WP PWIE SP B.2 & B.3 kick-off meeting VTT tasks

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Relevant tasks and deliverables from the PEP

Under SP B.2

D003: Balance between gross and net erosion of plasma-facing materials in controlled L- and H-mode plasma experiments (VTT)

Corresponding task: ”Determine gross and net erosion of marker samples and coatings (AUG, WEST) and migration of impurities in edge plasmas (AUG, WEST, W7-X): project coordination and surface analyses (VTT)”

Under SP B.3

D008: RBS, NRA, ERDA, LIBS, and SIMS characterization of selected AUG, WEST and W7-X wall tiles and plasma-exposed reference samples (VTT)

Corresponding task: ” Determine erosion, deposition, and fuel retention profiles on selected AUG, WEST and W7-X wall tiles as well as reference coatings from plasma exposures in MAGNUM-PSI, PSI-2 and GyM (VTT)”

Essentially these cover **surface analyses of tiles and components** in Finland (VTT and University of Helsinki) and in IPP-Garching (once the COVID-19 time is over)

Additional support of **4 days of accelerator beam time** for University of Helsinki

More concrete plans for SP B.2

AUG samples

1. Analysis (RBS, NRA, SIMS,…) of marker tiles from the 2020 AUG erosion experiment
   - ✓ Pending for lifting of the COVID-19 restrictions → autumn 2021?
   - ✓ Collaboration with MPG
2. Production and pre-characterization of marker samples for new AUG experiments in 2022
   - ✓ Depends on the experimental plans under WP TE → programme review in autumn 2021
   - ✓ Collaboration with MPG

After 2020 experiment

More concrete plans for SP B.2

Photo of the C3-22o tile before cutting

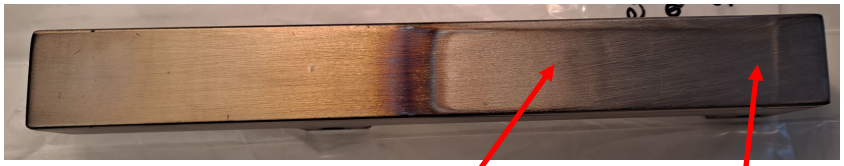
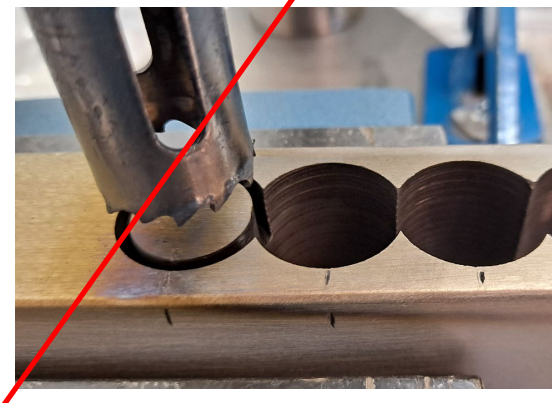


Photo of core samples with marks

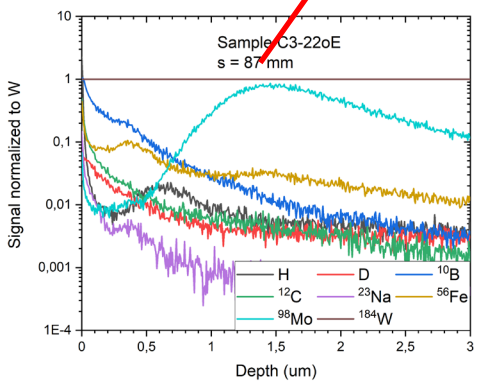


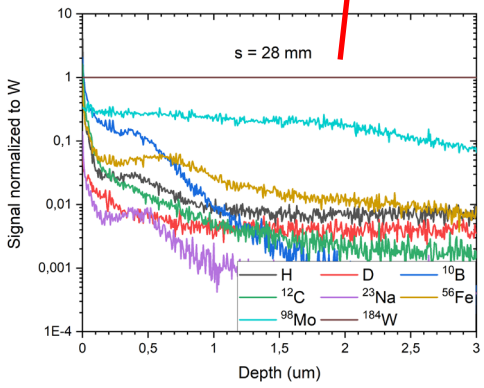
WEST samples

1. Completion of the analyses of two C3 marker-tile samples
   - ✓ SIMS measurements carried out under 2020 PFC tasks
   - ✓ Additional SIMS and ion-beam measurements (University of Helsinki) once shipped samples return to VTT → autumn 2021

2. Preparation of samples and initiating surface analyses of C4 marker tiles
   - ✓ Waiting for tiles from MPG

Examples of measured SIMS depth profiles





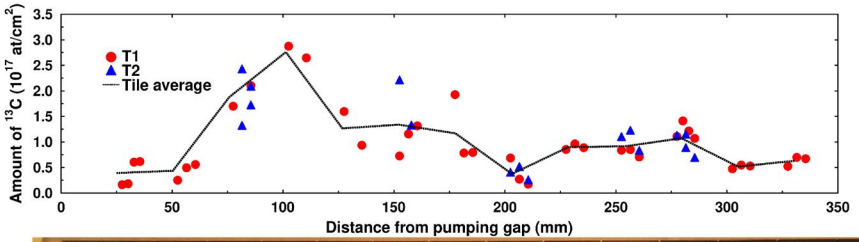
More concrete plans for SP B.2

W7-X samples

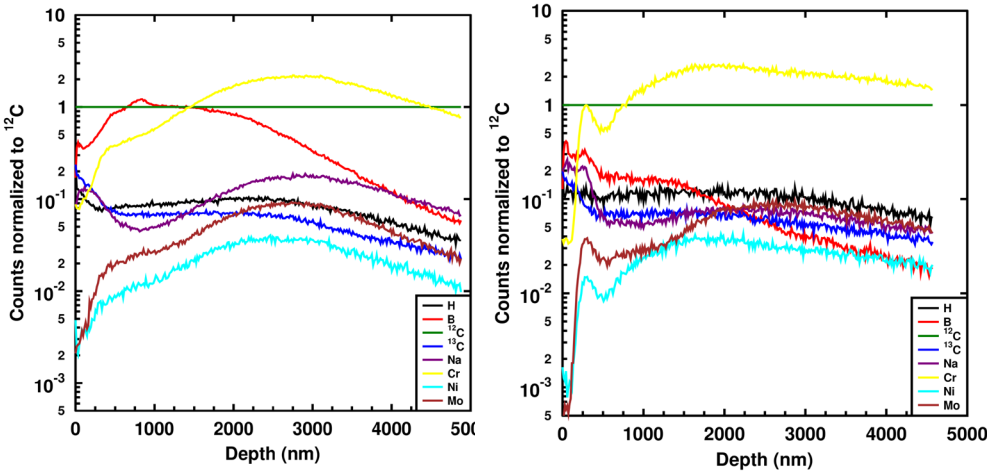
1. Additional ion-beam analyses (University of Helsinki) of the three tiles studied in 2020
   - ✓ Focus on areas where strong deposits have been observed
   - ✓ Timeline: analyses in the autumn!?

2. Surface analyses of additional W7-X tiles as agreed in 2019
   - ✓ Exchanging of samples between VR and VTT → to be clarified within the next weeks

^{13}C deposition on tile HM58TM100vTE9



Examples of measured SIMS depth profiles (low mass resolution)



More concrete plans for SP B.3

From our point of view, the SP B.3 deliverable **relates to a service task** where we study **other samples than those presented in the previous slides** that benefits from the available analysis capabilities of VTT

These could include:

- Additional WEST PFUs and W7-X tiles to determine the composition of deposited layers
- Samples originating from experiments in linear devices, e.g., exposure of reference coatings produced in SP B.4
- Potentially samples from additional AUG experiments where a second opinion is needed

More concrete discussions to be made in the autumn