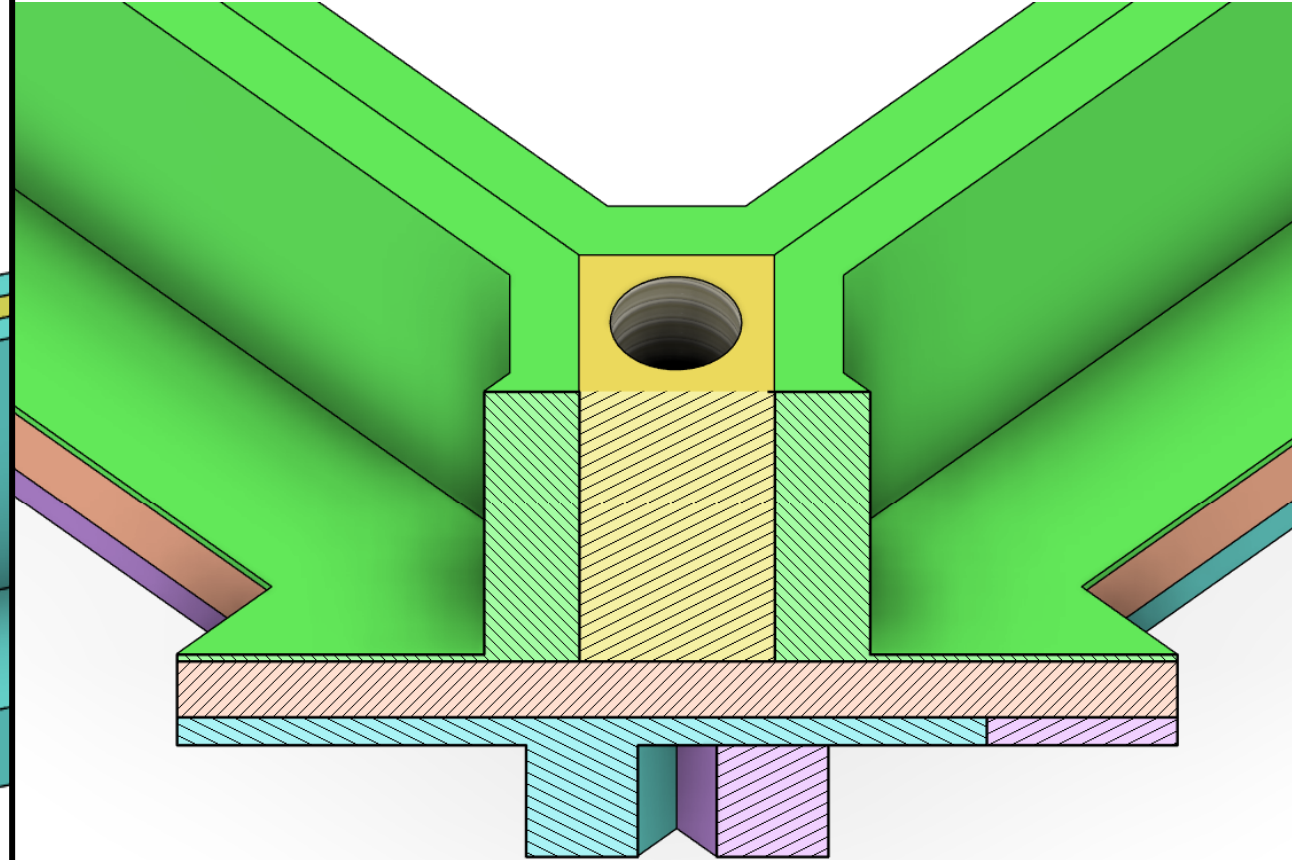
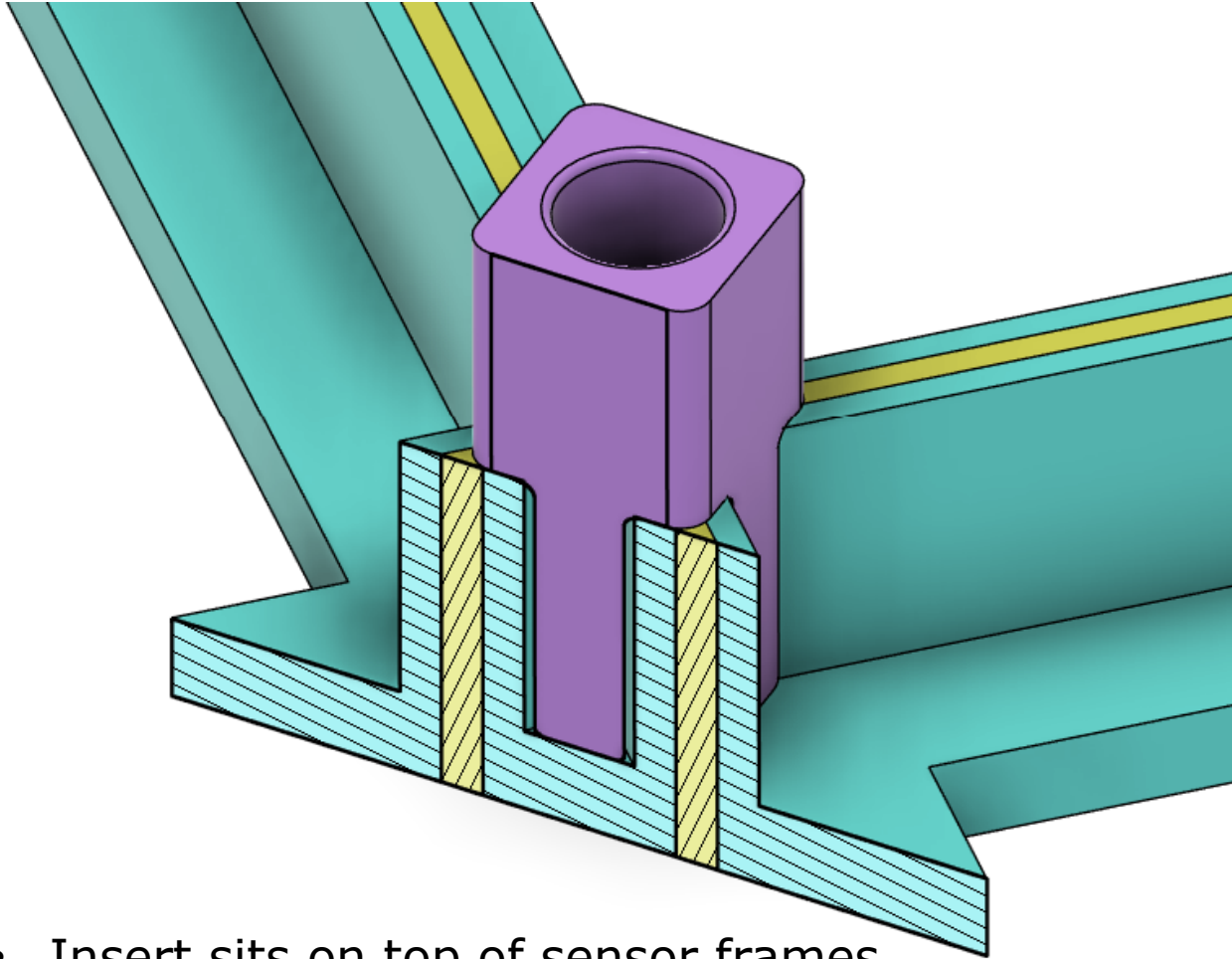


- Blue beams are continuous
- Purple beams fit between blue beams



- ◊ Inserts moved to the new space in between sensor frames instead of sitting on top of their corners
- ◊ Eliminates problem of standoffs breaking off from pullout or torsional forces
- ◊ Inserts not surrounded by four frames have increased bonding area to compensate
- ◊ Similar circular hold downs to former design





- Insert sits on top of sensor frames
- Thin legs are only adhesive interface

- Insert sits between sensor frames
- 10x more adhesive surface area

- ⬠ The length of the the t-beams to increase to account for the pyramid mirror mounting.
- ⬠ The modification also allows for the insertion of electrical grounding in the sensor and aerogel plane if needed,=.

- ⬠ Had meeting with Alex on 31st Oct 2024. Will implement changes Alex suggested before publishing the design to the group.

- ◊ Lexan co-bonding – will be shipped this week.