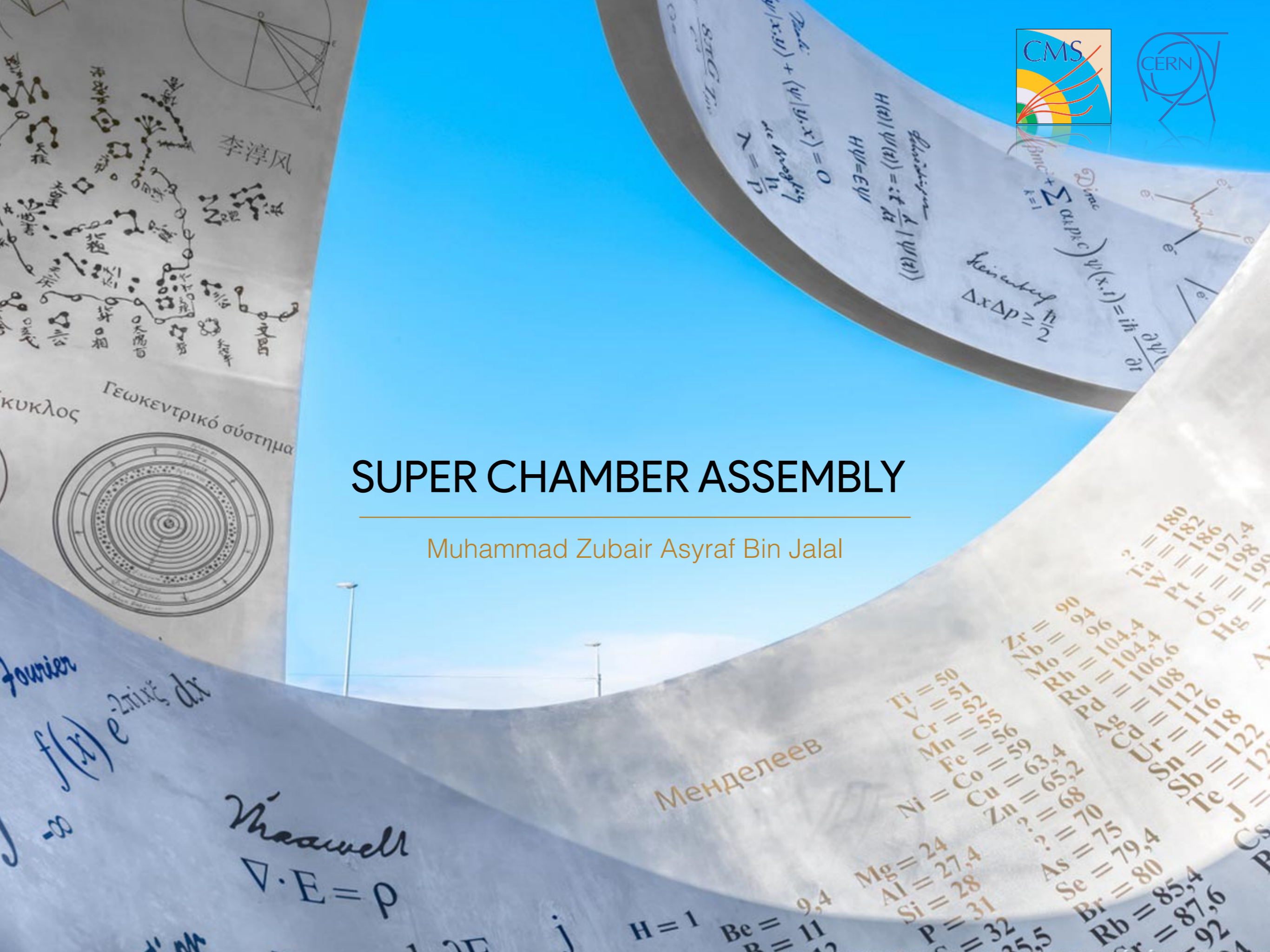
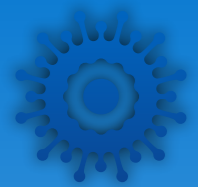




# SUPER CHAMBER ASSEMBLY

Muhammad Zubair Asyraf Bin Jalal





# Workflow

## #QC6

Preparation of the  
GEB & GEM

Installation of  
the GEB & Gas  
pipes

FEAST voltage  
test & VFAT  
Install

## #QC7

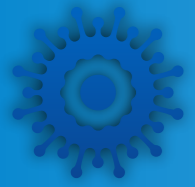
Opto-Hybrid  
Installation and  
Cooling System

## #QC8 PT

Chimney Prep &  
Super Chamber  
Assembly

QC6 - High Voltage Test  
QC7 - Electronics Test  
PT - Pressure test  
QC8 - Efficiency Test



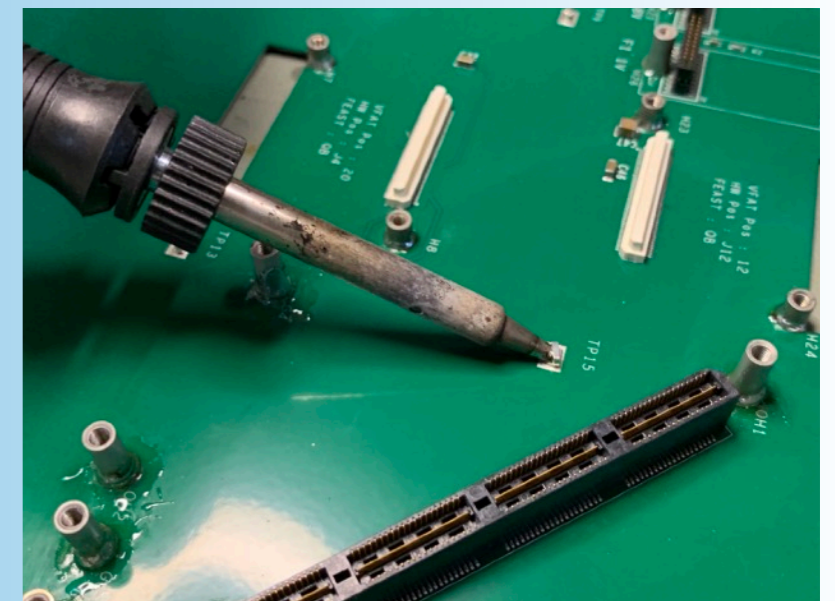
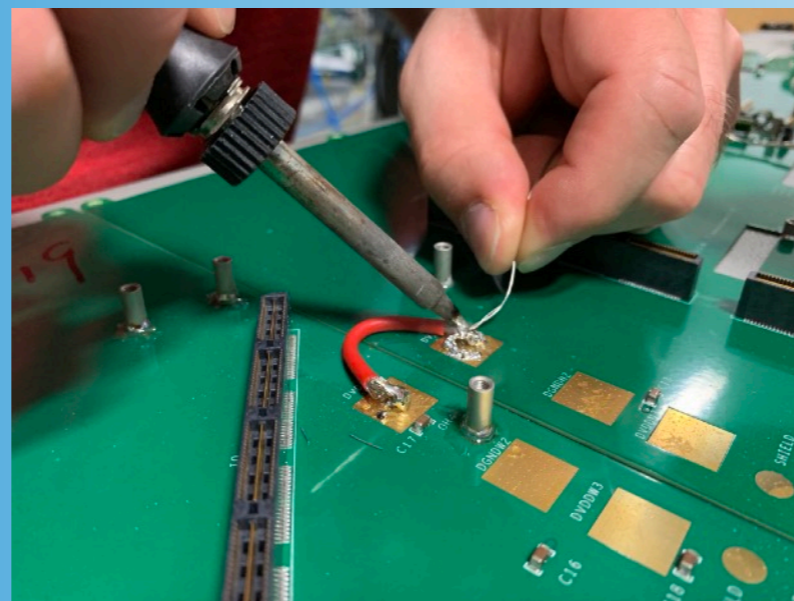
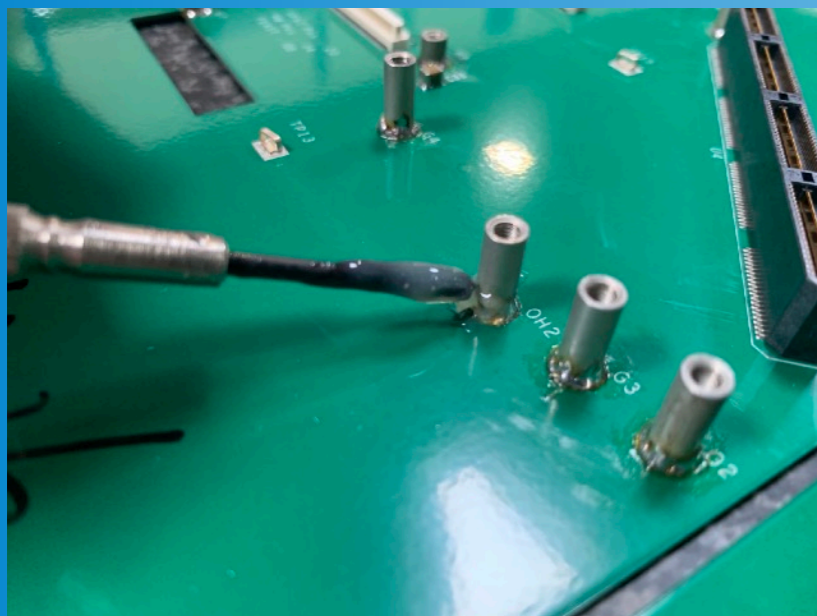


# Assembly



## Preparation of the GEB

- **Glue** the OH, VFAT and FEAST standoff with Araldite
- **Solder** 6cm Red and Black Low Voltage Cables connecting the wide and narrow GEB.
- **Solder the ground cables** at AGND3, AGND4, R10A, R20B and SHIELD on the GEB
- **Unsolder TP15** piece from the GEB.

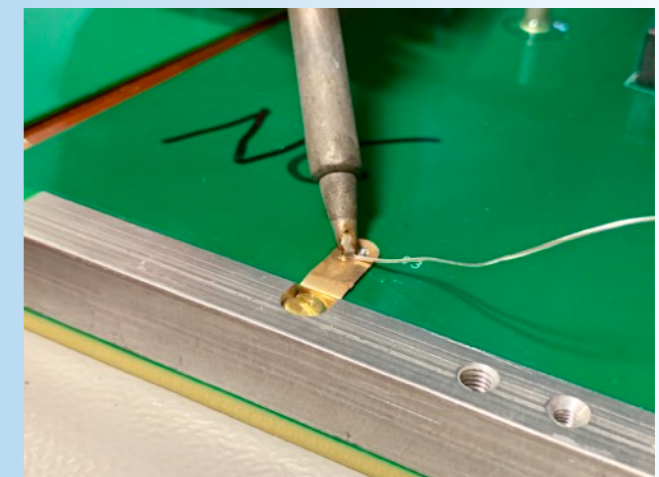
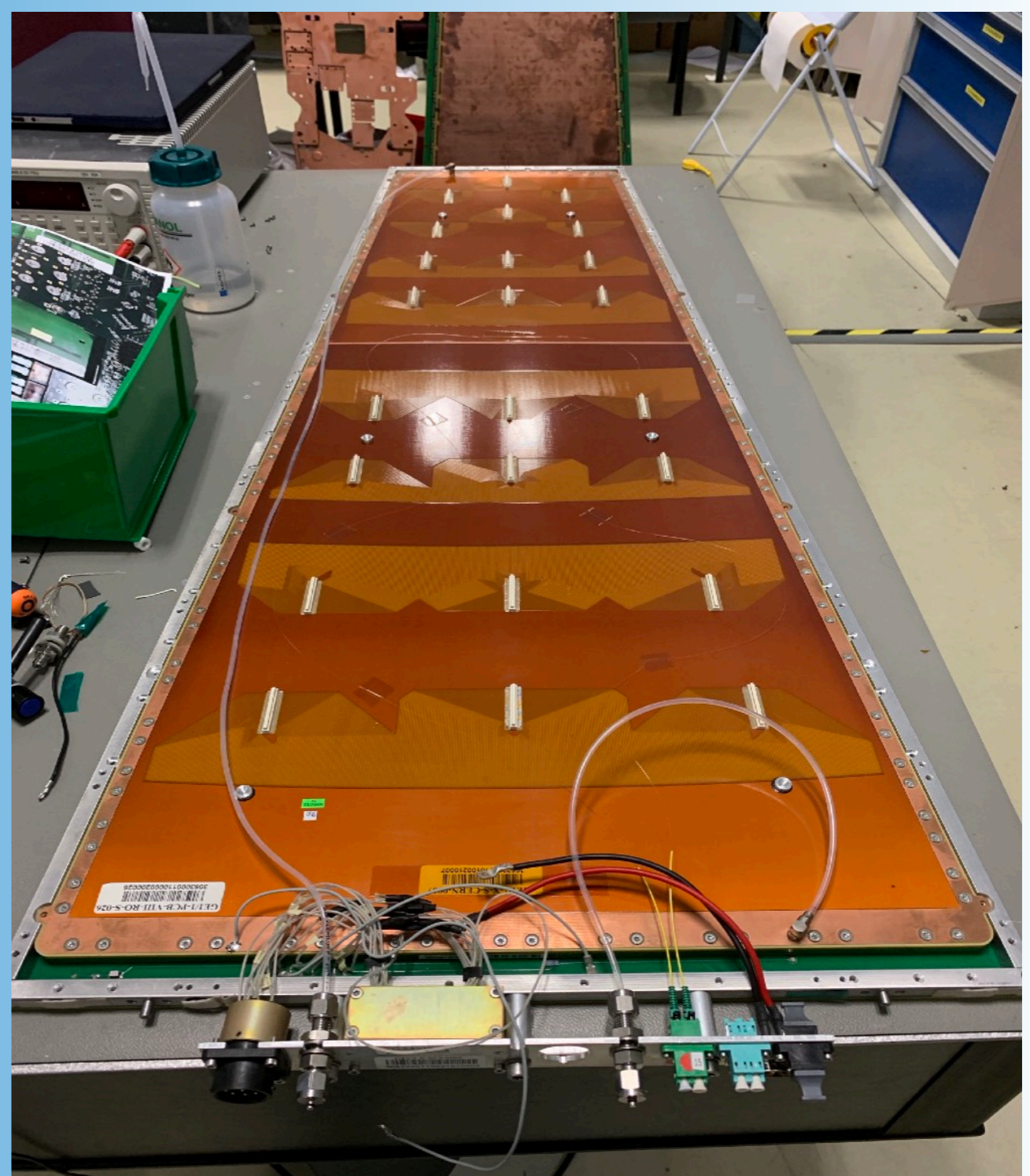


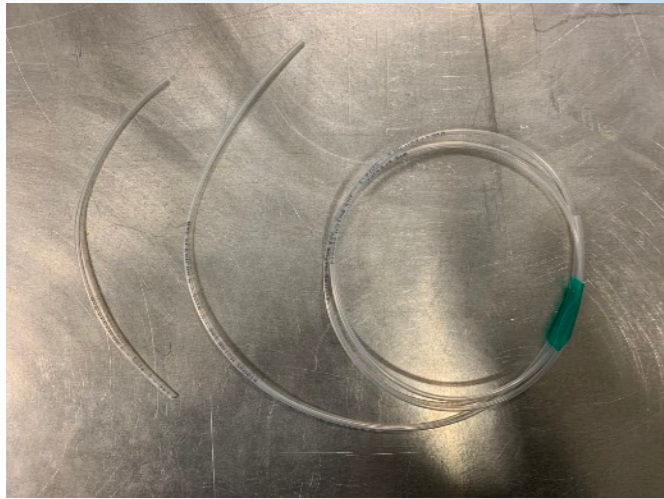
## Preparation of the GEM

- Tape the expose Fibre Optics with Kapton
- Clean the GEM with cloth and Ethanol
- Ground the GEM
- Install all the Connectors for LV and Fibre Optics.

## Installation of the GEB

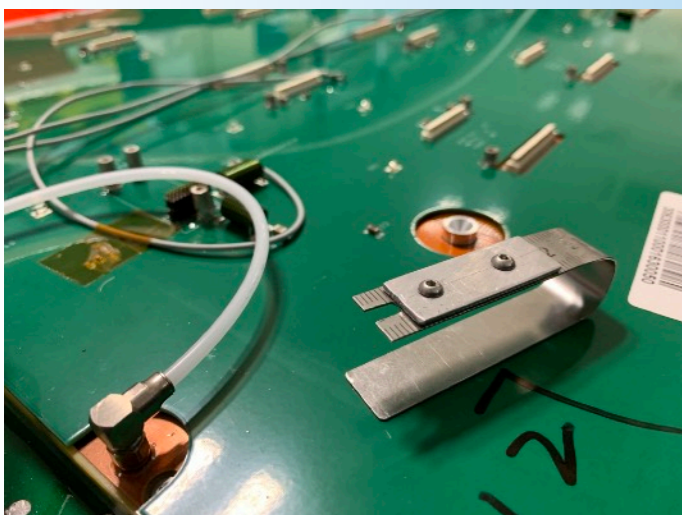
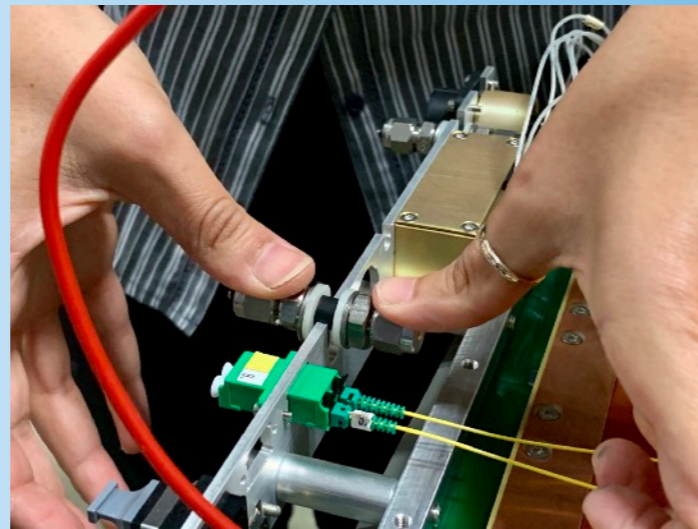
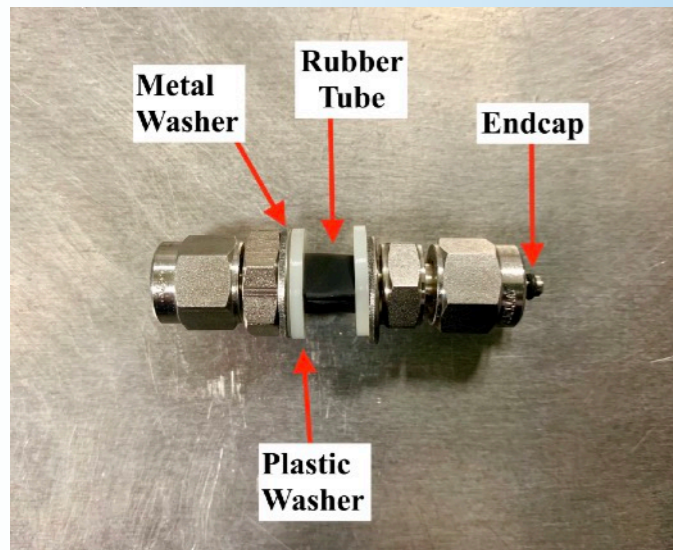
- Place the GEB onto the GEM carefully.
- Screw the GEB onto place.
- Screw the GEB grounding with eyelet screw and solder it onto the GEB





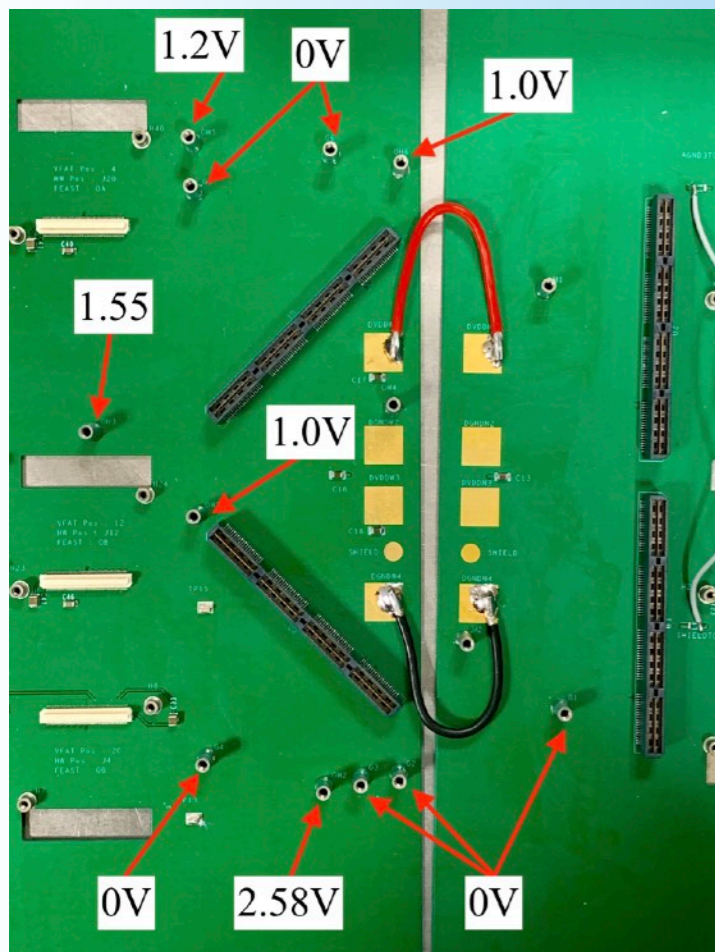
## Gas Pipes Preparation & Installation

- Measure and cut the pipes in two lengths.
- Assemble gas connector.
- Connect the gas line onto the GEM and tape in place with Kapton tape.



## Gas Pipes Dimensions

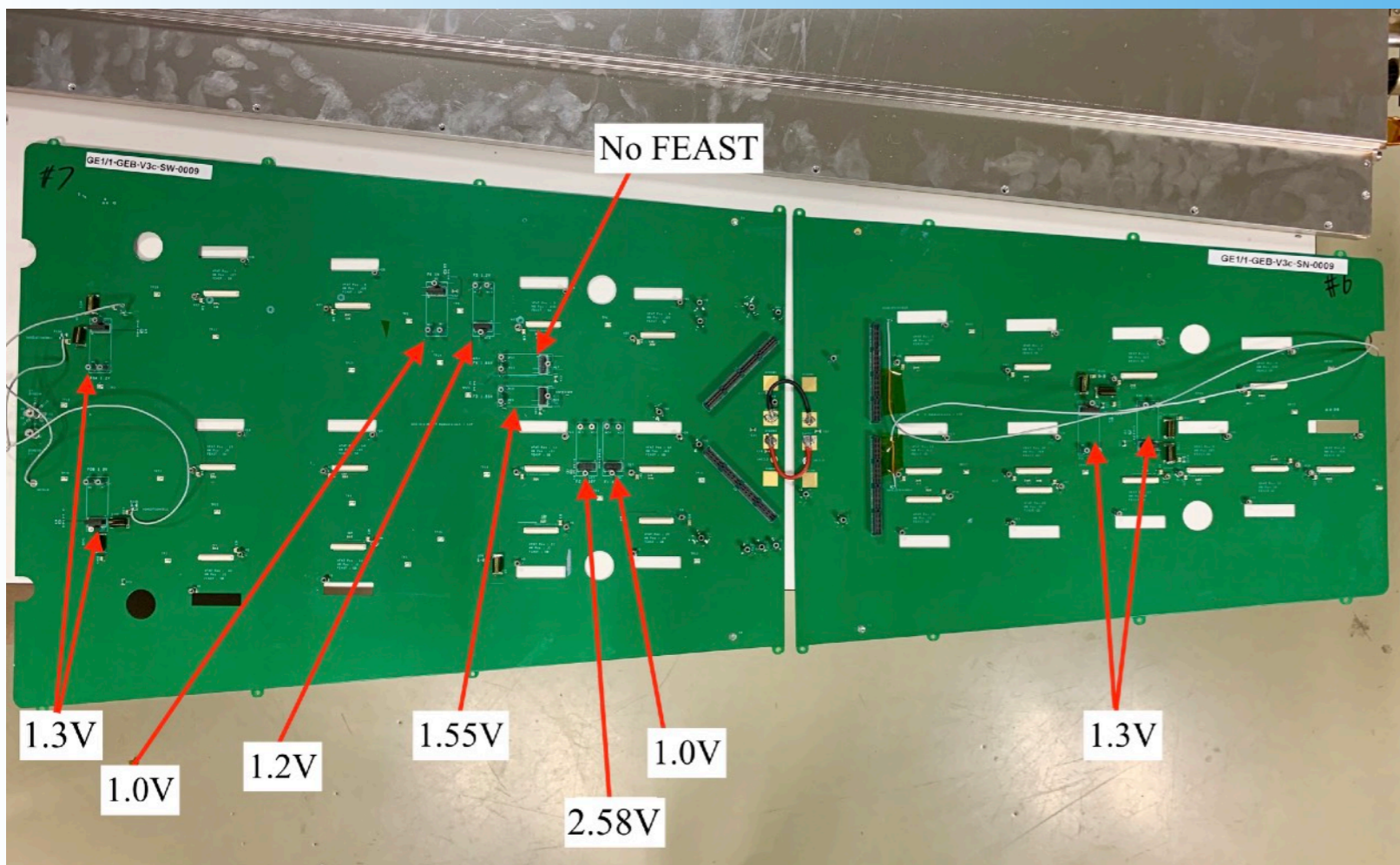
Short Chamber	Short	<b>21 cm</b>
	Long	<b>119 cm</b>
Long Chamber	Short	<b>40 cm</b>
	Long	<b>139 cm</b>



FEAST VOLTAGE TEST	
POWER SUPPLY VOLTAGE(V)	8
POWER SUPPLY CURRENT(A)	0.27
G2	0.00
G3	0.00
OH2	2.58
G4	0.00
OH1	1.00
OH3	1.55
G5	0.00
OH5	1.20
G6	0.00
OH6	1.00
OH4	NOT CONNECTED

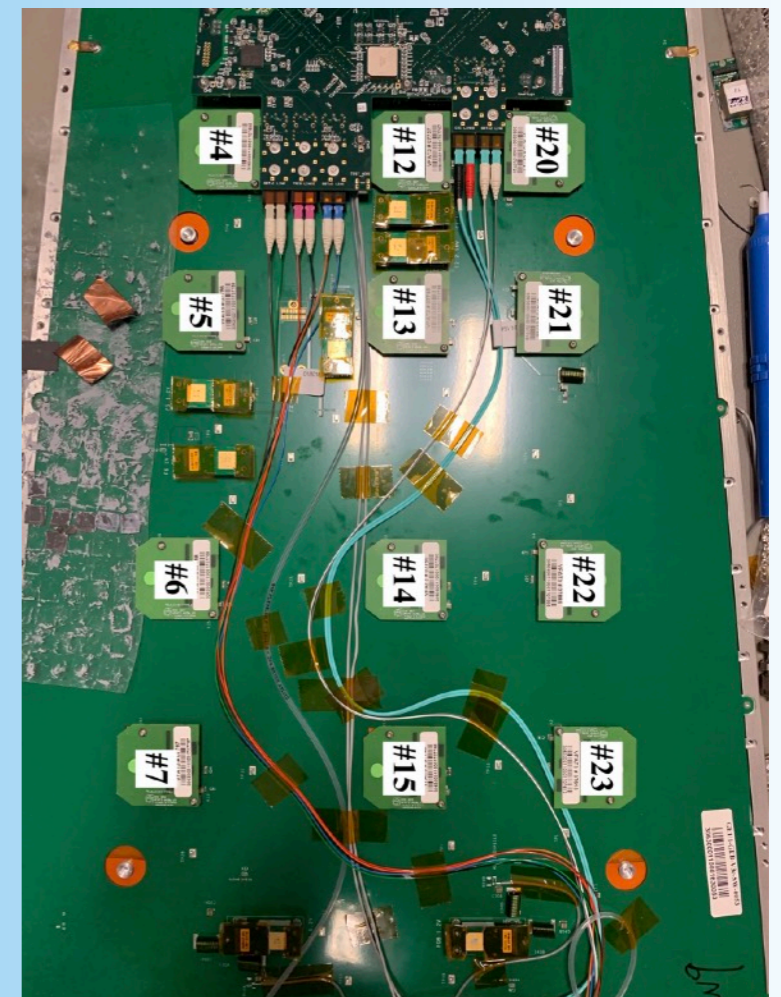
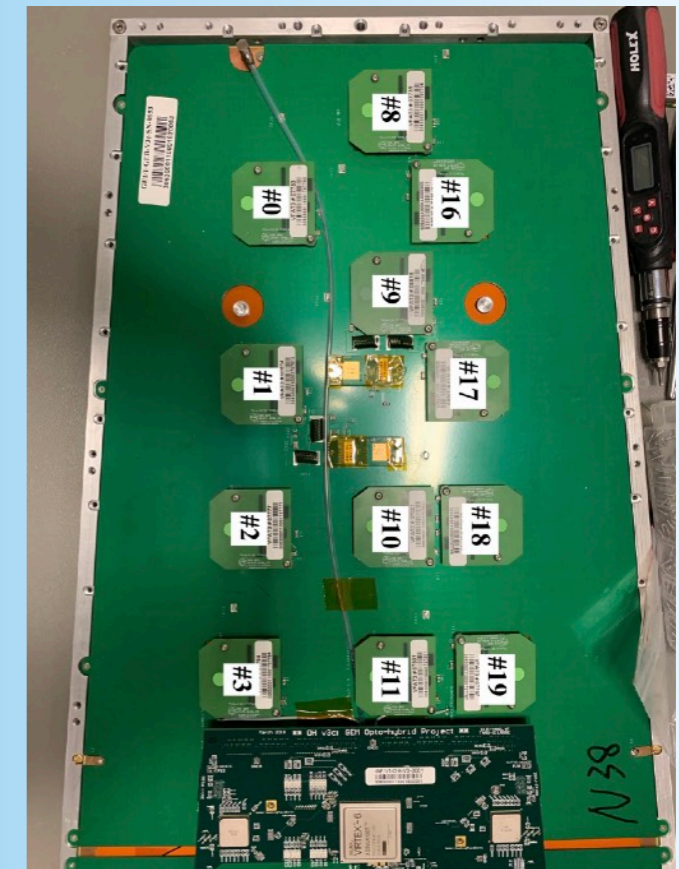
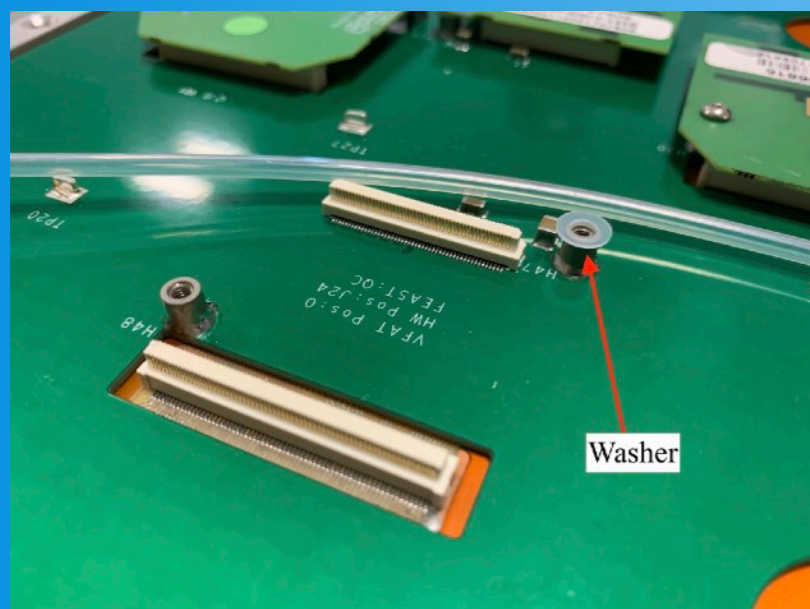
## FEAST voltage test

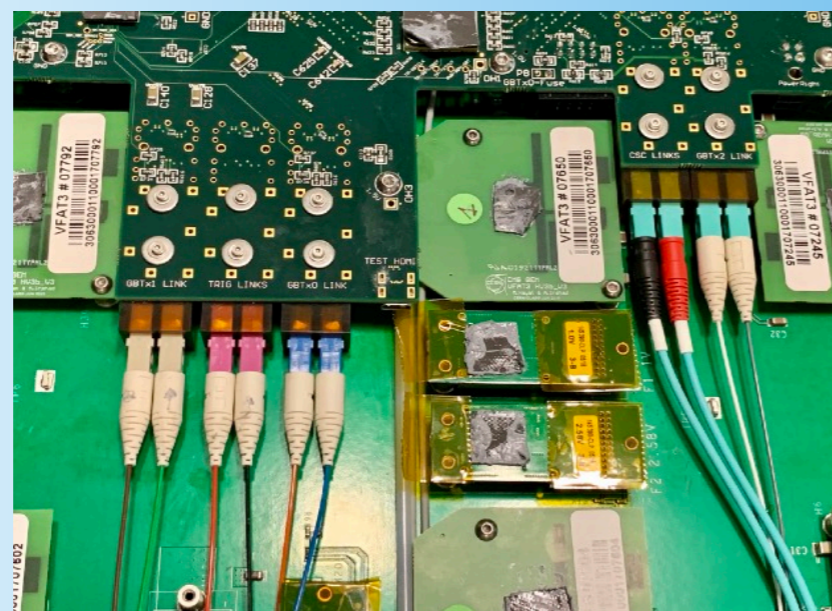
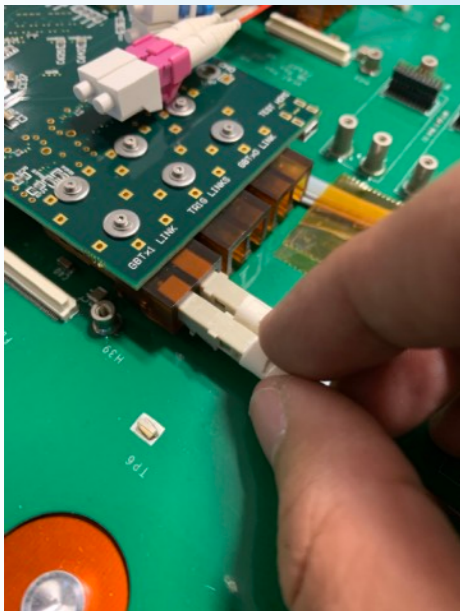
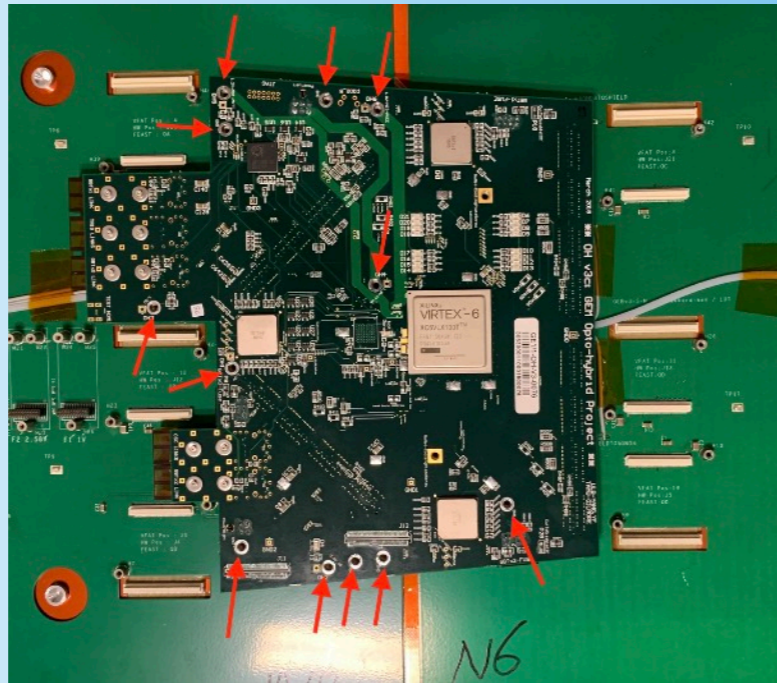
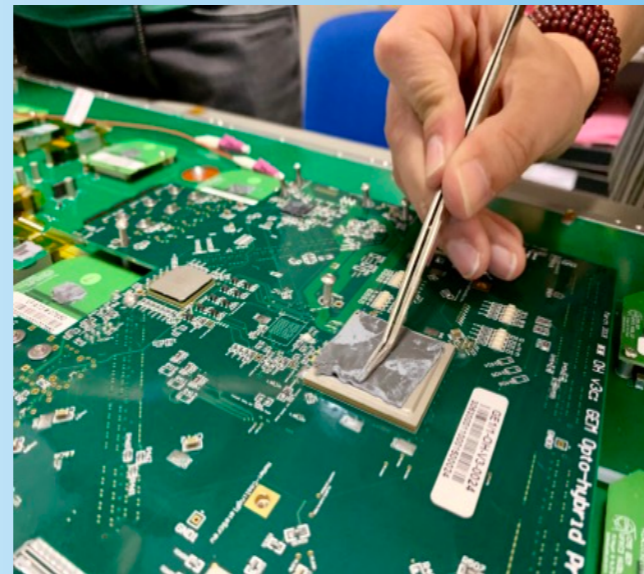
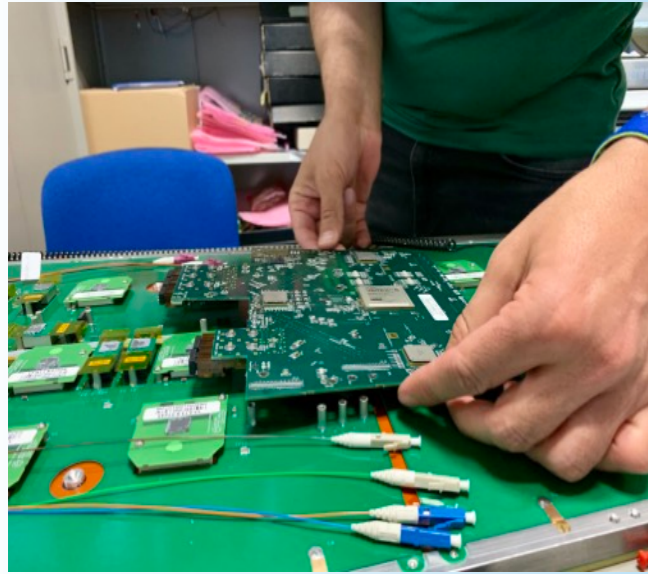
- Place handle washers on LV standoff and screw in the black and red LV cables to the GEB.
- Connect the FEAST onto the GEB according to the voltage.
- Plug in the DC power with 8V.
- Test the OH output using multimeter.
- Note the voltage in the spreadsheet.



## Installation of VFAT

- Place a washer on VFAT hybrids.
- Connect the VFAT according to the appropriate connector.
- Screw the VFAT using VFAT screws.
- Place thermal pads on the VFAT
- Note the VFAT number according to its position on the Spreadsheet.





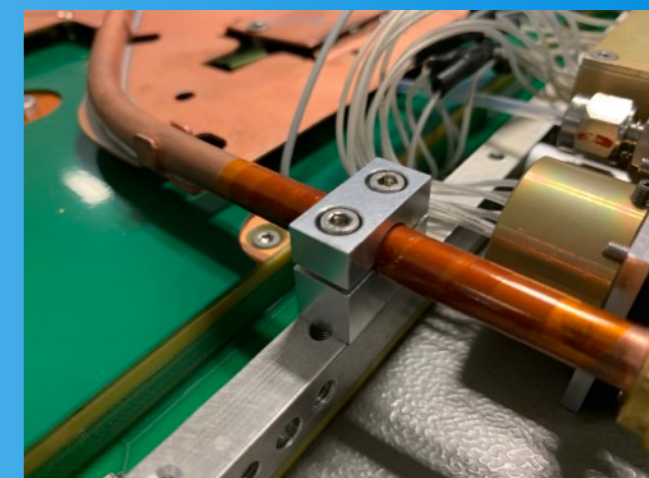
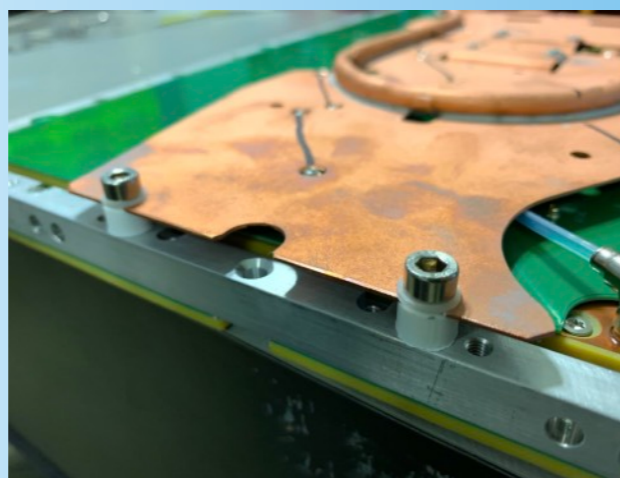
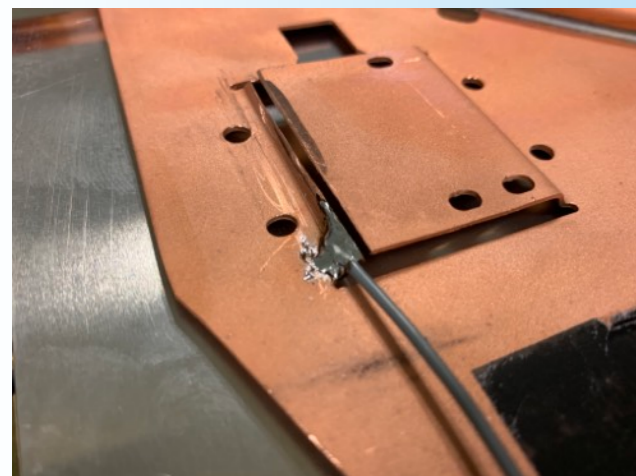
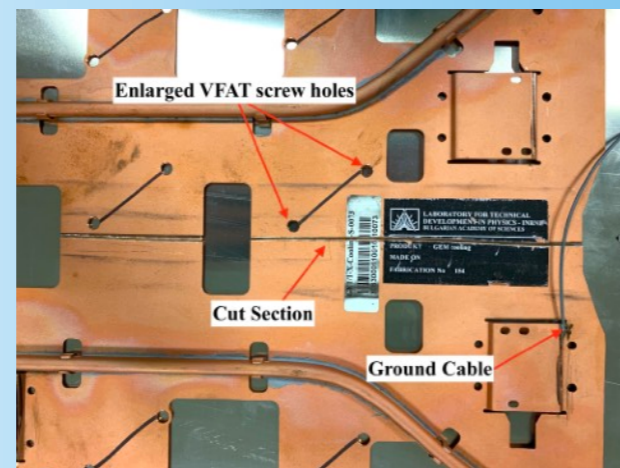
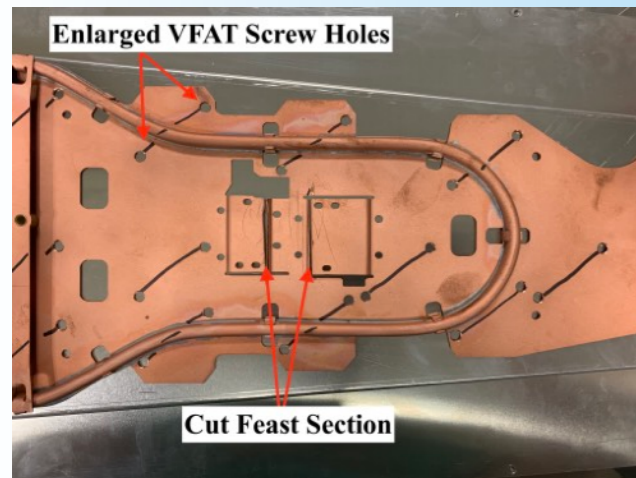
## OptoHybrid (OH) installation

- Line up the retrofitted OH (Tinned Rings) board with connectors on the GEB.
- Screw in the OH using self locking screws with a torque of 0.3 nm.
- Connect the fibre optics to the OH according to figure.
- Place thermal pads on the OH based on its respective sizes.



# Cooling System Installation

- Retrofitted Cooling plate is used.
- Solder ground cables bottom of the cooling.
- Tape Kapton around the pipes.
- Distribute thermal paste on VFAT, FEAST and OH.
- Place the cooling onto the GEM.
- Screw in the top and bottom holder.
- Check insulation with a multimeter.



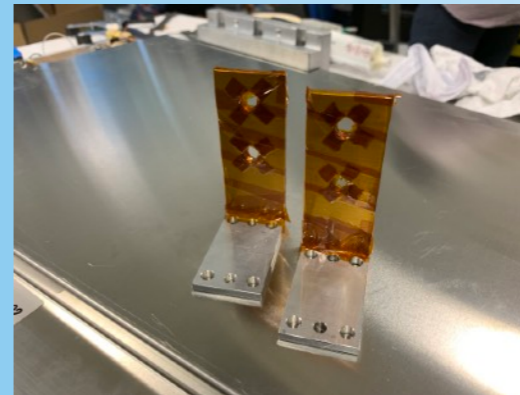
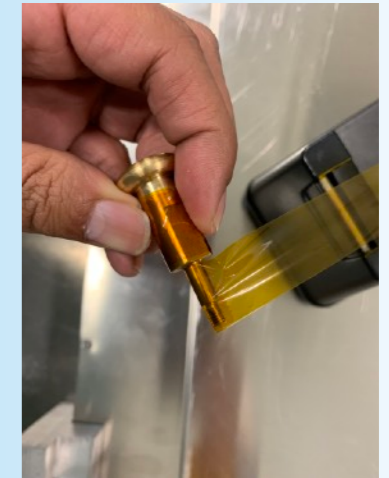
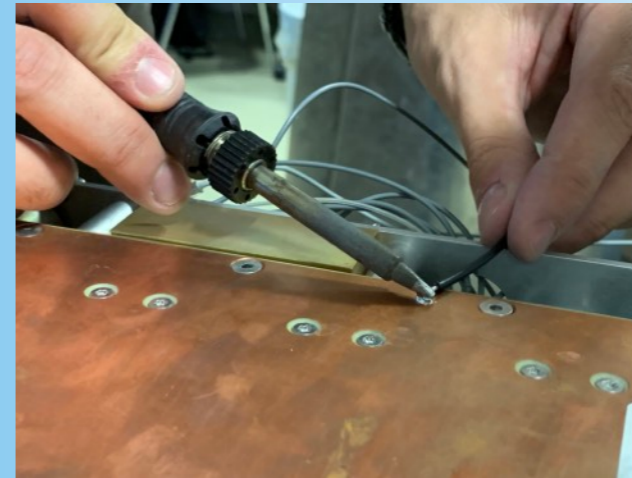
# Chimney preparation

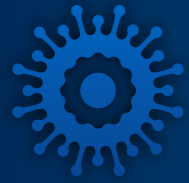
- Clean the surface with ethanol.
- Tape the middle, edge and inner with double sided tape.
- Lay Kapton on the chimney and cut to length.
- Stretch the Kapton and tape it into place.
- Cut excess Kapton from the chimney.
- Drill the bottom of the chimney.
- Place a ground wire with nuts and washer.



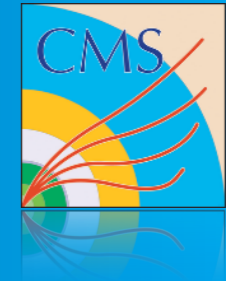
# Super Chamber Installation

- Close the chamber with the chimney and screw it in.
- Solder ground cables onto the Drift.
- Tape Kapton on the pivot and L-bracket.
- Place the chamber on the super chamber assembly stand.
- Remove the alignment pins.
- Screw in the retrofitted pivot.
- Place metal plate in front of the super chamber and screw/pin it in.
- Pin the L bracket onto the chamber.
- Screw in the Blue grounding cable on both chamber.
- Attach the gas pipes and copper pipes onto the super chamber.



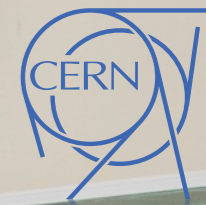


# Conclusion



## RETROFITTING OF CHAMBERS

- **Clean** electronic components from thermal grease.
- **Replacing** damaged thermal pads on VFAT and FEAST.
- **Add** screws and nylon washers on VFAT hybrids.
- **Unsolder** TP15 from the GEB.
- **Replace** OH with retrofitted OH with tinned rings.
- **Using** self locking screws for OH and apply 0.3 nm of torque.
- **Add** handle washers on the LV stand-off and apply torque of 1 nm.
- **Isolate** the gas connectors (heat shrink + nylon washers).
- **Drill** the chimney + installation of the ground cable.
- **Solder** ground cable onto the Drift.
- **Using** the latest of retrofitted Cooling plate.
- **Using** the retrofitted and isolated pivot and L-shape brackets for the super chamber assembly.



THANK YOU

*"When in doubt, use Kapton"*