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INFN LNL
Istituto Nazionale di Fisica Nucleare
Laboratori Nazionali di Legnaro

ARIES

QPR Nb/Cu treatment

Eduard Chyhyrynets,
Cristian Pira,
Fabrizio Stivanello

Content

1 Designed EP system

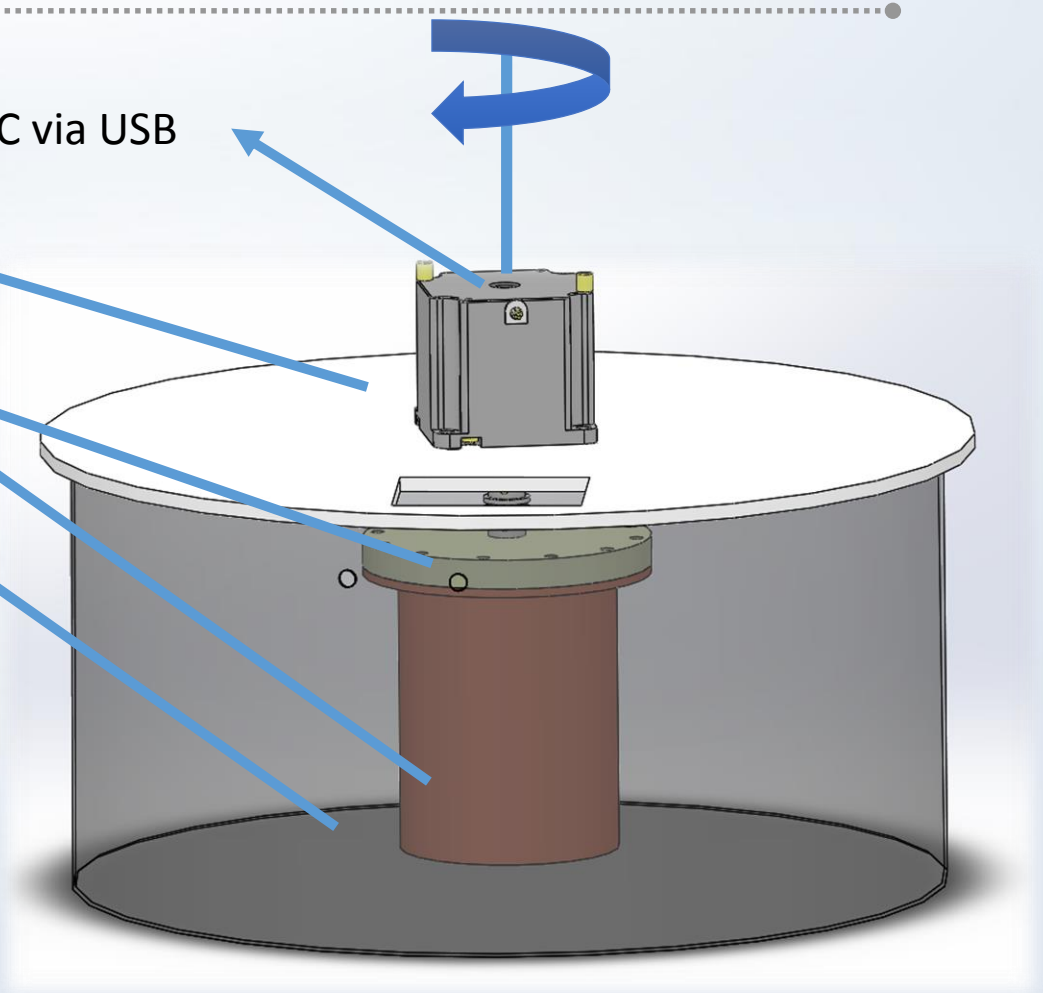
1) Electric motor 24V. Controlled by PC via USB

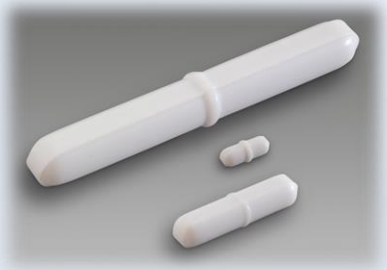
2) Top cover, PVC, Ø 340mm

3) Holder, PVC, Ø 99mm

4) QPR, Cathode with Cu welding

5) Bath, 316L, Anode +, Ø 300mm





Magnetic stirrer

Modes to test: Rotating, Stirring and Combination

2 Preliminary EP test

Cu/Nb 6 Ghz cavity

Initial state of Nb/Cu edge

1 phase - ~4 volts (5 min)
2 phase - ~18 volts (15 min)
3 phase - ~3 volts (10 min)

2 Preliminary EP test

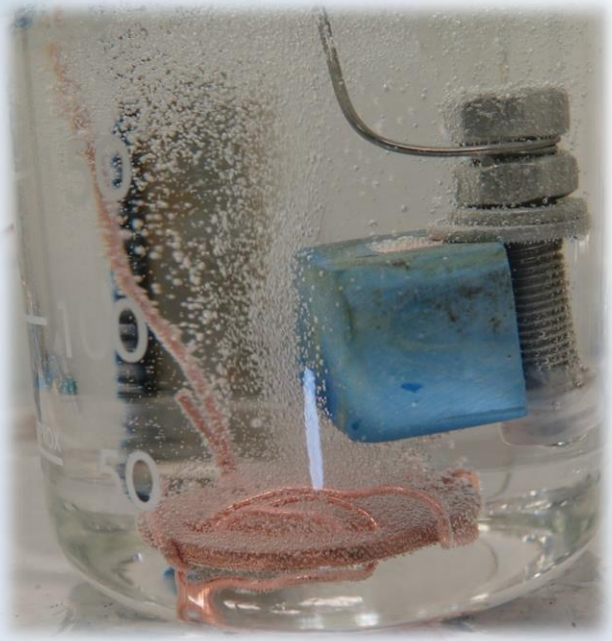
Cu/Nb 6 Ghz cavity

Oxidation of Nb

It is possible to deoxidize with 3-5% HF solution

1 phase - ~4 volts (5 min)
2 phase - ~18 volts (15 min)
3 phase - ~3 volts (10 min)

3 EP test with samples



Algorithm

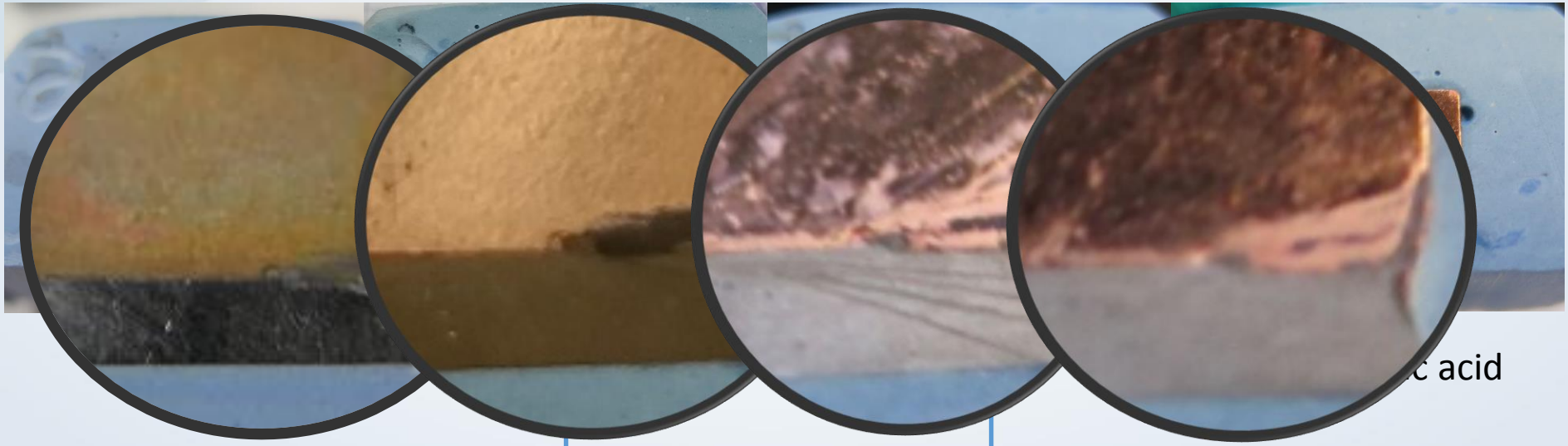
1) Ultrasound in soap

2) EP for 10 min (H_3PO_4:Buthanol = 3:4)

3) Deoxidation of the Nb in 3% HF

4) Citric acid cleaning

3 EP test with samples



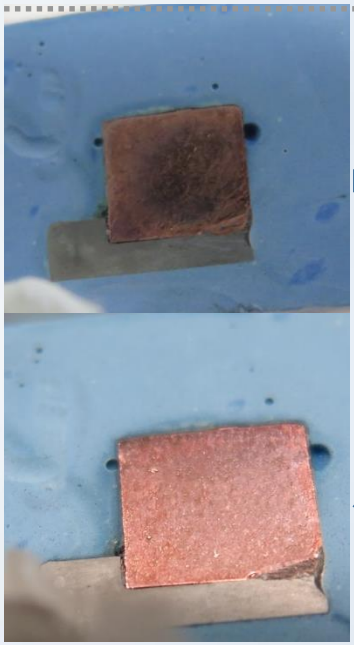
c acid

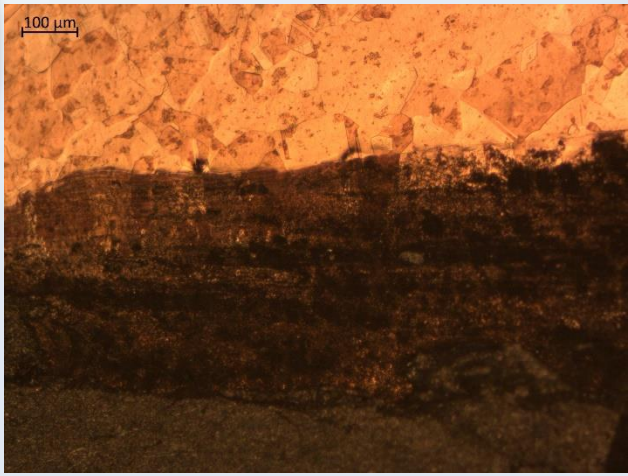
Same oxidation

Cu obtain some stains

4 SUBU5 test

72 °C, SUBU5
5 min, stirring.





No, visible effect on Nb. Welding is partially attacked.

5 Conclusions

- Designed system is being proceeded.
- EP stage oxidize the Nb -> need additional stage to deoxidize.
- SUBU doesn't effect badly both on Nb and welding.
- Test EP treatments are coming with different agitation modes.