4 th November 2025, WPTE General Programme Meeting, Lausanne

Introduction to the WP TE program in 2026-2027

N. Vianello for TE TFLs

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This work has been carried out within the framework of the EUROfusion Consortium, funded by the European Union via the Euratom Research and Training Programme (Grant Agreement No 101052200 — EUROfusion). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

Call cycle of WP TE

Call for Proposal 2026-2027

✓September 2025 (included call for RTC) **Deadline 10th of October**

Call for **experimental proposals for AUG/TCV/WEST/MAST-U for 2026-2027**
Call for **Research Topic Coordinators**

Review meeting

✓September 2025 (RT01-RT11)
✓October 2025 (JT-60SA)

To summarize the achievements of experimental campaigns in 2025, as well as planned ones. Include information on on-going modelling activites

Call for participation 2026

- November 2025

Will include work in support of scientific exploitation of AUG/MAST-U/TCV/WEST/JET + JT-60SA OP1 analysis / modelling for preparation of OP2 / W transition (pending budget availability) but NOT participation to OP2. **This week**

GPM

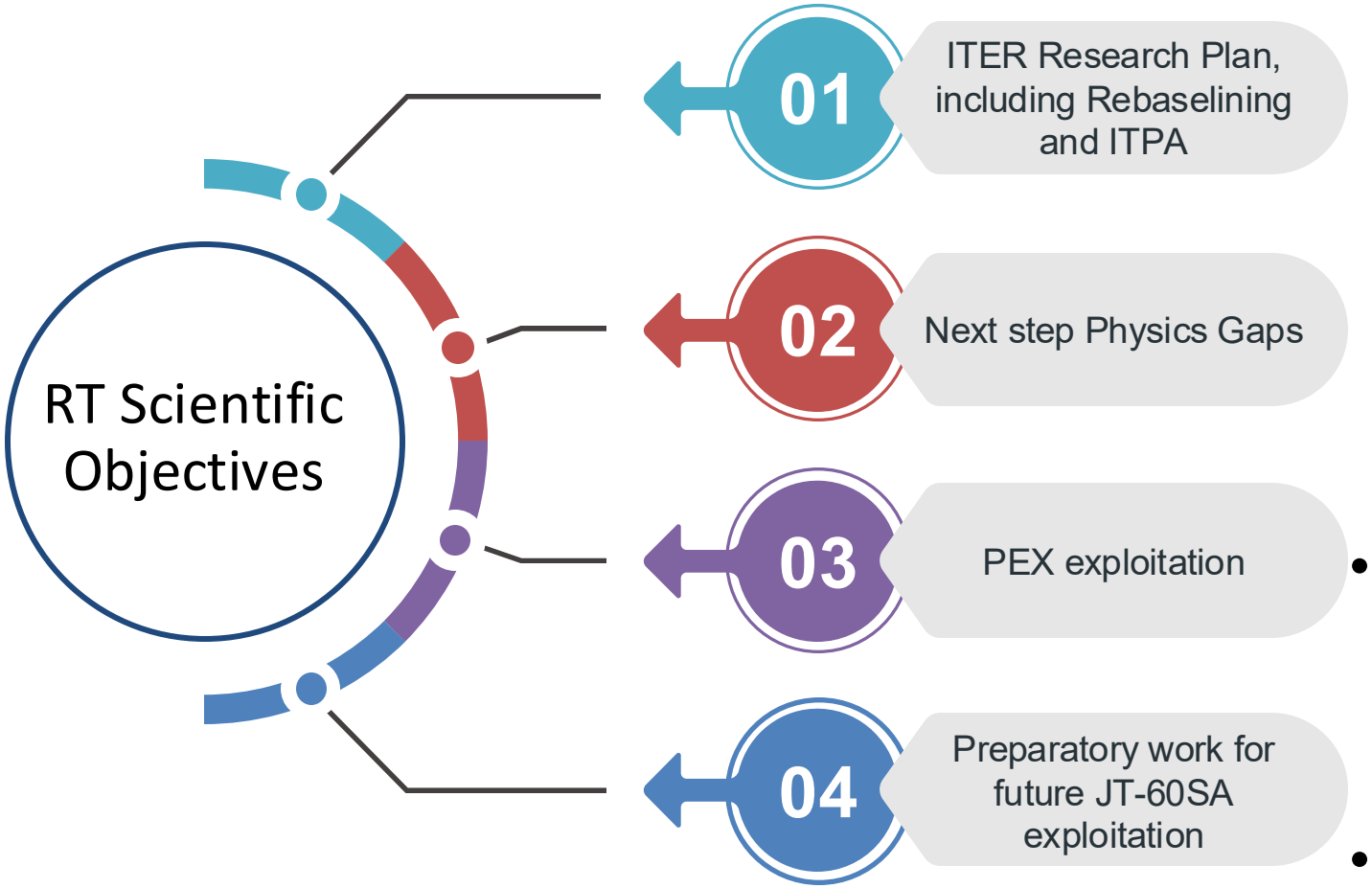
- **4-6/11/2025 in Lausanne Hybrid meeting**

Will include dedicated session to discuss EU proposals to OP2

Proposal assessment in IMS

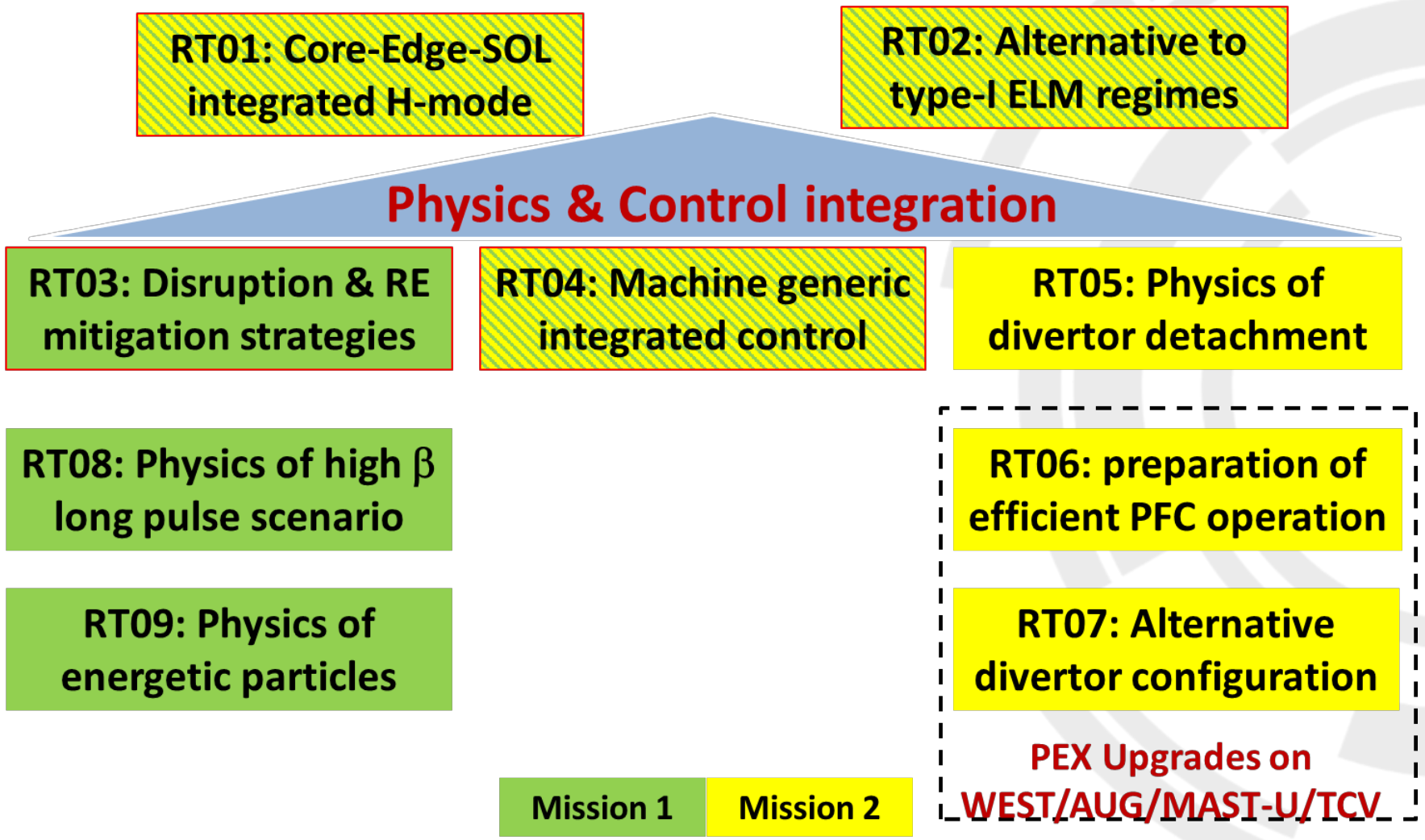
- Resources loaded by December 2025

How we build the WPTE program



- Research Topic structures and Scientific objectives build on the basis of:
  - ITER Research Plan (now considering the rebaselining)
  - Input from discussion on FPP or FOAK EUROfusion discussion
  - PEX exploitation
  - Preparation of future JT-60SA operation
- Program build to exploit the peculiarities of single tokamaks (JET, TCV, AUG, WEST and MAST-U) in an integrated way
- Call for participation include experiments (2026) and analysis (2022-2024) and JT-60SA Experimental Team activites

2026 Research Structure for EU-device in continuity



Selected scientific objectives updated for 26-27

- Scientific Objectives as listed in the call for proposal largely unchanged apart from RT03 and RT04
- Scientific objectives of RT03 (disruption & runaway) and RT04 (control) updated to account for progress achieved + minor amendment to others RT
- New numbering in AWP 26-27 to avoid confusion with previous version

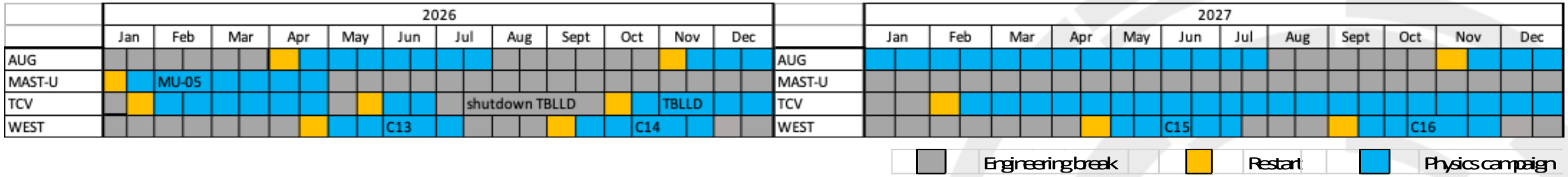
Scientific objectives RT03	Status as re-assessed after 2026/27 Sc. Obj. reformulation
D8: Develop an understanding of pellet assimilation for plasma densification in shattered pellet injection (SPI) experiments to avoid runaway electron (RE) generation	**Judgemental**
D9: Develop an understanding of SPI dynamics in off-normal plasmas, such as close to density limit and/or during impurity accumulation	**Judgemental**
D10 - Determine the physics mechanisms leading to benign termination of RE with H and D, specifically in the ITER relevant parameter range.	**Mature - needs underpinning**
D11: Determine the physics mechanisms generating run-away electrons in the current quench, including during a vertical displacement event (VDE), and in the plasma start-up phase, including electron cyclotron (EC) pre-ionization and EC-assisted burn-through	**Judgemental**
D12: Perform interpretative modelling of disruption mitigation dynamics, specifically aiming at physics understandings of experimental measurements to extrapolate models to ITER (in collaboration with TSVV-F).	**Judgemental**
D13: Characterise disruption loads, in particular during VDEs, to improve predictions for ITER	**Emerging**
D14: Investigate the role of plasma phenomena (turbulence, MHD, waves, fast ions etc) on the transport and confinement of REs	**Judgemental**

Scientific objectives RT04	Status as re-assessed after 2026/27 Sc. Obj. reformulation
D6 - Develop generalized controllers and state observers designed for application to a variety of devices	**Mature – needs support**
D7- Develop integrated control algorithms and techniques for pulse trajectory optimization in view of possible applications to next step device controllers	**Judgemental**
D8 - Optimize off normal events handling and disruption avoidance strategies for machine protection	**Mature – needs underpinning**
D9 - Integrate machine learning and physics driven techniques for control augmentation and performance boosting	**Exploratory**

- Correspondence between the new objectives for 2026-2027 and the original objectives for 2021-2025, including the attribution of SSRL starting level when applicable available upon request (WP TE wiki)

Machine availability for 2026-2027

Tentative timeline for TE devices in 26-27



- AUG facing late restart in 2026 whereas usual campaign length in 2027
- WEST running in usual ~ 3 months campaigns mode respectively
- TCV running in ~ continuous mode but longer shutdown foreseen to install Tightly Baffled Long Leg Divertor (TBLLD)
- MAST-U only available for ~ 3 months early 2026
- PEX enhancements now fully available (upper divertor in AUG, ITER grade divertor in WEST) + further upgrades (cryopump in MAST-U, ECRH in WEST and TCV + TE ENH diags)
- **Reduced WPTE Operational time in 2027 w.r.t. previous years due to budget constraints**
- **Reduced mission support and on-site participation. Priorities given to experiment participation**

% of op time	2025	2026	2027
AUG	50	40	27,5
TCV	40	35	27,5
WEST	40	40	27,5

WPTE 2026-2027 program definition

High Level Objectives

- Address urgent R&D issues related to the new ITER baseline / Research Plan (full tungsten wall) : far SOL physics and wall loads; tungsten sources, transport and screening; startup on tungsten limiters; runaway electron damage of tungsten first wall components and efficiency of boronisation in full tungsten devices.
- Provide a comprehensive qualification of the most promising no ELM scenario: X-point radiator (XPR) and quasi-continuous exhaust (QCE) now considered as a viable option for ITER / DEMO.
- Support modelling efforts for interpretation of available data from TE devices (including JET DD and DT last campaigns)
- Prepare the JT-60SA scientific exploitation in the OP2 and OP3 campaigns, pending resources becoming available.

List of Grant Deliverables 2026-2027

ID	Deliverables Table	Date
TE.D.16	Report on fully integrated simulation of high current partially detached plasma scenario including assessment of PFC erosion in D and DT plasma	Dec 2026
TE.D.17	Report on reduced model validation for plasma reattachment on multiple devices and wide operational space	Dec 2026
TE.D.18	Report on providing input on design and operation of conditioning systems for next step full W devices and focus on standard boronization systems	Dec 2026
TE.D.19	Report on qualification with experiment/modelling of the most promising no-ELM scenario in terms of confinement, exhaust capabilities and plasma wall interaction	Dec 2027
TE.D.20	Report on optimized scheme for “benign termination” of runaway beams documented in view of possible applicability for ITER	Dec 2027

List of Milestones 2026-2027

ID	Milestones Table	Date
TE.M.09	Proper figure of merit for cross-scenario comparison among no-ELM / ADC defined	Dec 2026
TE.M.10	First wall particle and heat fluxes quantified in XPR in metallic devices	Dec 2026
TE.M.11	ADCs characterized in H-mode conditions in all relevant TE devices	Dec 2026
TE.M.12	Modelling of SPI experiment on JET and ASDEX-Upgrade completed	Dec 2027
TE.M.13	Impact of N-NBI on plasma behaviour documented in JT-60SA and extrapolation to ITER investigated*	Dec 2027

* Pending resources are made available for JT-60SA related work

WP TE management team being set up for 26-27

Selection of DTFL ongoing

Role	*Name*	*Beneficiary*
Task Force Leader	Emmanuelle Tsitrone	CEA
Task Force Leader	Nicola Vianello	ENEA
Deputy Task Force Leader	Matteo Baruzzo	ENEA
Deputy Task Force Leader	Antti Hakola	VTT
Deputy Task Force Leader	David Keeling	UKAEA
Deputy Task Force Leader	Jeronimo Garcia	CEA
Deputy Task Force Leader	Valentin Igochine	MPG
Deputy Task Force Leader	Benoit Labit	EPFL
Project Support Officer	Zeinab Doagouei	MPG

Selection ongoing

(EU ETL for JT-60SA)

Team of Research Topic Coordinators (RTC) selected for 26-27

RT				
RT01	Carine Giroud	Lorenzo Frassinetti	Sven Wiesen	Marco Cavedon
RT02	Michael Faitsch	Olivier Sauter	Eleonora Viezzer	
RT03	Ondrej Ficker	Cédric Reux	Umar Sheikh	
RT04	Adriano Mele	Gijs Derks	Charles Vincent	Lidia Piron
RT05	Pierre David	Holger Reimerdes	Nicolas Rivals	Stuart Henderson
RT06	Yann Corre	Karl Krieger	A. Kirschner	
RT07	Ou Pan	Olivier Février	Kevin Verhaegh	
RT08	Chiara Piron	Sam Blackmore	Fulvio Auriemma	
RT09	Yevgen Kazakov	Joaquin Galdon	Anton Jensen van Vuuren	Roman Ochoukov

New RTC for 26-27

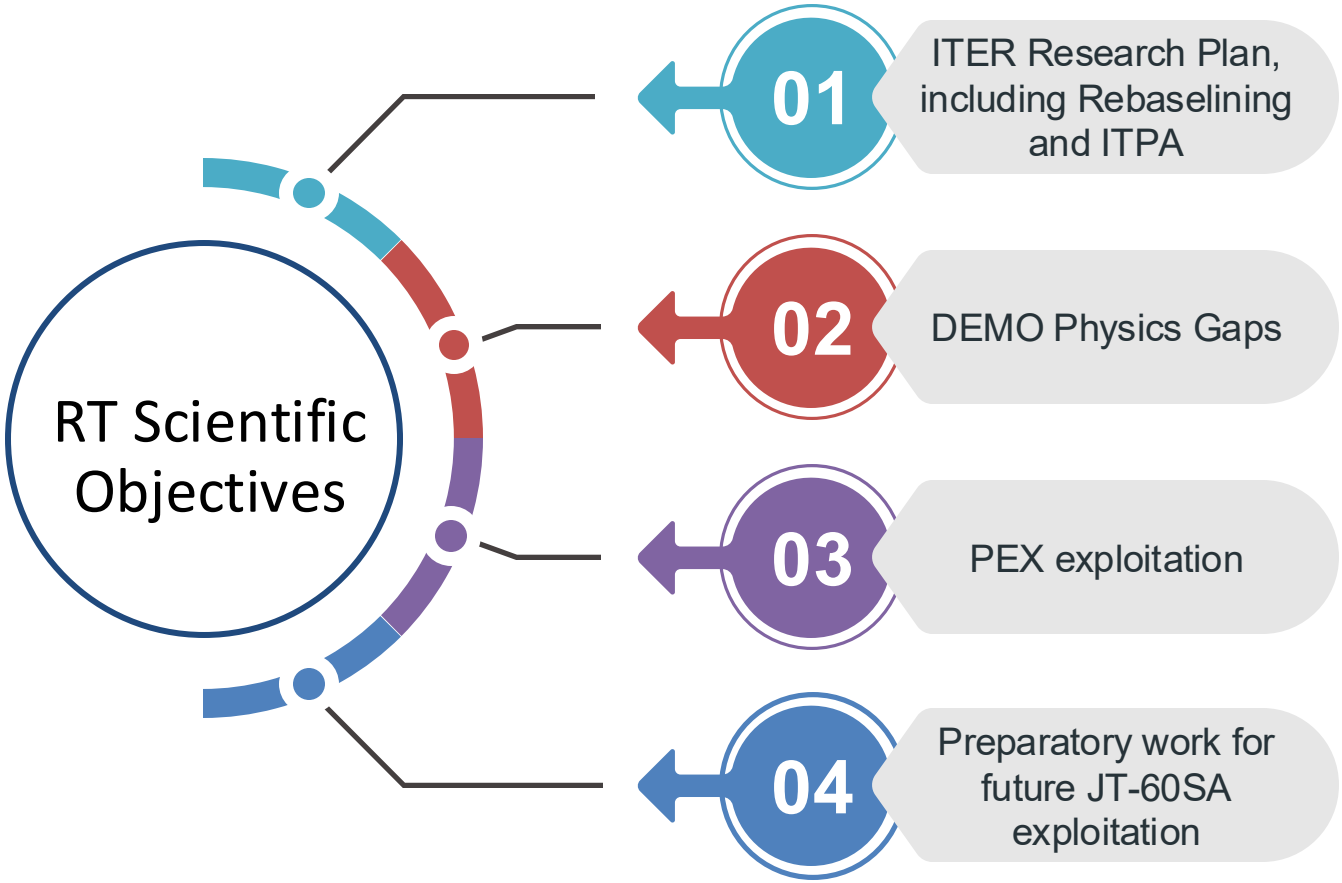
Ref TFL to be rediscussed after DTFL selection

Received Proposals

A total of 210 Experimental proposals received with some of the devices heavily overbooked also considering the 2 years program

RTA	AUG (Scientific Pulses)	AUG (Pulse Sce. Dev)	AUG (Total Session)	TCV (Scientific)	TCV (Sce. Dev)	TCV (Total)	MAST-U (Scientific)	MAST-U (Sce. Dev)	MAST-U (Total)	WEST (Scientific)	WEST (Sce. Dev)	WEST (Total)
RT-01	127	29	156	157	10	167	36	0	36	75	3	78
RT-02	180	8	188	280	101	381	70	16	86	210	10	220
RT-03	129	20	149	190	65	255	0	0	0	96	20	116
RT-04	134	4	138	350	60	410	102	8	110	184	23	207
RT-05	101	36	137	135	54	189	62	12	74	194	19	213
RT-06	90	9	99	0	0	0	0	0	0	745	59	804
RT-07	162	31	193	321	83	404	156	43	199	32	0	32
RT-08	45	55	100	96	80	176	80	16	96	125	20	145
RT-09	115	8	123	200	60	260	98	20	118	115	0	115
Total			1283			2242			719			1930
Overbooking			**~ 2**			**~ 1.3**			**~ 4**			**~ 3**

Prioritization scheme and criteria



Proposal Evaluated according to the criteria:

Adherence to the Scientific Objectives

Team effort

Size and feasibility

All these aspects were considered by the TFLs when setting the priorities – according to the following scheme

P1-2026-DEV: experimental priority for 2026: machine time granted but pulse budget might need reduction

P1-2027-DEV: experimental priority for 2027: machine time granted but pulse budget might need reduction

P2-DEV: will be done if time allows after *all* P1 proposals are completed

P3: low priority programme/out of scope

PB: piggy-back experiment/pure analysis proposal

Aim of the present meeting

Please bring in your thoughts / ideas / doubts – constructive criticism

Important items to be discussed.

- Discuss any justification for the proposed priorities (if different) and/or "good pulse" numbers for the achieving the research topic objectives.
- Highlight any special technical requirements (machine special settings or diagnostics) which will need significant advanced preparation, or which represent unusual machine risks.
- Identify overlaps or coordination needs between research topics or proposals
- Identify possible gaps in the proposed activities.
- Identify and discuss the strategy and the best timing for the experiments to take place.
- Check that the proposed pulse allocation is in line with the discussed/agreed priorities.
- Provide useful guidance for proper answering to the call for participation
- At present we do not foresee a new call for proposal at the end of 2026: checkpoint on program advancement and reallocation of shot distribution for 2027 among RT based on machine time availability and progresses of 2026 might be possible

Aim of JT-60SA Session during the GPM

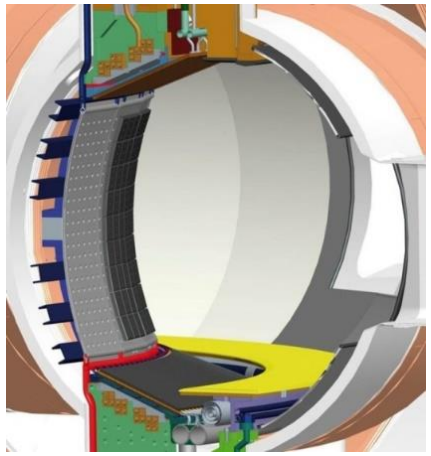
- JT-60SA OP2 call launched by Experiment Team Leaders with deadline **end of December**
- In agreement with EU ETL agree to propose a forum for discussing potential ideas from EU member (or potential members) of the JT-60SA Experiment Team aiming to : stimulate the discussion, create synergies, highlight strengths and potential weakness.
- This is a community discussion moment with **NO SELECTION/PRIORITY ATTRIBUTION**
- WPTE TFL will provide indication of which, among OP2 objectives are deemed as higher priorities with respect to WPTE EUROfusion program

JT-60SA Machine capabilities and enhancements	*Carlo Sozzi*
Seminar room	09:30 - 09:50
JT-60SA priorities for OP2	*Jeronimo Garcia*
Seminar room	09:50 - 10:10
WPTE perspective on OP2 priorities	*TFLs*
Seminar room	10:10 - 10:20
Coffee break	
Seminar room	10:20 - 10:40
Discussion on JT-60SA experiment proposals	*Various Proponents*
Seminar room	10:40 - 12:00

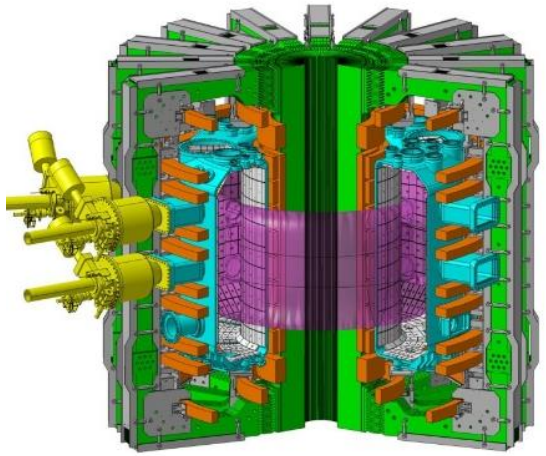
Next step: Call for participation 2026

AUG

WEST



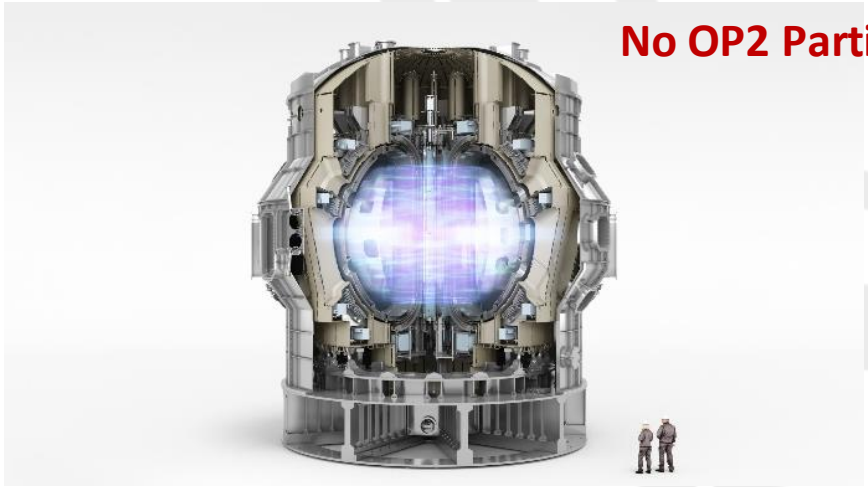
TCV



MAST-U

JET

JT-60SA



No OP2 Participation

NEXT STEPS: 2026 Call for participation Structure (to be issued this week)

	Research topic	Title	IMS tag
Mission 1	RT-01	Core-Edge-SOL integrated H-mode scenario compatible with exhaust constraints in support of ITER	RT01
	RT-02	Physics understanding of alternatives to Type-I ELM regime	RT02
	RT-03	Strategies for disruption and run-away mitigation	RT03
	RT-04	Physics-based machine generic systems for an integrated control of plasma discharge	RT04
	RT-08	Physics and operational basis for high beta long pulse scenarios	RT08
	RT-09	Physics understanding of energetics particles confinement and their interplay with thermal plasma	RT09
Mission 2	RT-05	Physics of divertor detachment and its control for ITER, DEMO and HELIAS operation	RT05
	RT-06	Preparation of efficient Plasma Facing Components (PFC) operation for ITER, DEMO and HELIAS	RT06
	RT-07	Physics understanding of alternative divertor configurations as risk mitigation for DEMO	RT07
JET specific	RT-10	JET data validation	RT10
	RT-11	Analysis and modelling of DTE2 related experiments on JET	RT11
JT-60SA specific	TG-ORD	Operation Regime Development	RT12
	TG- MHD	MHD Stability and Control	RT13
	TG-TC	Transport and Confinement	RT14
	TG-EP	High Energy Particle Behavior	RT15
	TG-PED	Pedestal and Edge Physics	RT16
	TG-DSP	Divertor, Scrape-Off Layer & Plasma-Material Interaction	RT17
	IMAS	Integrated Data Validation and data access with IMAS	RT18

JET Specific Research Topics

#	RT10
D2	Data analysis and modelling in support of ITER/DEMO not otherwise related to D1 or RT-01 to 09

#	RT11
D1	Complete analysis of parameter dependence of separatrix properties to support extrapolation to ITER operational scenarios
D2	Complete analysis of experiments utilising novel ICRH schemes relevant to ITER and extrapolation to ITER operational scenarios
D3	Complete analysis of experiments that provide specific information on isotopic effects relevant to ITER and extrapolate to ITER operational scenarios
D4	Complete analysis of L-H transition studies and databases including divertor configurations. Extrapolate results to ITER operational scenarios

Aimed to support the activity for JET exploitation not included in experiment performed under RT01-RT09

JT-60SA specific

- Present call includes resources for the EUROfusion supported participation to the JT-60SA Experimental Team for analysis of IC/OP1 as well as modelling in preparation for future experimental campaigns (e.g. OP2)
- Interested persons should apply to JT-60SA Specific Research Topic (RT12-RT18) coordinated by European Topical Group Leaders/Designated Contact Person

	Research topic	Title	IMS tag	TGL/CP
JT-60SA specific	TG-ORD	Operation Regime Development	RT12	J. Garcia
	TG- MHD	MHD Stability and Control	RT13	G. Pucella
	TG-TC	Transport and Confinement	RT14	L. Garzotti
	TG-EP	High Energy Particle Behaviour	RT15	Y. Kazakov
	TG-PED	Pedestal and Edge Physics	RT16	Y. Liang
	TG-DSP	Divertor, Scrape-Off Layer & Plasma-Material Interaction	RT17	G. Falchetto
	IMAS	Integrated Data Validation and data access with IMAS	RT18	F. Imbeaux

Conclusions

- Likely last opportunity for proposals and program definition of WPTE during FP9
- Discussion is presently happening with relevant stakeholders for the definition of the activities during FP10 in a fast-moving framework with many new actors in place
- We are looking for your cooperation to build a strong program which could provide significant steps and possibly complete a journey initiated back in 2021 with the definition of WPTE