

# ATLAS-ITK-Lecce Discussions

Gabriele Chiodini - INFN Lecce

ATLAS-ITK-Lecce  
25-Sept-2023



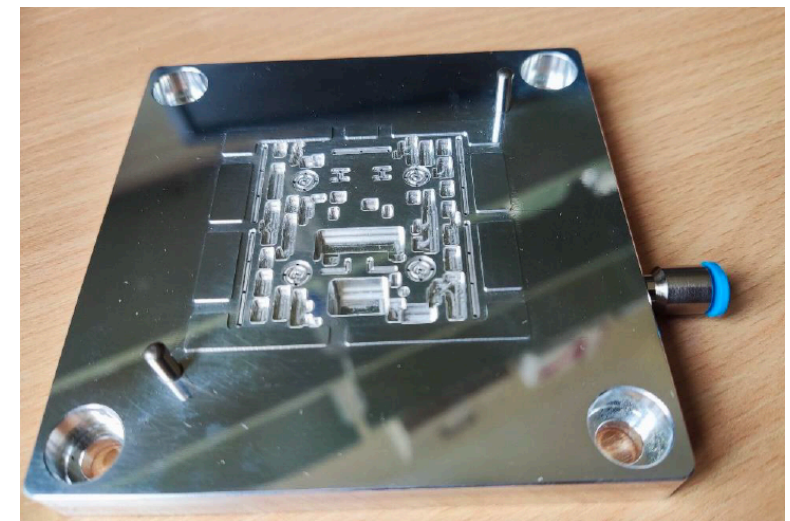
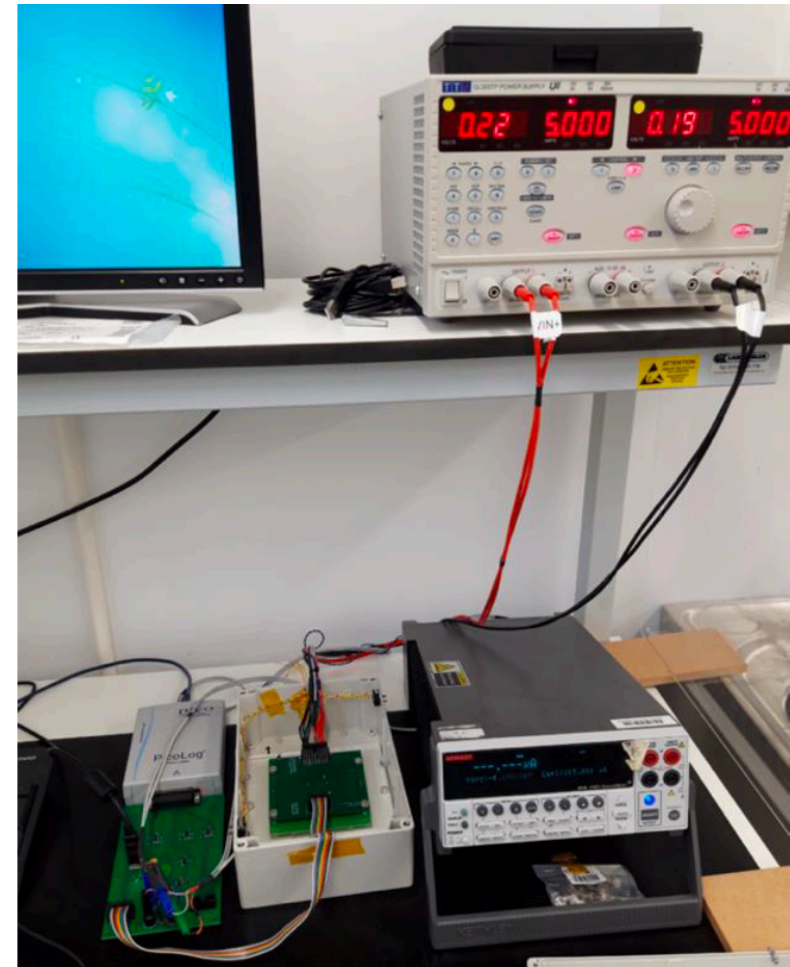


# Lavori aggiuntivi richiesti a ITK Italia

- Test dei flex dei moduli
- Harness servizi di un end-cap
- Saldatura orbitale degli half ring

# Test dei flex dei moduli con le componenti

- Circa 850 flex
- Inizio a Marzo 2024
- Durata fino a Dicembre 2024
- Solo QC test
  - Visual inspection
  - LV and HV test (15 minuti di dati)
  - Components metrology with dowel holes
- 1 flex= 1ora
- 5 flex= 1 giorno
- 25 flex= 1 settimana
- 100 flex= 1 mese
- 850 flex=8.5 mesi



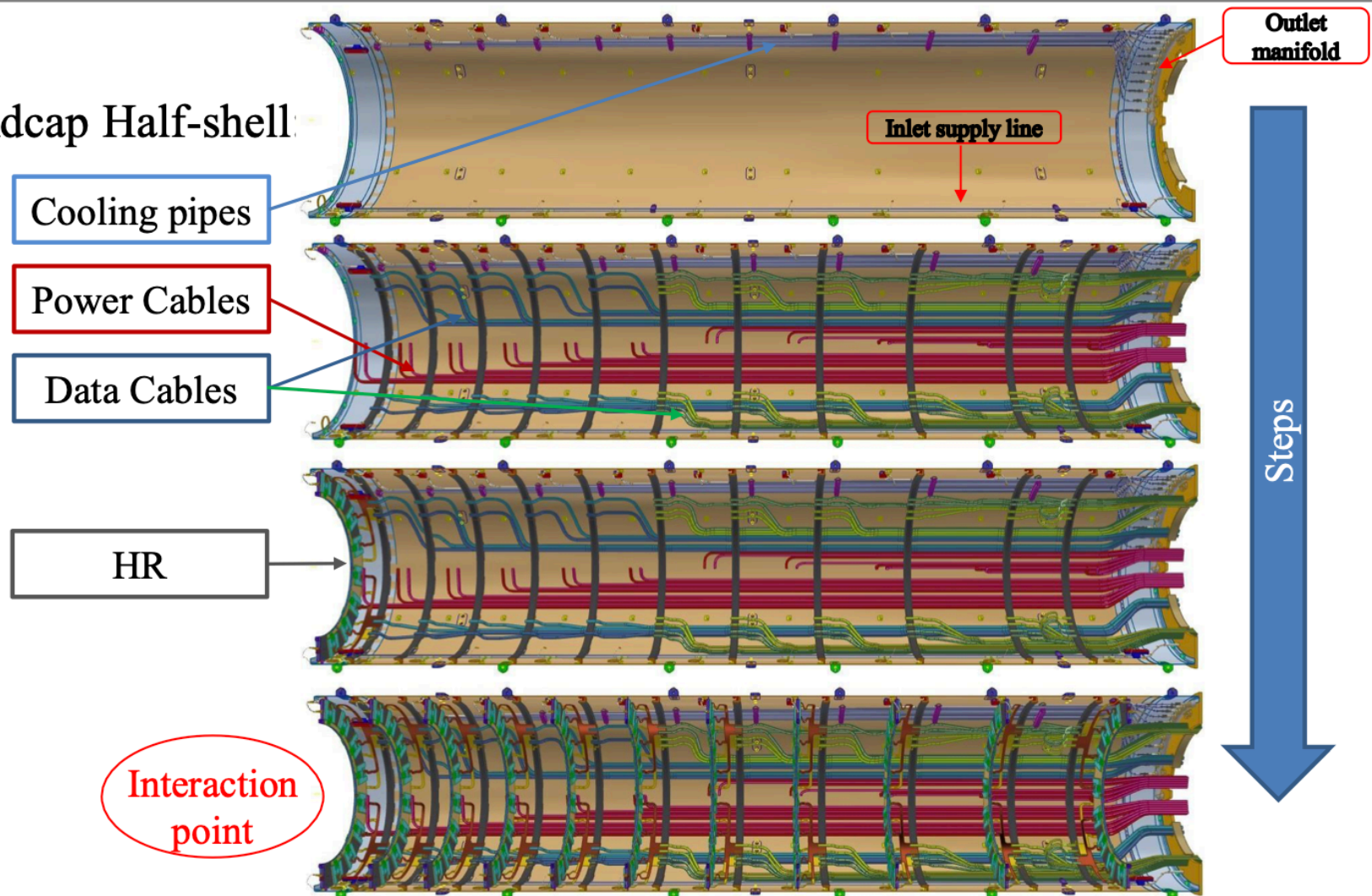
# Integrazione a Frascati

## Outer EndCap Half-shell assembly



- Loading of Services into Outer Endcap Half-shell

- Step 1: cooling pipes
- Step 2: electrical services (SP-links, Data links, Env-links)
- Step 3: Add half-rings one-by-one
  - a: Lower half-ring & attach
  - b: Weld cooling pipes
  - c: Connect T-sensors
  - d: Connect SP- & Data links
  - e: Test half-ring
- Proceed to next higher-z ring



Half-shells produced and tested in Liverpool (carbon fiber reinforced polymers - CFRP)



# Harness servizi di un endcap

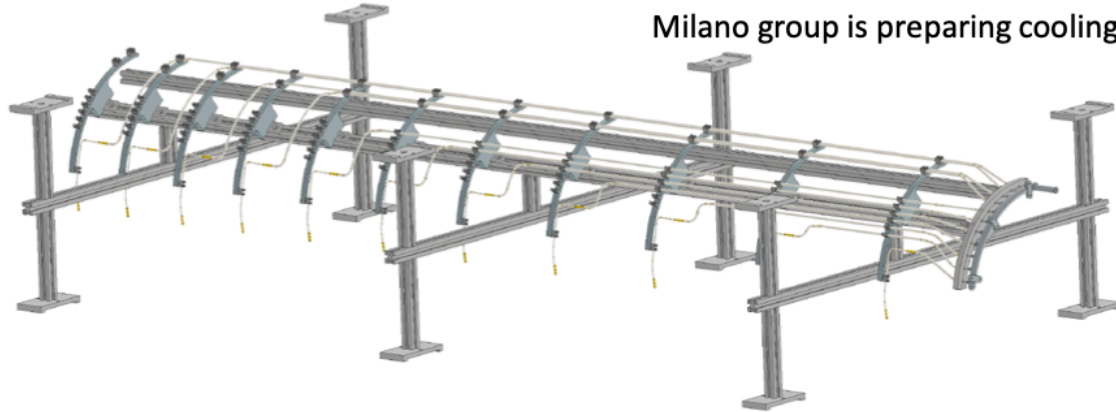
## Outer EndCap Services integration



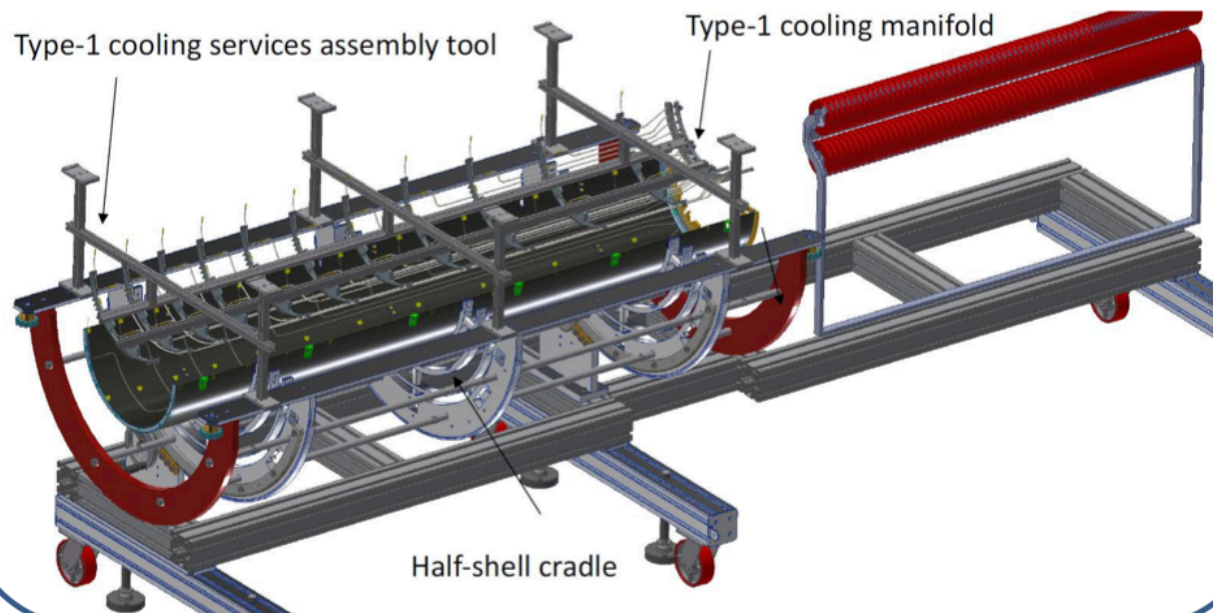
Equipment for preparation of the half shell for integration

### Design of Cooling pipes Harness Assembly Tool

Milano group is preparing cooling pipes

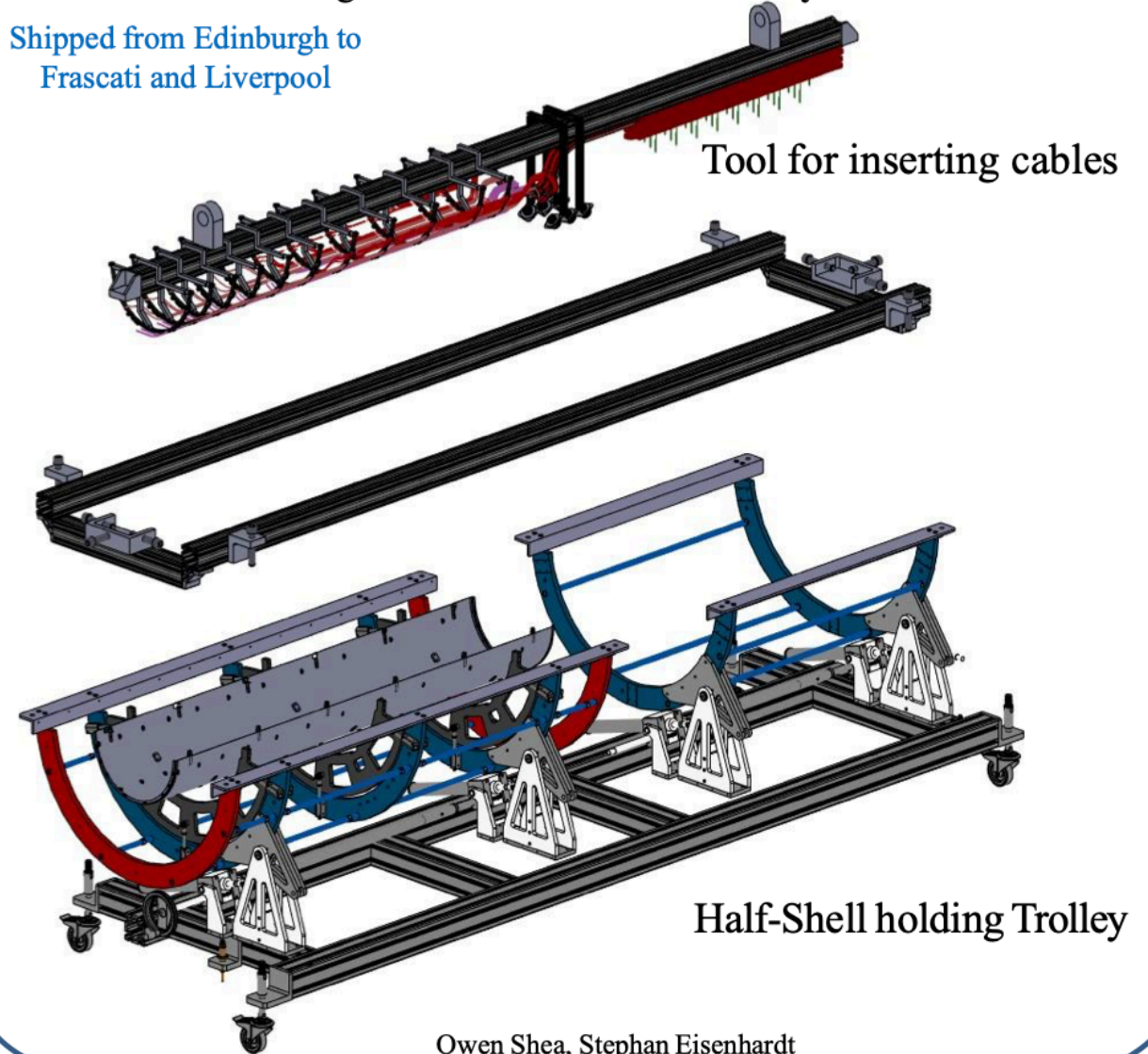


*Preliminary design of tooling to mount the cooling services on to a half-shell.*



### Design of Cable Harness Assembly Tool

Shipped from Edinburgh to  
Frascati and Liverpool

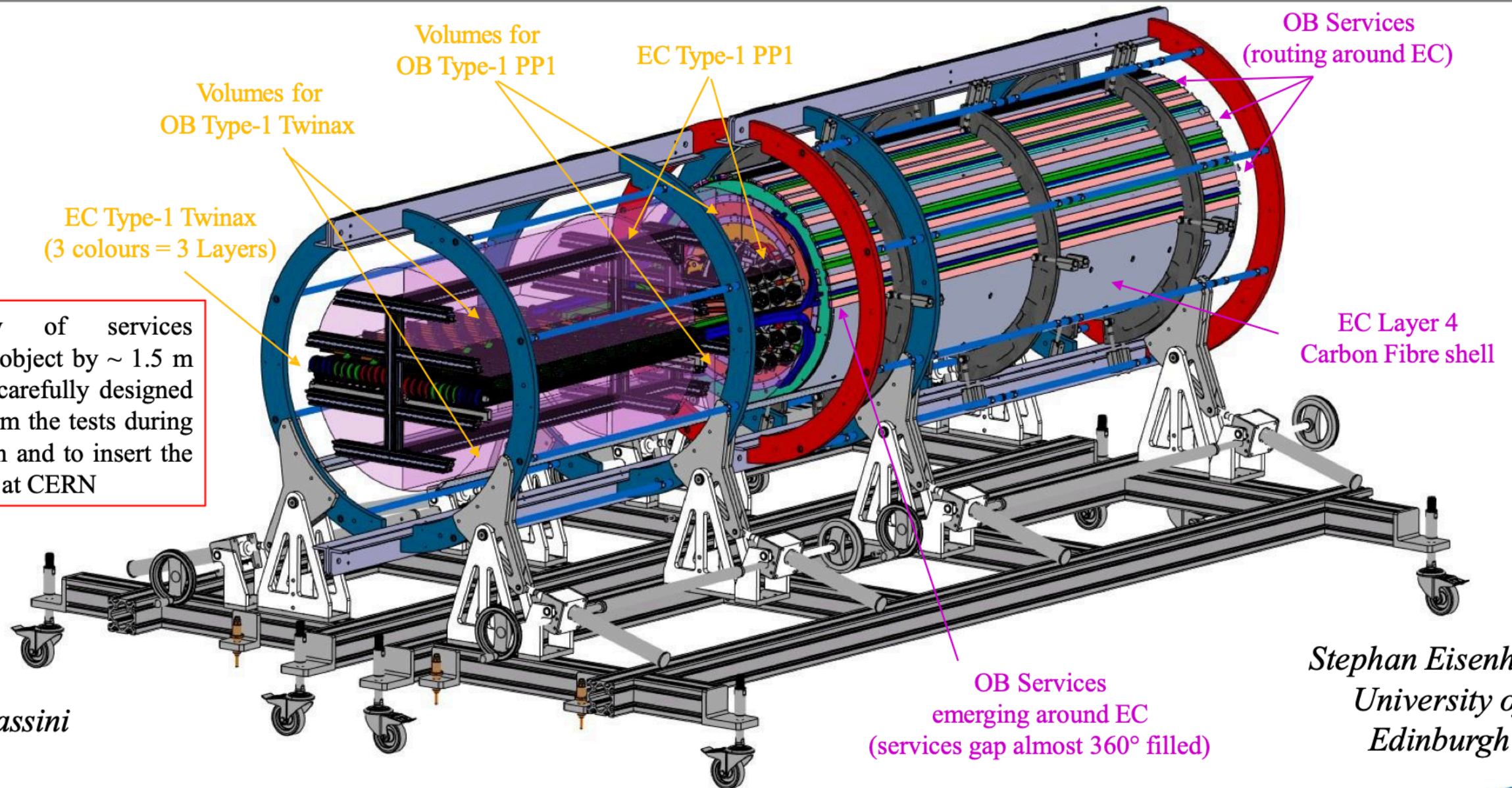


Owen Shea, Stephan Eisenhardt



# Harness servizi di un endcap

## Trolley with services



The trolley of services increases the object by ~ 1.5 m and must be carefully designed both to perform the tests during the integration and to insert the OE in the OB at CERN

*S. Tomassini*

*Stephan Eisenhardt  
University of  
Edinburgh*



# Cosa c'e' a Frascati ora



+ Mockup PP1 in  
collaborazione con i tecnici  
napoletani



# Harness servizi di un endcap

- 2 FTE per un anno
- Struttura 4 m x 3.5 m
- Strutture di trasporto a Frascati

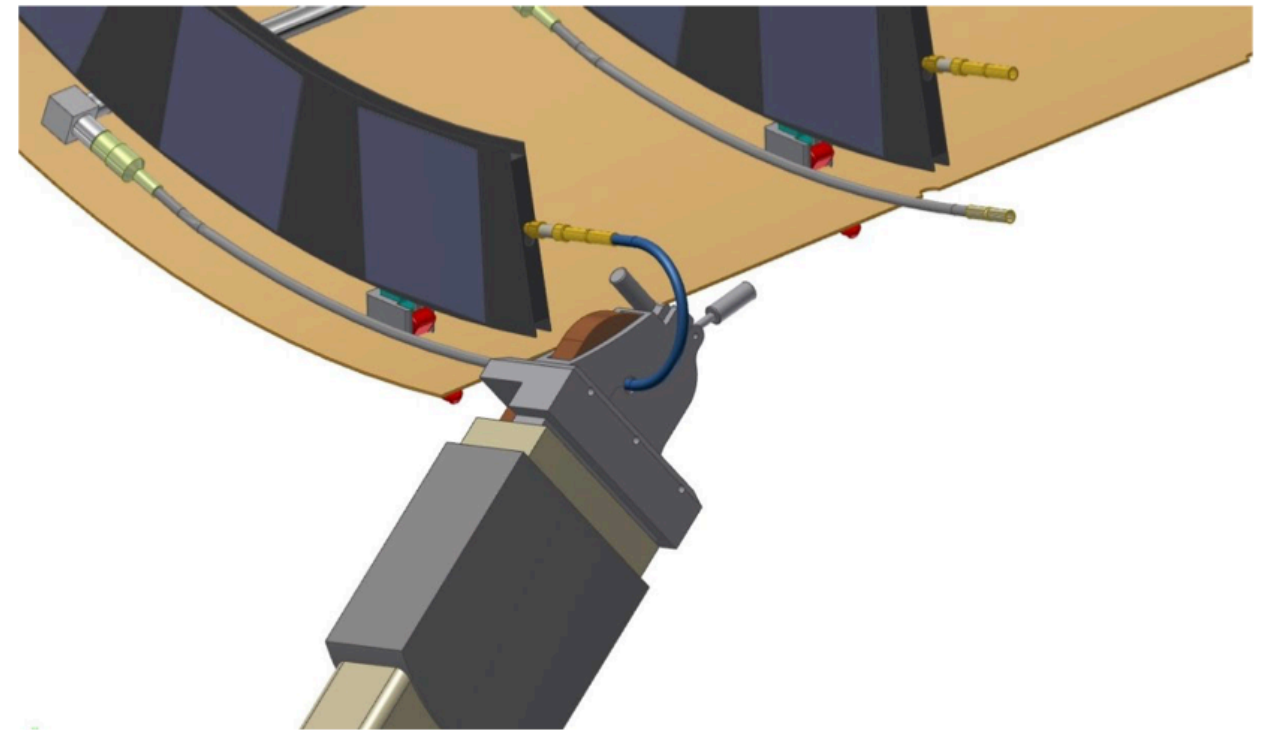
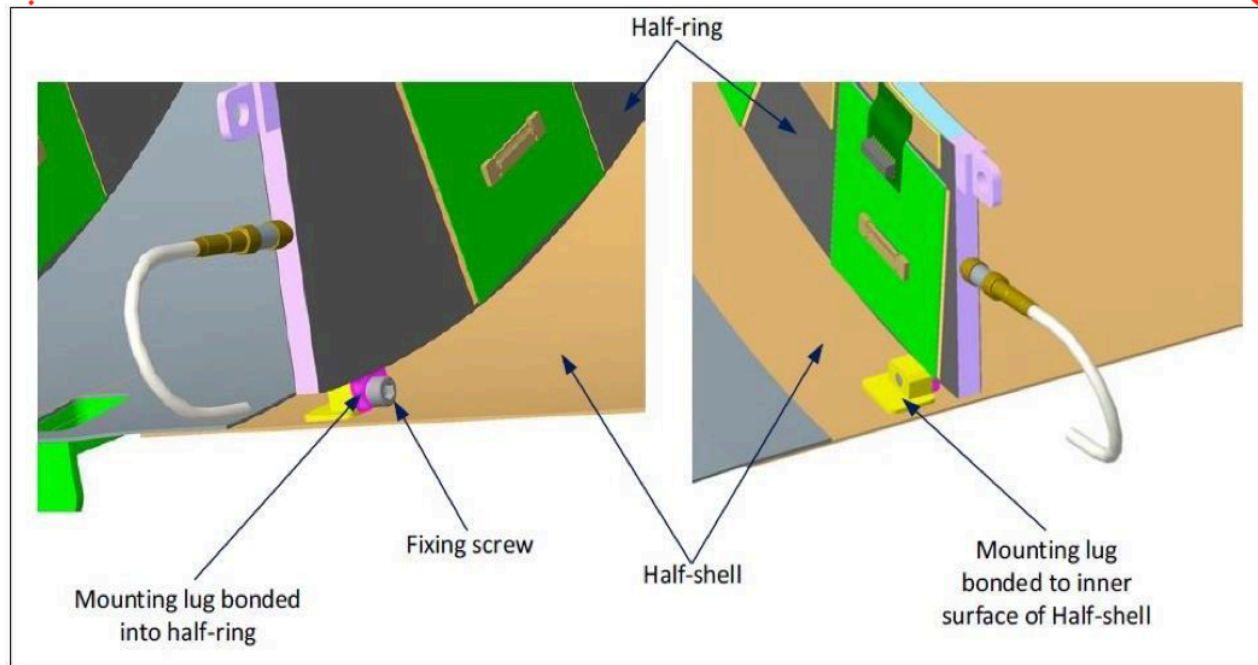
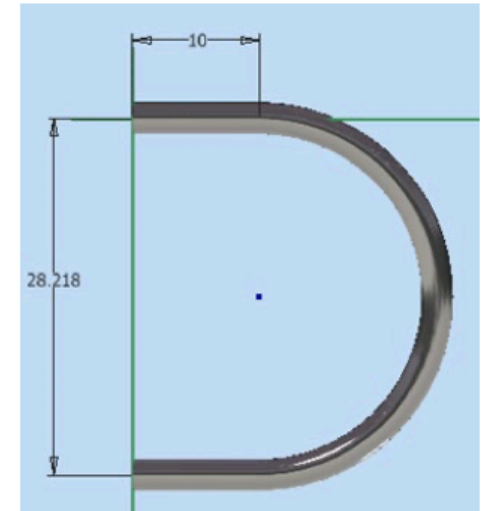
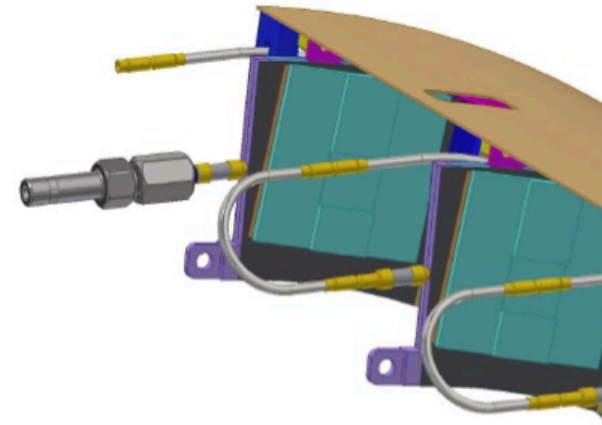
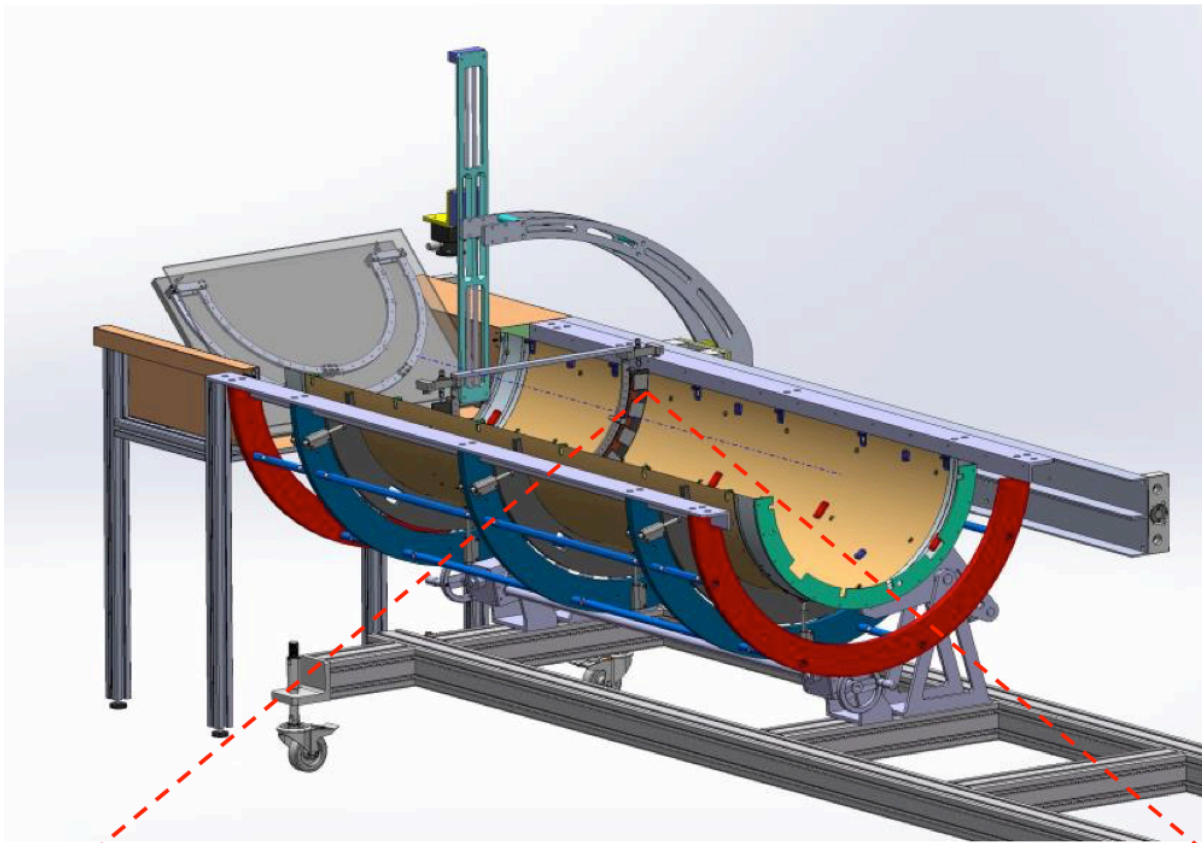


# Saldatura orbitale half ring

- 2 - 3 tecnici di Milano stanno facendo la qualifica: procedura lunga e costosa
- Milano ha saldatrice orbitale (70 keuro) con teste ad hoc per ITK (grand parte del costo)
- Dovranno realizzare tutti e 12 le manifold di cooling delle 12 half shell per i due endcap.
- Non riusciranno a portare la saldatrice orbitale a Frascati e saldare gli half ring
- Quando un half ring è nella half shell vanno fatte due saldature orbitali (30 minuti di lavoro) e i test di pressione.



# Saldatura orbitale half ring



# Saldatrice orbitale

94 **www.AXXAIR.COM** PART OF S F E SPECIALIZED FABRICATION EQUIPMENT

V4 - 11/2022

## SAXX-200

**AXXAIR**  
INNOVATIVE ORBITAL SOLUTIONS

**Fully-assured gas management**  
2 separate gas lines, free choice of inerting gas flow management

- Gas flow control and flow alarms
- Display of the actual flow rate right on the screen

The ergonomic shape of the power source, the water cooler and the carrying handle make transport easy

**Interface 5.7 colour touch screen + WiFi**

13 languages, possibility of remote control by smartphone or tablet

**Compatible with most closed head on the market**  
AMI, Polysoude, ESAB, Orbitec and Orbitalum

**Axis for added metal**  
Possibility of using Step mode

**Removable water colling**  
Can be separated **without tools** and makes the power source extremely portable  
Cooling capacity 700W, flow mini alarm

**Data acquisition**  
Records the last 999 welds on the USB key  
Integrated WeldReport, data's formatting and presenting of the instructions in the form of DMOS.

**Integrated printer**  
Printing program and actual parameters

**USB port on front panel**  
200 programs per USB key, several keys can be used  
- Software: Remote update possible  
- Sending and retrieving data through remote access to the SAXX's USB key

ORBITAL WELDING