Tomography on JLAB's conductor

23 September 2012

Tomography on JLAB's conductor

Objectives

- Voids into the JLAB's conductor are observed by tomography in CRT (Morlaix) on the 19th of September 2012.
- Conductor samples (AC 30 and AC 116) are provided by JLAB.
- Tomography is performed on one conductor before compression (AC 30) and after compression at 60kN (AC 116).
- The aim of this study is to check the influence of compression on the amount of voids into the conductor.

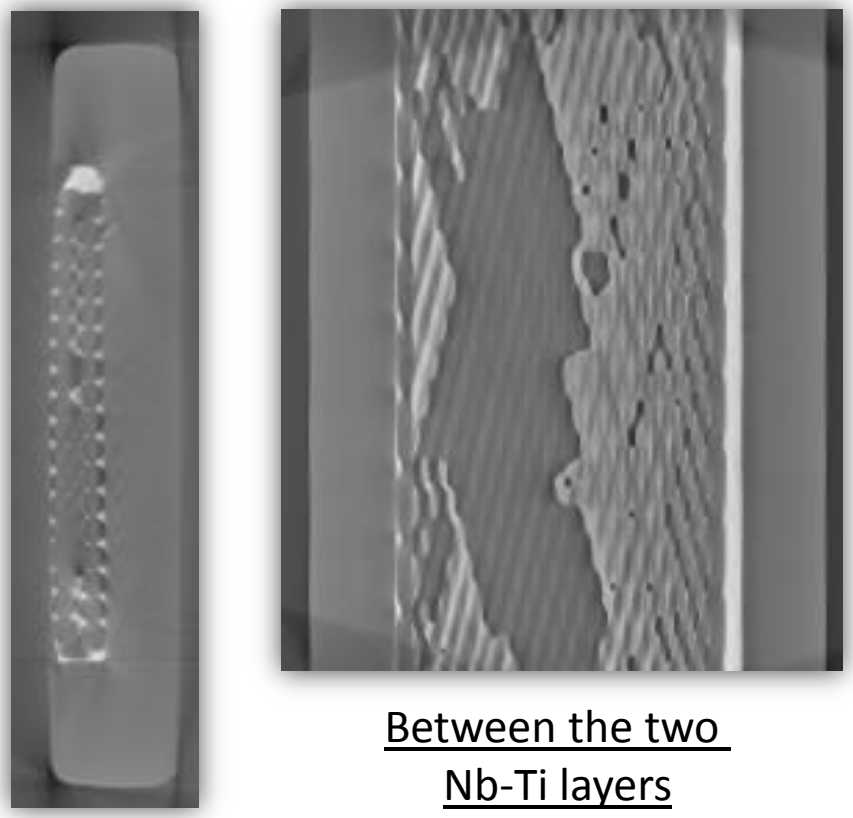
Conclusions

- We visually observe that voids volume decreases after compression.
- Some results are difficult to interpret because wavelengths of the different materials are close (for example we observe voids at incoherent places like in the Nb-Ti section or copper section).
- Although this test doesn't give a precise volume of voids, it informs us that compression improves the quality of the conductor.

Tomography on JLAB's conductor

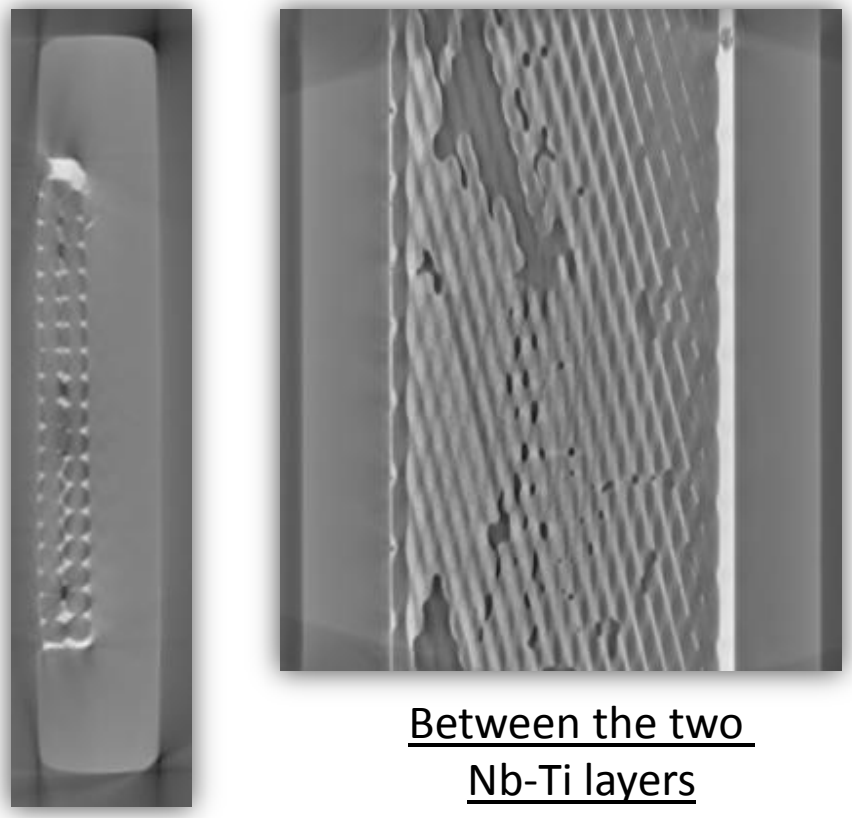
➢ **DISPLAY MODE : ORIGINAL**

Before compression (AC 30)



Between the two Nb-Ti layers

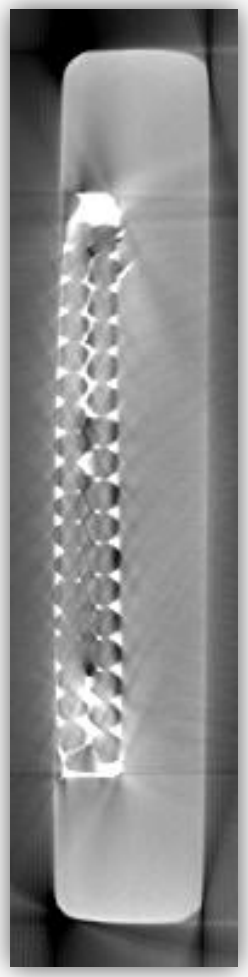
After compression (AC 116)

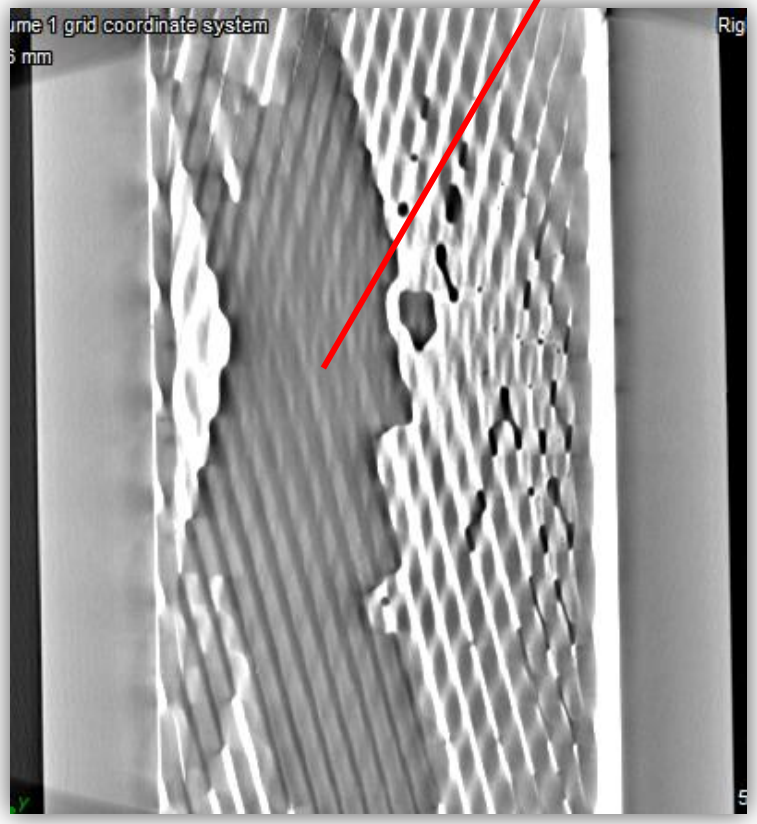


Between the two Nb-Ti layers

Tomography on JLAB's conductor

➢ **BEFORE COMPRESSION (AC 30)**



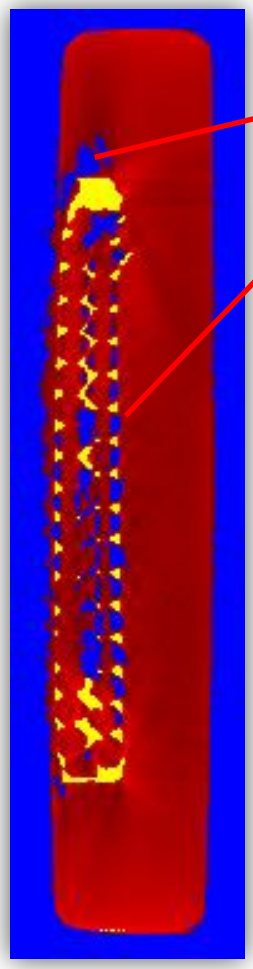


Between the two Nb-Ti layers

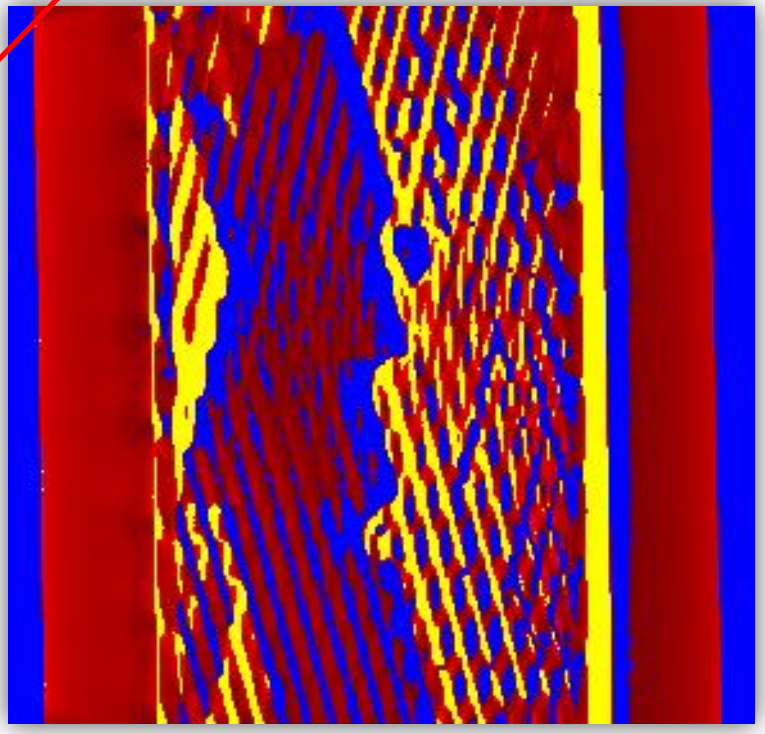
Between Nb-Ti and Copper

Tomography on JLAB's conductor

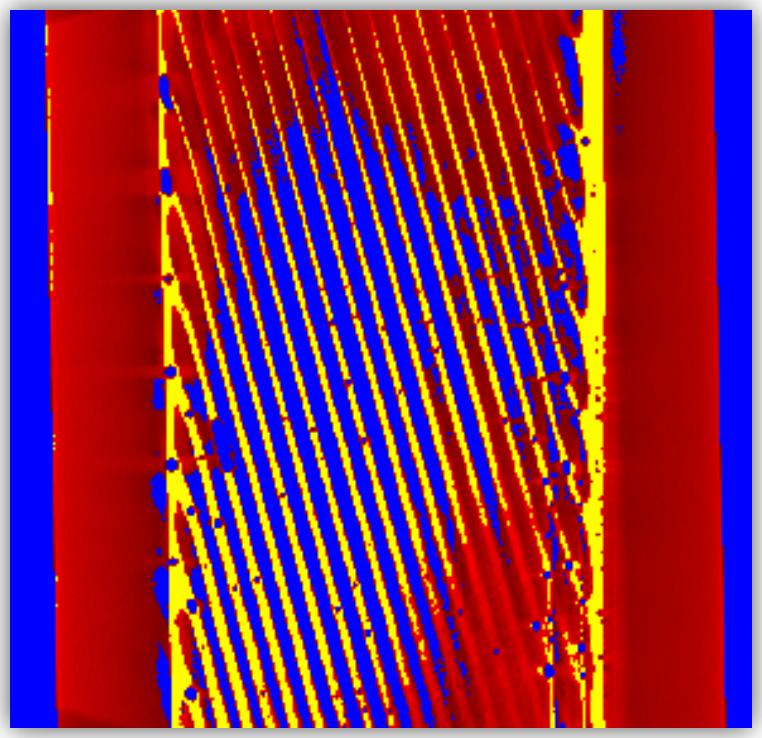
➢ **BEFORE COMPRESSION (AC 30)**



Incoherent results



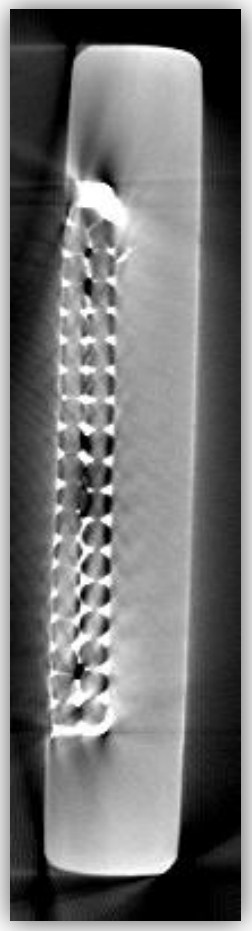
Between the two Nb-Ti layers

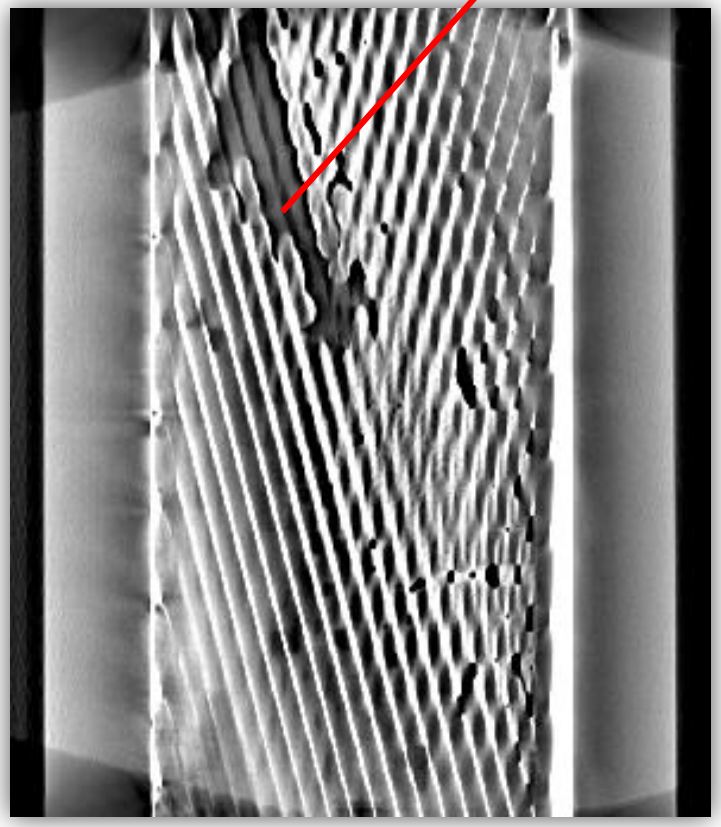


Between Nb-Ti and Copper

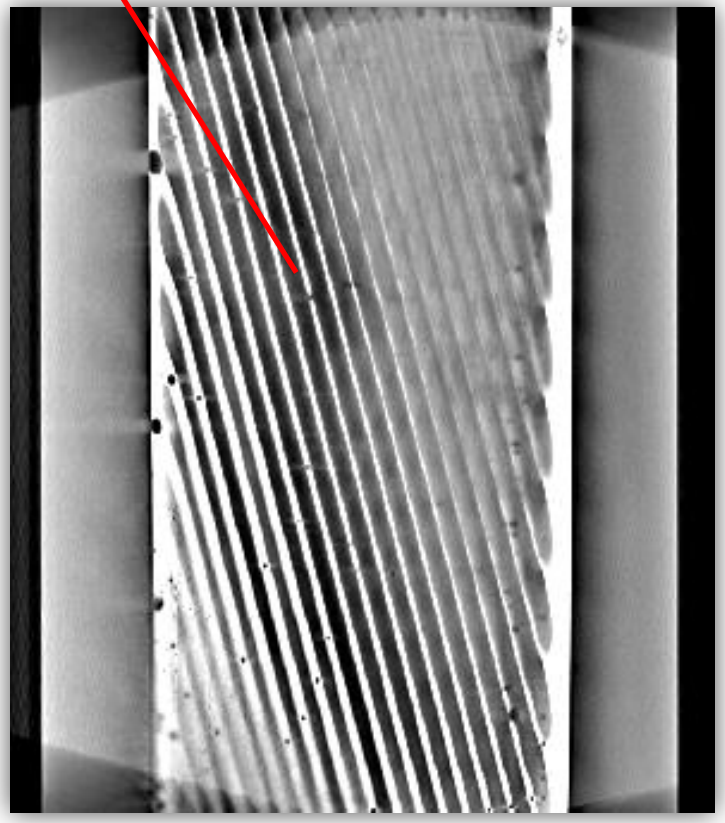
Tomography on JLAB's conductor

➢ **AFTER COMPRESSION (AC 116)**





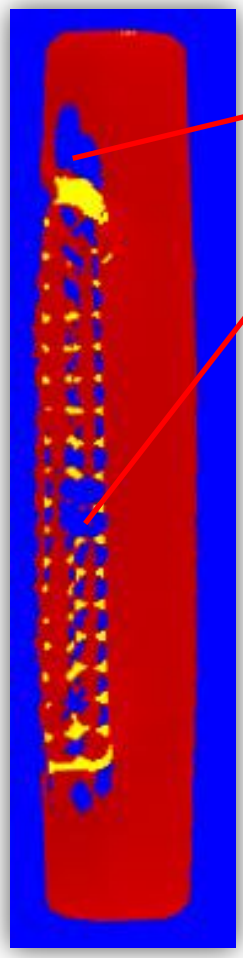
Between the two Nb-Ti layers



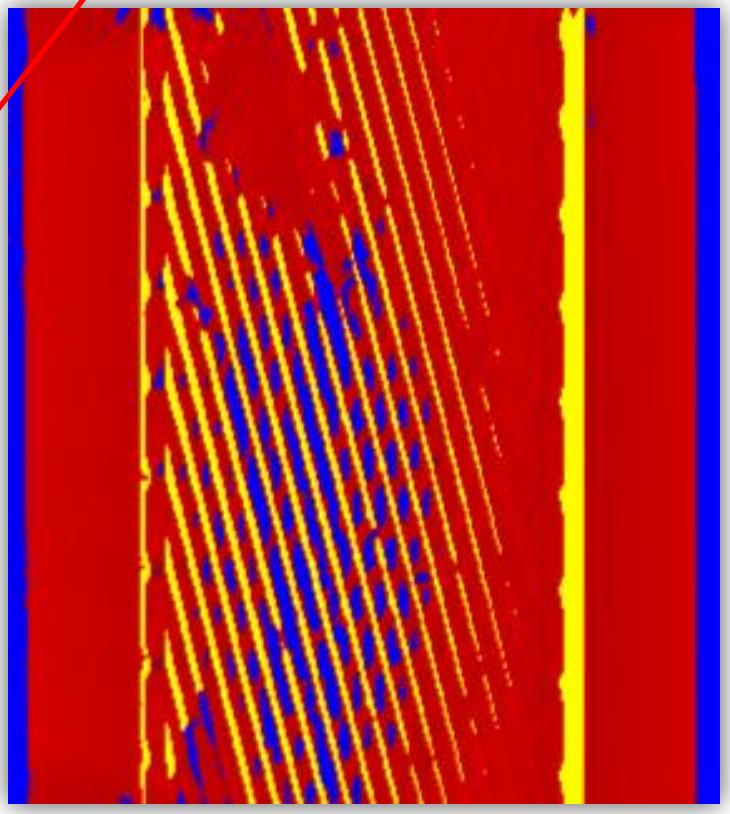
Between Nb-Ti and Copper

Tomography on JLAB's conductor

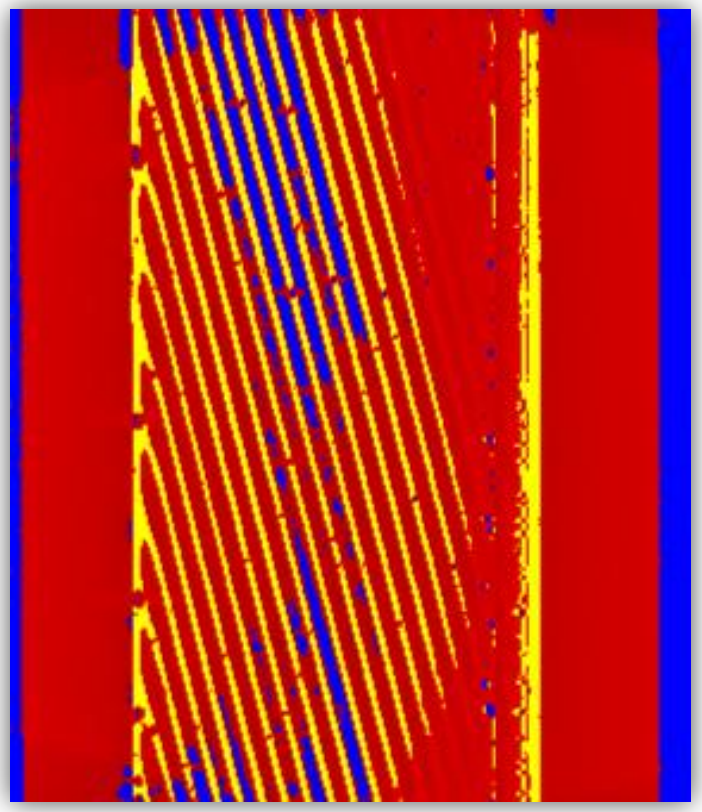
➢ **AFTER COMPRESSION (AC 116)**



Incoherent results

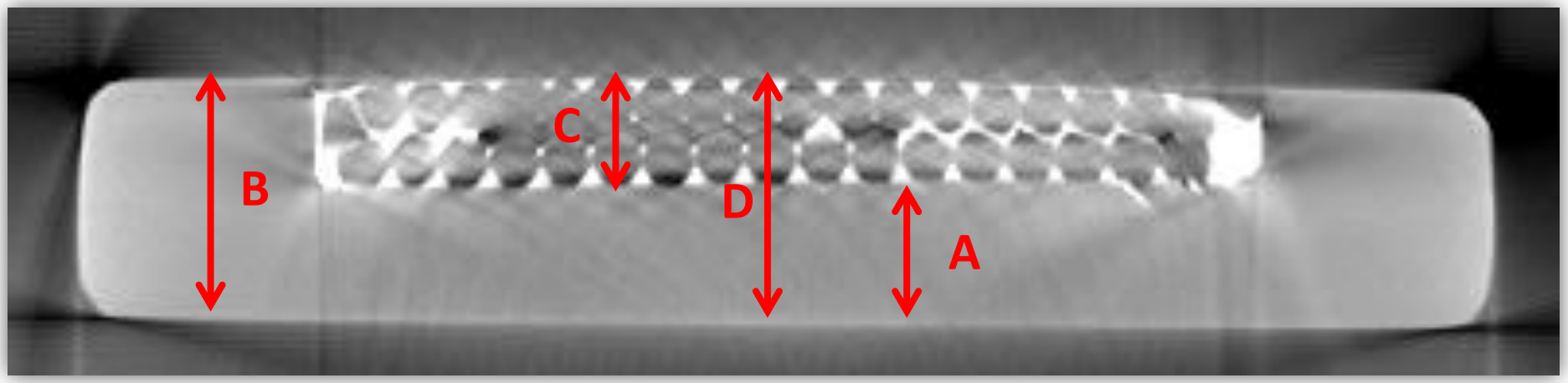


Between the two Nb-Ti layers



Between Nb-Ti and Copper

Tomography on JLAB's conductor



Thickness measurements		Before compression (mm)	After compression (mm)	Remanent strain (%)
A	CENTRAL COPPER	1.84	1.82	1.27
B	PERIPHERAL COPPER	3.14	3.08	1.91
C	TWO Ti-Nb LAYERS	1.3	1.26	3.08
D	TOTAL IN THE CENTER	3.16	3.09	2.22

- So the deformation in the SC cable (3,08%) is 2 times larger than in the copper (1,27%)