



# WP PWIE SPB.1 kick-off meeting

**Antti Hakola**



This work has been carried out within the framework of the EUROfusion Consortium and has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement number 633053. The views and opinions expressed herein do not necessarily reflect those of the European Commission.

# Goals and agenda of the meeting



## The goals of the meeting are to

- Introduce and discuss the tasks attached to each Research Unit under SP B.1,
- Identify possible gaps and opportunities for collaboration, and
- Decide on concrete next steps, to be reviewed in the autumn

10:30 Introduction to PWIE and SP B

10:45 Presentations of SP B.1 task holders – please focus on the question “What will be done in 2021 and what is needed from others/EUROfusion”  
Please be brief: each presentation is 8 min + 2 min for quick feedback

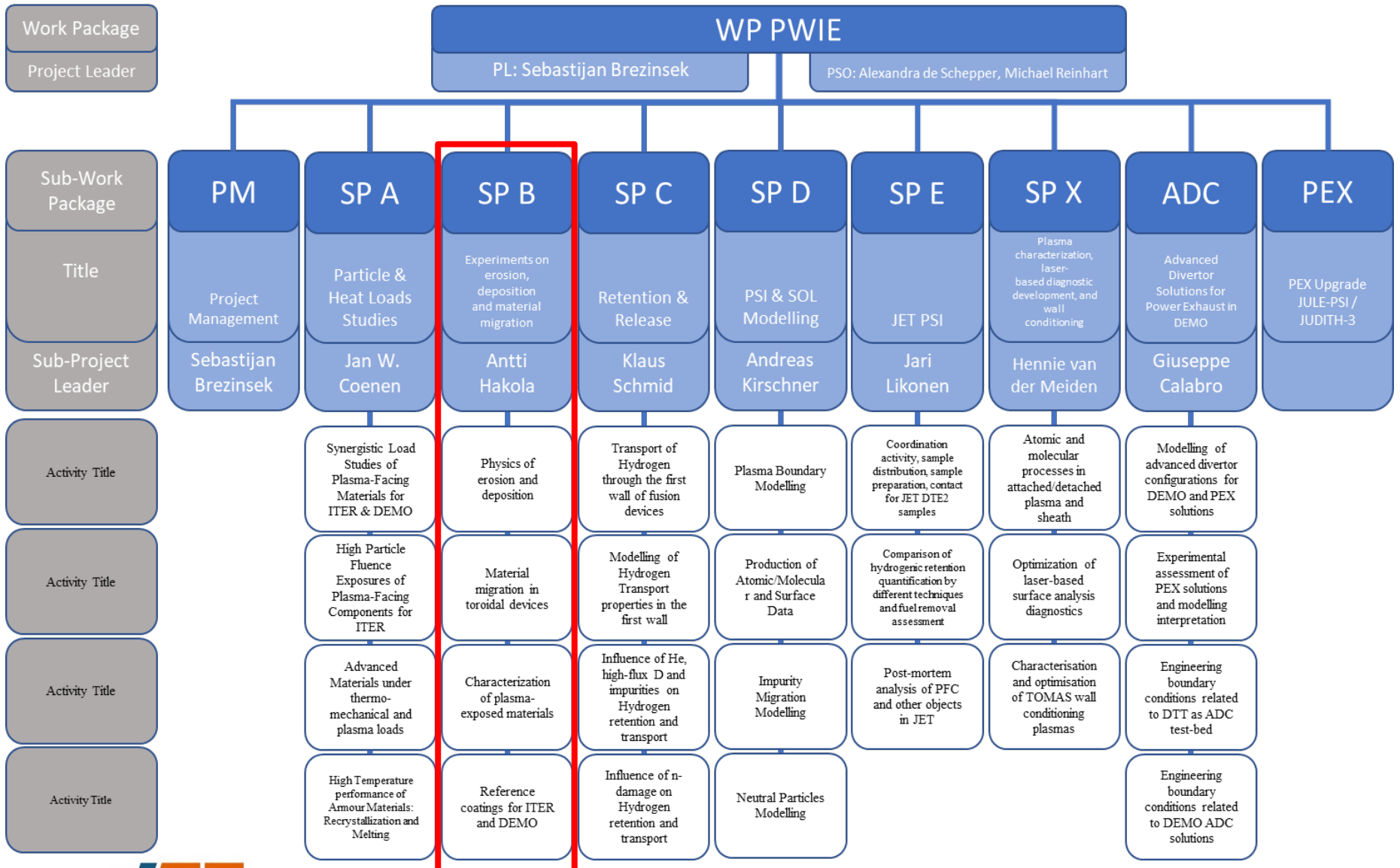
11:50 Discussion

12:15 End of the meeting

In this meeting we'll discuss the **physics behind erosion and deposition, both with the help of laboratory experiments and studies in linear facilities**. Modelling efforts are channelled under SP D.

**Everybody is invited to contribute to the discussions, also those who are not task holders of any of the SP B.1 activities!**

# Structure of PWIE and SP B



# SP B focus points in 2021



I: Experimental determination of effective tungsten sputtering yields on different types of rough surfaces in pure and mixed plasmas and comparison with laboratory experiments (ITER+DEMO) → SP B.1, SP B.2, SP B.4

II: Provision of the gross and net erosion balance of W PFCs in L- and H-mode plasmas in tokamaks with the aid of marker probes (ITER) → SP B.2, SP B.3

III: Completion of surface analyses of W marker tiles exposed in the deuterium campaign C3, first assessment of the erosion/deposition balance on W PFUs in WEST after the He campaign → SP B.2, SP B.3

IV: Production of reference layers for the benefit of SP B and other subprojects → SP B.4

# 2021 Deliverables SP B.1



Deliverable ID:	Deliverable Title:
D1	Erosion rates of W model systems and composition and structure of re-deposited layers in MAGNUM-PSI at varying plasma conditions (DIFFER)
D2	Effective sputtering yields of W model systems with varying morphologies in pure and mixed plasmas in GyM and by hypervelocity dust impacts (ENEA)
D3	Erosion rates of W model systems with varying morphologies as well as composition and structure of re-deposited layers in PSI-2 at varying plasma conditions (FZJ)
D4	Effective sputtering yields of W model systems, including angular distributions of sputtered particles, and re-deposited W layers following exposure to controlled D and impurity ion beams (ÖAW)
D5	Size distribution and composition of Be and W dust formed during air and water leaks (IAP)
D6	RBS, ERDA and MEIS/LEIS characterization of selected samples from laboratory erosion and dust experiments (VR)

# 2021 Resources SP B.1



Deliverable Owner	Beneficiary	PM
T. Morgan	DIFFER	4
A. Uccello	ENEA	4
O. Marchuk	FZJ	7
C. Lungu	IAP	2
F. Aumayr	ÖAW	5
D. Primetzhofner	VR	3
<b>Total</b>		<b>25</b>

Device	Beneficiary	Days	Related Deliverable
MAGNUM-PSI	DIFFER	4	D1
GYM	ENEA	15	D2
PSI-2	FZJ	15	D3
Accelerator	DIFFER	3	D1
Accelerator	FZJ	3	D3
Accelerator	VR	5	D6

# 2021 Tasks SP B.1



1. Determine the impact of **plasma conditions** on erosion of W model systems and formation of re-deposited layers: **MAGNUM-PSI experiments** and analyses (DIFFER)
2. Elucidate the sputtering properties of **W model systems with varying morphologies** in pure and mixed plasmas: **GyM experiments** and analyses (ENEA)
3. Assess the influence of **evolving surface morphology** on the sputtering properties of W model systems and formation of re-deposited layers: **PSI-2 experiments** and analyses. (SEM, LEIS, NRA, QMS) (FZJ)
4. Determine the **sputtering properties, including angular distributions** of sputtered particles, of W model systems with varying morphologies and re-deposited W layers: **laboratory experiments** and analyses (ÖAW)
5. Characterize surface erosion induced by **hypervelocity W dust impacts: dust-gun experiments** and analyses (ENEA)
6. Investigate the formation and properties of W and Be **dust produced in off-normal** (air and water leaks) **conditions** in fusion reactors (IAP)
7. Perform ion-beam analyses for samples from dust studies and laboratory experiments (**VR - jointly with ENEA and ÖAW**)

**Please note that surface analyses of relevant samples can also be done under SP B.3 and/or SP B.2!**

# Contact info and next steps



- Your SP B contact  
Antti Hakola ([antti.hakola@vtt.fi](mailto:antti.hakola@vtt.fi))
- Project leader  
Sebastijan Brezinsek ([s.brezinsek@fz-juelich.de](mailto:s.brezinsek@fz-juelich.de))
- Project Support Officer  
Michael Reinhart ([m.reinhart@fz-juelich.de](mailto:m.reinhart@fz-juelich.de))
- PMU Coordination Officer – starting in late 2021  
David Douai ([david.douai@cea.fr](mailto:david.douai@cea.fr))

- ✓ Approval of the Project Execution Plan (PEP)  
**Mid- till end of June**
- ✓ Refining task descriptions, in separate meetings or by email  
**From June till mid-July**
- ✓ Intermediate report and midterm meeting - **October**
- ✓ Annual meeting and report on Deliverables – **TBD**