

# Status of the activities at CEA

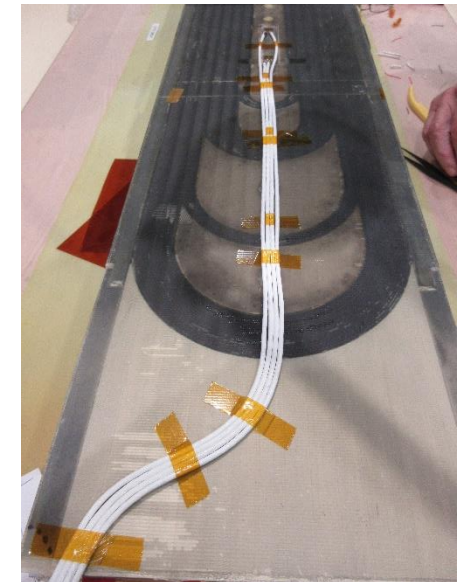
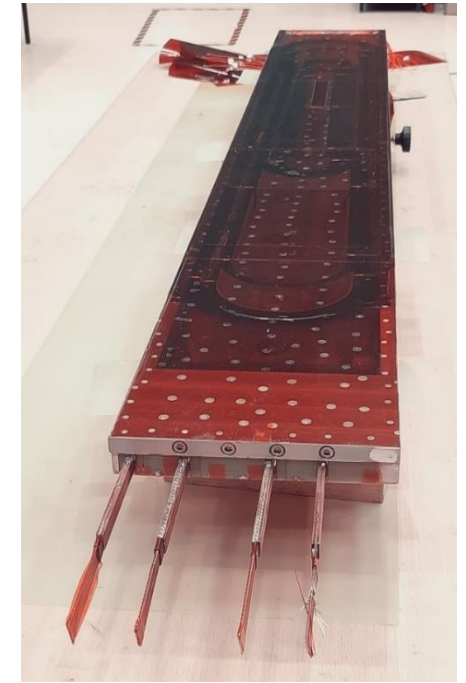
CEA: **E. Rochepault**, V. Calvelli, G. Campagna, M. Durante, H. Felice,  
E. Fernandez Mora, G. Lenoir, G. Minier, S. Perraud, F. Rondeaux

CERN: J. C. Perez

RD Line 3 2<sup>nd</sup> Forum meeting, 20/12/2023

# R2D2 Cu prototype coil

- Instrumentation tests (strain gauges + voltage taps in the junctions)
- Acquisition of data and experience with the Faro arm
- Order of a diamond wire saw: delivery expected end 2023 - early 2024
- Preparation ongoing for cuts of the coil and analysis



# Dimensional changes during Heat Treatment

- Transverse expansion on 10-stacks

Reaction Cavity	Expansion during HT	
	HF cable	LF cable
Nominal	2.90%	3.10%
Free	4.00%	4.00%
Extracted from coil	4.17%	4.70%



Measurement of cable thickness at CERN

- Longitudinal contraction on short coils:

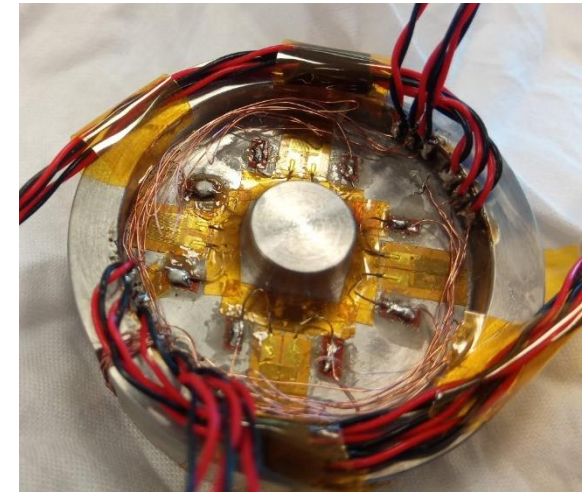
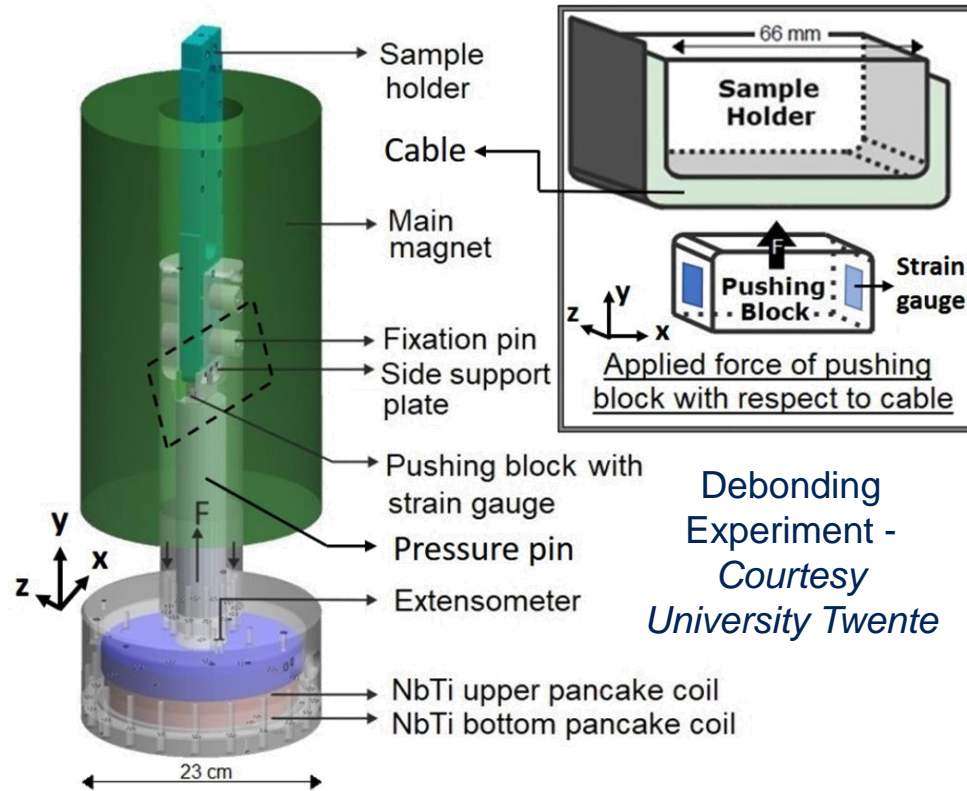
	HF coil 1	HF coil 2	LF coil 1	LF coil 2
Coil length variation (mm)	-0.40	-0.34	-2.34	-2.22
Central gap variation (mm)	-2.40	-2.05	-3.77	-3.48
Coil length variation / $L_1$	-0.06%	-0.05%	-0.34%	-0.32%



Measurement of coil length at CEA

- See “Longitudinal and Transverse Dimensional Changes during Heat Treatment of the Nb<sub>3</sub>Sn Cables for the Graded Research Racetrack Dipole Demonstrator (R2D2)”, E. Fernandez Mora et al., presented at MT28, under publication

# Debonding at the interface coil/components



Load cell for low-force high sensitivity measurement at cold

## PhD G. Campagna:

- Design and calibration of a dedicated load cell at RT and 77 K
- Preparation ongoing of a test at Twente

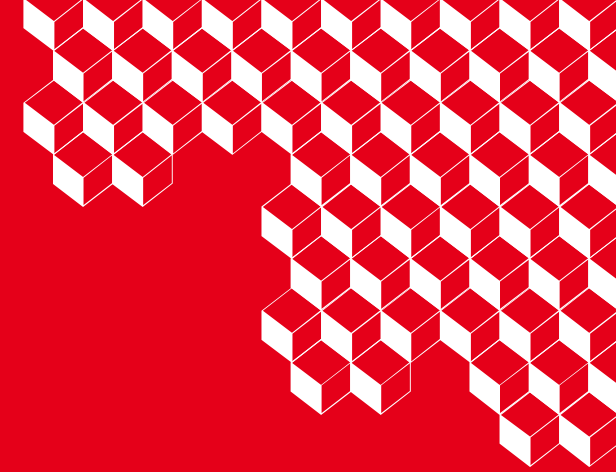
# Preparation for the Nb<sub>3</sub>Sn coils

- Cable insulated and shipped by CERN: delivery expected end 2023
- 2 set of components shipped from the vendor and expected end 2023
- Adaptations ongoing to include inlets/outlets of Argon in the reaction tooling
- Preparation ongoing for the calibration of the thermocouples and the oven
- 4 Nb<sub>3</sub>Sn coils foreseen for 2024:
  - 1 practice
  - 2 "series"
  - 1 spare





irfu



**Merci !**  
**Thank you !**