

# Micro-distribution of fuel and metal in carbon based plasma facing materials

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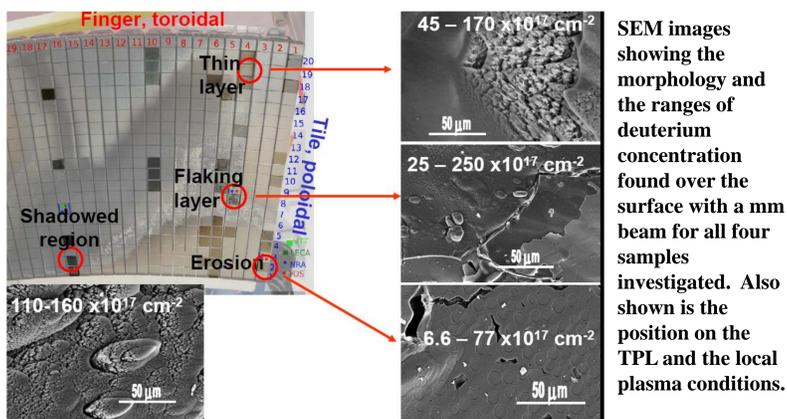
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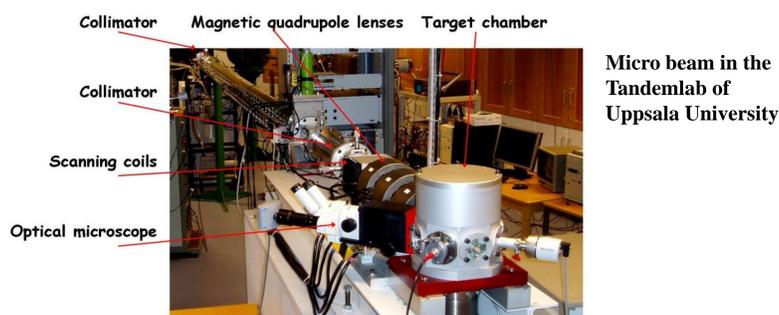
## Introduction

- Detailed knowledge of fuel retention in present-day tokamaks is crucial for the prediction of tritium inventory in a reactor-class device with D-T fuel.
- Surface retention of deuterium and metals was examined in Tore Supra N11 (SNECMA) tiles of the Toroidal Pump Limiter (TPL) within the DITS Project[1]
- The aim** was to determine the variations in the content and distribution of fuel and metal species.

## Experimental

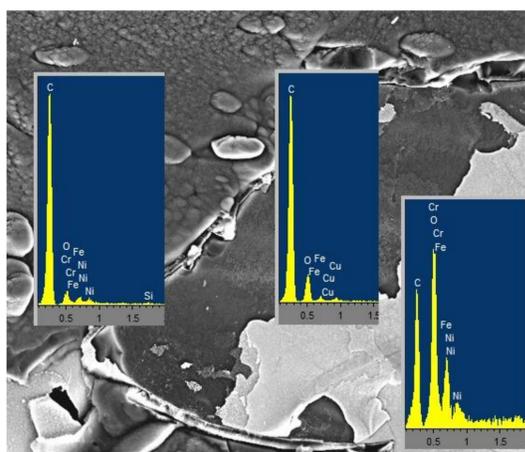


## Ion Beam Analysis



3 MeV <sup>3</sup>He<sup>+</sup>  
NRA: 100 mSr 1500  $\mu$ m detectors  
PIXE SI(Li) detector 30mm<sup>2</sup> 6mm thick  
FAST MPA-3 data collection  
SIMNRA data analysis [1]

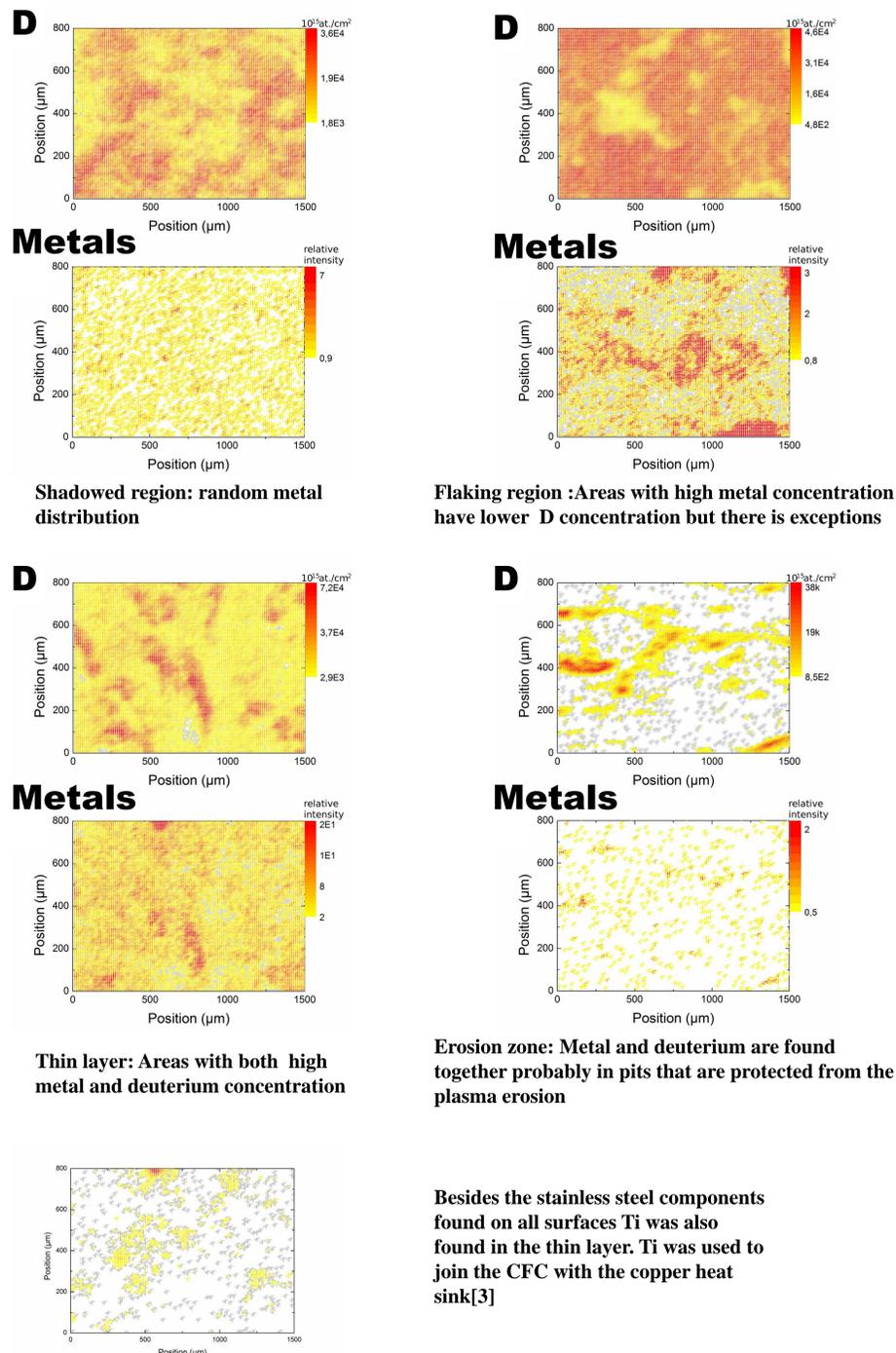
## Results



## References and further reading

- [1] E. Tsitrone et al., Nucl. Fusion 49 (2009) 075011  
[2] M. Mayer, Am. Inst. Phys. Conf. Proc. 475 (1999) 541  
[3] P. Pelicon, NIM-B (2011) doi:10.1016/j.nimb.2011.02.049

## Results



## Summary and Conclusions

- Simultaneous mapping of deuterium and metals has been performed
- The stainless steel components Fe Cr and Ni appear together
- Other metals (Ti) can have other patterns
- There are relations between the metal and deuterium concentration that are dependent on plasma condition

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