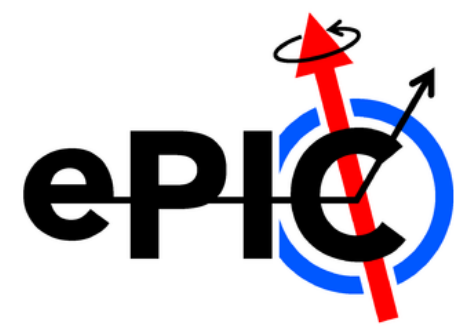




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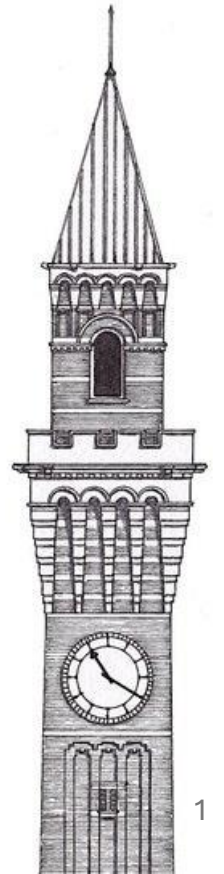


Flat stave design

Eve Tse

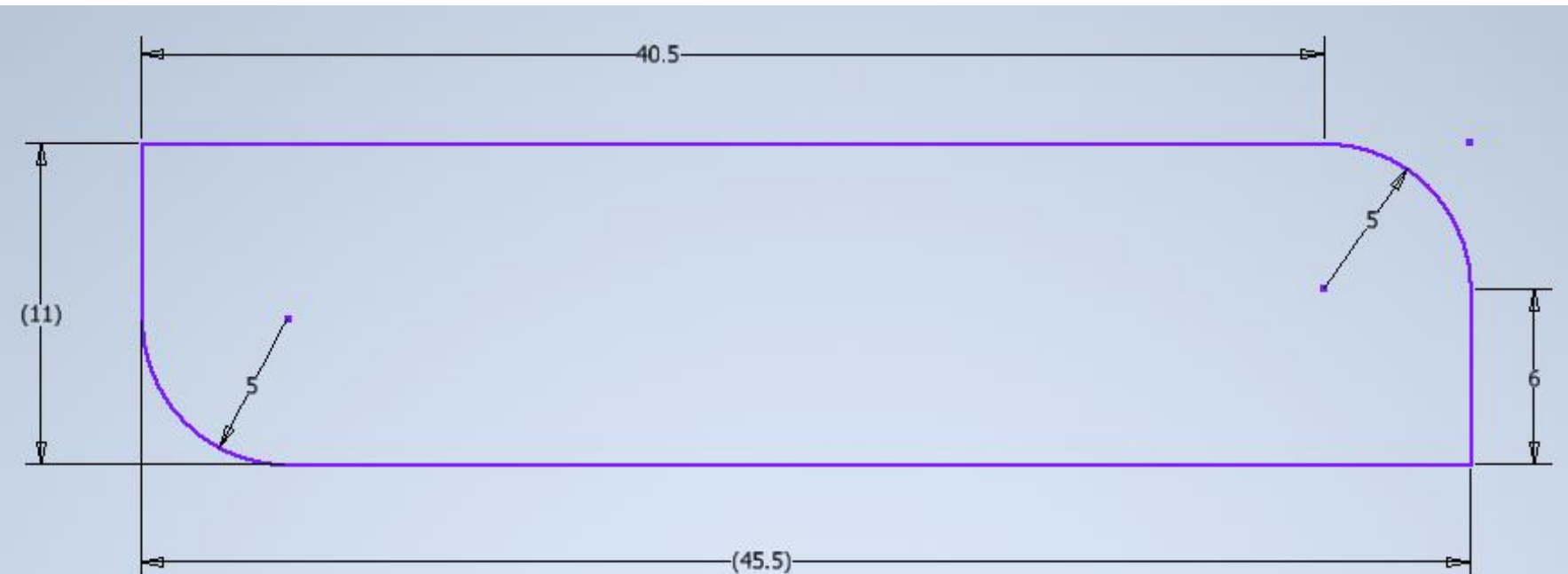
EIC-UK WP1

Wed, 6th November 2024



Stave design requirements

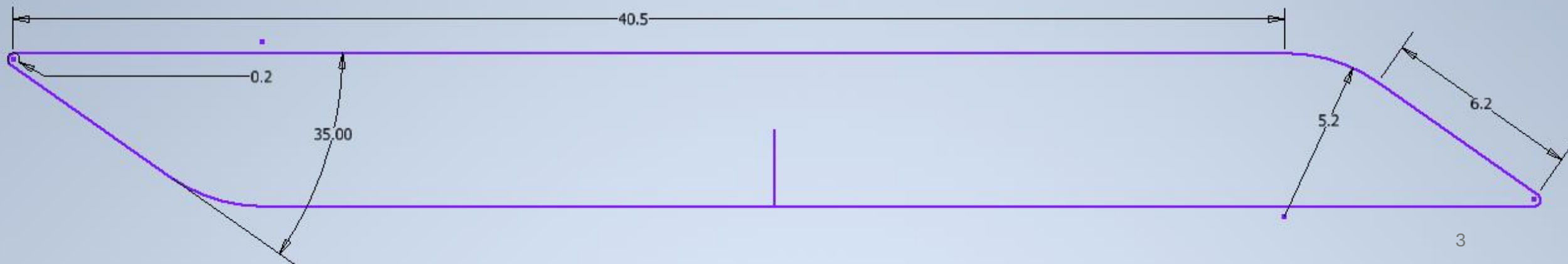
- FPC has a minimum bend radius of 5mm and an estimation of 6mm width
- To accommodate 2 LAS sensor ($\approx 19.6 \times 2$) on the flat surface



- So if we were to create the stave as a rectangle, the stave would be at a thickness of around 11mm

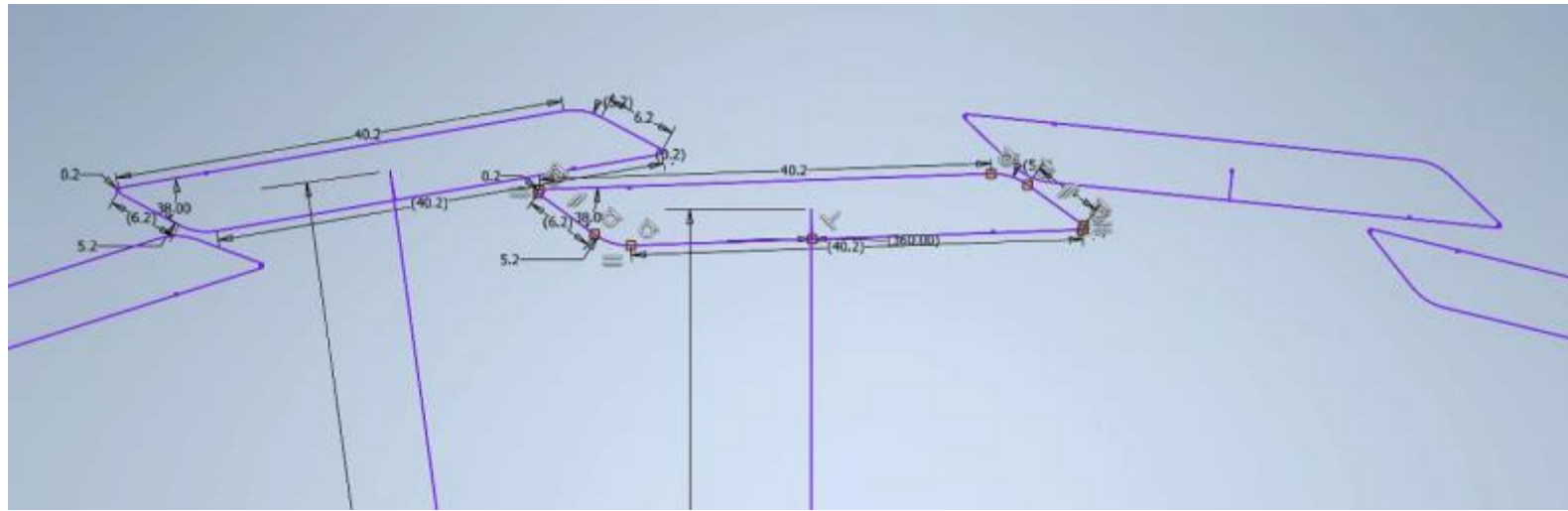
Parallelogram stave design

- Thinner stave structure (but wider)
- Flat surface for sensor to locate and easier for bonding
- A much larger bend radius for FPC
- FPC can then be located on the slope surface
- Sensors attached to the top stave surface will not be perfectly aligned with sensors attached to the bottom stave surface.





In order to fit the same number of staves with no collision, a tilt has been added to the design



Old values (curved)

New values (Flat)

Layer	Radial aim	Inner most radii	outer most radii	RSU per EIC LAS	Staves per layer	EIC-LAS per layer
L3	272	264.75mm	279.25mm	6RSU-LAS	46	368
L3	270	263.6mm	276.40mm	6RSU-LAS	46	368

Overlaps are then calculated with an estimation of a total module height of 0.2mm

The stave length gets shortened from 543.1 to 527.2 to fit the supporting cone with a smaller inner-most radii

Stave

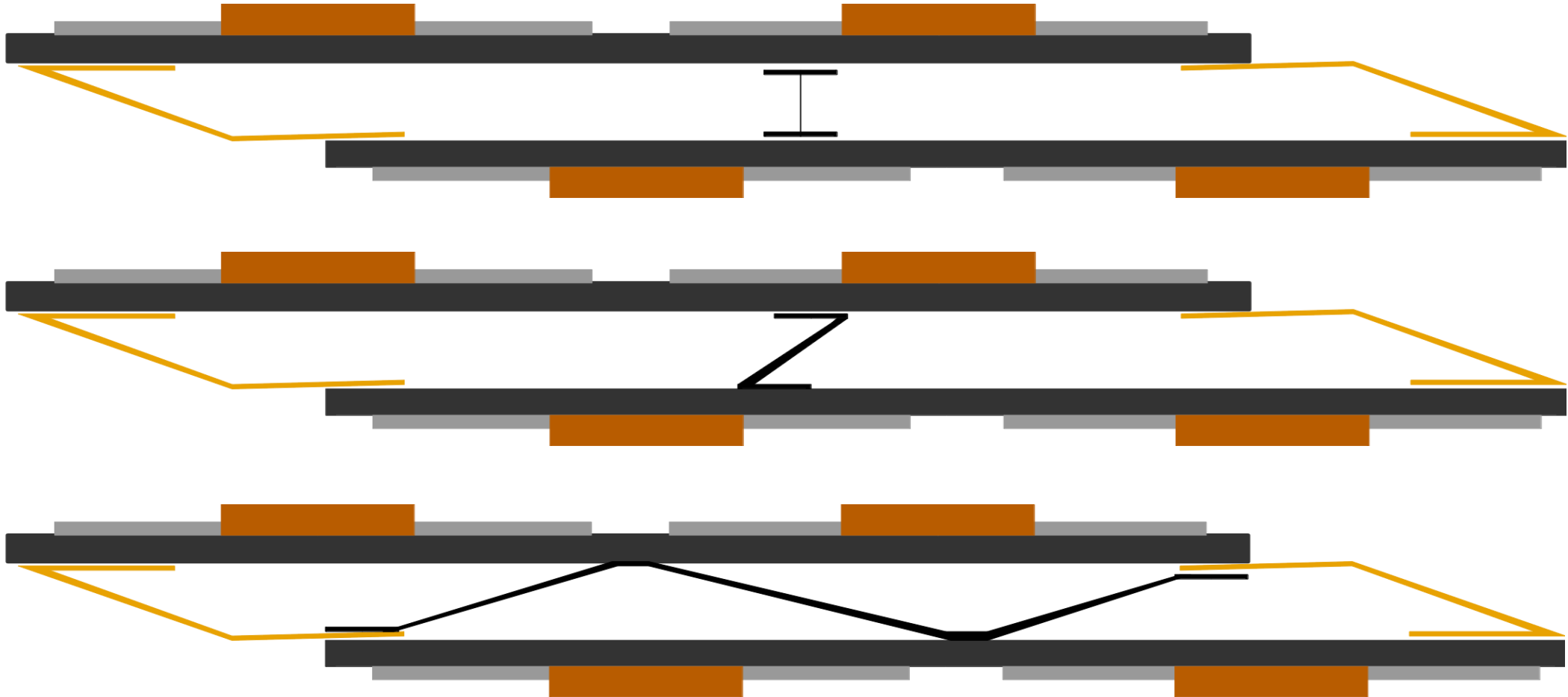
Overall width of stave	48.864	mm
Overall thickness of stave	5.277	mm
Small bend radius	0.2	mm
Angle at small bend radius	38	degree
Large bend radius	5.2	mm
Angle at large bend radius	142	degree
Flat sensor area	40.5	mm
Flat slop area	6.2	mm
Tilt	2	degree
Inner area	187.112	mm ²



Thank you



Internal support idea





Depends on the structural test result, we might be able to substitute the carbon-fibre for Kapton so that it is one single sheet (same sheet as the two main FPC on the edge)

