



# RBI activities in 2021: IBA of AUG, WEST and W7-X samples – plans and capabilities

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# Tasks to be performed:



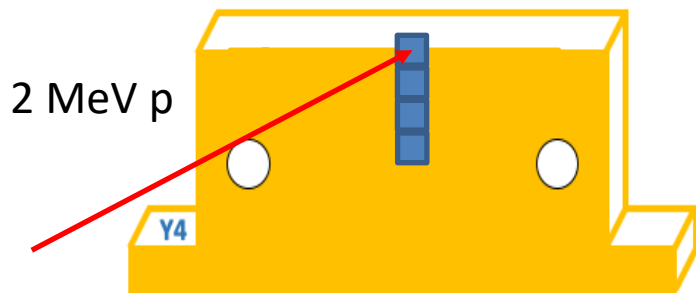
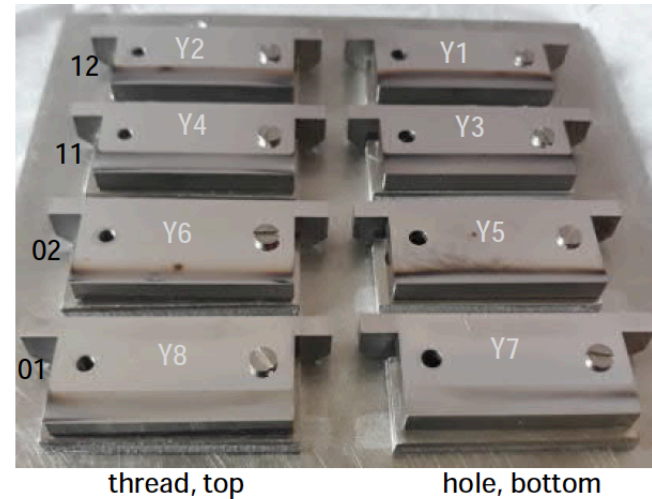
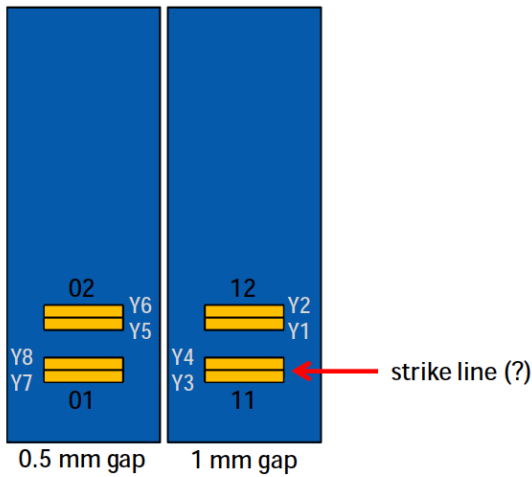
- Ion-beam measurements (broad-beam and microbeam) of marker samples and other samples from specific plasma experiments (AUG, WEST, W7-X), comparison to linear devices and lab experiments
- D10 - ERDA, RBS, NRA and PIXE characterization of selected samples from experiments on AUG, WEST, and W7-X as well from laboratory and linear plasma experiments

# Analysis of Pt gap samples after AUG exposure by using microPIXE with 2 MeV protons

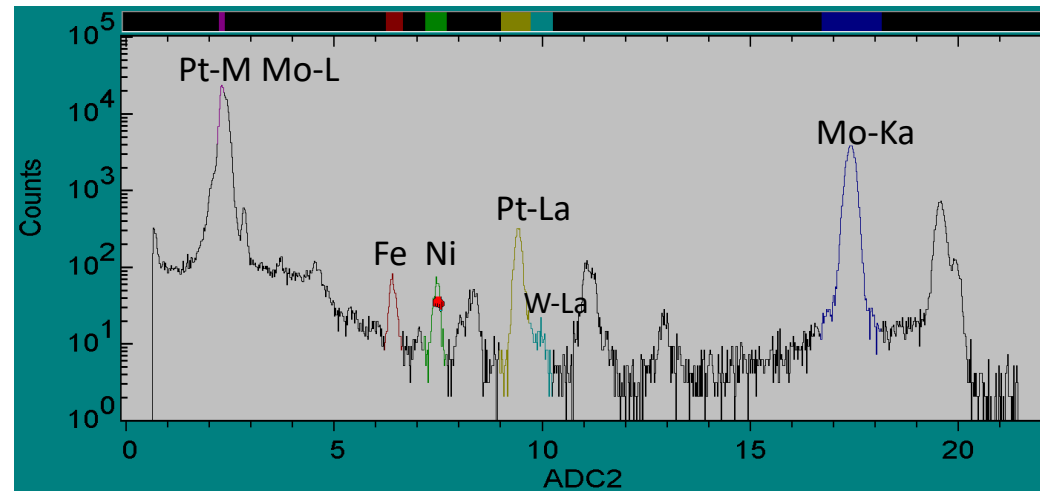


- 1<sup>st</sup> and 2<sup>nd</sup> round gap samples after AUG exposure

Mo samples coated with roughly 20 nm (1<sup>st</sup>) or 70 nm (2<sup>nd</sup>) Pt



- Scanning 1x1 mm<sup>2</sup>
- Each scan was projected on y axis

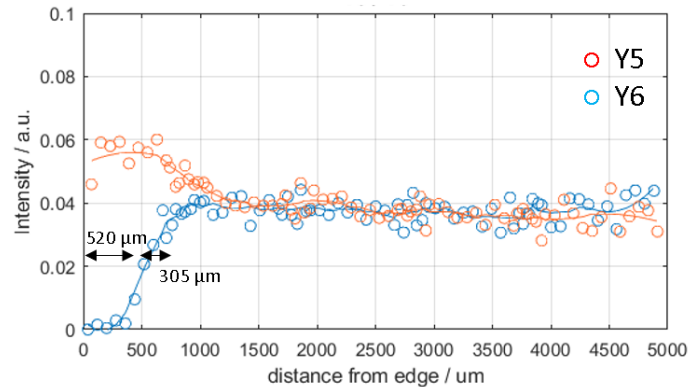


# Analysis of Pt gap samples after AUG exposure by using microPIXE with 2 MeV protons

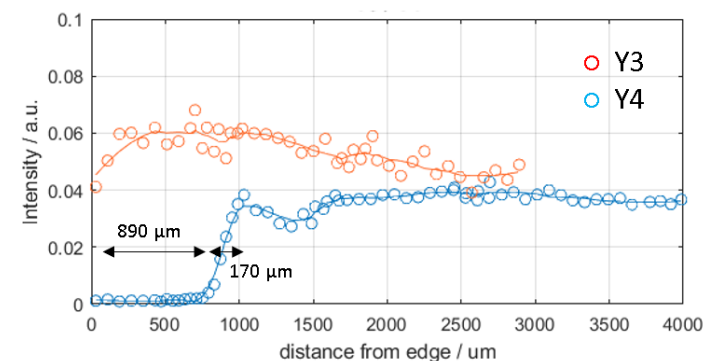
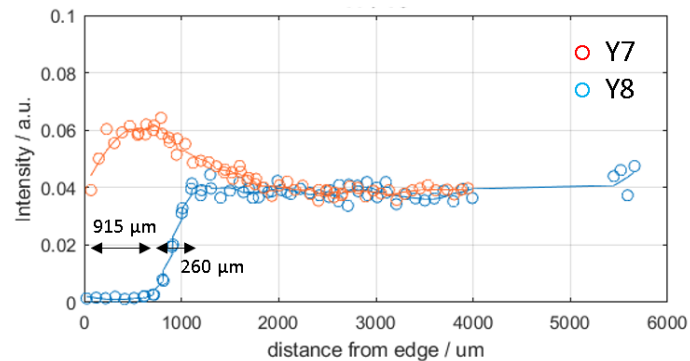
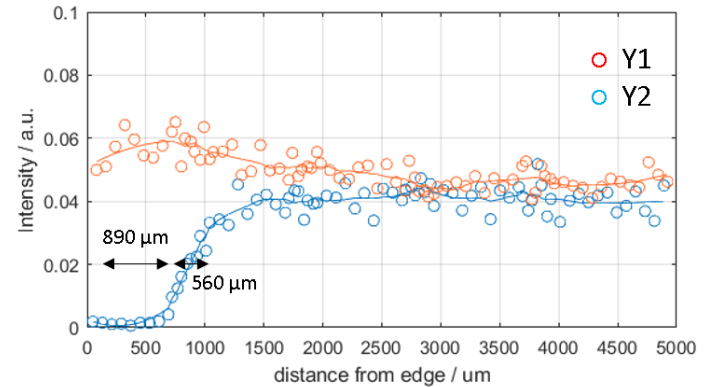


## Post-exposure analysis: Pt linescans

Gap: 0.5 mm



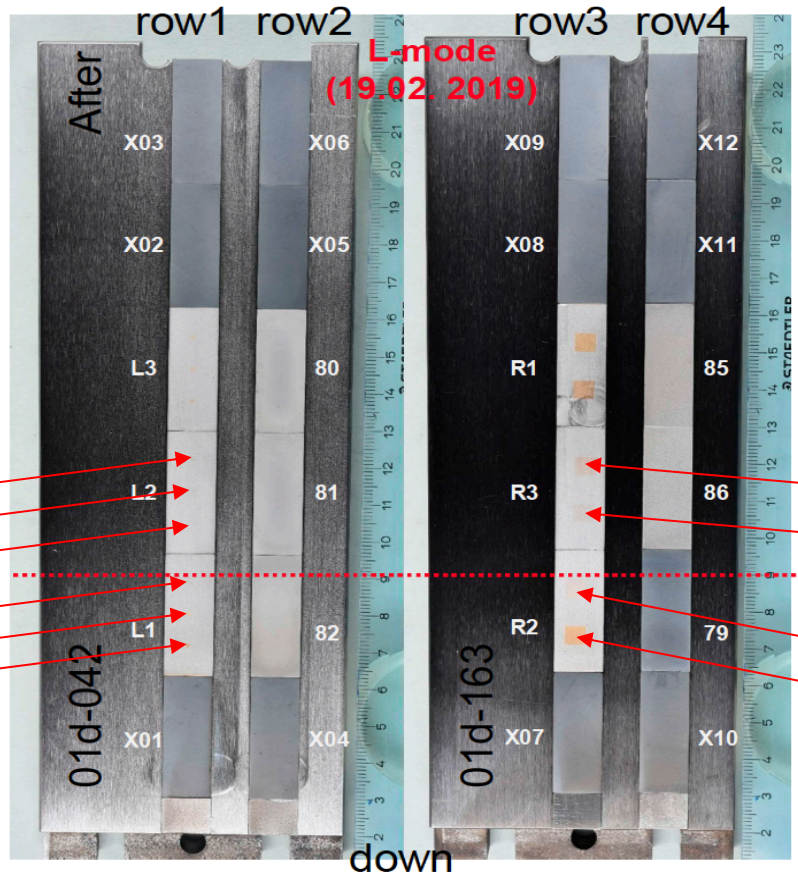
Gap: 1 mm



- Results for the 1<sup>st</sup> round of gap samples already delivered
- Measurements and analysis of the 2<sup>nd</sup> round of gap samples is ongoing



# Au thickness for AUG samples exposed to L-and H-mode plasma using $\mu$ -beam PIXE/RBS

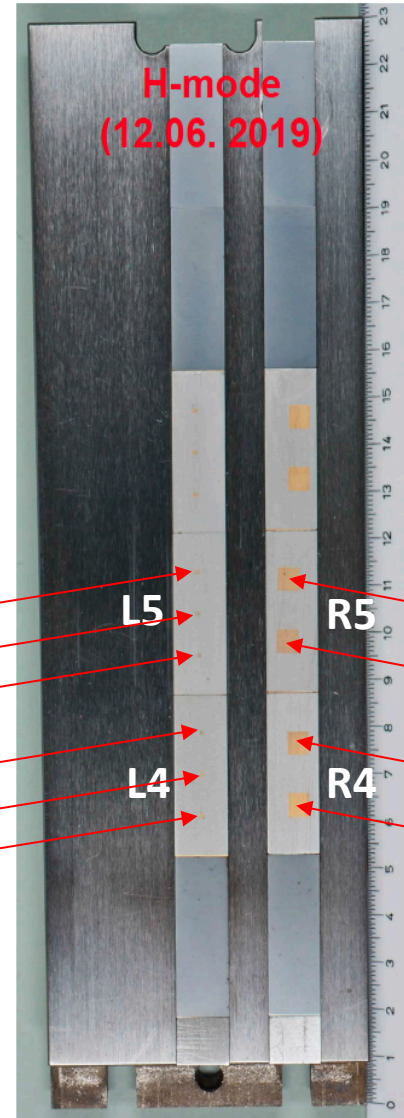


11.0 nm  
8.3 nm  
6.4 nm

11.4 nm  
19.2 nm  
22.8 nm

15.7 nm 20.6 nm  
9.6 nm 22.5 nm  
24.3 nm

15.6 nm 15.3 nm  
28.9 nm 21.1 nm  
24.7 nm



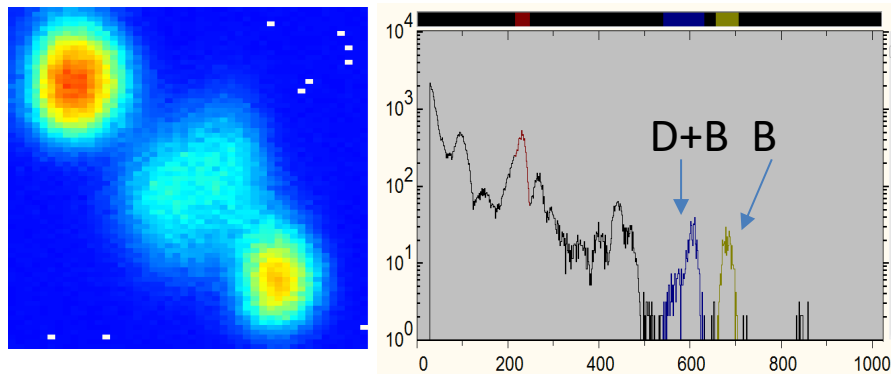
26.9 nm  
27.6 nm

25.1 nm  
26.4 nm

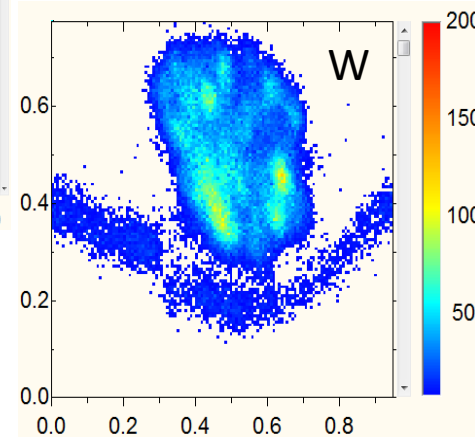
**No Au found by PIXE above MDL outside Au spots!**

# Micro analyses of dust particles deposited on dust collectors in ASDEX tokamak using $^3\text{He}$ -NRA, PIXE, RBS

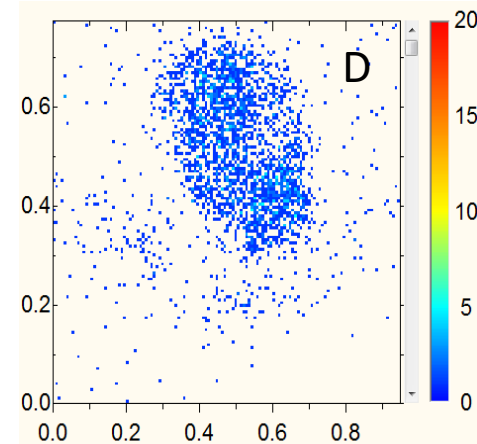
- 2.7 MeV  $^3\text{He}$  microbeam was used and simultaneous NRA, PIXE and backscattered spectra were measured
- measured selected particles from PAD19 and PAD HS-12
- Many particles contain B which creates problems for quantification for such particles.
- Additional measurements were done afterwards to allow calibration for (semi)quantitative analysis of deuterium
- Analysis is in progress



Zoom to Region 19 on PAD19.  
W and B are clearly seen.  
There is an overlap between D and B.  
From the peak ratios presence of D can be confirmed.



Zoom to particle 08, pad HS-12.  
There is no B, so definitely D is observed.

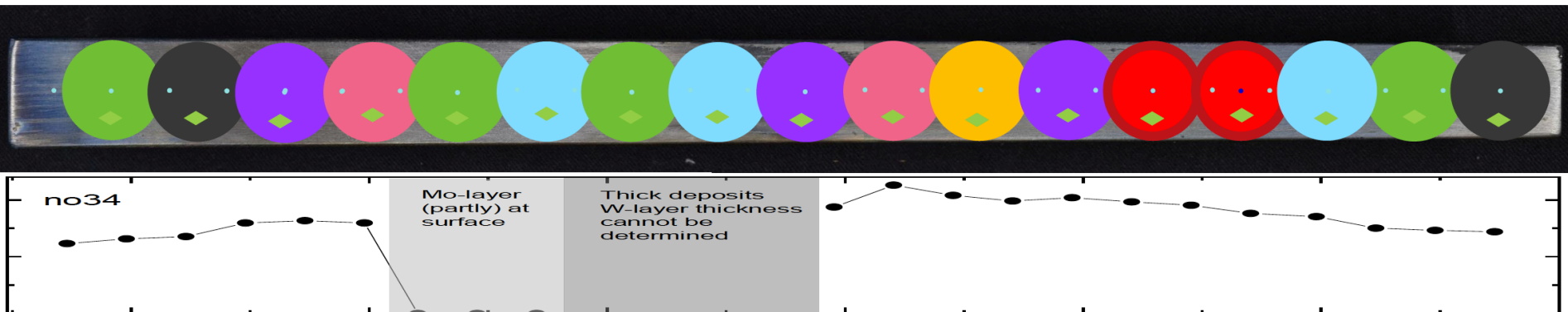


# Analysis of C3 erosion marker tiles from WEST



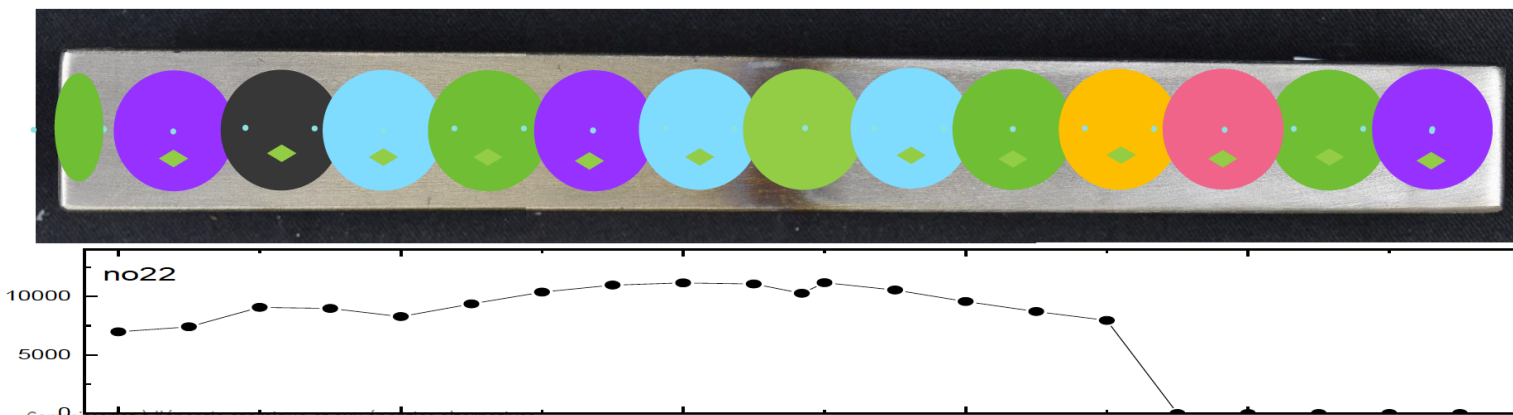
C3-34i: 17 samples

SPARES (2)



C3-22o: 13 samples

VR (NRA, PIXE, ERDA)  
 + IPPLM (SEM, TEM)  
 VTT (SIMS)  
 RBI (RBS, tofERDA)  
 JSI ( $\mu$ NRA, ERDA)  
 IAP (GDOES)  
 UT (LIBS)



Commissariat à l'énergie atomique et aux énergies alternatives

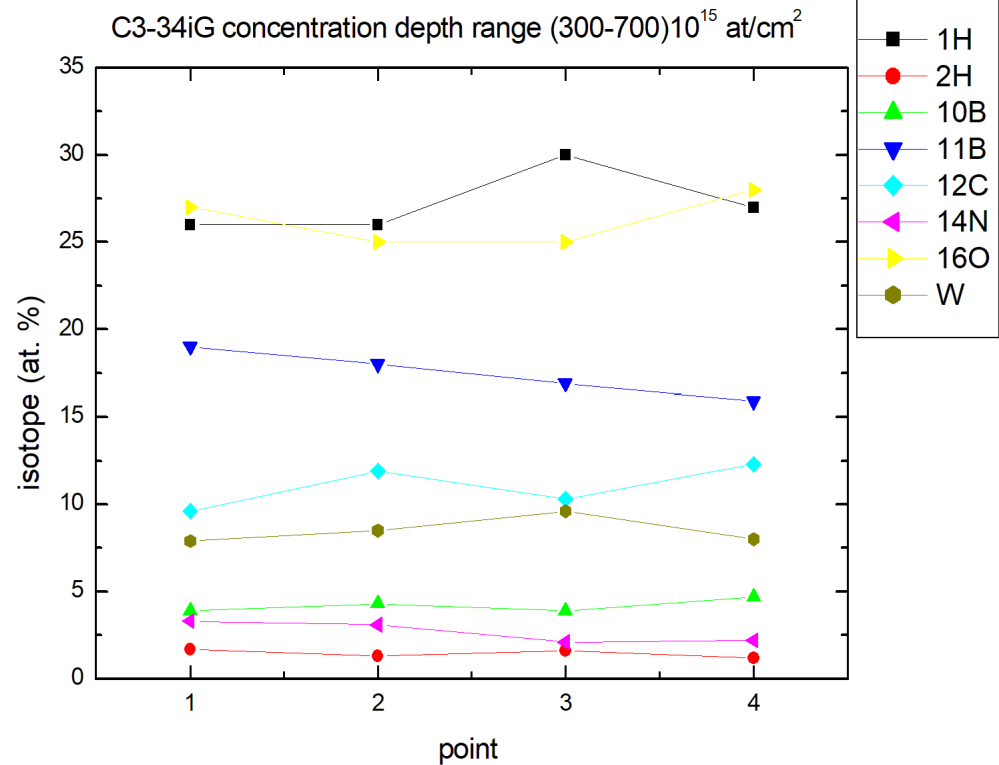
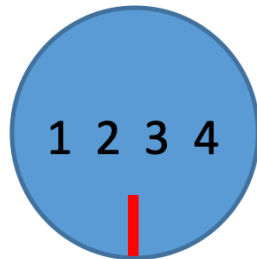
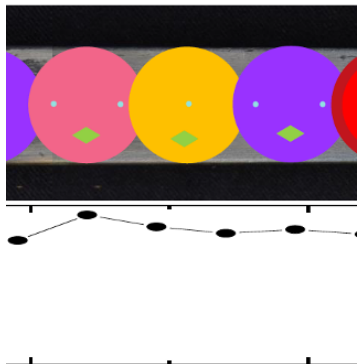
- Two samples analysed by RBS and TOF-ERDA – measurements done, data analysis ongoing

# Analysis of C3 erosion marker tiles from WEST



- 4 positions measured by TOF ERDA
- Distance between each point was 3 mm and beam dimension at the point was 2 mm

## C3 -34iG





# Analysis of C3 erosion marker tiles from WEST



## C3 -22oD

