



Overview of SP B.4 in 2022

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Goals and agenda of the meeting



The goals of the meeting are to

- Discuss the detailed work plans of tasks under SP B.4,
- Identify possible gaps and opportunities for collaboration, and
- Decide on concrete next steps, to be reviewed in the midterm meeting

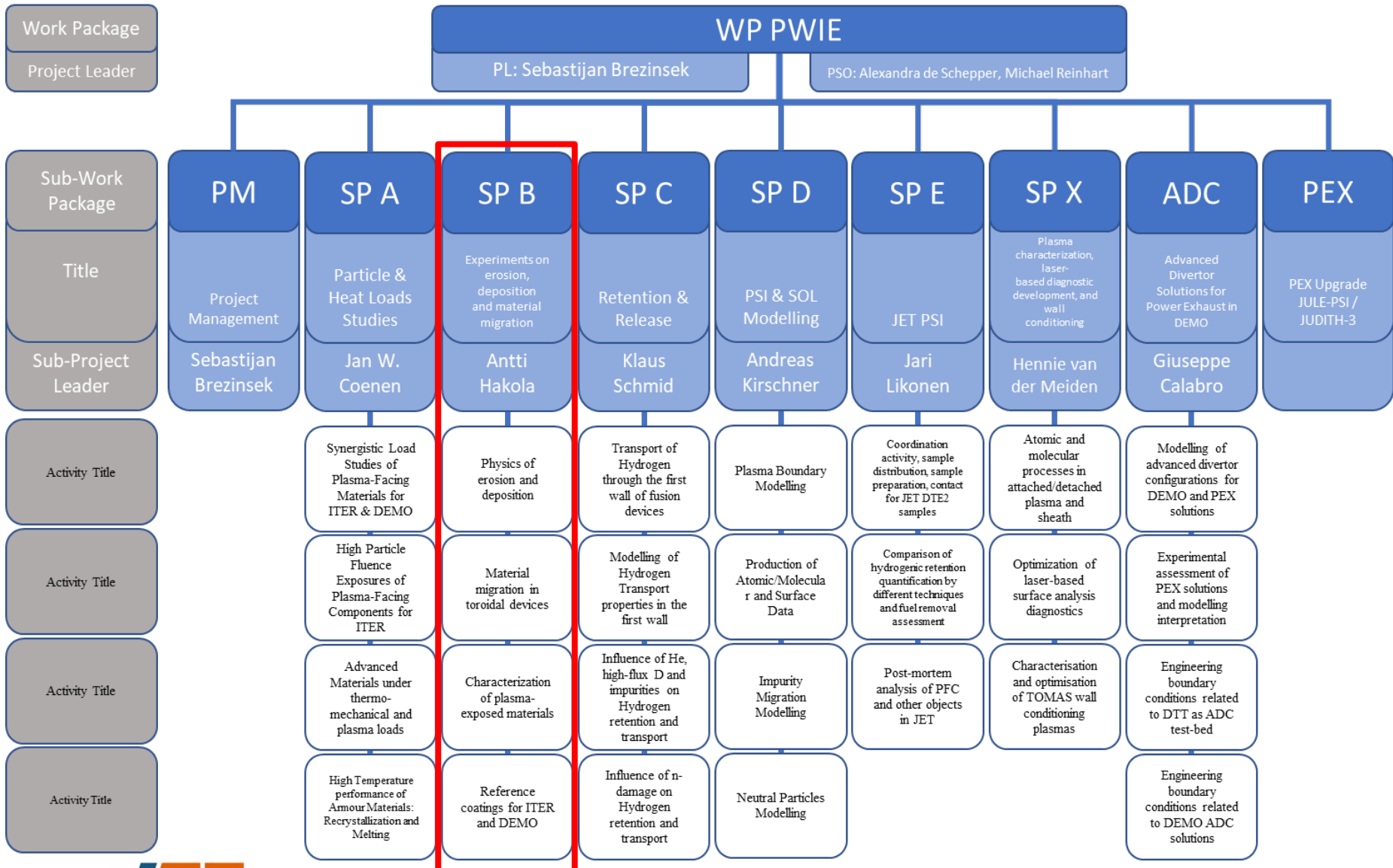
10:00	Introduction to PWIE and SP B & update of sample production matrix
10:20	Overview of sample production activities
11:05	Highlight talks on the analyses results of the produced reference samples
11:25	1-slide summaries of the activities in different labs
11:45	Discussion
12:15	End of the meeting

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In this meeting we'll discuss **production and characterization of reference layers for ITER and DEMO**. 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.4 activities!

Structure of PWIE and SP B



SP B focus points in 2022 – relevant milestones



WM31	SP B	Effective sputtering yields and erosion rates of W model systems with varying impact angles, morphologies, and surface structures at varying plasma conditions available (ITER+DEMO)	31.12.2022 SP B.1
WM32	SP B	Erosion and re-deposition patterns on selected marker samples and plasma-facing components, extracted from ASDEX Upgrade (2019-2021), WEST (C4, C5), and W7-X (OP1.2B) elucidated (ITER+DEMO)	31.12.2022 SP B.2 SP B.3
WM33	SP B	Be- and W-based reference coatings produced with composition, fuel content, and structure similar to those of typical co-deposited layers in tokamaks (ASDEX Upgrade, WEST, JET) (ITER+DEMO)	31.12.2022 SP B.4
WM34	SP B	Post-mortem analysis of material samples and components exposed to medium and high flux operation campaigns 2021/2022 in MAGNUM-PSI and PSI-2 performed.	31.12.2022 SP B.1 SP B.2 SP B.3

SP B deliverables in 2022 – SP B.4



Activity	Deliverable ID(s)	Title
SP B.4	D001	W-based coatings with pre-defined properties (incl. SEM, AFM, TDS characterization) produced for analyses and plasma experiments (ENEA)
SP B.4	D002	Be and W-based coatings with pre-defined properties (incl. SEM, XRD, GDOES, TDS characterization) produced for analyses and plasma experiments (IAP)
SP B.4	D003, D004, D005, D006, D007, D008	Characterization of selected Be and/or W reference samples (CEA, CIEMAT, IST, JSI, RBI, VTT)

2022 Resources SP B.4



Deliverable Owner	Beneficiary	PM
C. Pardanaud	CEA	2
D. Alegre	CIEMAT	3
M. Passoni	ENEA	3
C. Porosnicu	IAP	7
E. Alves	IST	2
V. Nemanic	JSI	4
I. Bogdanovic Radovic	RBI	2
A. Hakola	VTT	2
Total		25

Device	Beneficiary	Days	Related Deliverable
Accelerator	IST	3	D005
Accelerator	RBI	5	D007
Accelerator	VTT	1	D008

Quick overview of SP B key changes compared to 2021



- Most of the tasks will be **smooth continuation of the 2021 activities with the following exceptions**
 - ✓ new task for IAP under SP B.3 (analysis of WEST samples)
 - ✓ shifting the JSI task from SP B.3 to expand the scope of the SP B.4 task (analysis of Be reference samples)
 - ✓ inclusion of shifted 2021 tasks (DIFFER, IAP, IPPLM) into the 2022 work programme
 - ✓ **New, 21 March, 2022: 2 PM transferred from SP D to SP B for FZJ work on W fuzz samples in PSI-2**
- Main changes per activity
 - ✓ SP B.1: **MAGNUM-PSI and GyM experiments** to be initiated
 - ✓ SP B.2 and SP B.3: focus on **WEST C4 marker PFUs** and one ITER-like PFU and **MAGNUM-PSI samples**; inclusion of pre- and post-exposure characterization of **marker coatings for He experiments on AUG (July 2022)**
 - ✓ SP B.4: first 2021 batches available for analyses
- Main classes of **reference samples under SP B.4 in 2022**
 - ✓ W coatings with varying morphologies and compositions (w/ and w/o FIB markers) for PSI-2, MAGNUM-PSI, and GyM experiments
 - ✓ influence of O and seeding gases (N) on the structure and D content of Be and W reference coatings
 - ✓ influence of annealing on the properties of Be samples with H/D inclusions

Contact info and next steps



- Your SP B contact
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- Project leader
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David Douai (david.douai@euro-fusion.org)

- ✓ Kick-off meetings and detailed definition of tasks
March-April 2022
- ✓ Thematic meetings on topics agreed on in the review and planning meeting
April-May 2022
- ✓ WPPWIE progress meeting – **July 2022**
- ✓ Midtem meeting of SP B activity areas – September-October 2022
- ✓ Review meeting of WPPWIE– **November 2022**

Minutes and slides of the meeting at

<https://indico.euro-fusion.org/event/1975/>

SP B deliverables in 2022 – SP B.1



Activity	Deliverable ID(s)	Title
SP B.1	D001	Erosion rates of W model systems and composition and structure of re-deposited layers in MAGNUM-PSI at varying plasma conditions (DIFFER)
SP B.1	D002	Effective sputtering yields of W model systems with varying morphologies in pure and mixed plasmas in GyM and by hypervelocity dust impacts (ENEA)
SP B.1	D003	Erosion rates and angular distribution 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)
SP B.1	D004, D006	Effective sputtering yields of W model systems with varying morphologies and structures, including angular distributions of sputtered particles, and re-deposited W layers following exposure to controlled D and impurity ion beams (ÖAW, VR)
SP B.1	D005	Size distribution and composition of Be and W dust formed during air and water leaks (IAP)

SP B deliverables in 2022 – SP B.2



Activity	Deliverable ID(s)	Title
SP B.2	D001	Erosion, re-deposition, and fuel-retention patterns on selected WEST PFUs after C3, C4, and C5 campaigns (CEA)
SP B.2	D002, D003	Balance between gross and net erosion of plasma-facing materials, including components with different surface roughness and morphology, in controlled L- and H-mode plasma experiments (JSI, VTT)
SP B.2	D004, D005, D006, D007, D008, D009, D010	Characterization of marker samples and coatings from selected plasma experiments on AUG, WEST, and/or W7-X with conclusions (FZJ, MPG, VR, IPPLM, RBI)

SP B deliverables in 2022 – SP B.3



Activity	Deliverable ID(s)	Title
SP B.3	D001	Database on ageing, erosion, and fuel-retention behavior of selected WEST PFUs (CEA)
SP B.3	D002, D003, D004, D005, D006, D007, D008	Characterization of selected AUG, WEST and/or W7-X wall tiles and plasma-exposed reference samples (FZJ, IPPLM, IST, IAP, MPG, NCSRD, VTT)