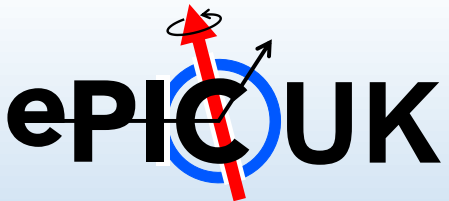
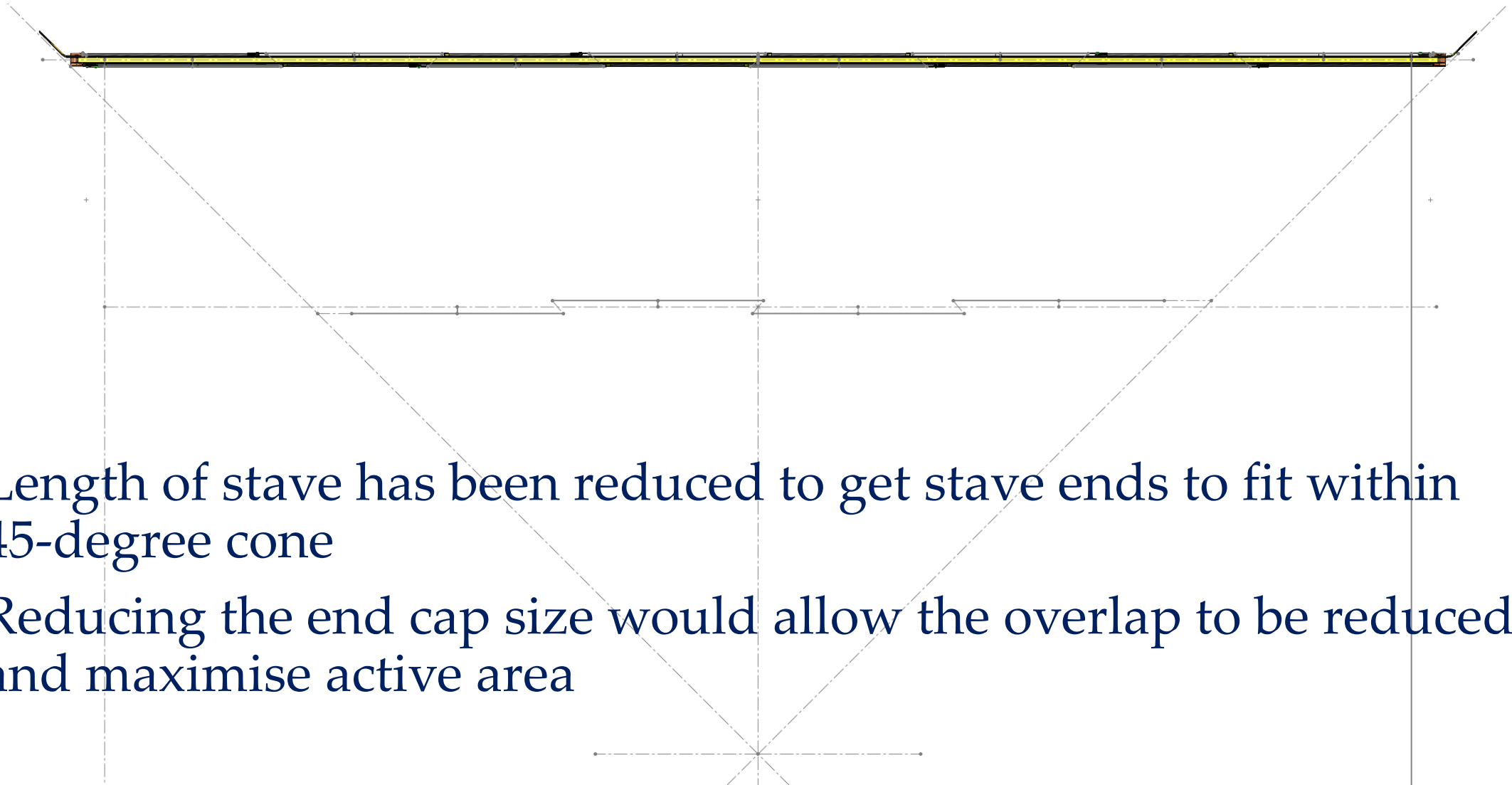


ePIC Silicon Vertex Tracker Stave End Region Ideas

Adam Huddart



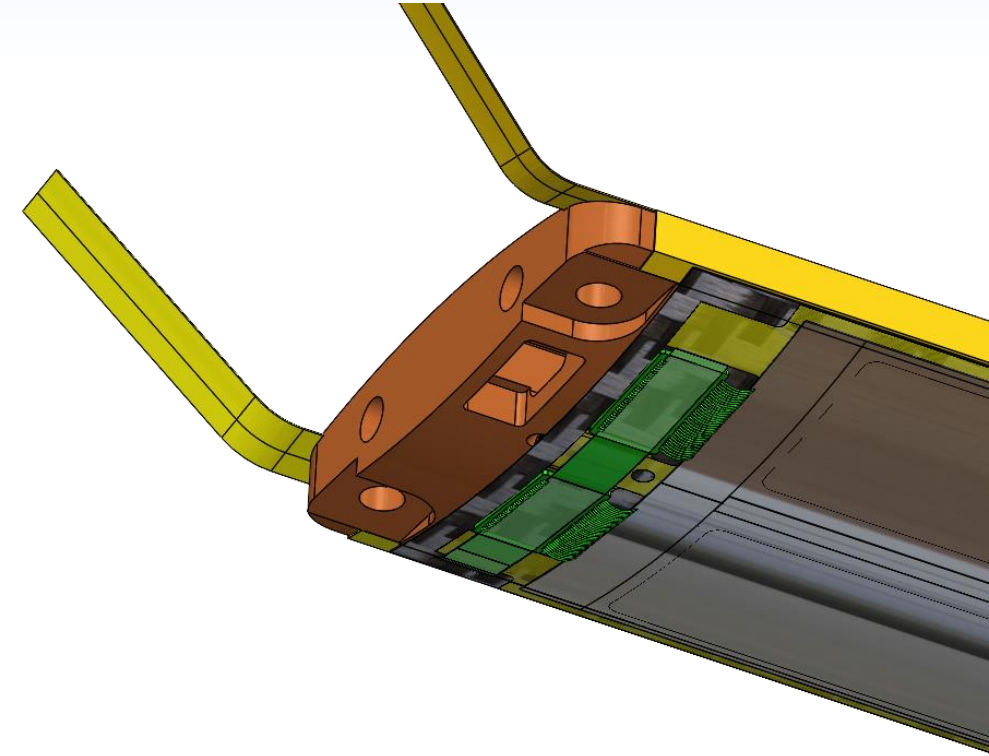
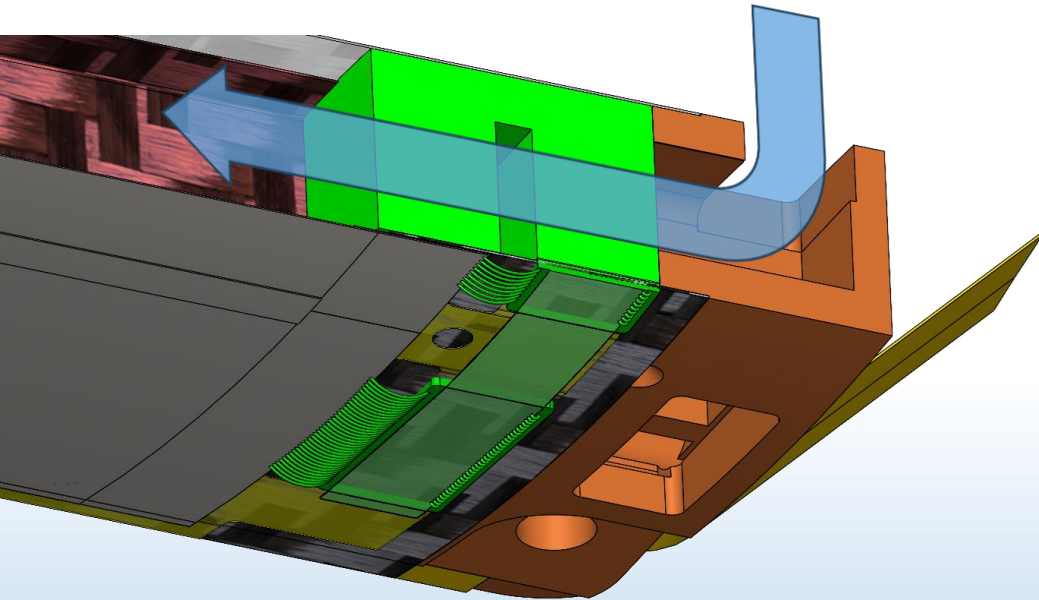
L4 Layout



- Length of stave has been reduced to get stave ends to fit within 45-degree cone
- Reducing the end cap size would allow the overlap to be reduced and maximise active area

Stave End Support

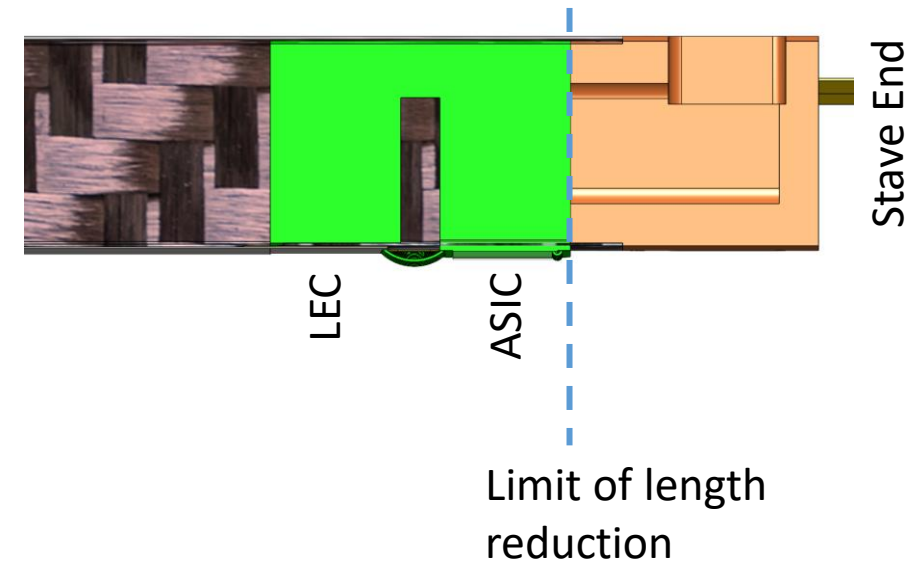
- Combined flow distributor/air interface and structural support
- Interfaces with support cone
- Current version mounts with 2 x m2.5 screws from underside
- Mounting solution must accommodate tolerance in stave length



Reducing Stave Length

Design Considerations

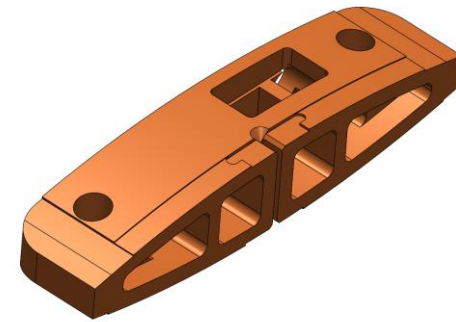
- Need K9 foam under LEC & ASIC for thermal management
- First ASIC and LEC are near flow inlet (low coolant temperature) so can accommodate sub-optimal thermal path
- Current solution adds 8 mm to the end of each stave



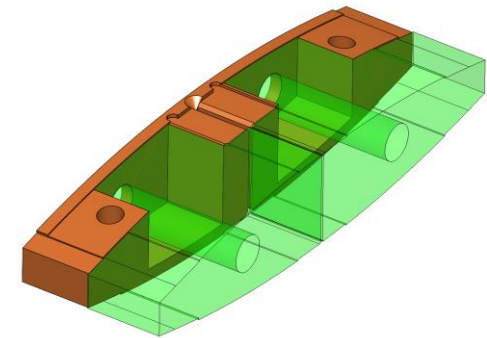
Revised Design

- New Design

- ASIC supported on K9 foam (identical thermal resistance to other modules)
- End support only 1.5 mm longer than module end



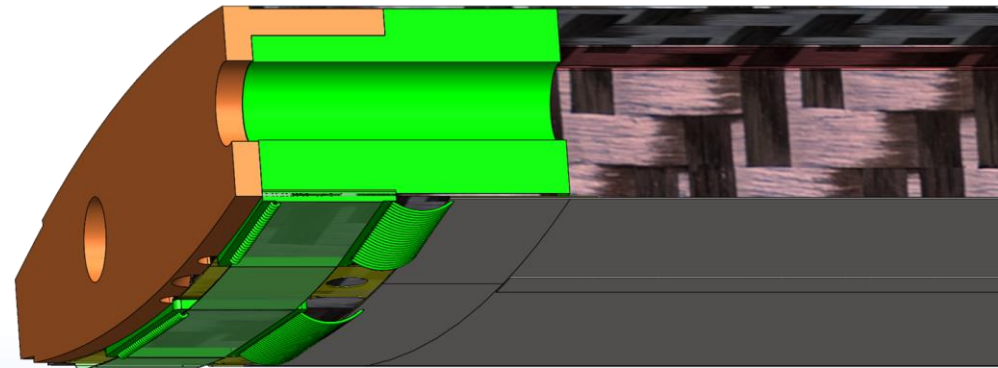
Old Design



New Design

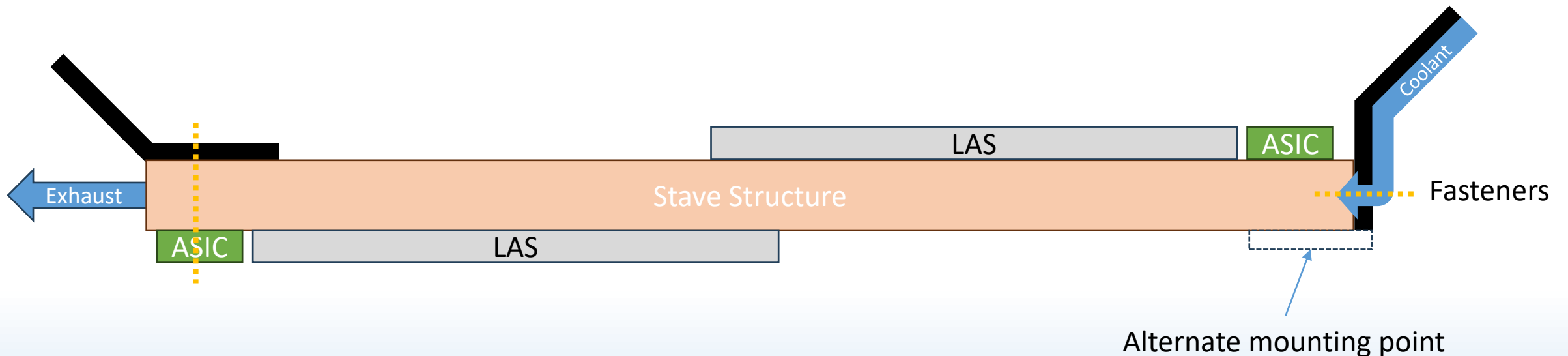
- Coolant inlet/outlet must be on stave end face

- Difficult to arrange inlets for counterflow, easy to achieve co-current flow.



Revised Design

- Support cones need to be sided
 - Left side module is on bottom side of the stave structure
 - Cone interface must be on top surface
 - Right side module is on the top side
 - Cone support must be on the bottom surface or end face



Conclusions

- Revised design reduces extension to 1.5 mm from 8 mm
- Any further reductions would require reversing of modules (ASIC on far side to end support)
 - Increases FPC power loss (longer traces)
 - ASIC/LES for multiple modules would likely overlap
- Current air inlet only $\varnothing 3$ mm \rightarrow Increased pressure drop over inlet/outlet
- More limited stave support options, difficult to achieve counterflow arrangement