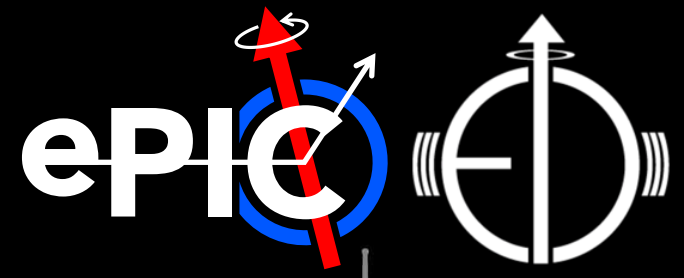




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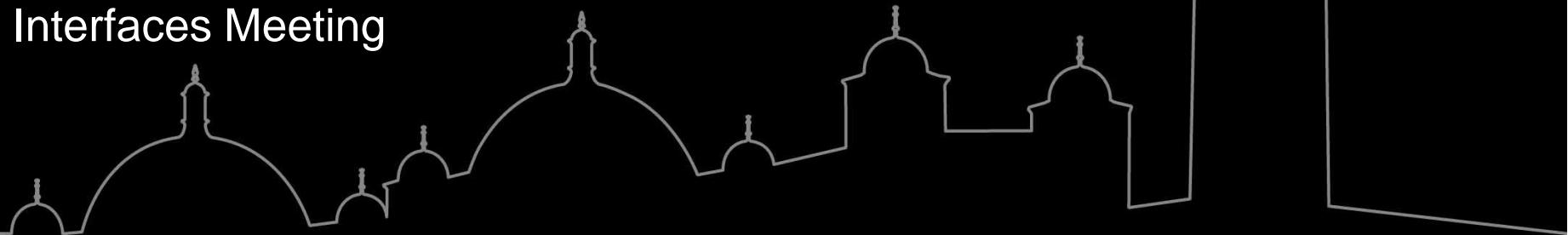


FPC mounting & bonding (spTAB) - update

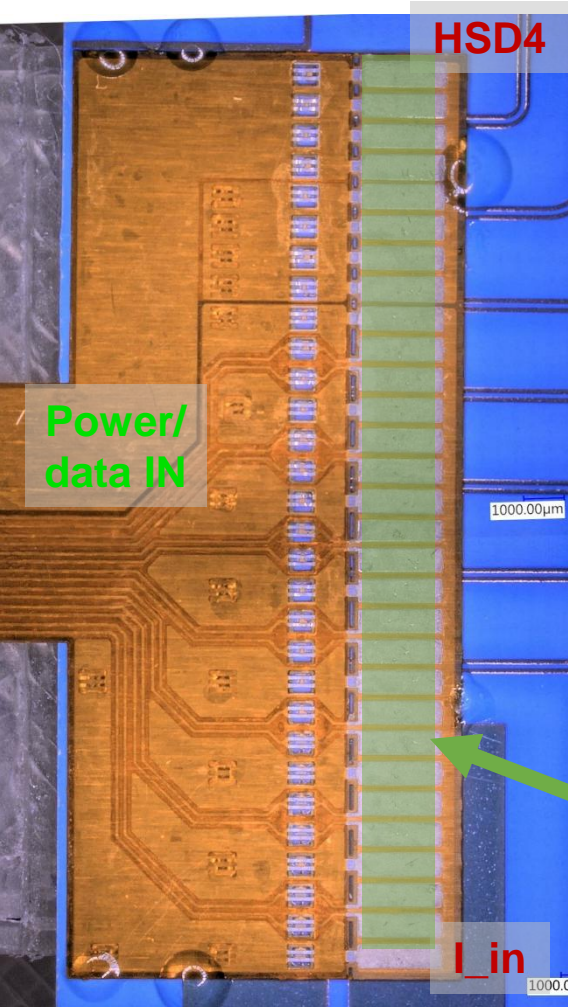
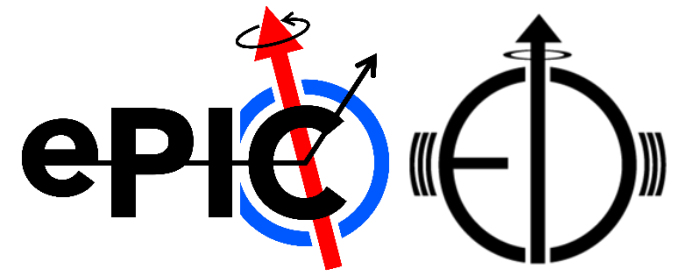
James Glover

ePIC SVT WP3: Electrical Interfaces Meeting

Thu, 13th March 2025

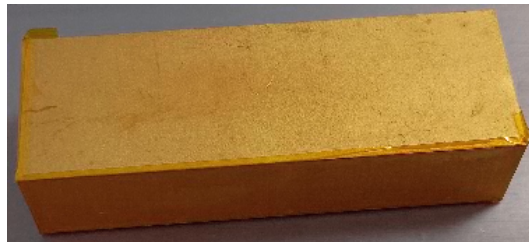


Prototype to PCB mounting



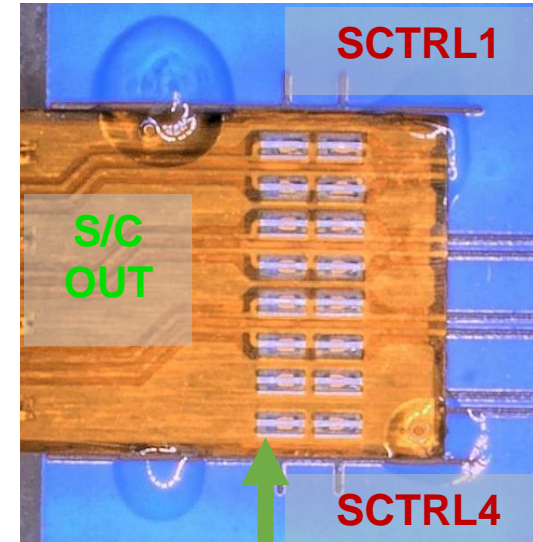
Following on from:

- Bond trials ([reported here](#)).
- Initial PCB mounting ([reported here](#)).



Reminder:

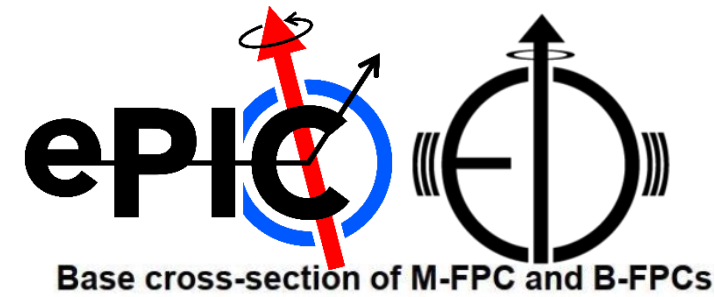
- Used a Kapton coated weight to hold FPC while applying glue.
 - Utilised the solder/probe pads on the **Power/data IN** side of the FPC – mounting was easy!
 - Limited locations for the weight on the **S/C OUT** side of the FPC.



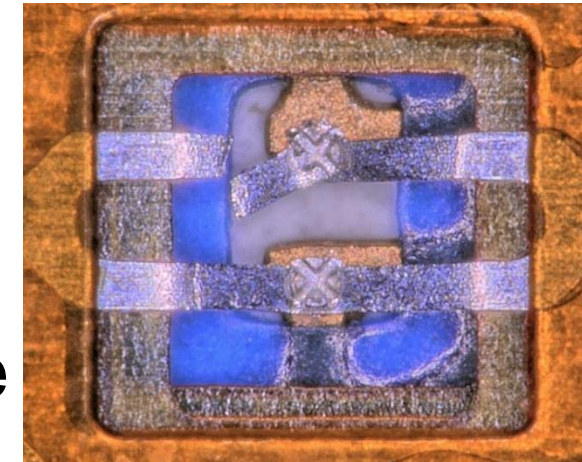
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Pushing the Al foil

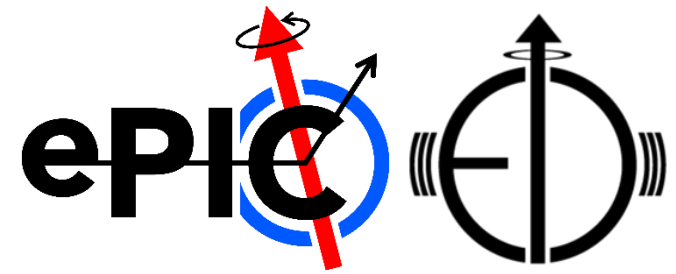
- The FPC was mounted up-side-down, therefore aluminium foil was being stretched further than planned
 - Bonding top layer, instead of bottom, to the PCB!
- It was found that this appeared to be pushing the foils to their limits.
 - A lot of foil traces were damaged!
- Especially bad on the **S/C OUT** side.
- Since the bonding, we have been handling the structure to prepare mounts for shipping.



Cover layer (insulating)	Pi 12.5 (25)um	Kapton	Ni-SnBi (for soldering)
Glue ~5um			
Top Layer (signals)	Al 14um	FDI-A-24	
Glue ~5um	Pi 10um		
Spacer	Pi 25um	Kapton	
Glue ~5um			
Bottom (GND)	Al 14um	FDI-A-24	
	Pi 10um		



Visual inspection (post bonding)



Power/data IN

- 5 (out of 60) snapped foils.
- 76.6% of bonds appeared perfect (46/60).
- 9 foils showed irregular foil deformation (badly kinked).

S/C OUT

- 7 (out of 16) snapped foils.
- 37.5% of bonds appeared perfect (6/16).
- 3 foils showed irregular foil deformation (badly kinked).

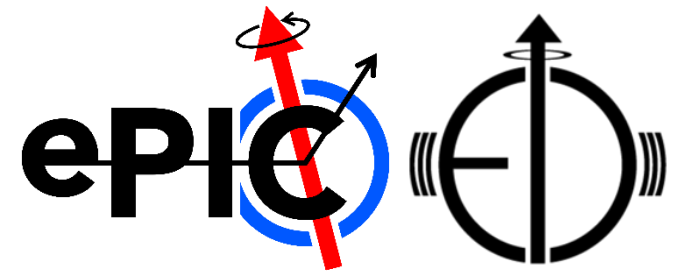
Can be seen from original [spreadsheet](#).

[Image repository](#)



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Visual inspection (post handling)



Power/data IN

- 5 (out of 60) snapped foils.
- **75%** of bonds appeared perfect (45/60).
- 9 foils showed irregular foil deformation (badly kinked).
- 1 bond was poorly aligned, foil was twisted, limiting contact to PCB (previous image was not well focussed to see this).

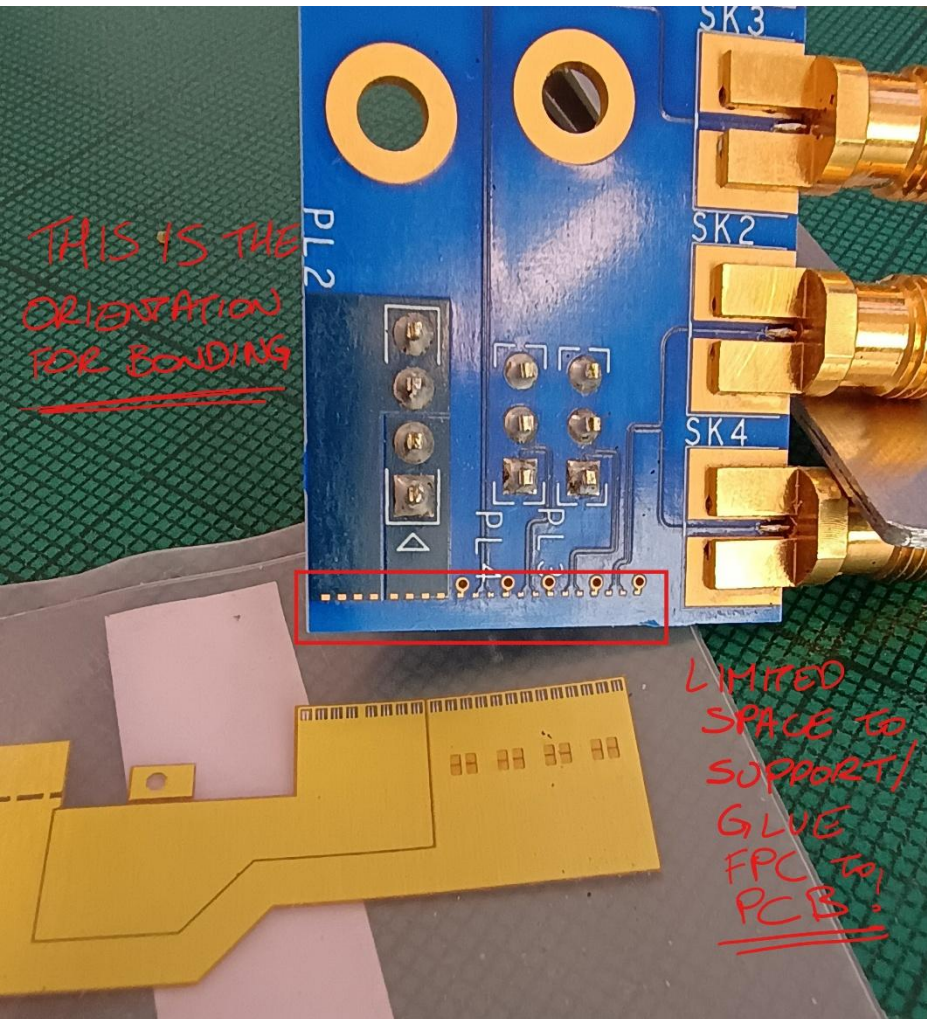
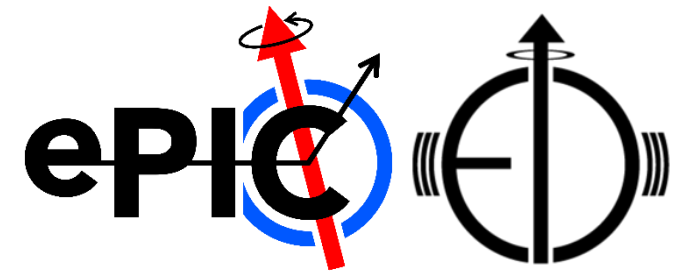
S/C OUT

- **10** (out of 16) snapped foils.
- **18.75%** of bonds appeared perfect (3/16).
- 3 foils showed irregular foil deformation (badly kinked).

Can be seen from new [spreadsheet](#)
(extra tabs to compare old and new data).
[Image repository](#)



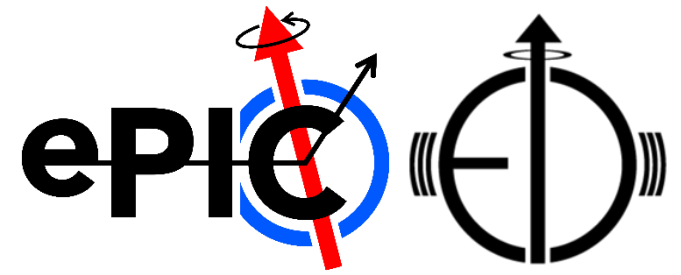
Next spTAB sample



- We now have a B-FPC-B and PCB from DL to retry the spTAB set-up.
- Complications with support jig for PCB (cut-outs needed for header).
- Limited PCB space to support the FPC.
 - We will see how best to support and mount the FPC to the PCB.

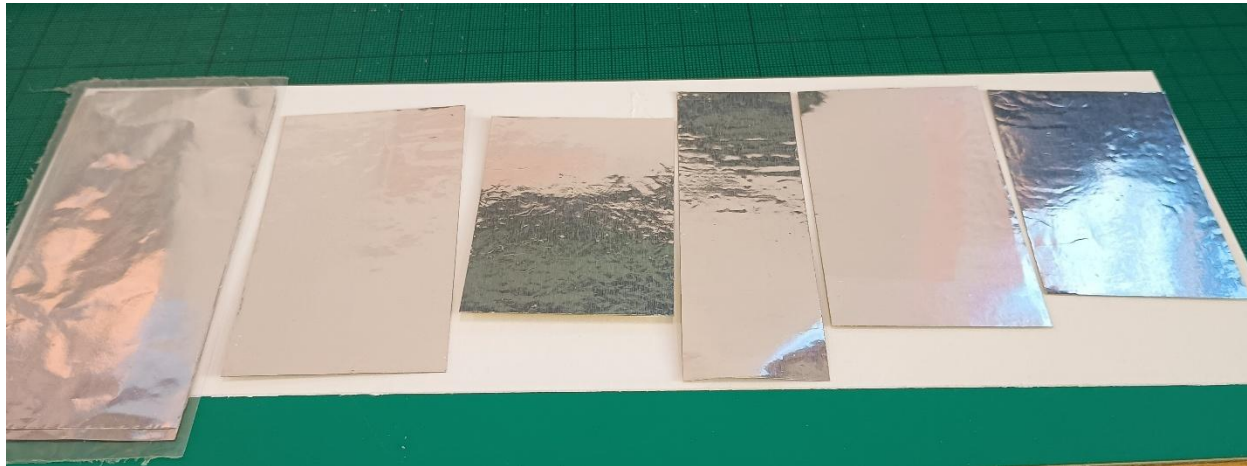


Wire bond samples

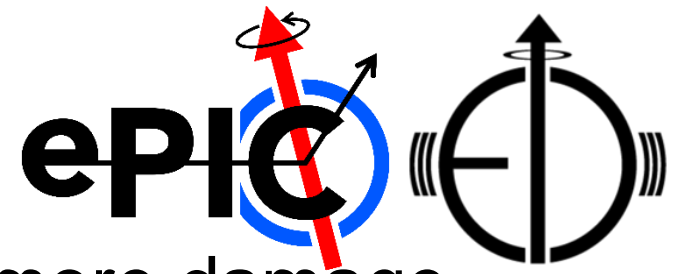


We now have some samples from LTU to trial wire bonding (and perform pull tests on).

- Single Al foil layer: LTU-15-10
- Dual Al foil layers: LTU-15-10 + 25 μ mKapton + LTU-15-10



Summary

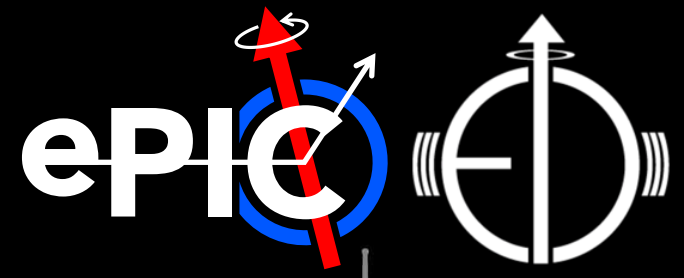


- Handling of original M-FPC sample has revealed more damage to aluminium foil (only on the **S/C OUT** side).
- Is this linked to difficulty supporting and mounting this side of the M-FPC?
- New sample received for trialling bonds on B-FPC-B.
 - Can be used to see how bonding performs when FPC is in correct orientation.
 - We will also look for better ways to support the FPC on the PCB.
- New samples for trialling wire bonding are also now in hand.
 - Work to be done.
 - Samples to be shared with University of Liverpool.



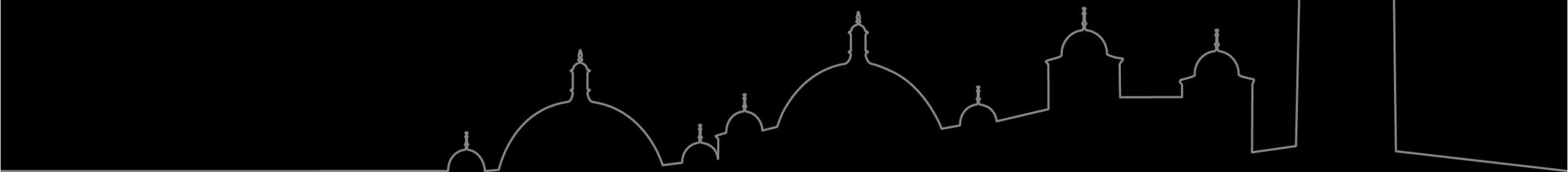


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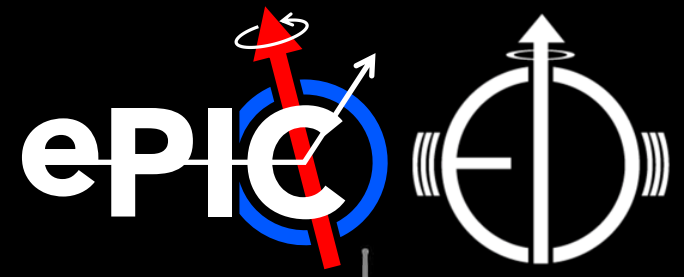
Thank you very much!

Any questions?





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Additional (support) slides

