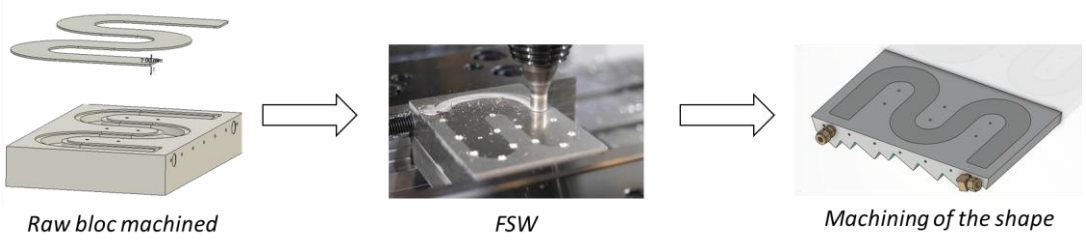
Backward Ecal / EEEMCal

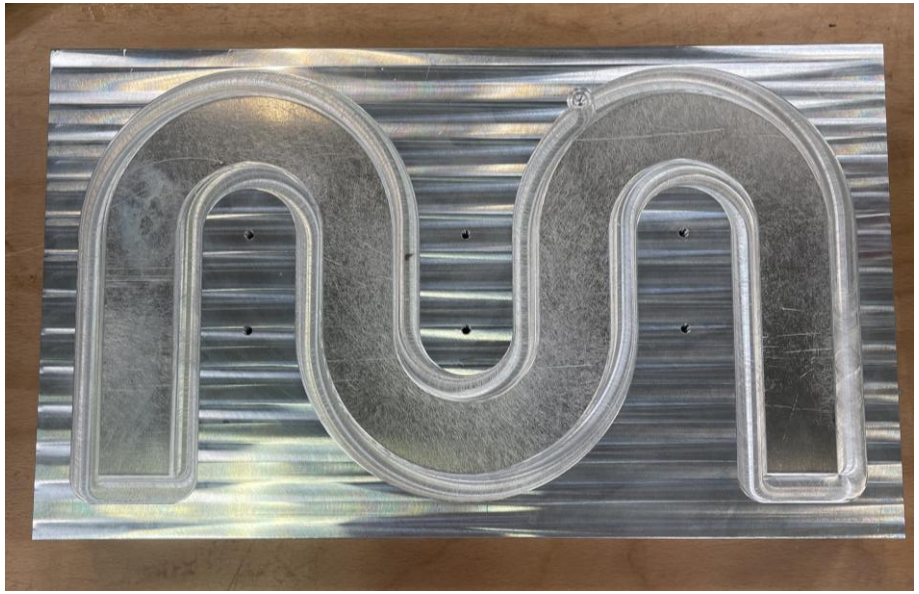
Triple I Engineering Meeting Update (28/07/2025)

Julien Bettane

Prototype External structure – FSW

- Prototype to check the efficiency of the cooling
- Test the Friction Stir Welding (FSW) technology
- Good watertightness and good for the pressure
- Machining finished
- Metrology checking required because of the deformation
- **Receiving this week**

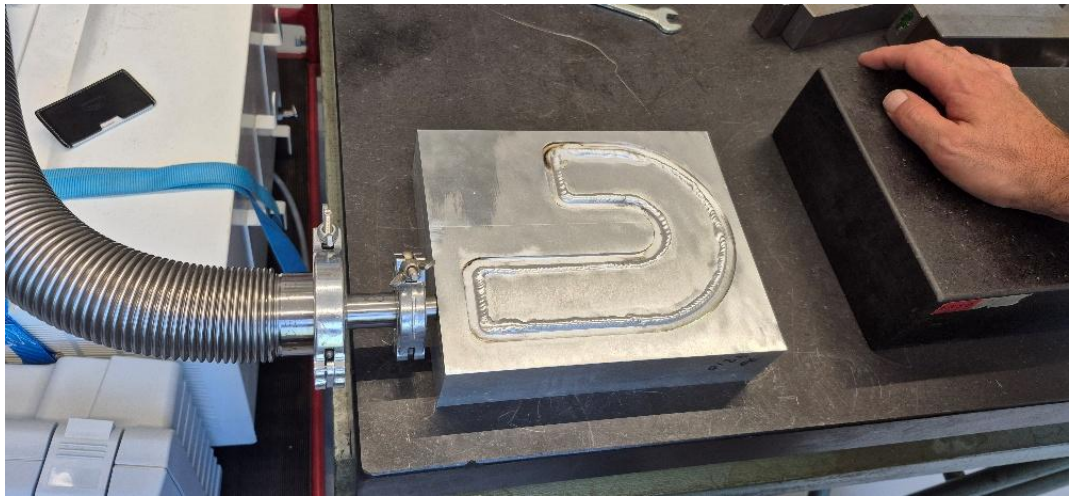




Prototype External structure – Welding (back up)

- Aluminum welding tests in progress
- Machining tests of the shape in our mechanical workshop in order to practice
- **Ready to machine the steps of the FSW prototype received**

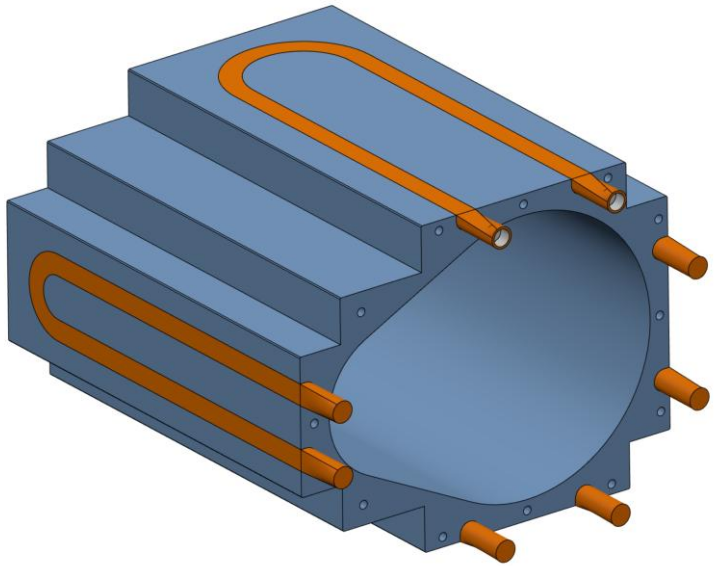
Machining of the steps
Metrology testing of the shape < 0,025 mm

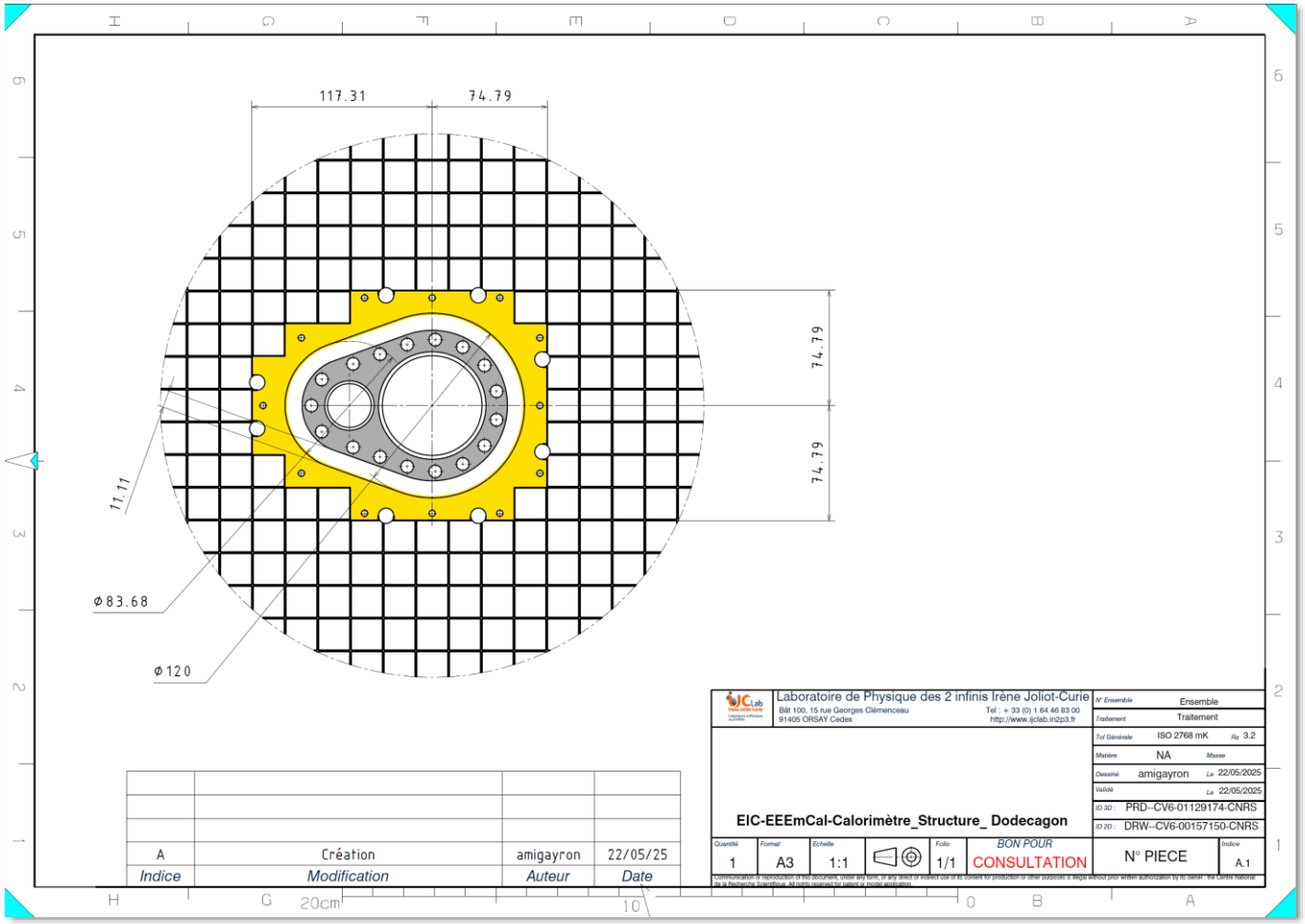


Additional welding test to improve the quality (tightness test OK)

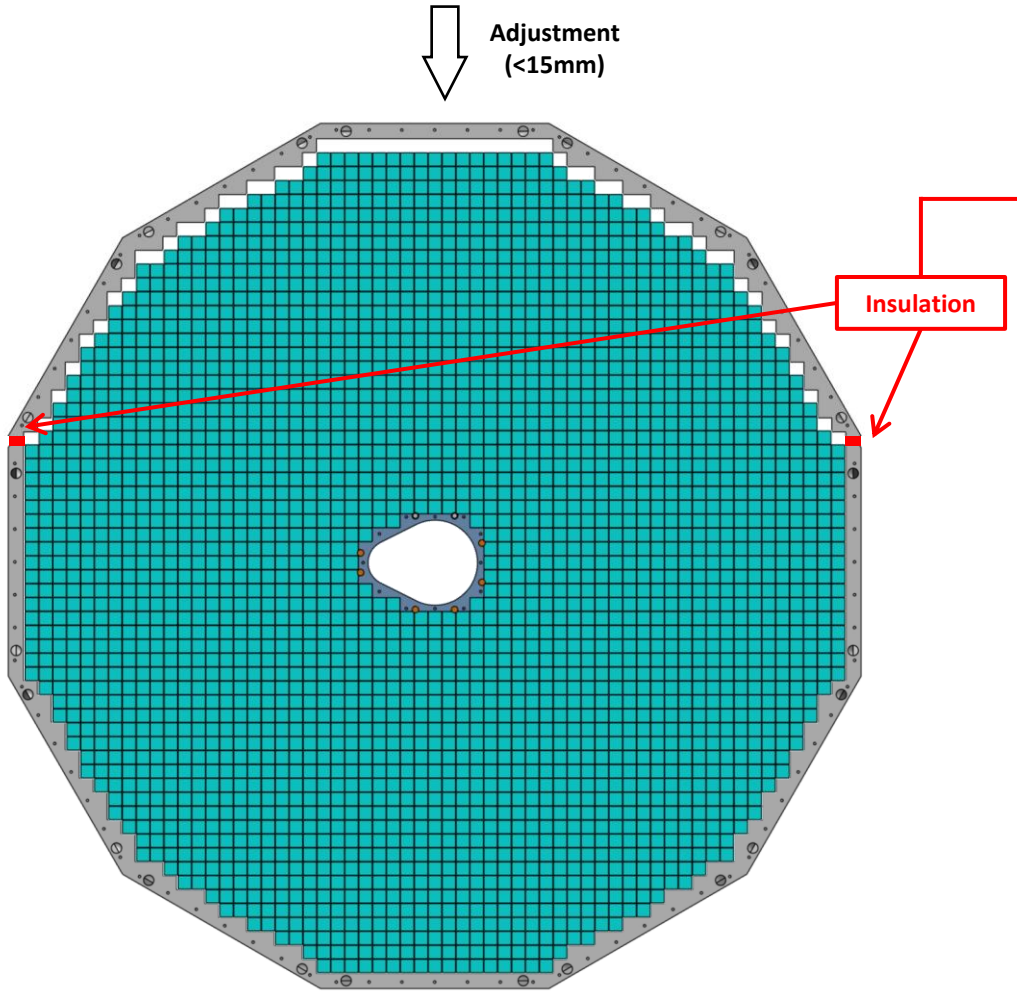
Prototype Internal structure – Copper tubes

- Prototype with copper tubes
- **Machining and assembly in progress**
- Design stays the same even if the flange is reduced → Not possible to add crystals
- **Clearance = 11 mm**

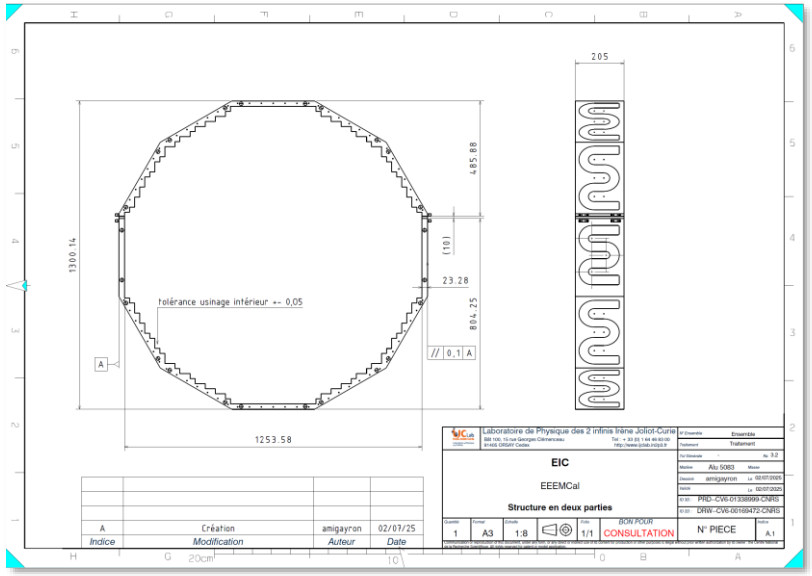




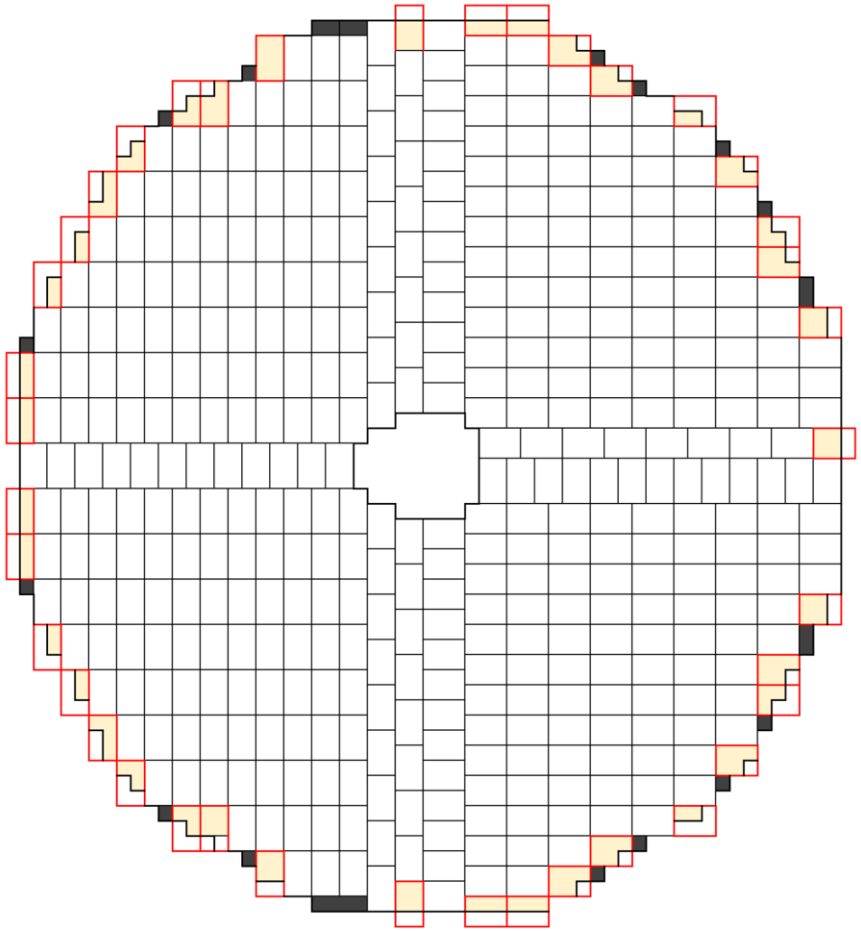
Fabrication of the External structure



- External structure in one block at the beginning
- External structure in two parts at the end (after machining)
  - *Better for the Eddy current*
  - *Better for the contact with crystals on the top (cooling)*
- Good for the deflection & the stress
- Good for the tolerances and the positioning of the crystals
- **Current discussion with Company**



Design & Cooling for the FEB



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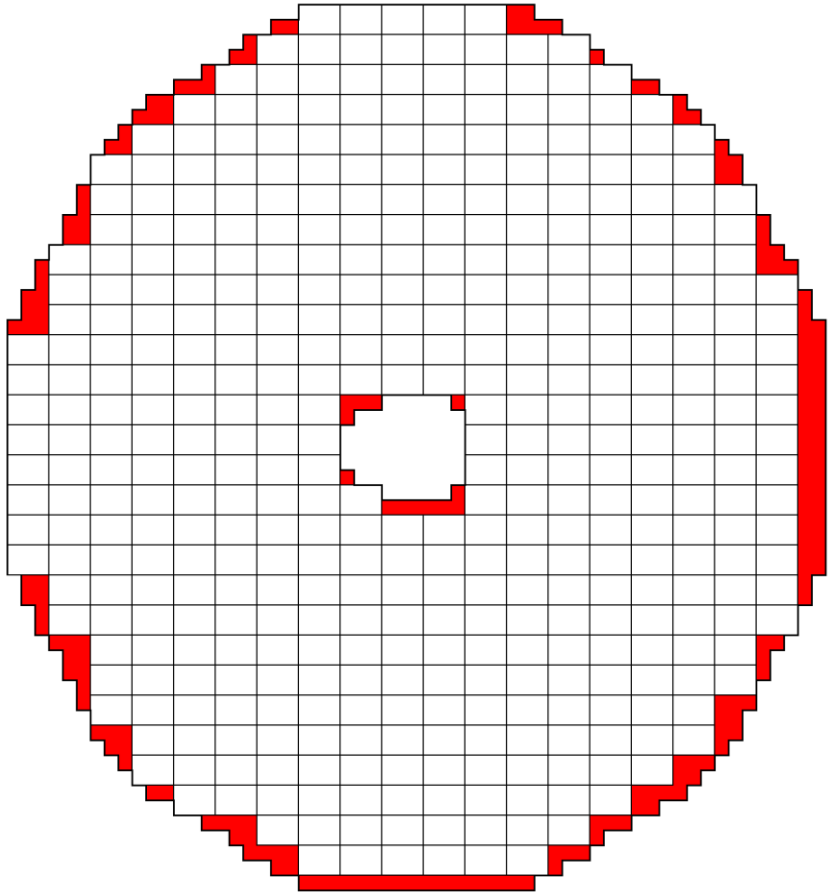
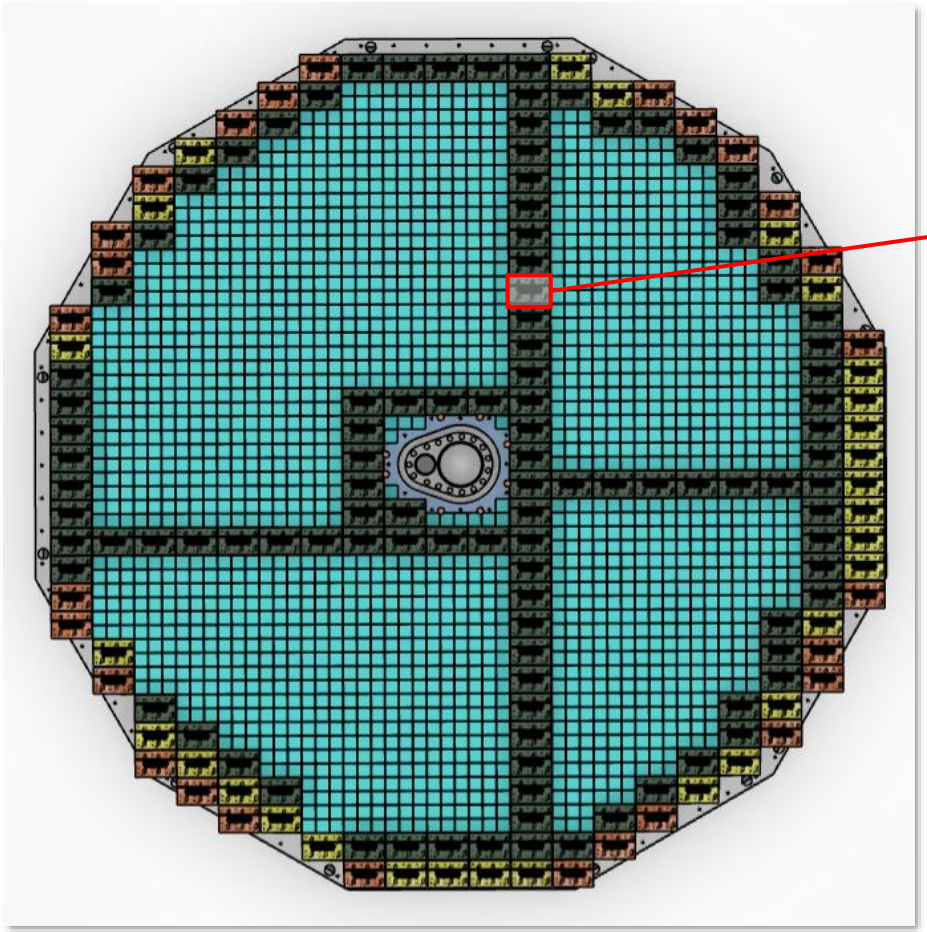
Good mapping	Hard to cool
Good fitting at the center	Bad fitting on the edge

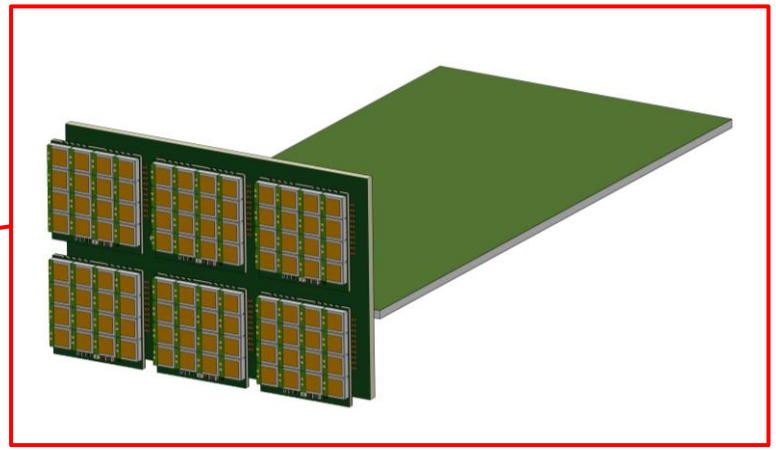


+	-
Easier to cool	Bad fitting at the center
	Bad fitting on the edge

Design & Cooling for the FEB



Clearance OK
Clearance OK – On structure
Clearance KO – Adjustment required

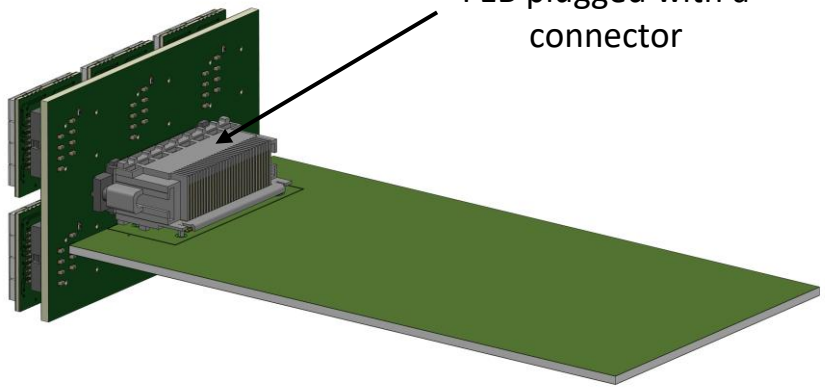


≈ 500 (Adapter + FEB)

→ Work in progress

Based on the optimum for the Asics
→ 1 lpGBT for 3 EICROC (OMEGA, IN2P3)

1 FEB for 6 crystals



Installation

- Two rails at 3 & 9 o'clock
- Validate the kinf of rails
- Mass= 2,5 tons
- Increase the surface to reduce local stress on the structure
- Two Guide bearing or Plain bearing per face
- Carbon tube removed ?
- PfRICH attached ?