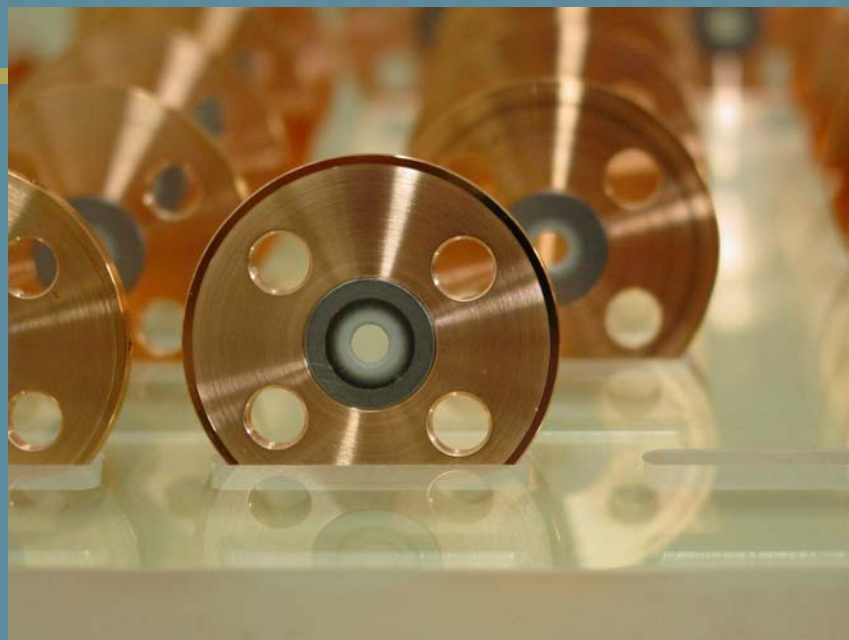
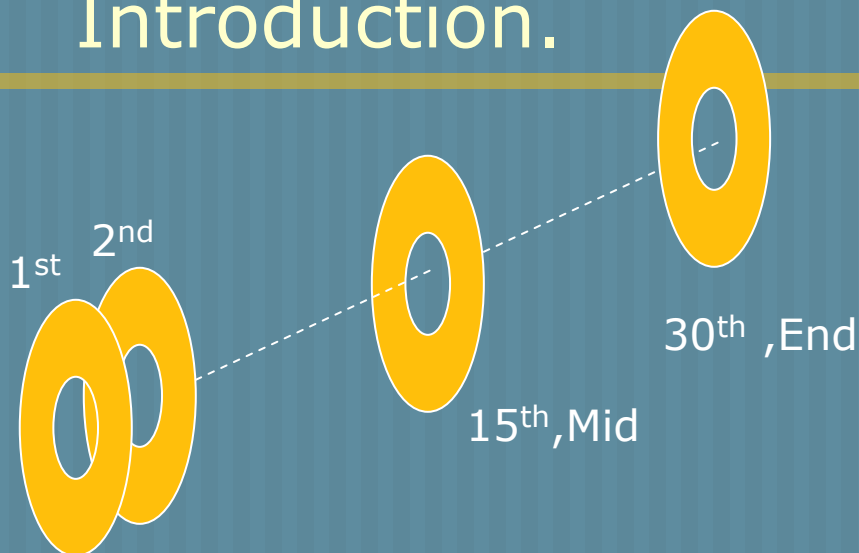


# SEM analysis of structures with Mo iris run at CTF3 .

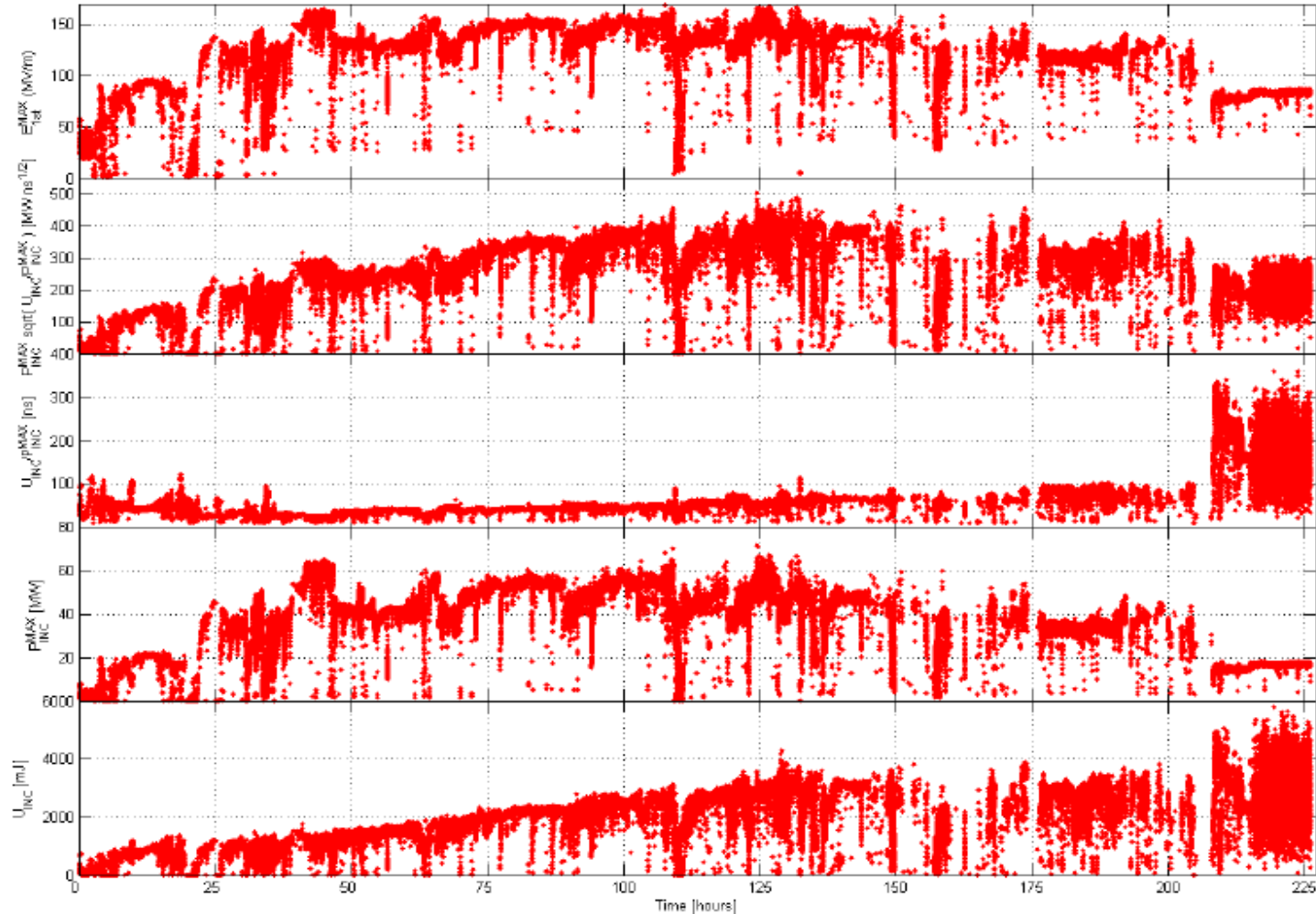
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# Introduction.

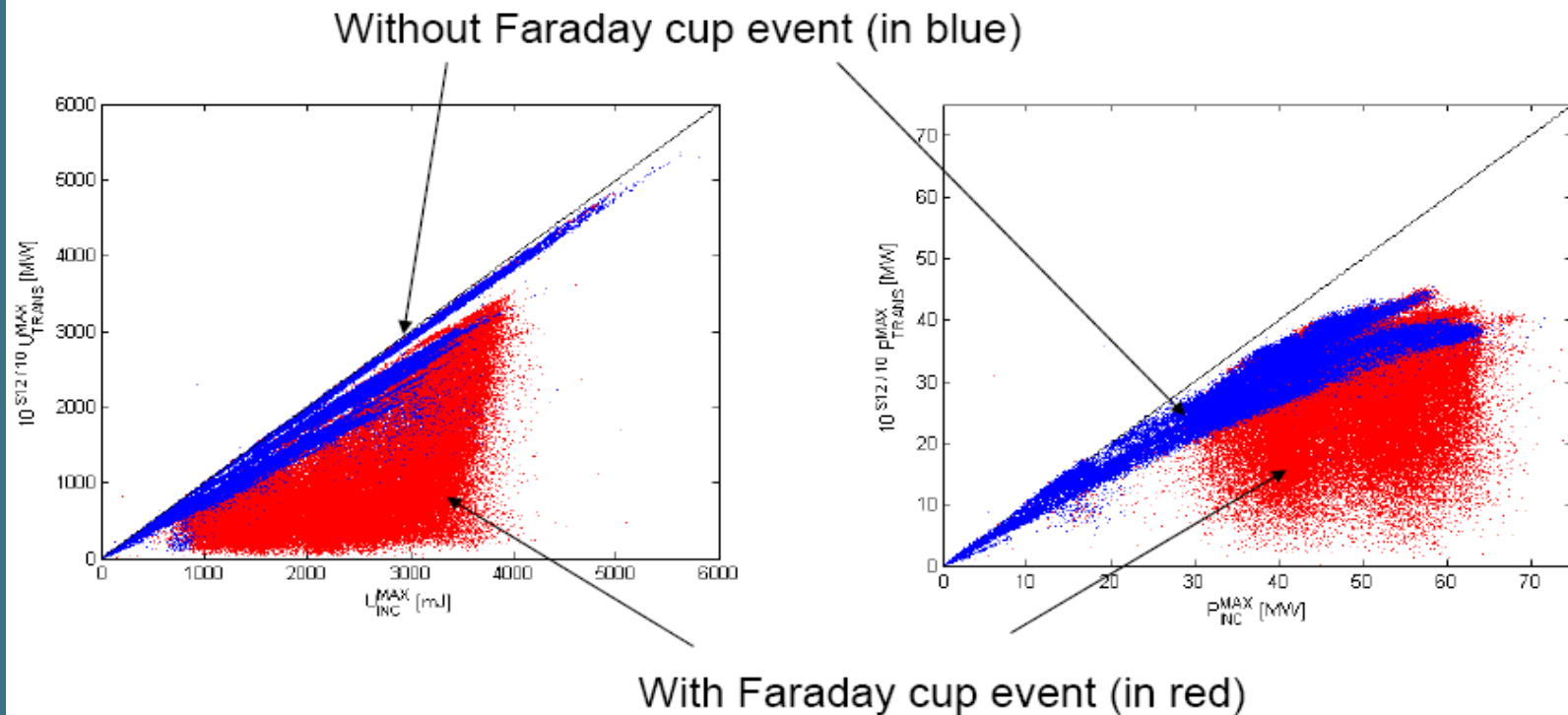


- Background:
  - Iris-in-copper-disc structures.
  - Mo iris, fired at 800 °C.
  - Run in CTF3 2005, 30 GHz.
  - Run history presented by Roberto, see next slide.
- Analyses:
  - Surface SEM + EDS for first and last cavities.
- Compared to other structures run in CTFII and SLAC.

## Conditioning: Effective time



## Calibration uncertainty



# Contents.

---

- Intro.
- Surface modifications.
  - Overview and comparison with historical structures.
  - Details of worst region.
  - Comparison of different irises along the structure.
  - Comparison of different radial positions within one iris.
- Cu wall
- Surface composition. Contamination/cleaning

# Surface modification in tip region 1<sup>st</sup> iris. Comparison SLAC / CTFII / CTF3 runs.

SLAC 1<sup>st</sup>

Reminder from SLAC

200x 100  $\mu$ m

CTF3 Mo 1<sup>st</sup>

200x 100  $\mu$ m

CTFII Mo 1<sup>st</sup>

Reminder from CTFII

200x 100  $\mu$ m

CTFII Mo Mid

Reminder from CTFII structures

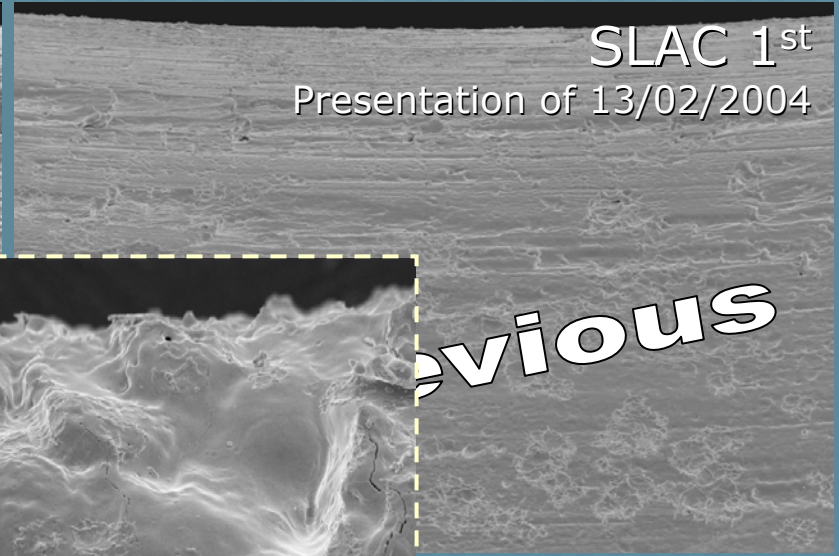
200x 100  $\mu$ m

# Surface modification in tip region. Comparison historic structures / CTF3 run.

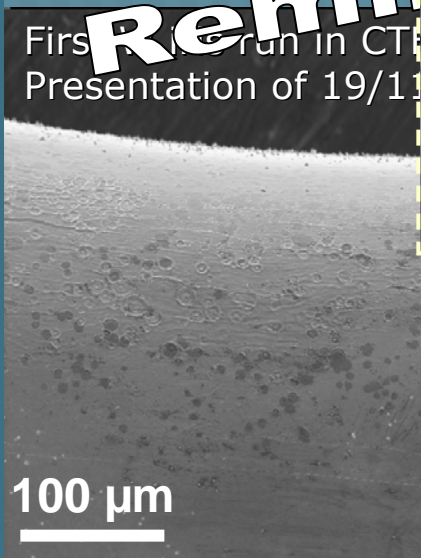
First Cu cavity run in CTFII.  
Presentation of 12/04/2001.



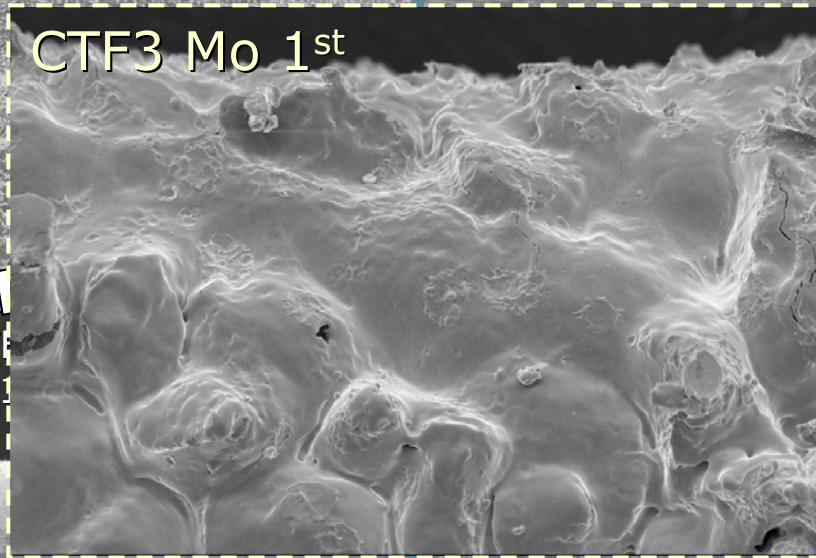
SLAC 1<sup>st</sup>  
Presentation of 13/02/2004



First Mo run in CTFII.  
Presentation of 19/11/2001

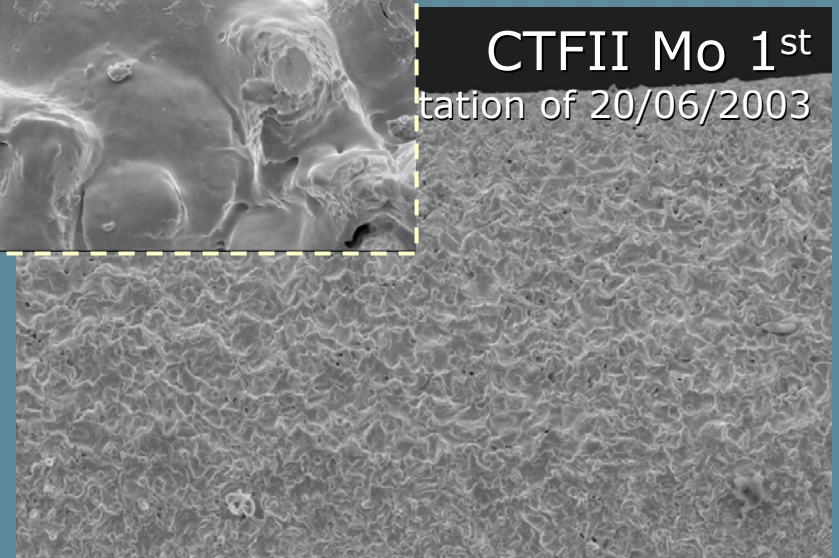


CTF3 Mo 1<sup>st</sup>



obvious

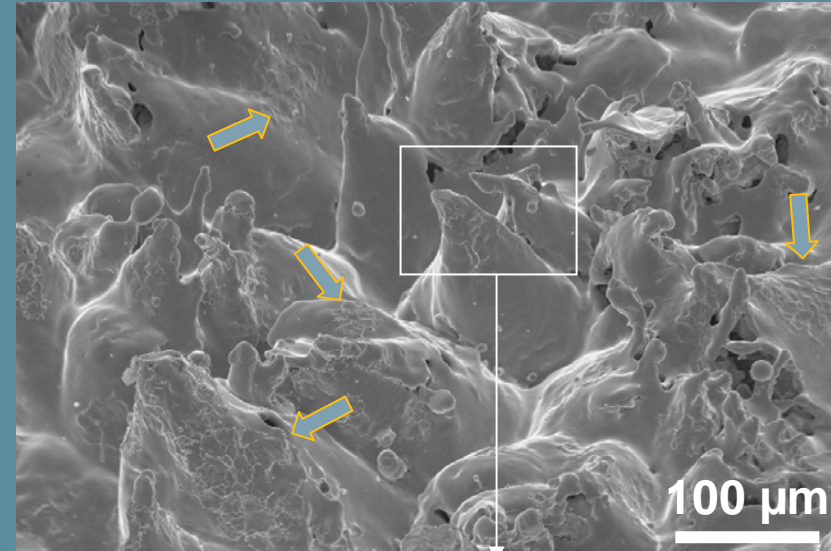
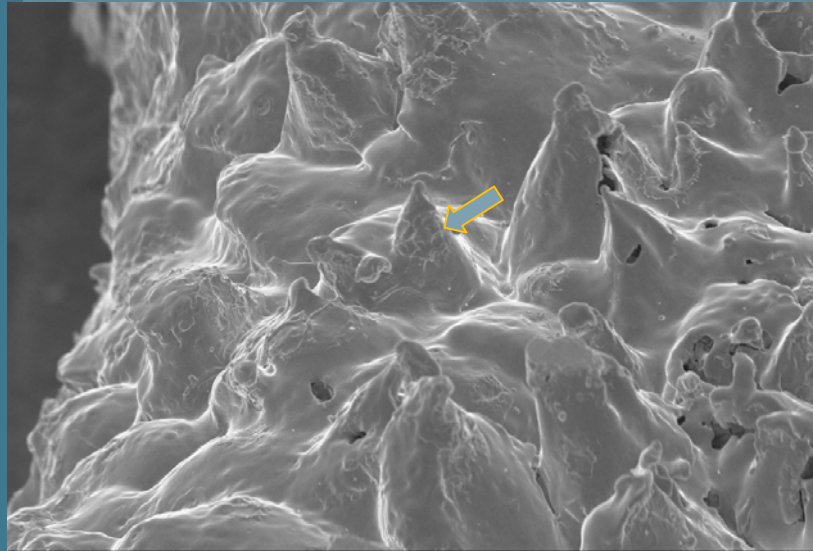
CTFII Mo 1<sup>st</sup>  
Presentation of 20/06/2003



200x 100 μm

# Surface modifications.

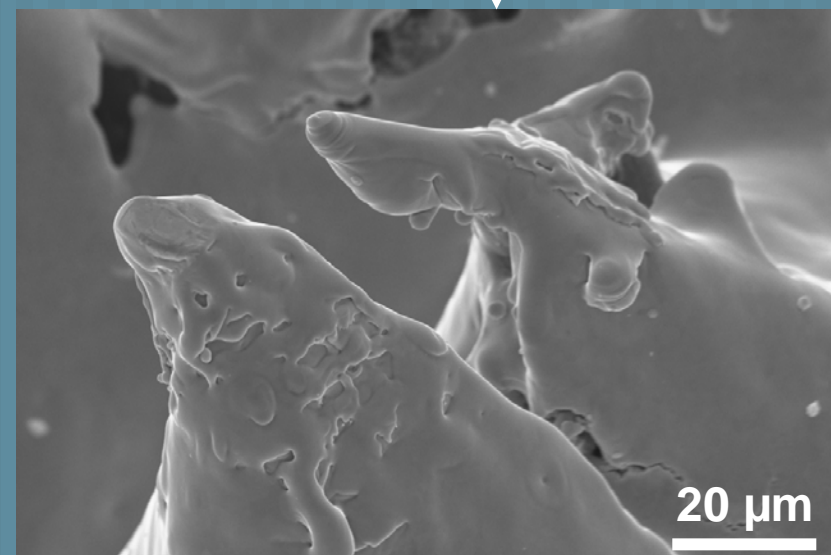
## Overview of worst region: tip of 1<sup>st</sup> iris.



200x

Very **sharp** and **high** peaks.  
Different that what has been  
observed so far in DC spark  
craters.

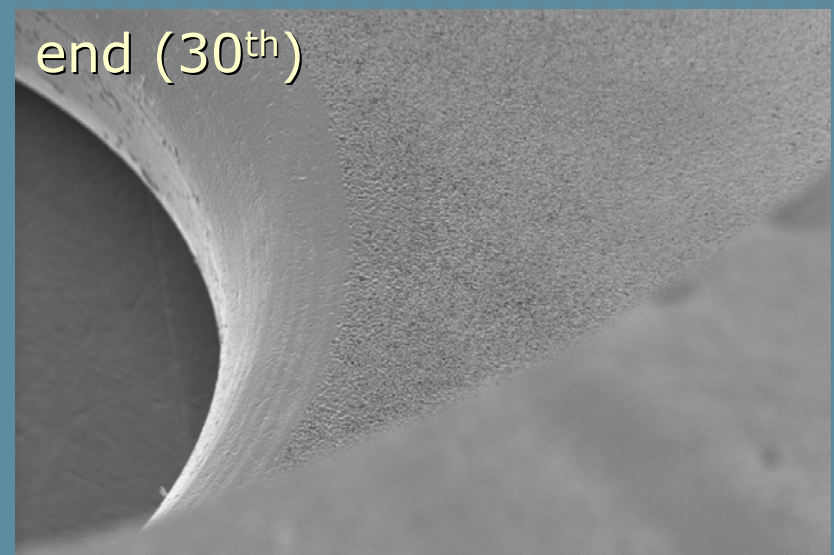
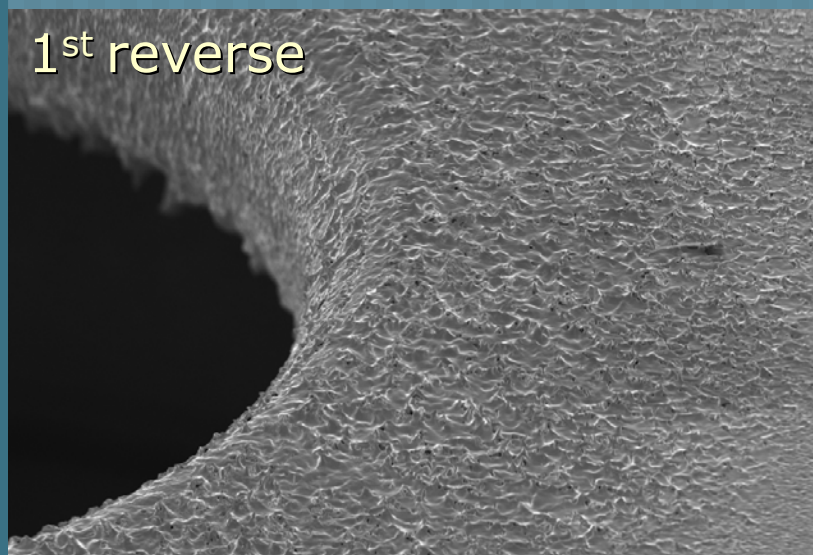
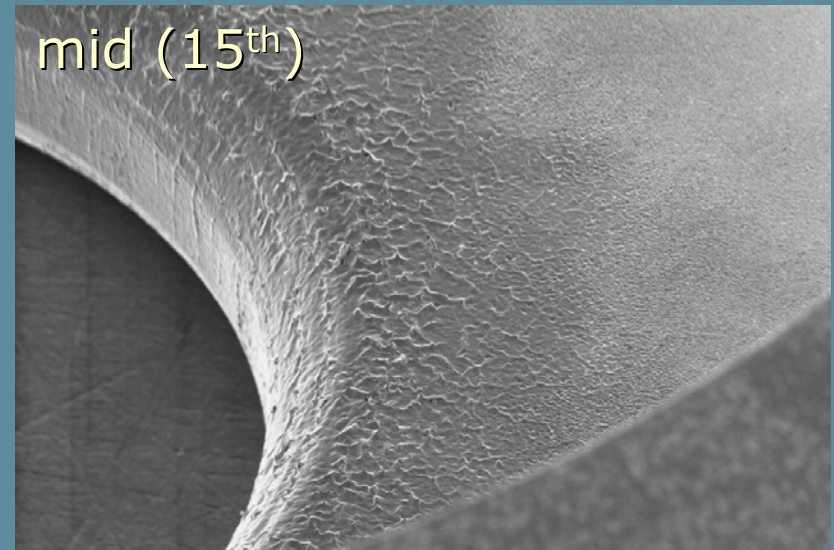
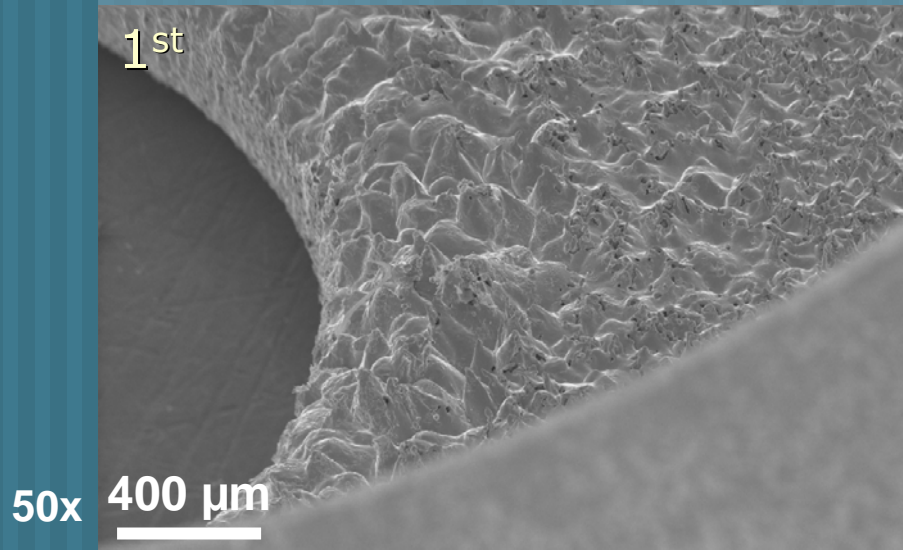
Clusters of craters are not always  
localized on top of the peaks.



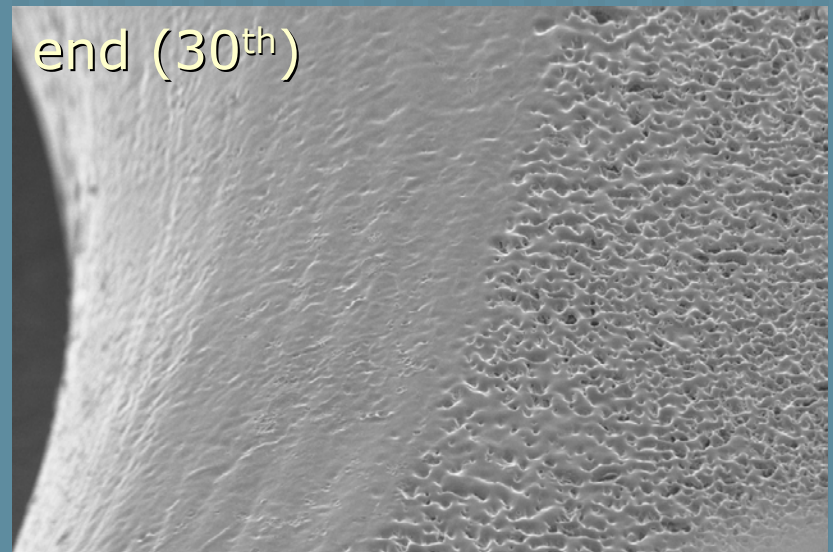
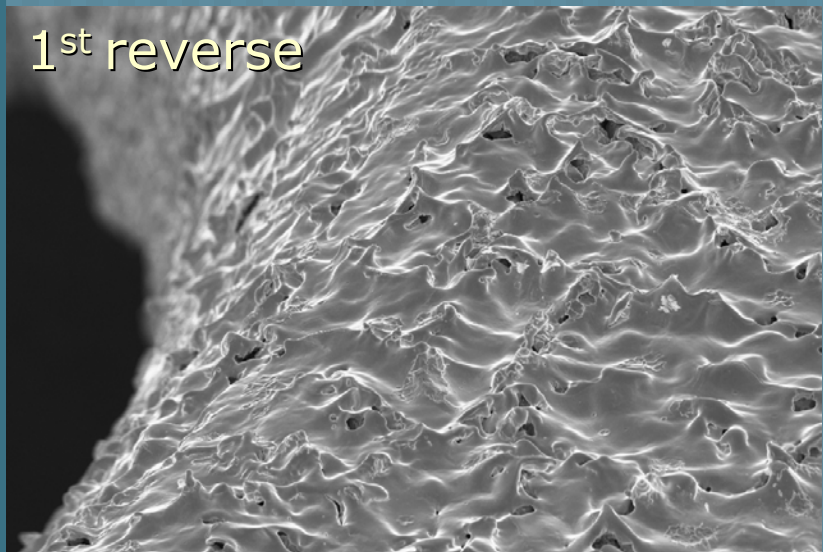
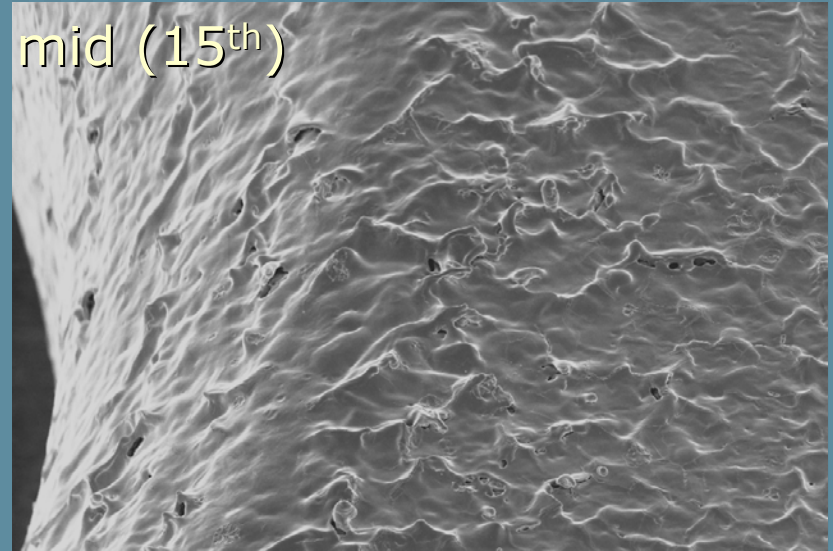
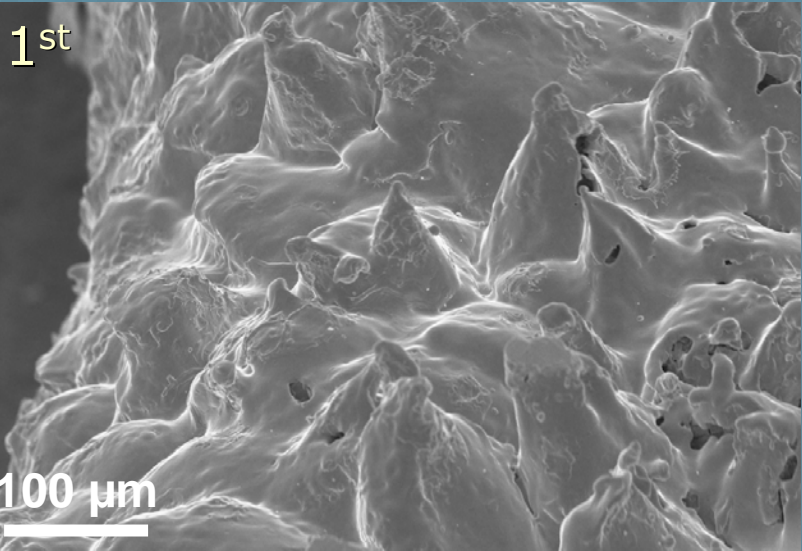
1000x



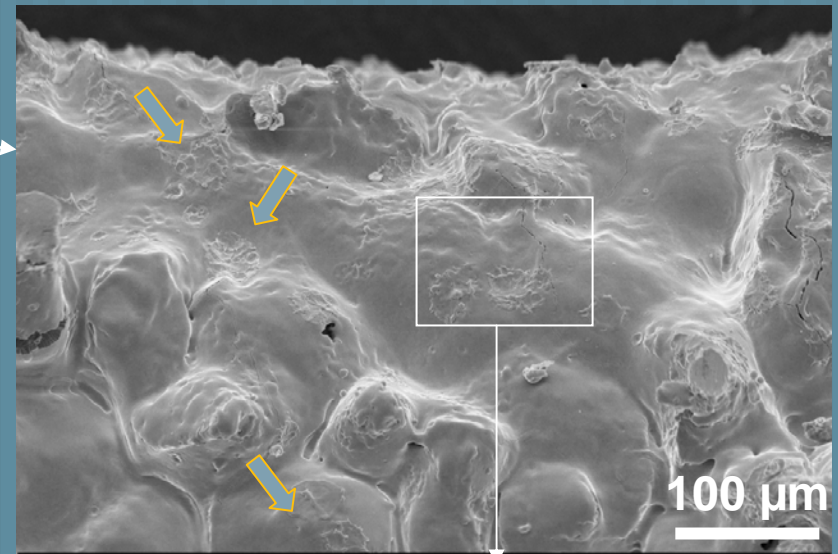
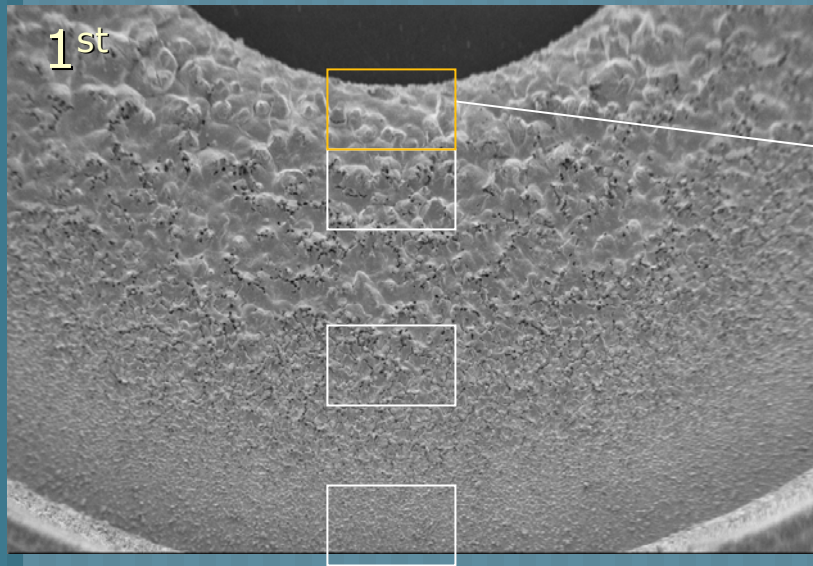
# Surface modifications. Comparison of irises along the structure.



# Surface modifications. Comparison of irises along the structure.

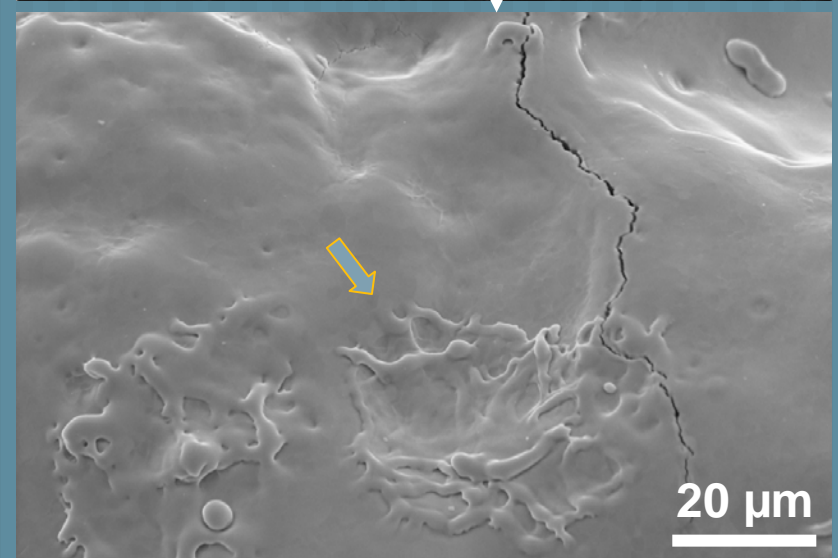


# Surface modifications. Comparison along radial locations 1<sup>st</sup> iris.

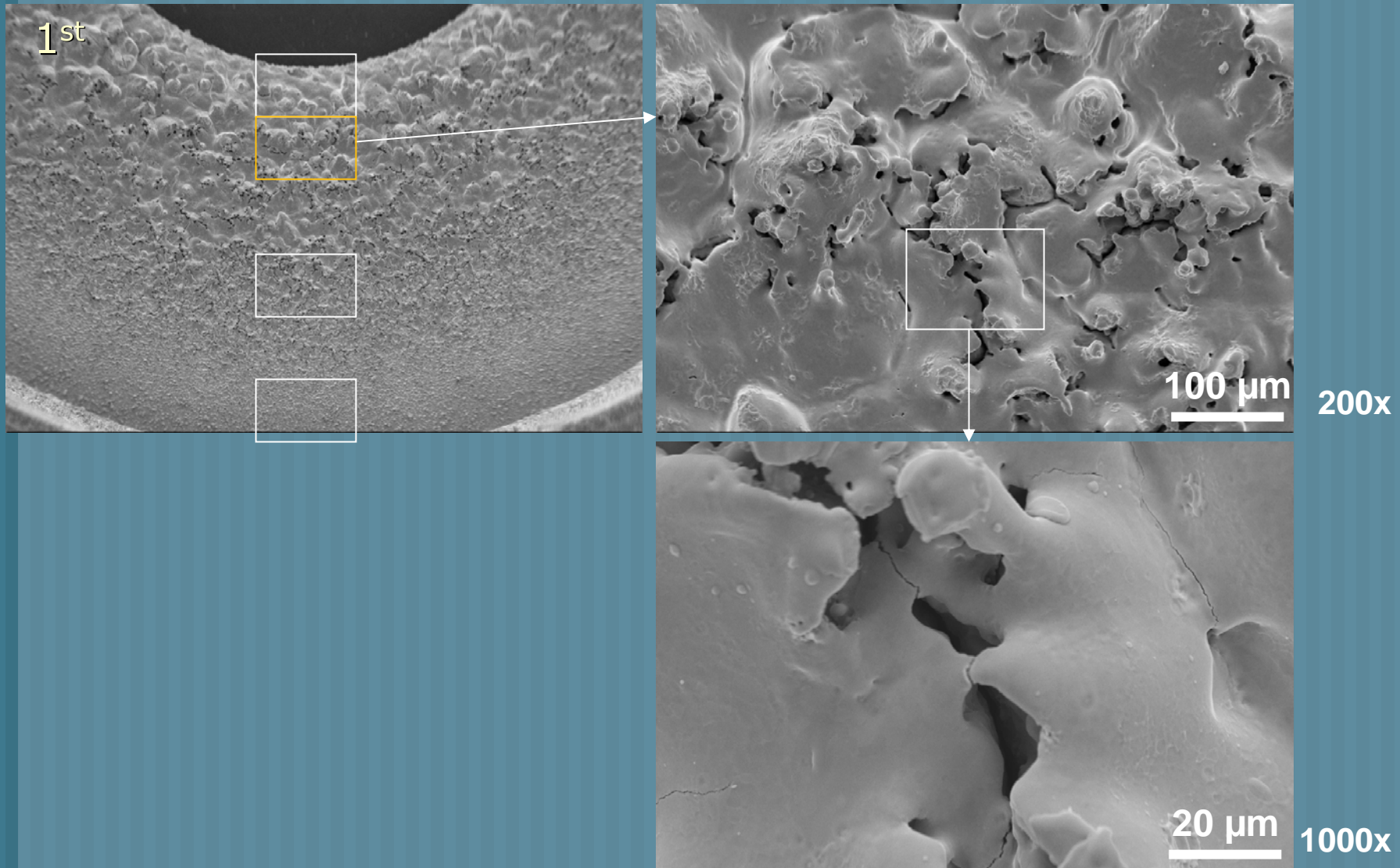


Localized clusters of craters.

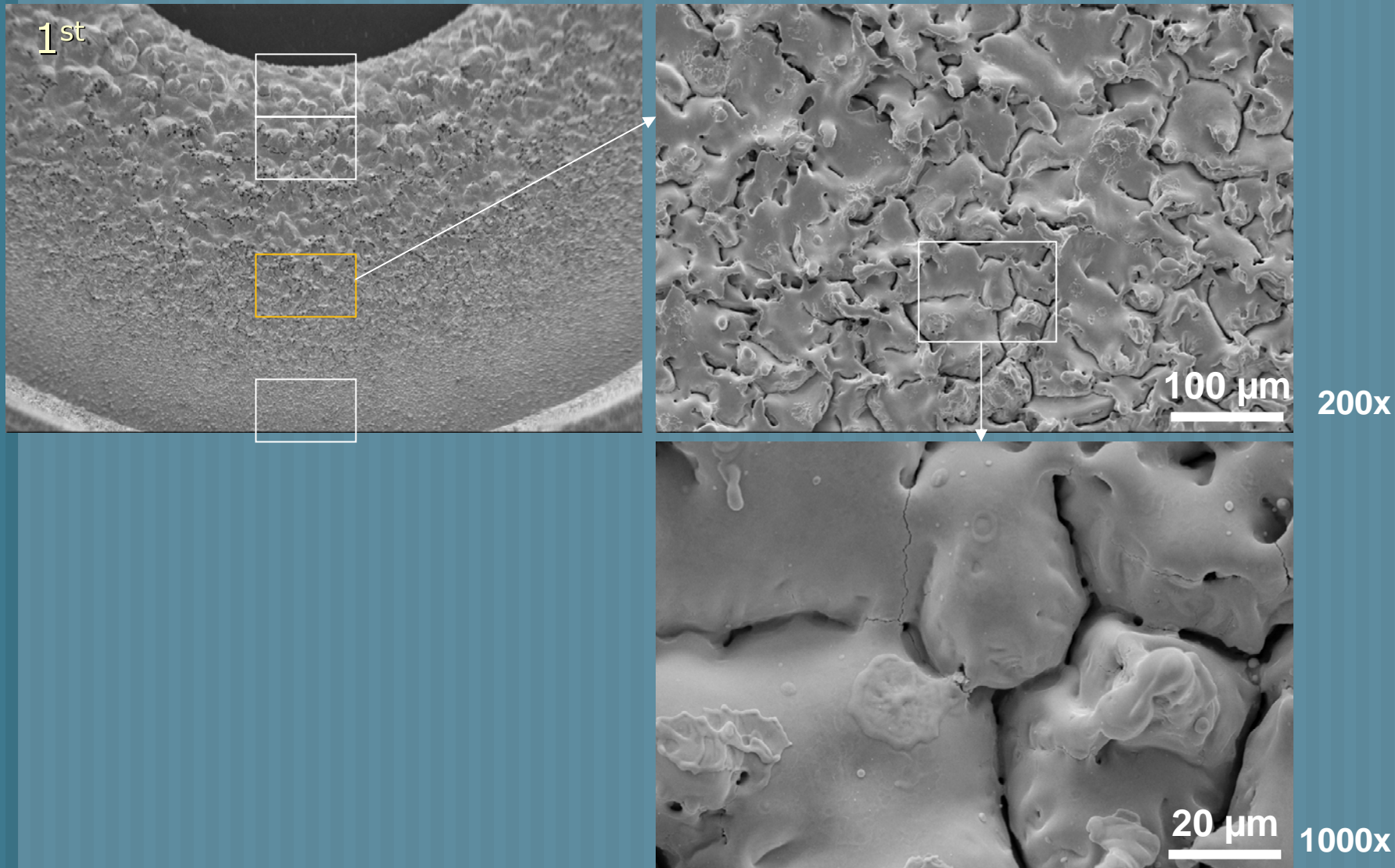
Craters coexist with smoothly eroded surface.  
Two different phenomena?



# Surface modifications. Comparison along radial locations 1<sup>st</sup> iris.

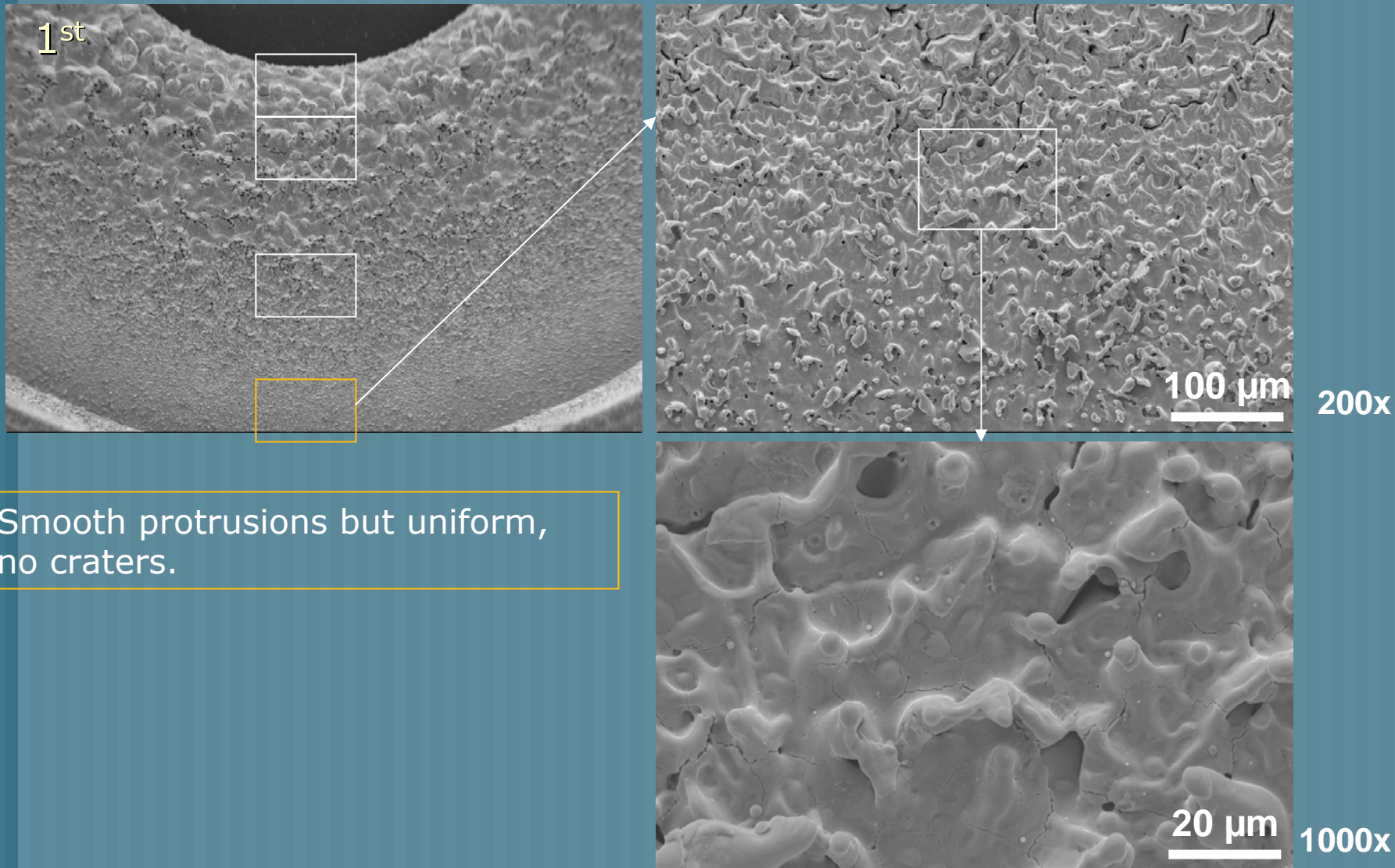


# Surface modifications. Comparison along radial locations 1<sup>st</sup> iris.

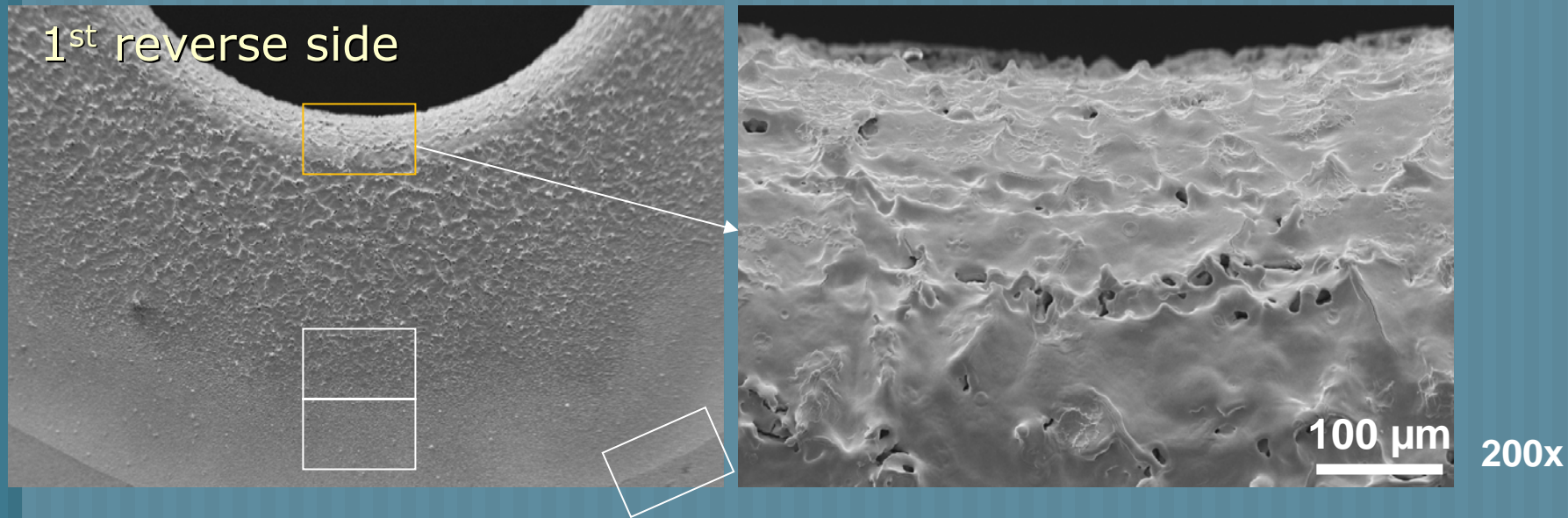


# Surface modifications.

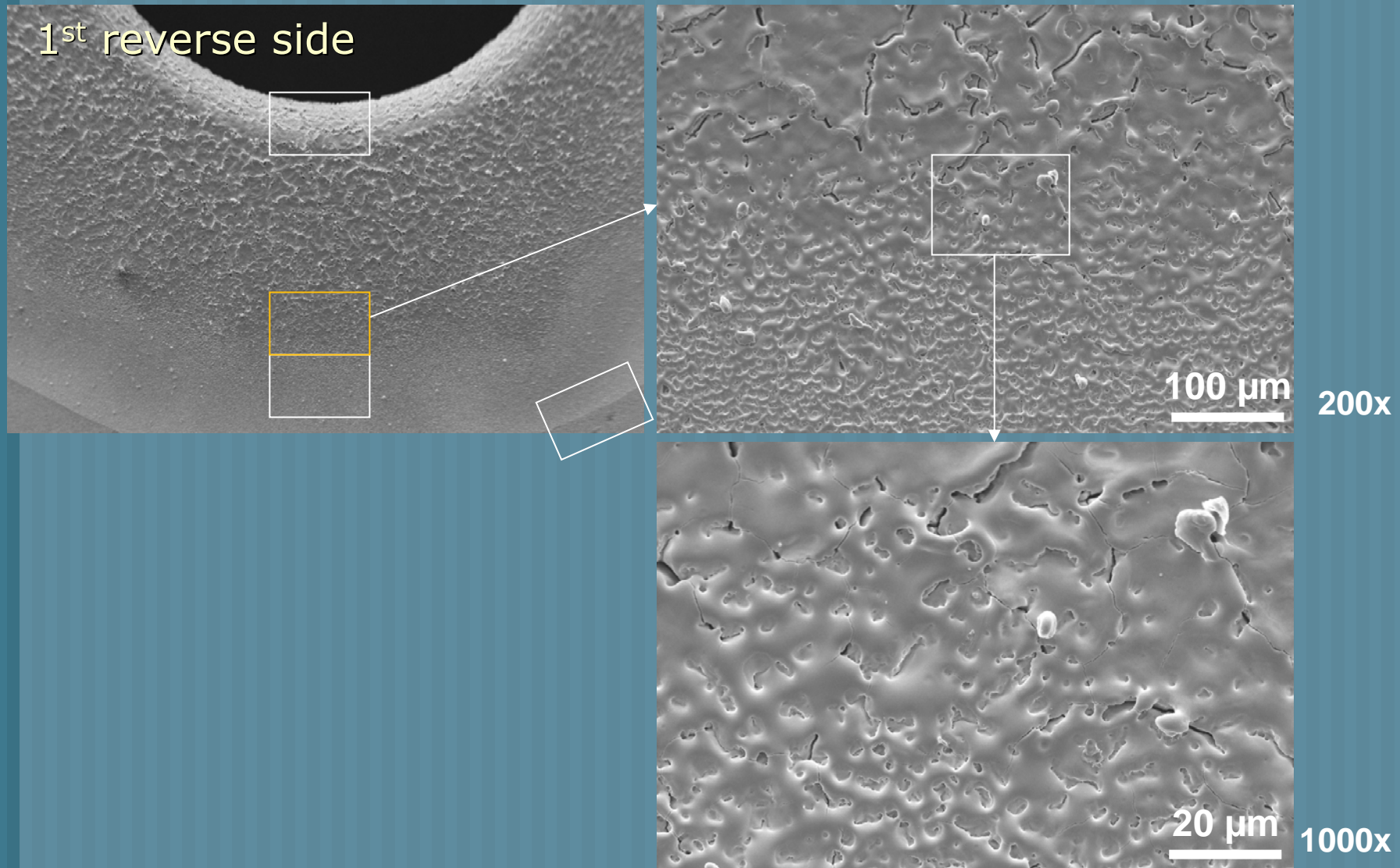
## Comparison along radial locations 1<sup>st</sup> iris.



# Surface modifications. Comparison along radial locations 1<sup>st</sup> iris.



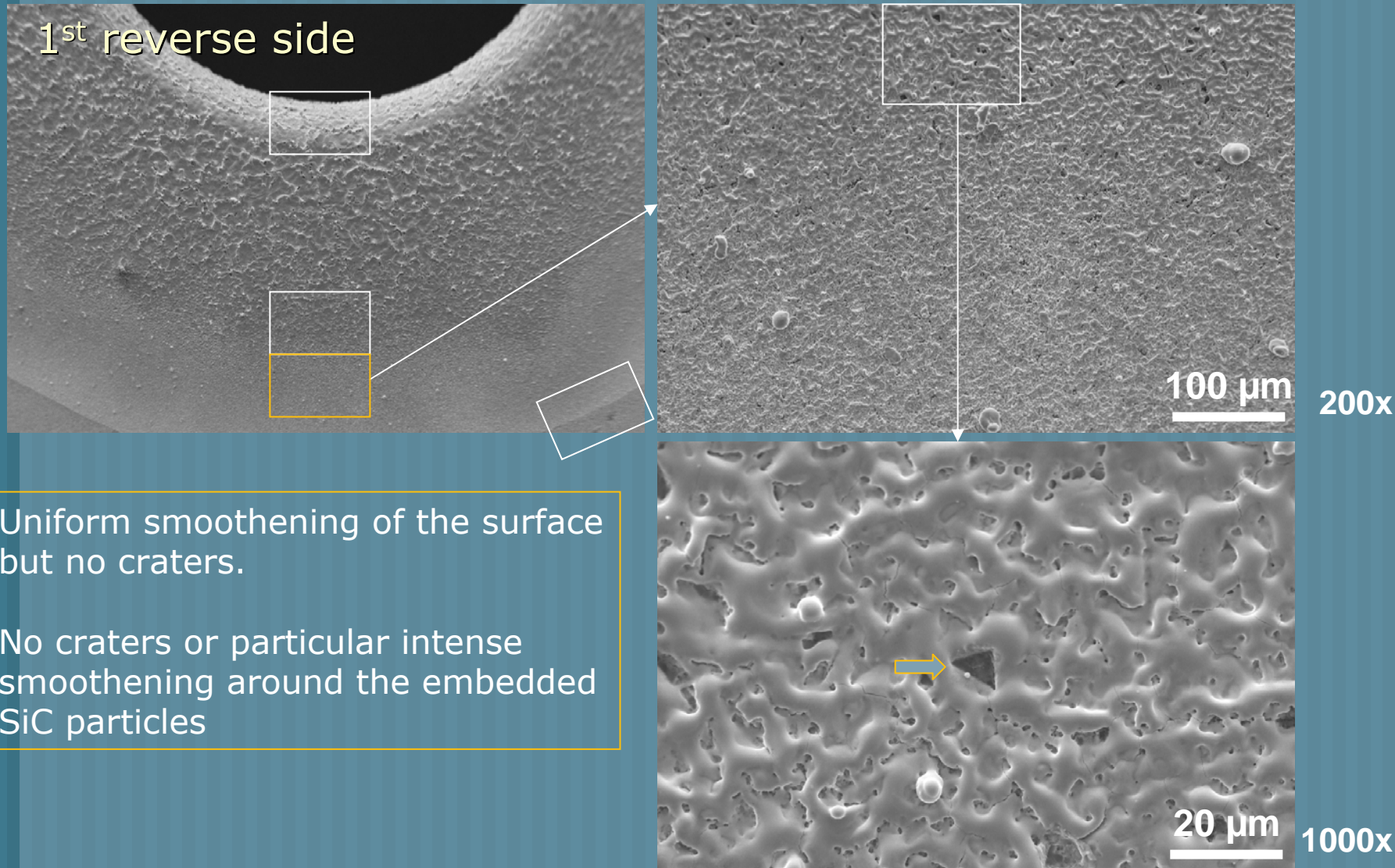
# Surface modifications. Comparison along radial locations 1<sup>st</sup> iris.





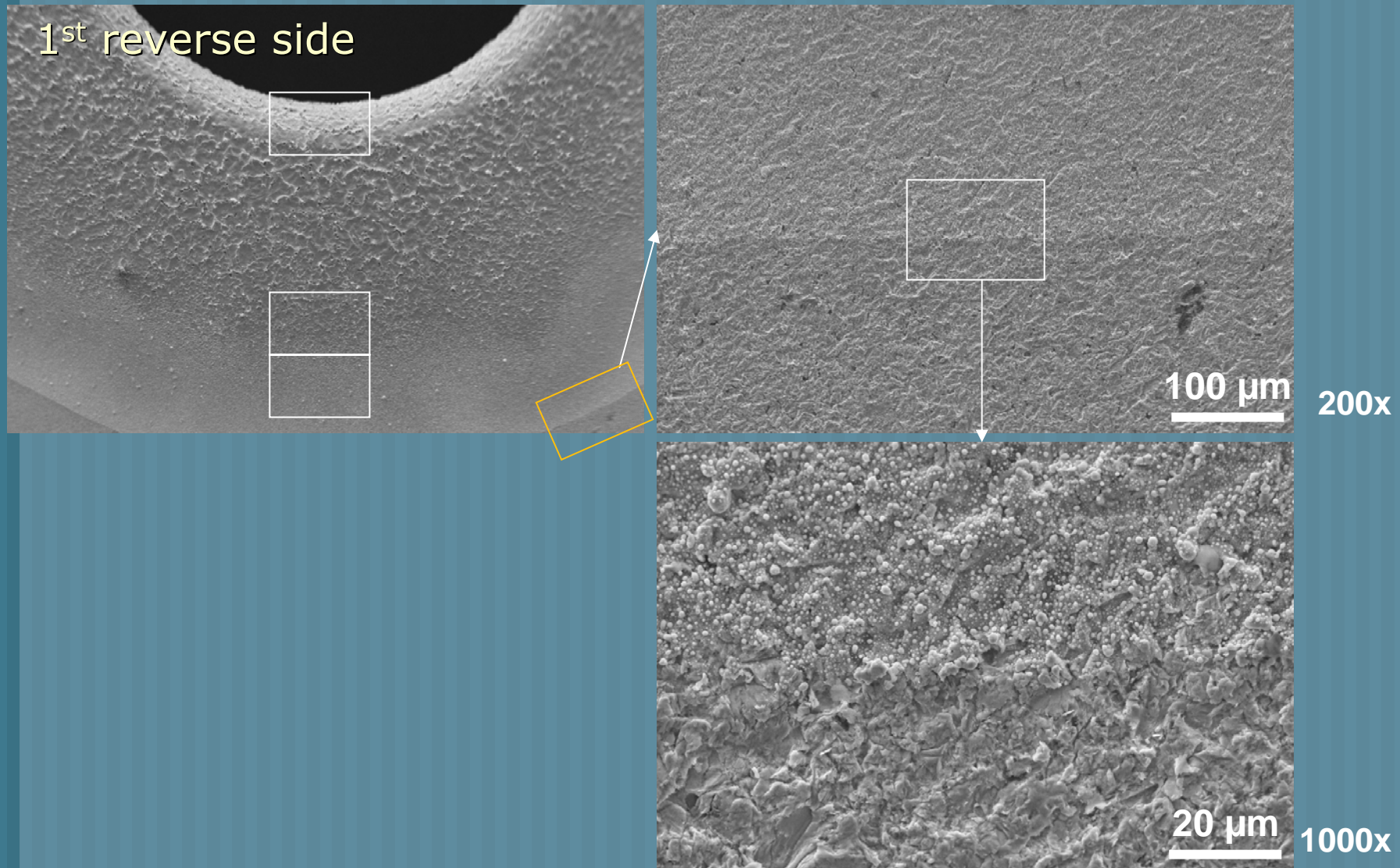
# Surface modifications.

## Comparison along radial locations 1<sup>st</sup> iris.



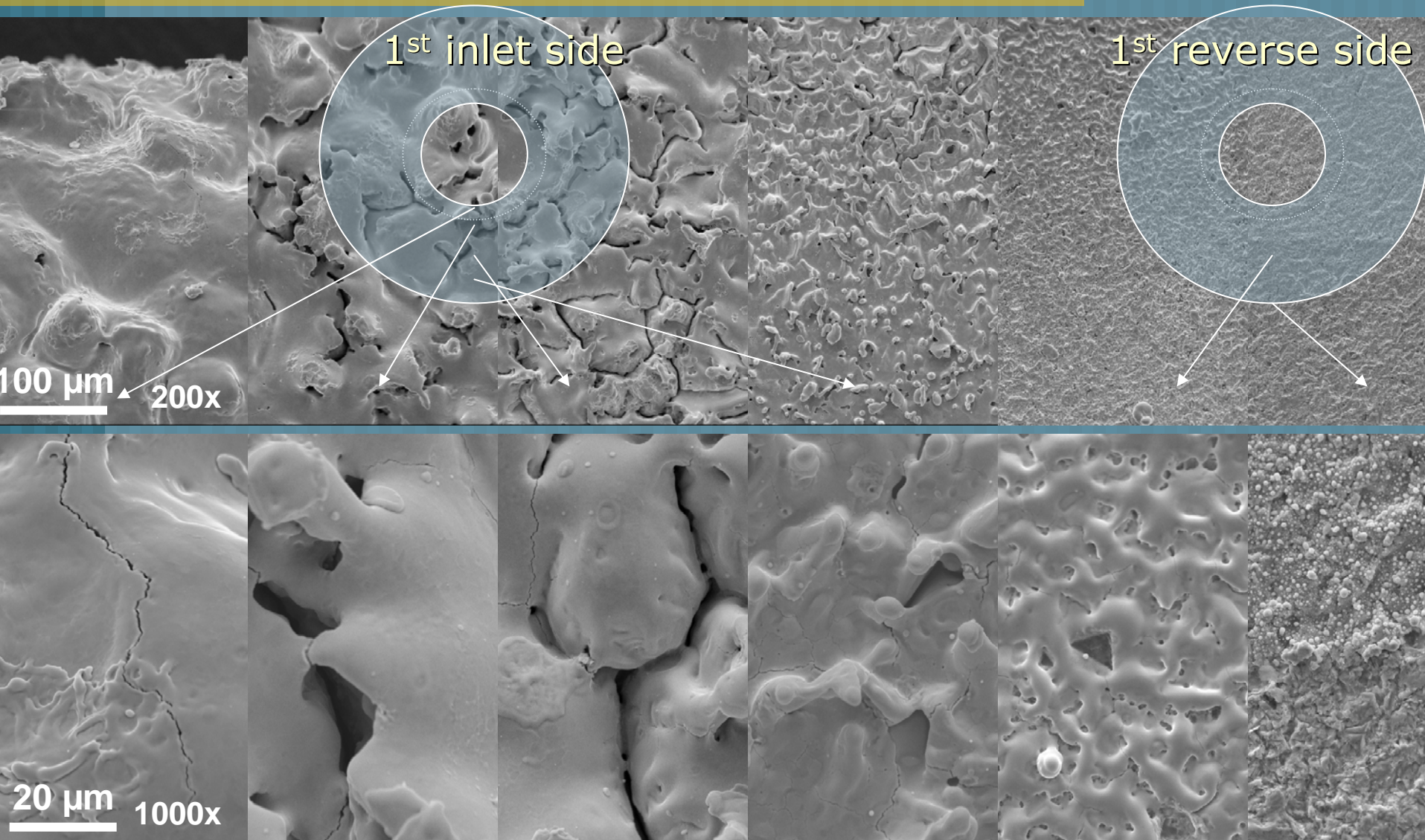
# Surface modifications.

## Comparison along radial locations 1<sup>st</sup> iris.



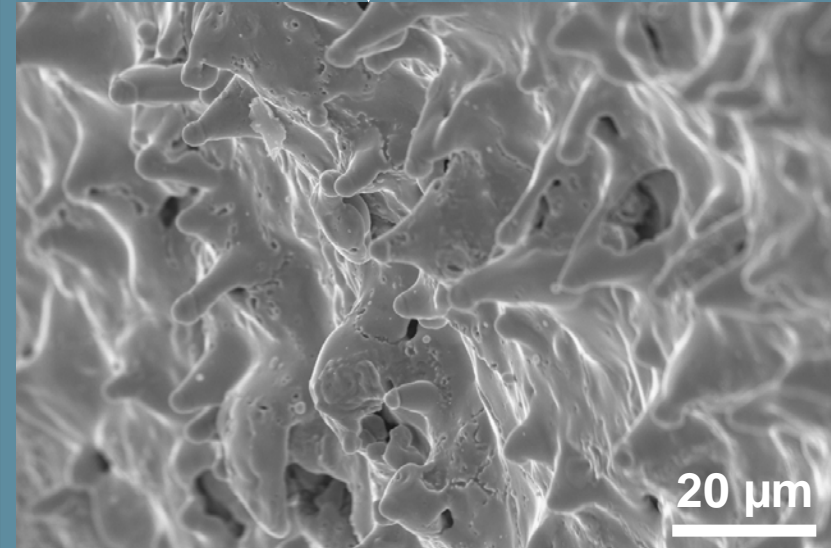
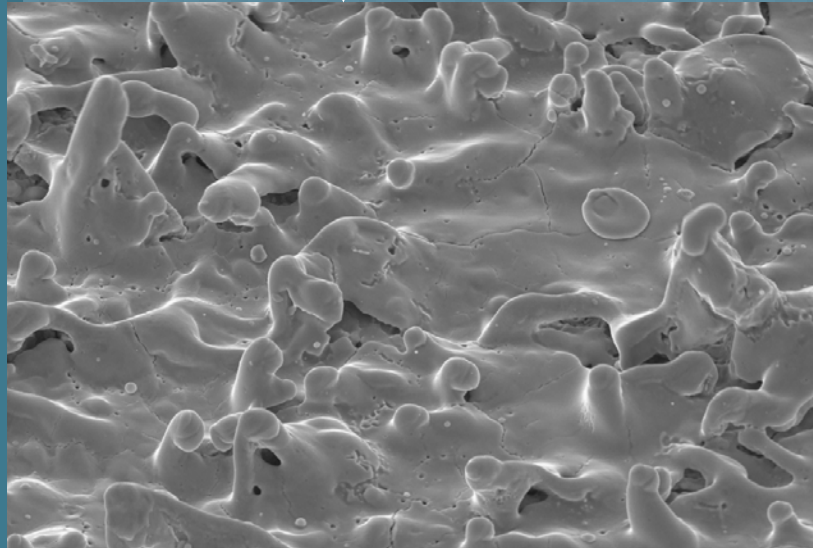
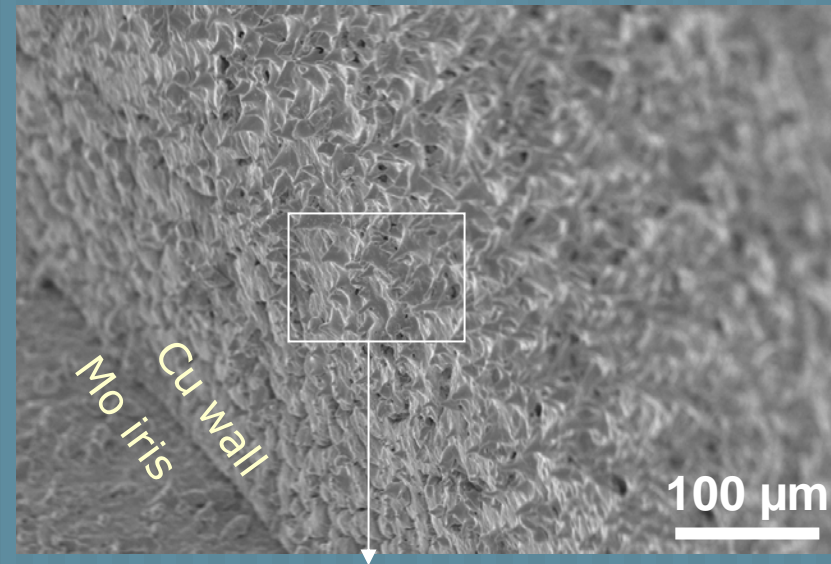
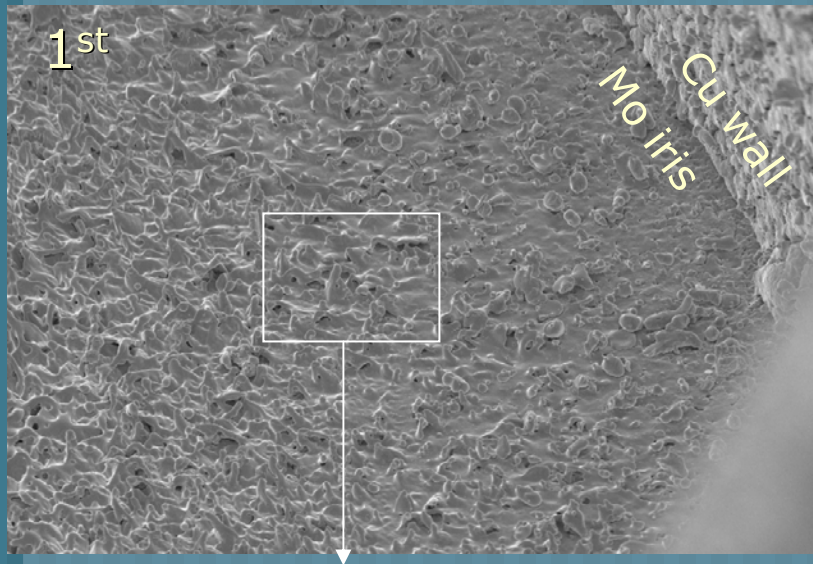
# Surface modifications.

## Comparison along radial locations 1<sup>st</sup> iris.

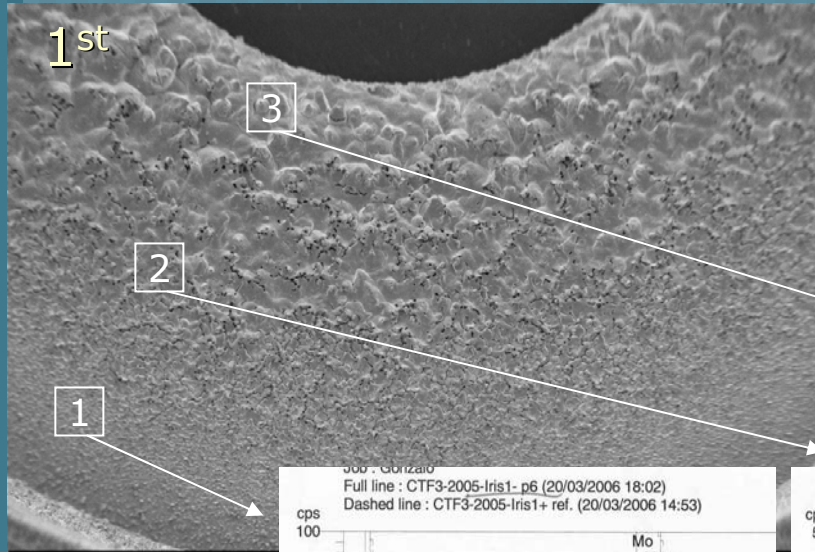


# Surface modifications.

## Close to the Cu wall, 1<sup>st</sup> iris.



# Surface contamination/cleaning. Comparison along radial locations 1<sup>st</sup> iris.

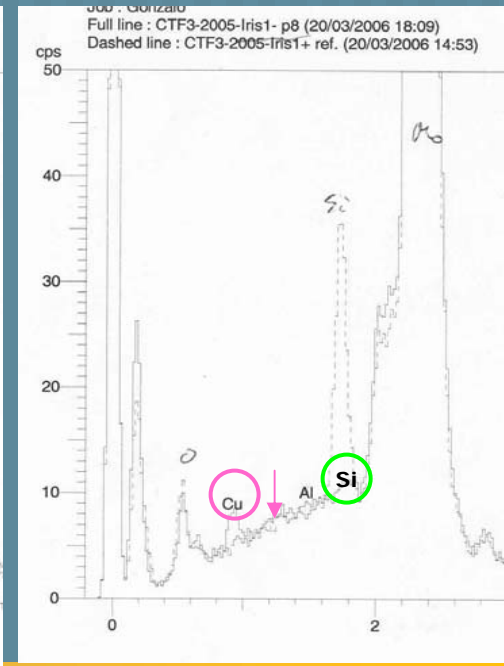
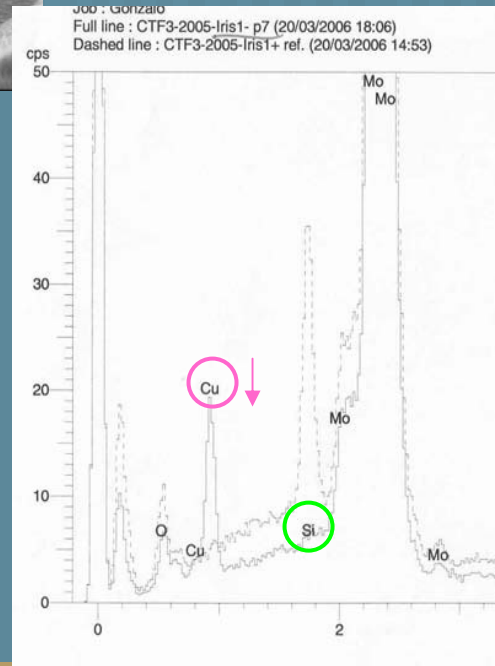
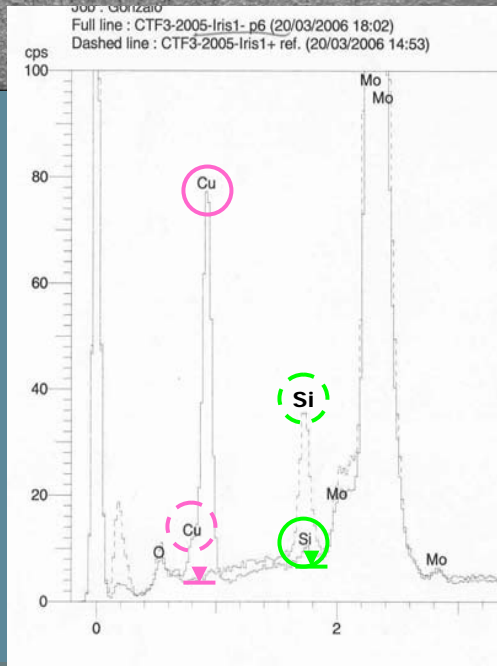


Ref.: Si peak from SiC embedded particles, no Cu peak

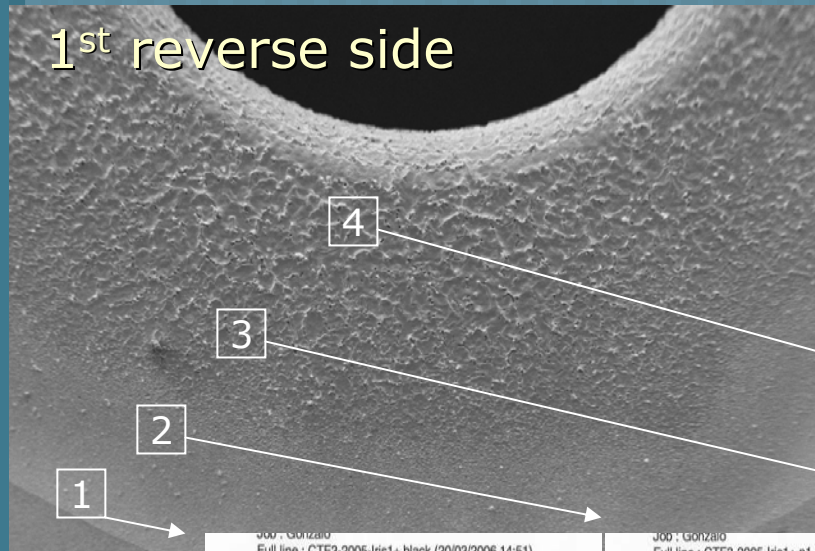
- 1: reduced Si, significant presence of Cu
- 2: absence of Si, presence of Cu
- 3: absence of Si, slight presence of Cu

- Copper contamination. The closer to the wall the higher.
- Si (from SiC particles) disappeared.

EDS analysis:  
—: spectra at the given points  
--: reference spectrum from a ground surface not exposed to RF

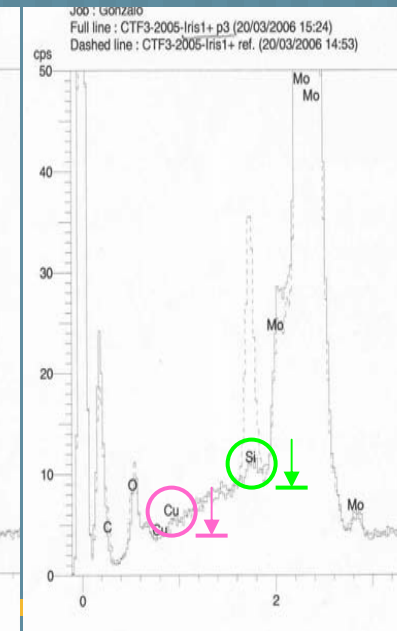
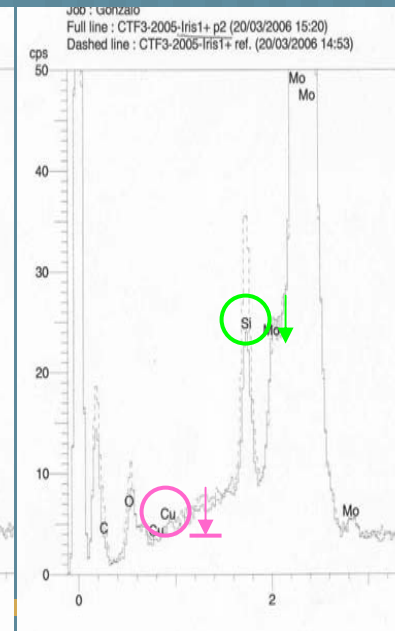
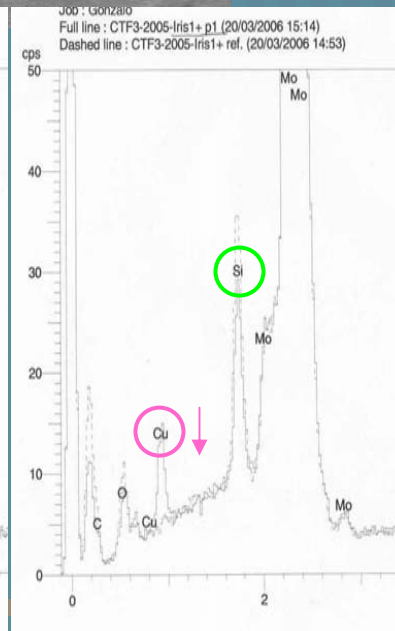
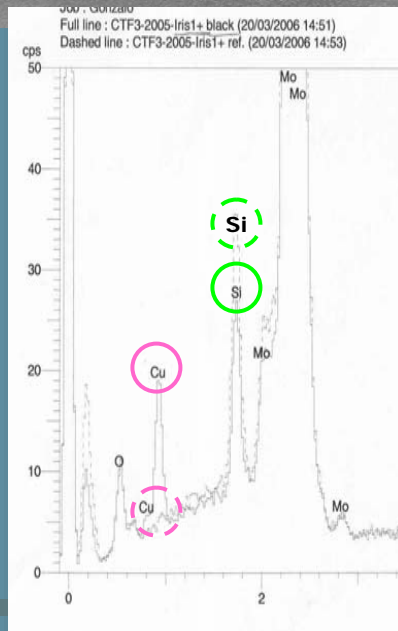


# Surface contamination/cleaning. Comparison along radial locations 1<sup>st</sup> reverse.

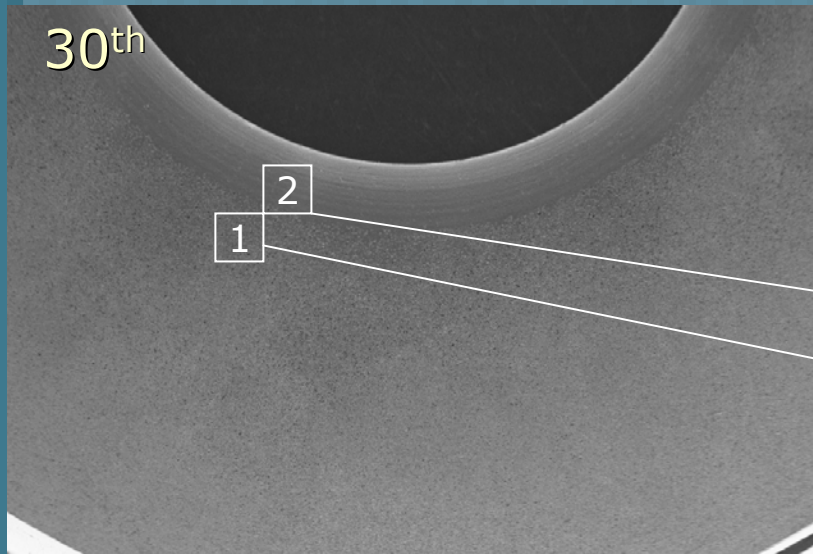


- Copper contamination. The closer to the wall the higher.
- Si (from SiC particles) starts disappearing.

EDS analysis:  
—: spectra at the given points  
--: reference spectrum from a ground surface not exposed to RF



# Surface contamination/cleaning. 30<sup>th</sup> iris.



- Copper contamination also on the 30<sup>th</sup> iris!
- Though here the Cu wall do not seems remelt.

Does Cu contamination comes from most damaged first irises?

