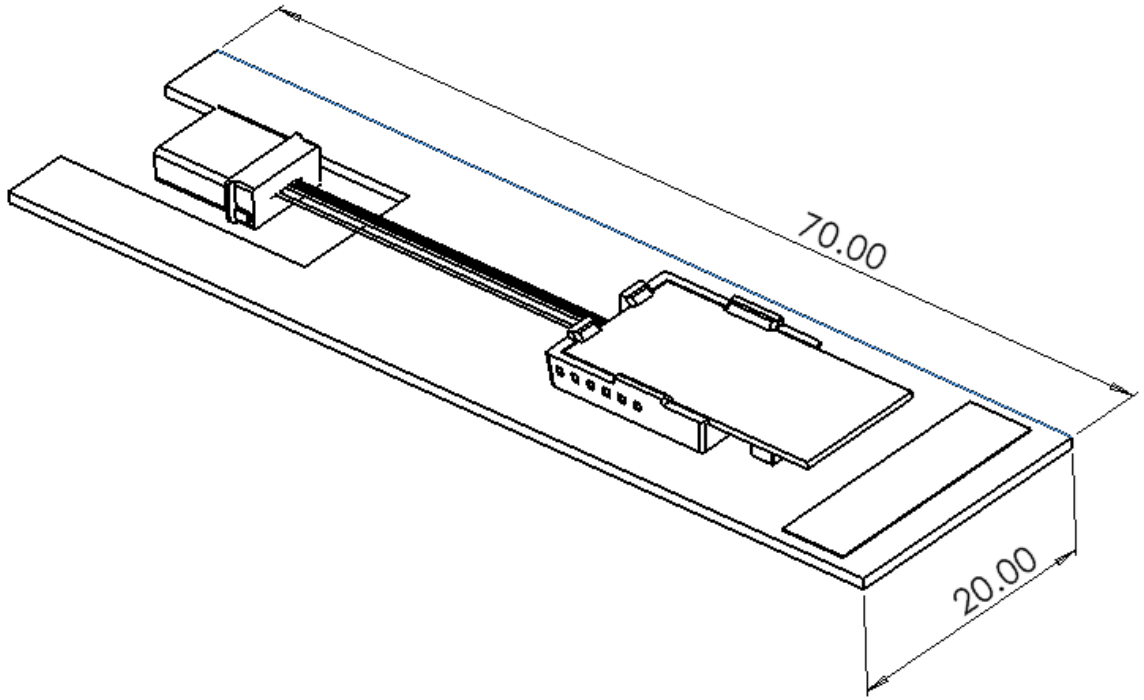
Stave Supports and FIB Integration

08/10/2025

ePIC UK

FPC Interface Board

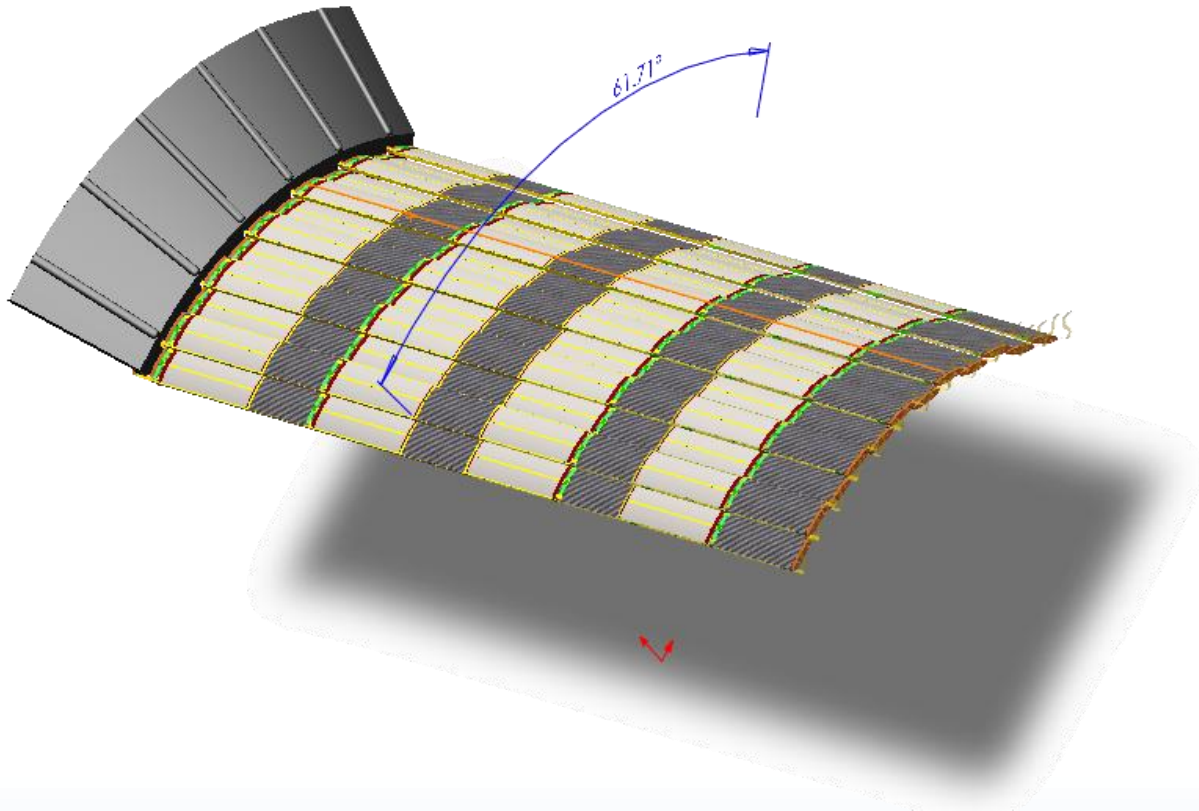
- One VTRX+ per FIB
- Most likely a solder interface between the FIB and the FPC
- Current plan is that FIB will be soldered to the FPC prior to stave co-curing/module installation
- FIB must be carefully supported/protected throughout build process



- L4 Stave – 2 FIB per end (4 total)
- L3 Stave – 1 FIB per end (2 total)

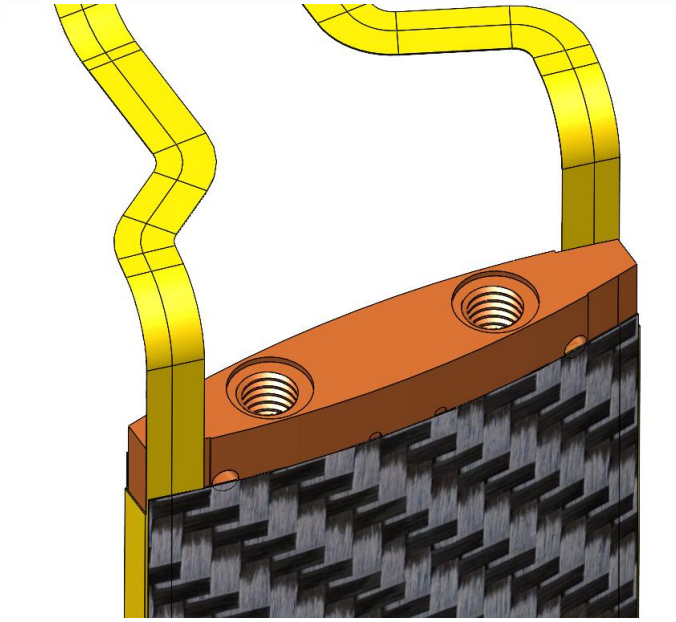
L4 Support Cone

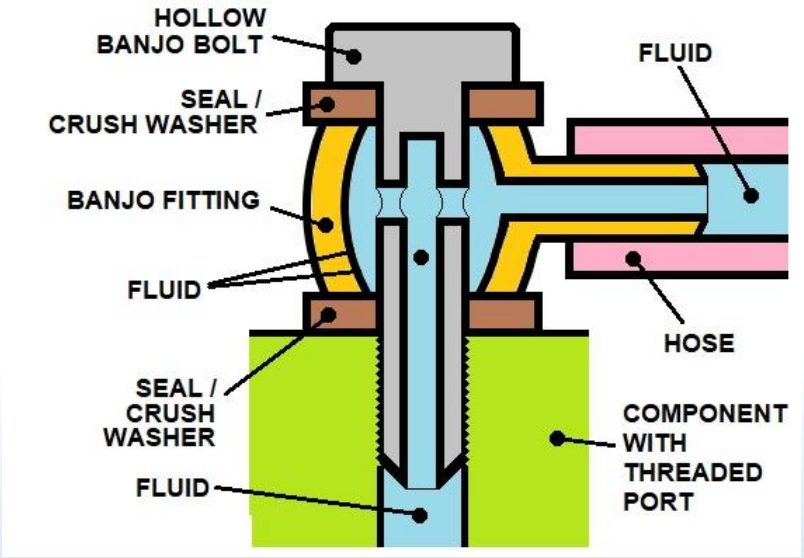
- Group X Staves (currently 12 in the model) to a manifold, support cone currently broken into sections which match the stave manifold angular span
- Air channel integrated into support cone, multiple feed channel to provide more flow area, add redundancy, minimise pressure drop/equalise feed pressure to all staves

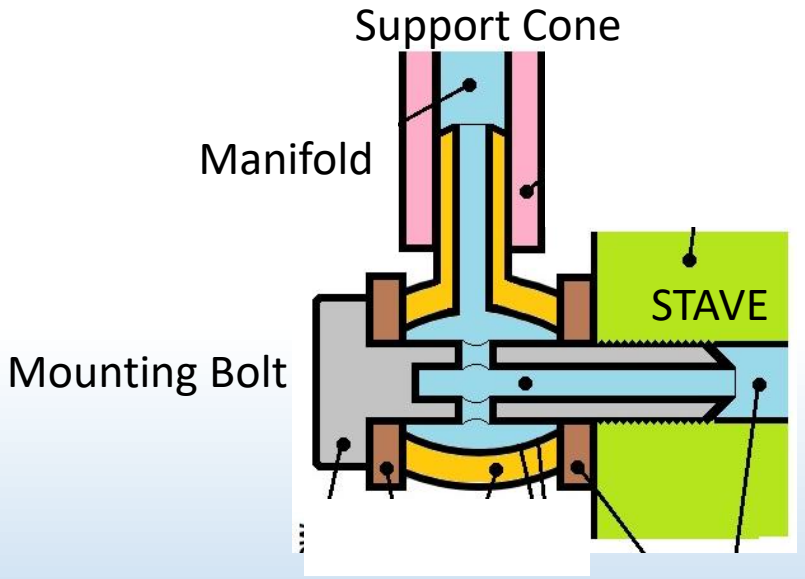


Stave End 1 – Air Inlet, Z Constraining

- Current scheme designed around con-current flow, both inlets in the Z constraining side
- Inlet is an M5 threaded hole
- O-ring integrated into stave end mount
- Mounting uses a banjo style fitting (common in hydraulic systems) for air feed and structural mounting
  - High strength connection suitable for very high-pressure systems
  - Diameter of the hollow bolt can be tightly controlled to limit flow rate

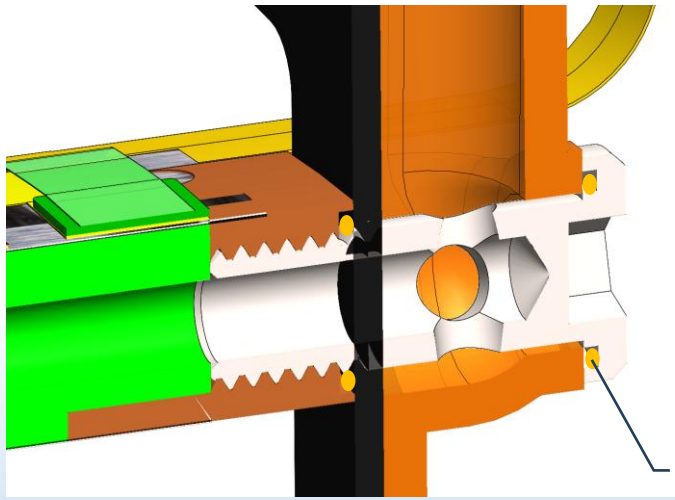


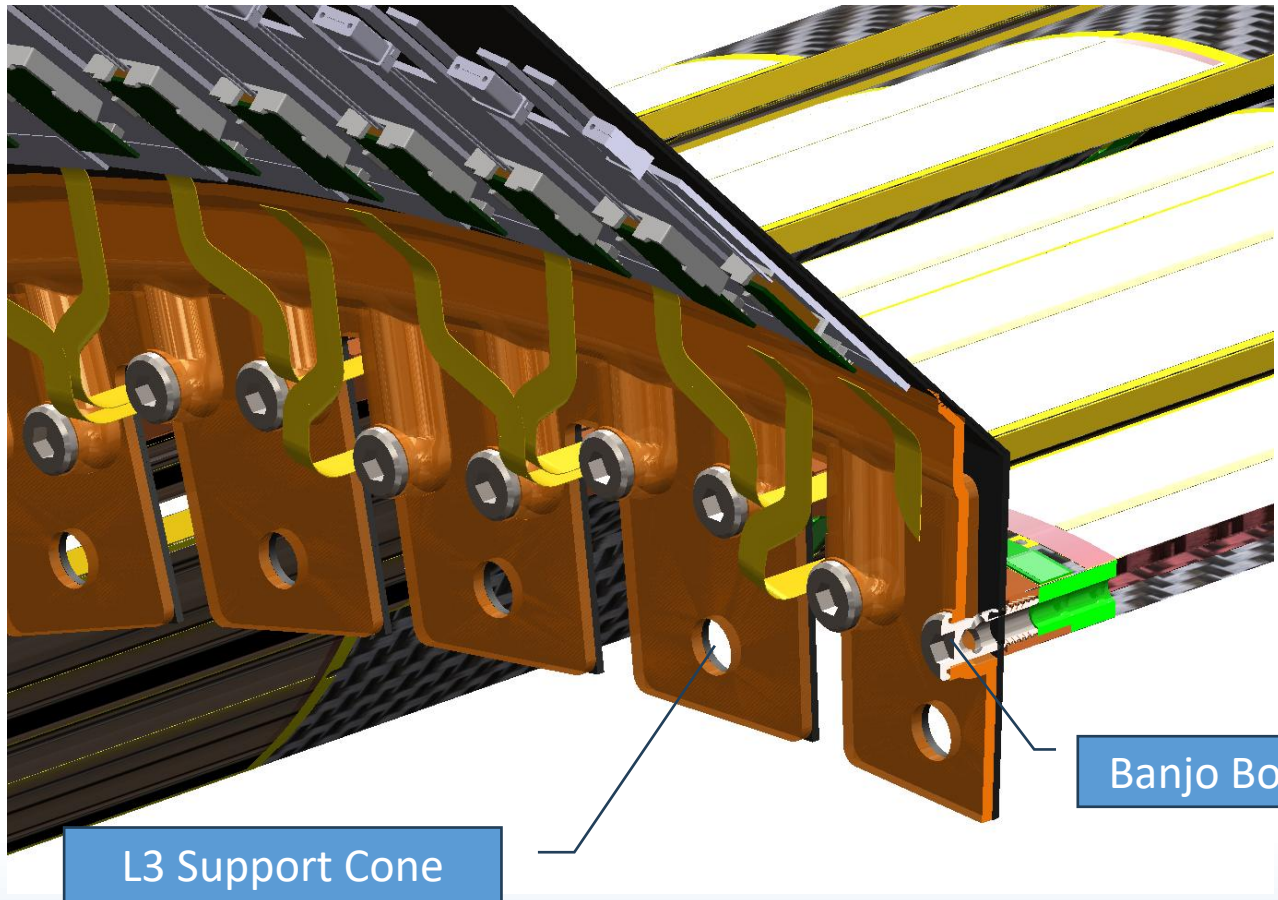




L4 Stave End 1 – Air Inlet, Z constraining

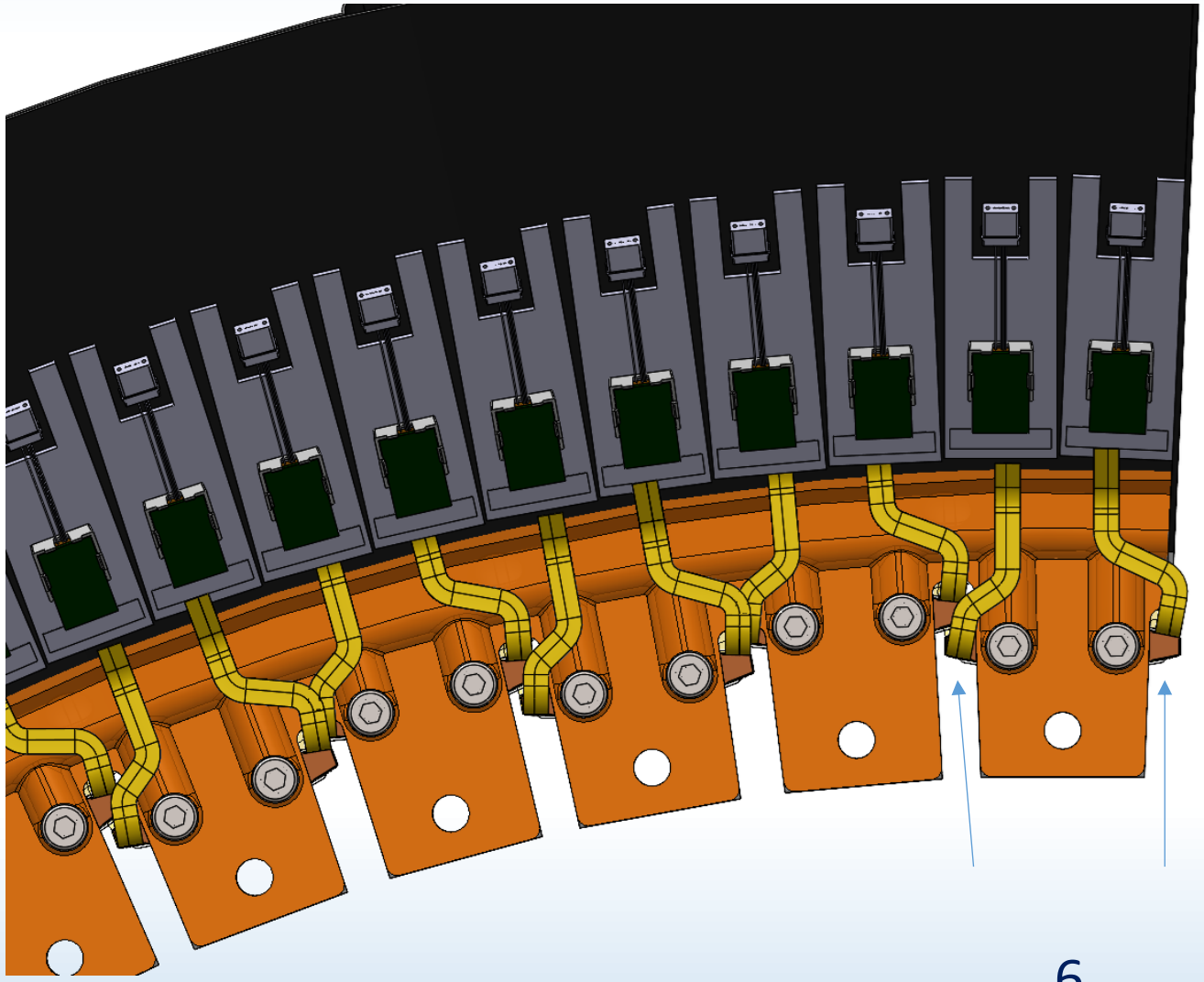
- Banjo bolt has a 3 mm hole
  - At choked flow condition with a 5-bar inlet pressure flow rate is approx. 400 litre/minute
  - To achieve 100 ltr/min would require approx. 1.25 bar supply pressure
- Stave ends/support cones will need a separate feature for alignment, this may be a slot and pin which can guide the stave into position





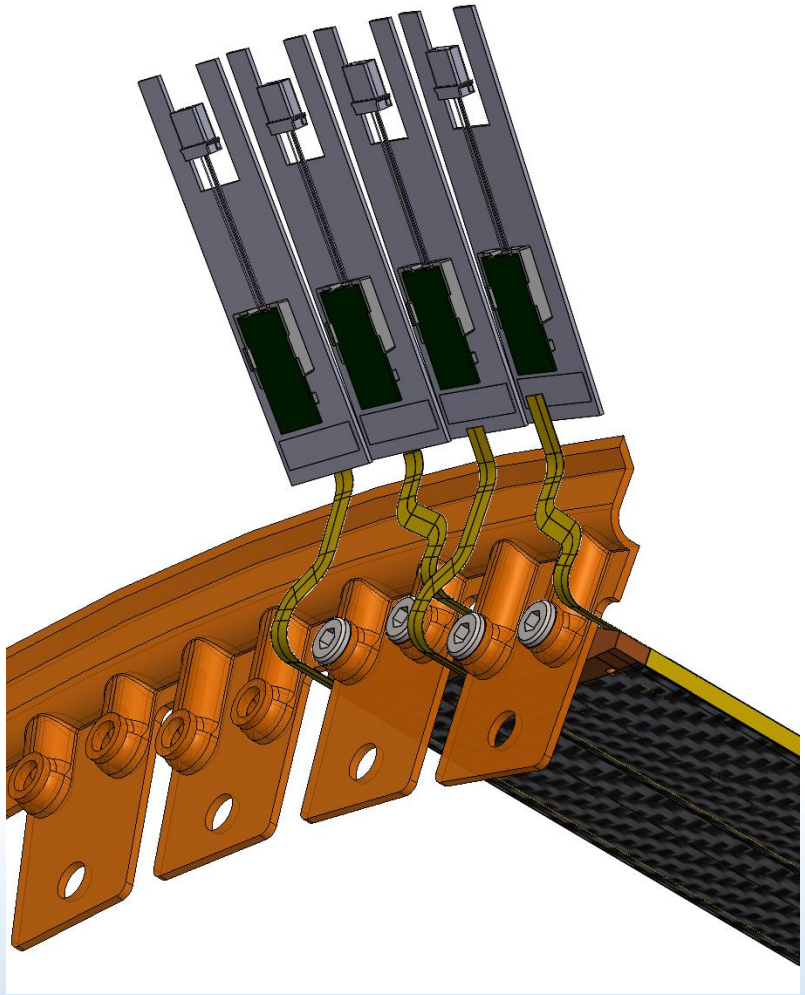
FPC Routing

- Stave mount inside of the barrel, cutouts in support cone/manifold allow FPC to be routed through without having to lace the FPC/FIB through any holes
- Control board would mount on the support section of the support cone

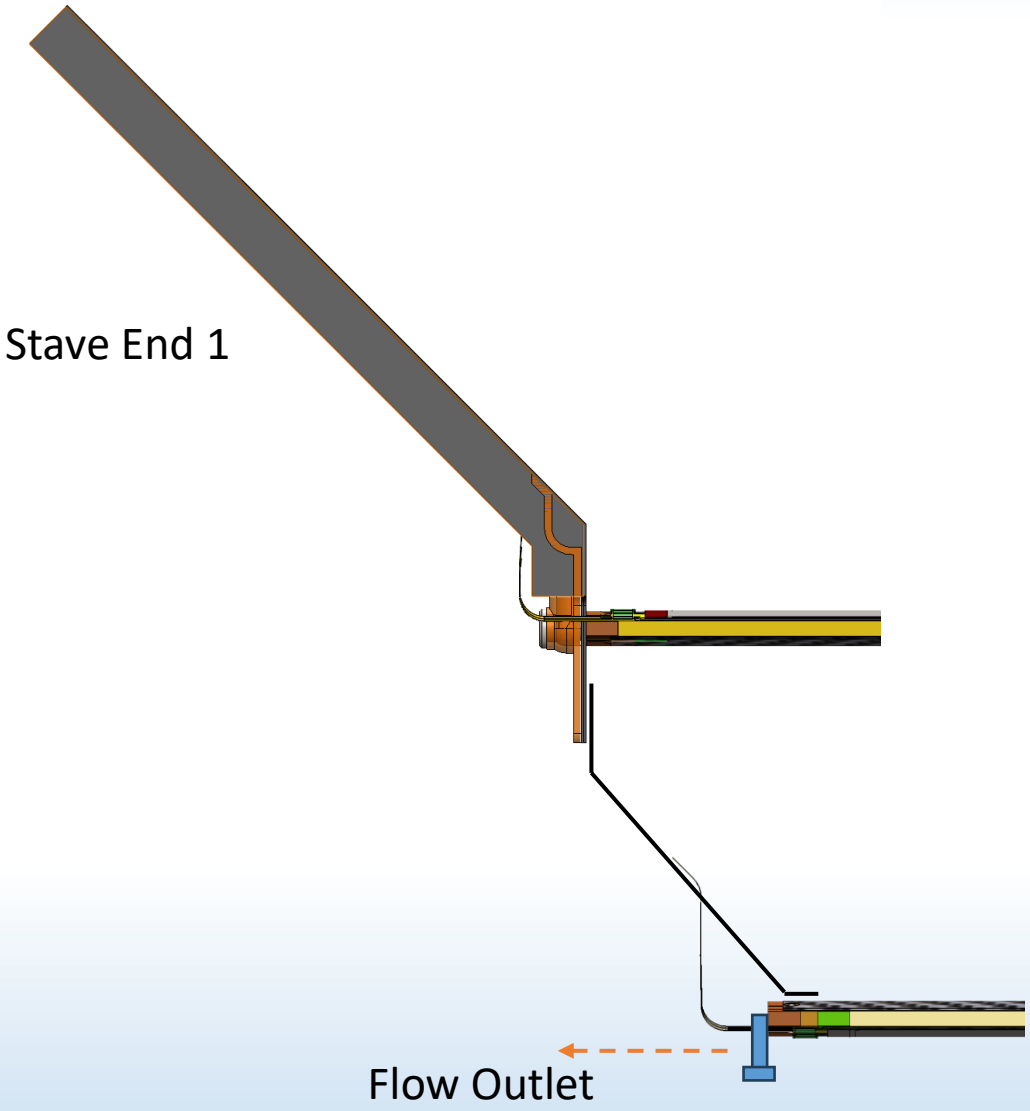


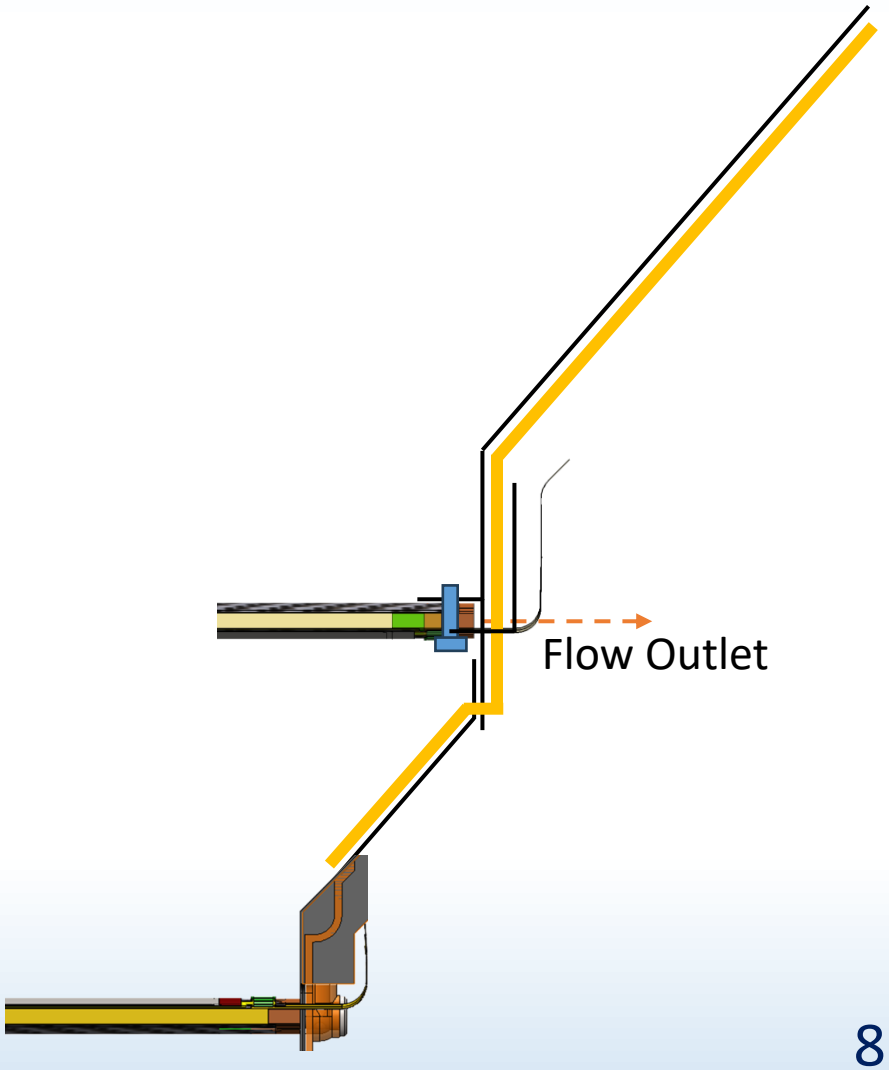
FPC Routing

- FPC would be flattened and FIB held on support tooling during installation
- Once the stave is mounted the FIB can be removed from support tooling and attached to the support cone



L4 Stave End 2 – Outlet, Z Floating & L3





Further work

- FIB mounting system
  - Current plan is to use an m.2 style mount, slots into one side and retained by a screw
- L3 coolant path
  - Should be relatively simple provided L3 & L3 can be fed from opposite ends
- Control board locations
  - Need to determine if a single board will connect to L3 & L4 staves
  - Most likely an L3 control board would still mount on the L4 section of the support cone due to space constraints.