09th- 10th November 2026

RT-01 “Core-Edge-SOL integrated H-mode scenario compatible with exhaust constraints in support of ITER” Discussion about proposals and allocated priorities

N. Vianello

On behalf of WPTE TFLs
E. Tsitrone, N. Vianello, M. Baruzzo, J. Garcia, V. Igochine, D. Keeling, A. Hakola, B. Labit

Research Topic Coordinators
C. Giroud, L. Frassinetti, S. Wiesen, M. Cavedon

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2027 : continuity in the WP TE objectives but streamlining the programme

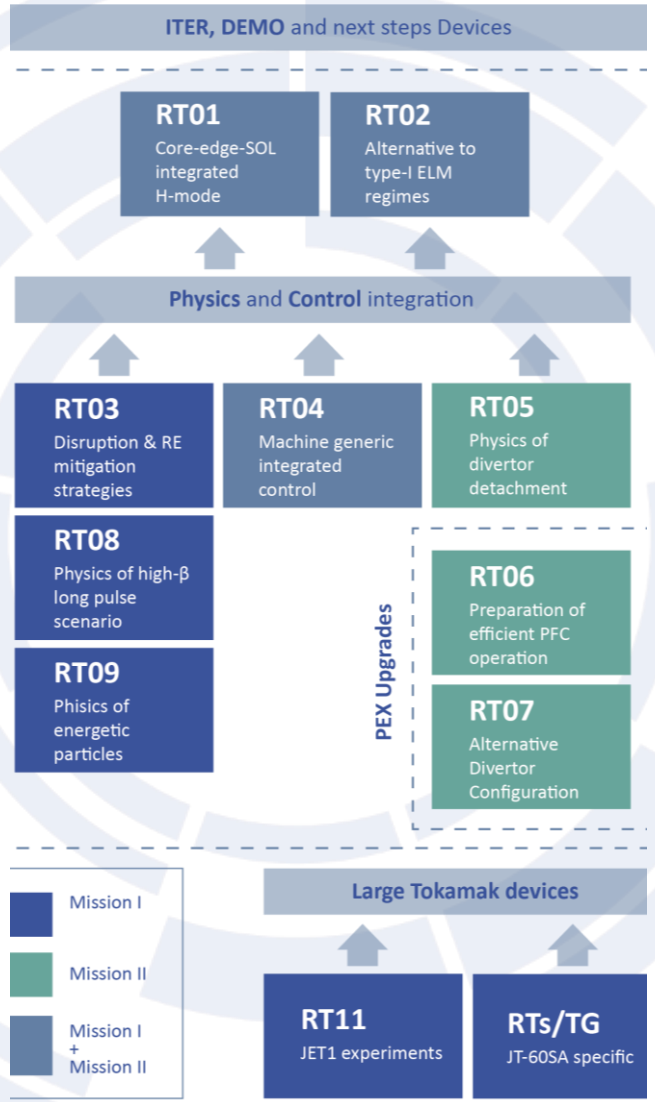
2026-2027 conceived as a 2 years programme

- A unique call for experimental proposals covering 2026 and 2027 for AUG, MAST-U, TCV, WEST
- Call for participation on each of the calendar year

High Level objectives for 2027

- Address urgent R&D issues related to the new ITER baseline / Research Plan (full tungsten wall) → ITER MoU
- Provide qualification of the most promising no-ELM scenario (focus = XPR and QCE, applicable to both ITER and FPP and JET-ITER BL with seeding)
- Support modelling efforts for interpretation of available data from TE devices
- Run the JT-60SA OP2 campaign and work towards W transition of JT-60SA

Same Research Topic structure and team of Research Topic coordinators for 2027



WPTE Grant Deliverables and RT01 contribution

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

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

Scientific Objectives and status of SSRL

** Number up to 1.09.2026*
*** Up to summer break*

Scientific objectives	Status based on 2022 level 3 reports	Status based on 2023 level 3 reports	Status based on 2024 level 3 reports	Status based on 2025 level 3 reports_ 23.02.2026
D1: Develop stationary high-power H-mode scenario at low core and pedestal collisionalities compatible with detached divertor	Judgemental	Mature - needs underpinning	Mature - needs underpinning	Mature – needs suppor
D2: Provide physics-based cross-field transport coefficients to TSVVs (1, 3, 4 and 11) for turbulence modelling	Exploratory	Exploratory	Judgemental	Judgemental
D3: Determine the impact of different impurity mixes for partially detached divertors in high power operations in view of ITER radiative scenarios	Judgemental	Mature - needs underpinning	Mature - needs underpinning	Mature - needs underpinning
D4: : Assess pedestal performances in condition closer to future devices including large SOL opacity, low pedestal collisionality, peeling limited plasma	Judgemental	Judgemental	Mature - needs underpinning	Mature - needs underpinning
D5: Quantify impurity screening for high temperature pedestals	Exploratory	Judgemental	Judgemental	Mature - needs underpinning

Device	**AUG**	**MAST-U**	**TCV**	**WEST**
Shot 2026 allocated/performed*	**3**	**16**	**75**	**0**
Shot allocation	**34****		**90**	**15**

RT-01 Strategy as conceived by RTCs

BLOCK 1
ITER baseline scenarios

Objectives	D1	D2	D3	D4
Machines	JET	AUG	TCV	

BLOCK 2
Low v* scenarios

Objectives	D1	D2	D4	D5
Machines	JET	AUG	TCV	MAST-U

BLOCK 3
Specific scenarios for transport studies

Objectives	D2		
Machines	AUG	TCV	WEST

BLOCK 4
Momentum transport and intrinsic torque

Objectives	D2		
Machines	AUG	TCV	MAST-U

Summary of the experimental proposal as received at the end of 2025

No	RT	Proposal name	Proposer	Block	Machine time in 2026	Priority at GPM 2025
1	RT01	Power and size dependence of the density limit in TCV and AUG	Daniel Fajardo	3	✅	P1-2026-TCV, P1-2027-AUG
2	RT01	Intrinsic and NTV torque sources at the H-mode and L-mode edge plasmas in MAST-U, TCV and AUG	Tuomas Tala	4	✅	P1-2026-TCV, P2-AUG, P1-2026-MAST-U
3	RT01	Low nu*/peeling limited experiments in MAST-U, TCV and AUG	Lorenzo Frassinetti	2	✅	P1-2026-MAST-U, P1-2026-TCV, P1-2026-AUG
4	RT01	Underpin impurity temperature screening conditions at the periphery of AUG plasmas	Athina Kappatou	2		P1-2026-AUG, P1-2027-AUG
5	RT01	Extension of multi-machine LH transition database	Emiliano Fable	3		P1-2026-AUG, P2-TCV
6	RT01	Hydrogen isotope transport in low-collisionality H-mode plasmas	Jesper Rasmussen	2		P1-2026-AUG
7	RT01	Shape dependence of pedestal impurity transport	Jorge Morales	3		P2-WEST
8	RT01	Core-integrated ITER baseline scenario in AUG and TCV in support of JET IBL results	Carine Giroud	1		P1-2027-AUG, P1-2026-TCV, P1-2027-TCV
9	RT01	Electron particle and heat transport in long-pulse WEST plasmas	Tuomas Tala	3	✅	P1-2026-WEST
10	RT01	Flows and turbulence approaching the L-H transition	Laure Vermare	3	✅	P2-WEST, P1-2026-TCV, P1-2027-TCV

Machine time does not imply completion

Summary of the completed work in 2026 as from the Review Meeting

From RT01 RTC Review meeting presentation 25.09..2026

Completed To be completed Not executed yet

BLOCK 1 · ITER baseline scenarios

IBL scenario

AUG	autumn 2026
JET-ILW	
TCV	continue in 2027 (Focusing on Ar injection and Ar/N comparison)

Dominant electron heating

TCV	finalize in autumn 2026, 2 gyrotrons

BLOCK 2 · Low v* scenarios

W screening

AUG	autumn 2026 or 2027
JET-ILW	

Peeling limited scenarios

AUG	2027
JET-ILW	
MAST-U	completed
TCV	repeat shots with SPR and DBS
TCV	high elongation part in 2027, no TBLLD

BLOCK 3 · Specific scenarios for transport studies

Turbulence and transport

TCV	fav. vs unfav. with same n_e not achieved; v* not low enough
WEST	autumn 2026

P_{LH} studies

TCV	with TBLLD in autumn 2026; 170 kA plasmas in 2027
AUG	autumn 2026

Density limit

AUG	completed
TCV	high power scans in 2027

H/D transport

AUG	back-up (fully ready to go)

BLOCK 4 · Momentum transport and intrinsic torque

Momentum transport and intrinsic torque

AUG	back-up (fully ready to go)
MAST-U	completed
TCV	2027 (NBH1, NBH2, no TBLLD)

Update due to machine constraints

Completed To be completed Not executed yet

BLOCK 1 · ITER baseline scenarios

IBL scenario

AUG	Initial work in autumn 2026
JET-ILW	
TCV	continue in 2027 (Focusing on Ar injection and Ar/N comparison)

Dominant electron heating

TCV	Postponed to 2027 for increasing power

BLOCK 2 · Low v* scenarios

W screening

AUG	Before Summer break 2027
JET-ILW	

Peeling limited scenarios

AUG	2027
JET-ILW	
MAST-U	completed
TCV	repeat shots with SPR and DBS
TCV	high elongation part in 2027, no TBLLD

BLOCK 3 · Specific scenarios for transport studies

Turbulence and transport

TCV	fav. vs unfav. with same n_e not achieved; v* not low enough
WEST	autumn 2026

P_{LH} studies

TCV	~~with TBLLD in autumn 2026~~; 170 kA plasmas in 2027
AUG	autumn 2026

Density limit

AUG	completed
TCV	high power scans in 2027

H/D transport

AUG	back-up (fully ready to go)

BLOCK 4 · Momentum transport and intrinsic torque

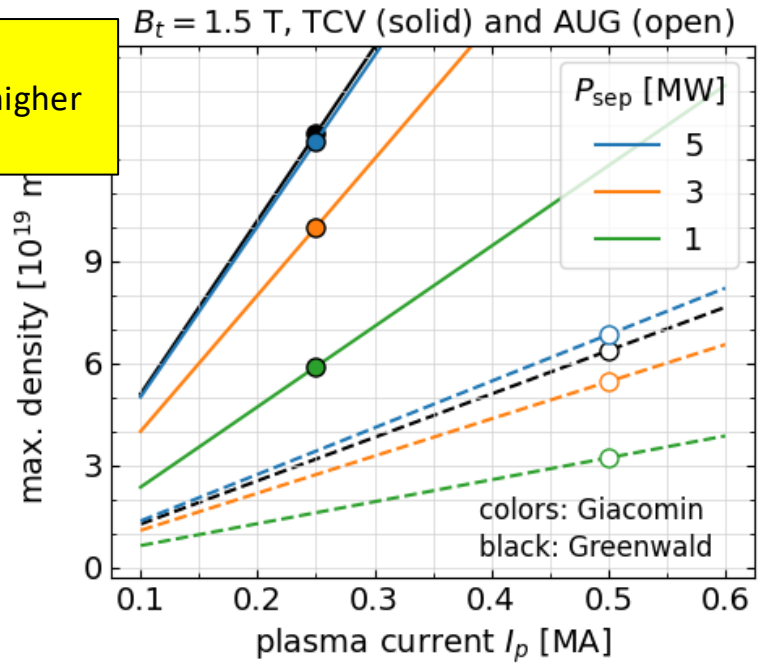
Momentum transport and intrinsic torque

AUG	back-up (fully ready to go)
MAST-U	completed
TCV	2027 (NBH1, NBH2, no TBLLD)

#001-Power and size dependence of the density limit

- **Proponents and contact person*:**
  - Daniel Fajardo*
  - Clemente Angioni
  - Olivier Sauter
  - Paolo Ricci
  - Alessandro Pau
  - Ondrej Grover

Updated consideration
We expect to extend operation on TCV to higher power



- **Scientific Background & Objectives**
  - Recent density limit expressions [Giacomin 2022 PRL, Zanca 2019 NF] have a power dependence, and field/current/size exponents beyond Greenwald → strong implications for future reactors
  - Objectives:
    - Find the density limit (DL) at different heating powers in TCV and AUG, at the same magnetic field (1.5 T) and q_{95}, focusing on deviations from Greenwald
    - Test the size dependence (or lack thereof) of the DL, comparing TCV and AUG
    - Characterize the power dependence of the DL against the new scalings, by performing additional power scans at lower current in TCV

- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - H-mode operation in LSN up to available power in TCV, up to that same power in AUG
  - ECRH heating scheme at high density in TCV needs careful planning
  - Edge density measurements will be essential

Proposed pulses

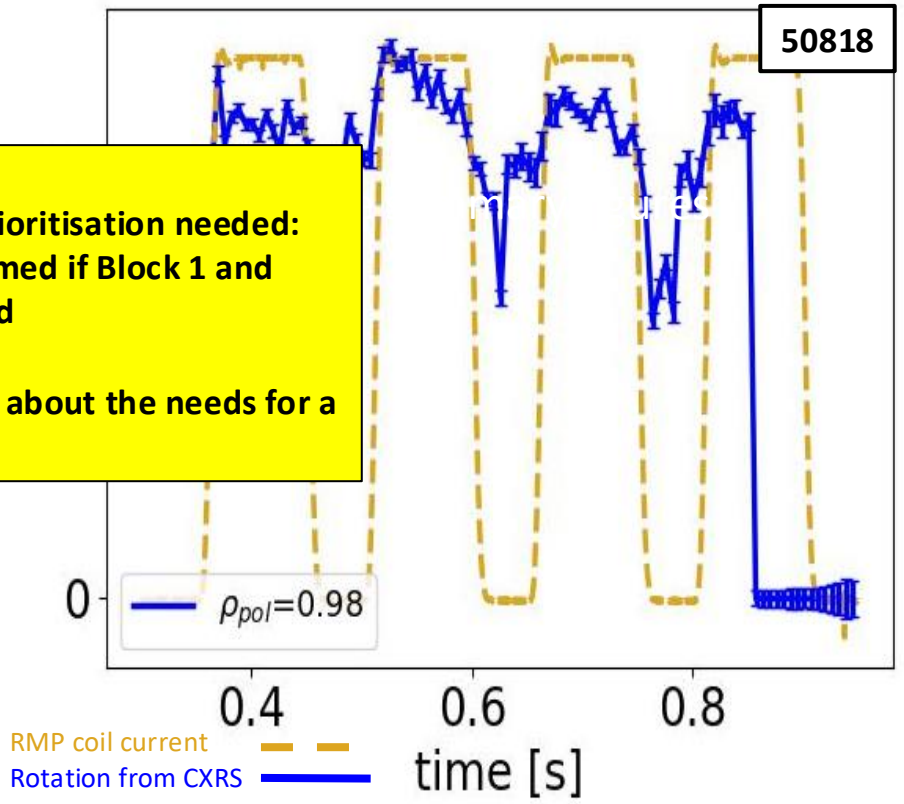
Device	# Pulses/Session	# Development
AUG	3	0
MAST-U	-	-
TCV	6	5
WEST	-	-

#002-Intrinsic and NTV torque sources at the H-mode and L-mode edge plasmas in MAST-U, TCV and AUG

- **Proponents and contact person:**
- Tuomas.Tala@vtt.fi + 23 others (+2 on DIII-D propo

Updated consideration
P1-2027-TCV but strong prioritisation needed:
P2-2027-AUG to be performed if Block 1 and Block 2 program completed

TFL to discuss with the SCs about the needs for a conclusion



- **Scientific Background & Objectives**
  - NTV and intrinsic rotation sources dominate in ITER and fu
    like DEMO → we need to understand them to be able to p
    any future tokamak, also answering ITER HPI B2.2 and B12.2.
  - Multi-machine joint experiment to quantify the Er dependence of NTV torque on MAST-U and AUG (+ DIII-D similar proposal is being written under multi-machine ITPA TC-9 scope) and intrinsic torque on TCV, and in future also JT60-SA (similar proposal already planned)
  - Provide the best possible data to validate NTV codes/models, gyro-kinetic codes and transport models for TSVV-A

- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - Perform an Er scan by using the NBI to vary toroidal rotation profile (and thus Er) in MAST-U and AUG H-mode and L-mode to quantify the NTV torque dependence on Er
  - On TCV, vary pedestal height/gradient using the baseline ELMy H-mode scenario from RT-01 and various small ELM or no ELM scenarios in RT-02 to quantify the dependence of intrinsic torque on the magnitude the temperature and density gradient to quantify the intrinsic torque between negative and positive triangularity plasmas
  - On TCV. perform triangularity scan ranging from positive to negative triangularity a comparison of intrinsic torque profiles between negative and positive triangularity plasmas

Proposed pulses for 2026-2027

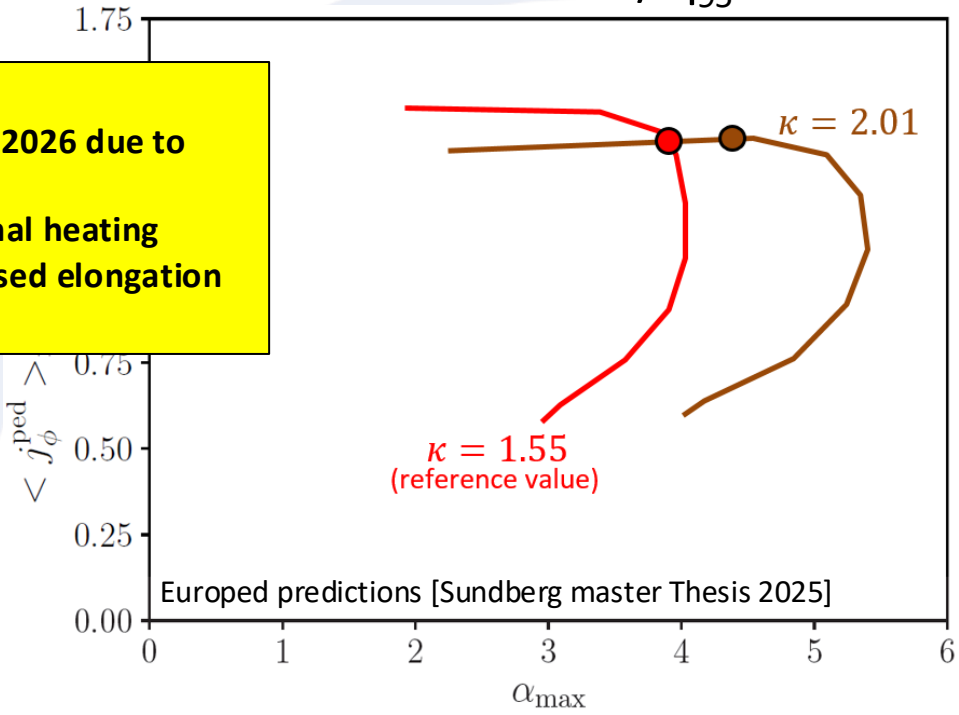
Device	# Pulses/Session	# Development
AUG	15	2
MAST-U	16	0
TCV	40	10
WEST		

#003-Low ν*/peeling limited pedestals

- **Proponents and contact person:**
  L. Frassinetti, S. Saarelma, B. Labit, M. La Matina, S. Blackmore
- **Scientific Background & Objectives**
  - ITER will operate at low ν*. There is high uncertainty abo
    (either peeling or ballooning)
  - Study of peeling limited pedestal is only at its early stages
    boundary have been achieved only in MAST-U
  - Objectives:
    - Reach pedestal fully at the peeling boundary in TCV
    - Start exploratory work to reach peeling limited pedestals in AUG
    - Quantify in low ν* plasmas:
      - Pedestal structure
      - Pedestal transport (fluctuations measurements)
      - Fuelling (neutral density, ionizations rate), at least in TCV and MAST-U
- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - TCV: operate at high elongation (based on predictive modelling) and perform gas, power, shapes scans
  - MAST-U: start from the RT-01 reference at the peeling boundary and perform gas and strike point position scan.
  - AUG: employ the JET strategy and increase q95 (high Bt) and then perform gas/power scans.
  - Diagnostics
    - TCV: TS, CX, THB, SPR, DBS, GPI
    - MAST-U: TS, CX, BES, HVS, DBS
    - AUG: TS, CX, ECE, CECE, THB, Li-beam, reflectomery

Updated consideration
P1-2027-AUG: No experiment in 2026 due to machine constraints.
P1-2027-TCV Benefit for additional heating power (among the others increased elongation experiment)

TCV at Bt=1.5T / q_{95}=5



Proposed pulses

Device	# Pulses/Session	# Development
AUG	10	5
MAST-U	20	
TCV	35	
WEST		

#004-Underpin impurity temperature screening conditions at the periphery of AUG plasmas

Updated consideration
P1-2027-AUG but the reduced number of pulses for 2027 will require program streamline

Proponents and contact person:

A. Kappatou (Athina.Kappatou@ipp.mpg.de), J. Hobirk, D. F
Dux, O. Samoylov, C. Angioni, T. Pütterich, J. Stober, A.R. Fie

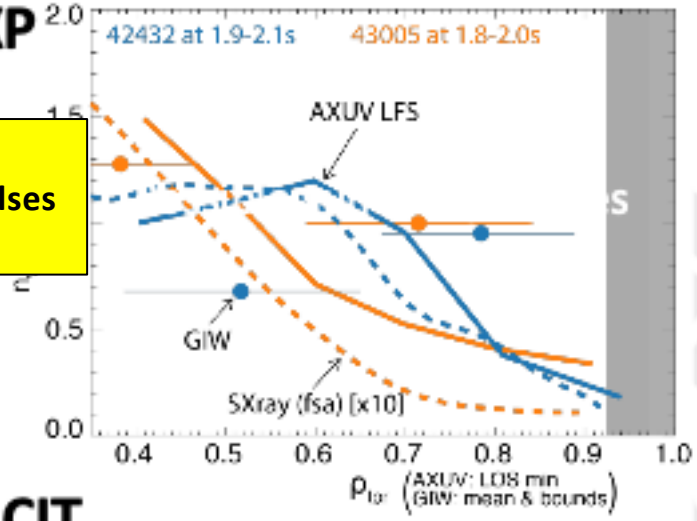
Scientific Background & Objectives

- In the last AUG campaign, demonstrated controlled tungsten content and radiation at very high performance improved H-mode scenario pulses.
- Transport analysis indicated temperature screening (outward convection) of W inside the pedestal top.
- ➢ Investigate transport of several impurities in these conditions to underpin the findings for W obtained experimentally and via modelling: Ne-seeding, W-LBO and/or Ca-LBO
- ➢ Attempt to obtain stronger outward convection for W (and potentially extend further out) by operating at a lower plasma current of 800kA with an overshoot at 1MA
- ➢ Confirm results by improving on the diagnostic measurements (mainly electron density)

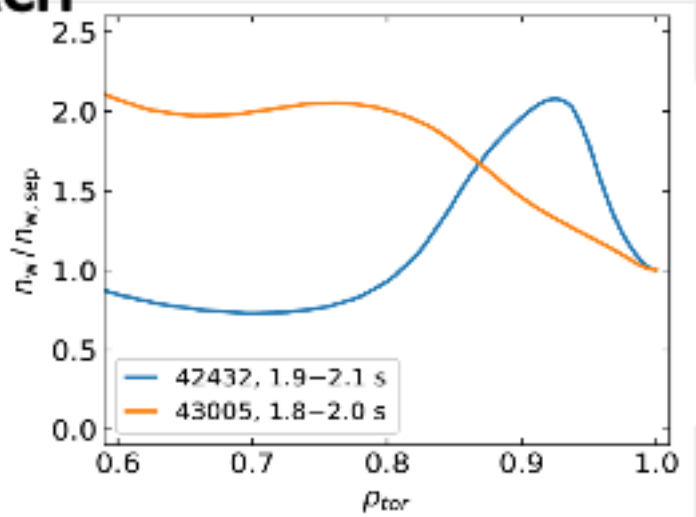
Experimental Strategy/Machine Constraints and essential diagnostic

- Improved H-modes at 1.0MA (1.2MA overshoot) and at 0.8MA (1.0MA overshoot)
- Scenario development to act against (3,2) modes and prolong "screening" phase for further impurity transport investigations
- Ne seeding, LBO (W or Ca)
- Diagnostics: All CXRS, TS, Li-beam, div. & lim. spectroscopy, LBO, bolometry, soft X-ray, profile reflectometry

EXP



FACIT



Proposed pulses

Device	# Pulses/Session	# Development
AUG	10 pulses	16 pulses

#005-Extension of multi-machine LH transition database

- **Proponents and contact person:**

Emiliano Fable emf@ipp.mpg.de, C Angioni, G Birkenmei
L Aucone, M Cavedon, P Vincenzi, A H Nielsen, A S Thrys

Updated consideration
To be completed in fall 2026 the AUG part if possible. High current (Ip > 1MA) to be postponed before summer break 2027
TFL to discuss with the SCs about the needs for a conclusion

- **Scientific Background & Objectives**

The proposed experiments will be conducted at AUG and TCV, w
existing datasets and addressing the following scientific objectives:

AUG

Test $n_{e,min}$ & $P_{threshold}$ dependencies on current and Q_{ion}, with pure ECRH, high n_e branch

TCV

- Identify $n_{e,min}$ (if it exists) and dependencies
- Study the P_{LH} scaling with B_{pol} (at least 4-5 different current values are required)
- Compare Q_i for dominant electron and ion heating

- **Experimental Strategy/Machine Constraints and essential diagnostic**

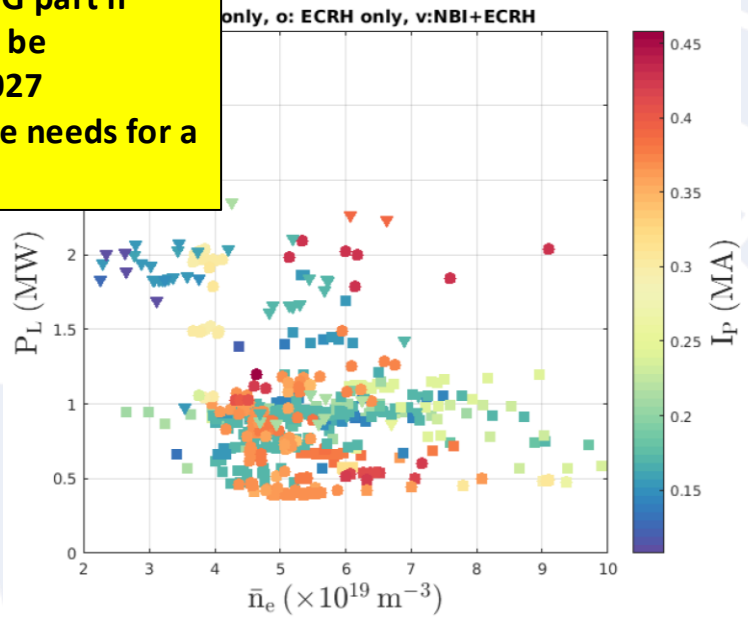
AUG: LH and HL transitions in pure ECRF heating. LSN favourable grad B drift

TCV:

- Complete TCV L–H database with wide density and current scans (ECRH/NBI)
- Extend mixed ECRH+NBI & H/D experiments to assess electron vs ion heating, isotope effects.
- Scan ion-to-electron heat flux ratio at optimal density to explore torque-compensated conditions.

	I_p/B_t	shape	Heating	Gas	Essential diagnostics
AUG	0.8-1.2MA/2-2.5T	LSN mid-δ	0-5MW ECRH	D	Li-beam, Doppler Reflectometry
TCV	170-450kA/1.4T	LSN	NHI and NH2 / ECRH	D	TS, CXRS (also sys4), DBS, GPI

Fig 1: available TCV pedestal database.



Proposed pulses

Device	# Pulses/Session	# Development
AUG	6	2
TCV	30	5

#006-Hydrogen isotope transport in low-collisionality H-mode plasmas

Addressing Sci. Obj. 1, 2
P1-2027-AUG during H transition

- **Proponents and contact person:**

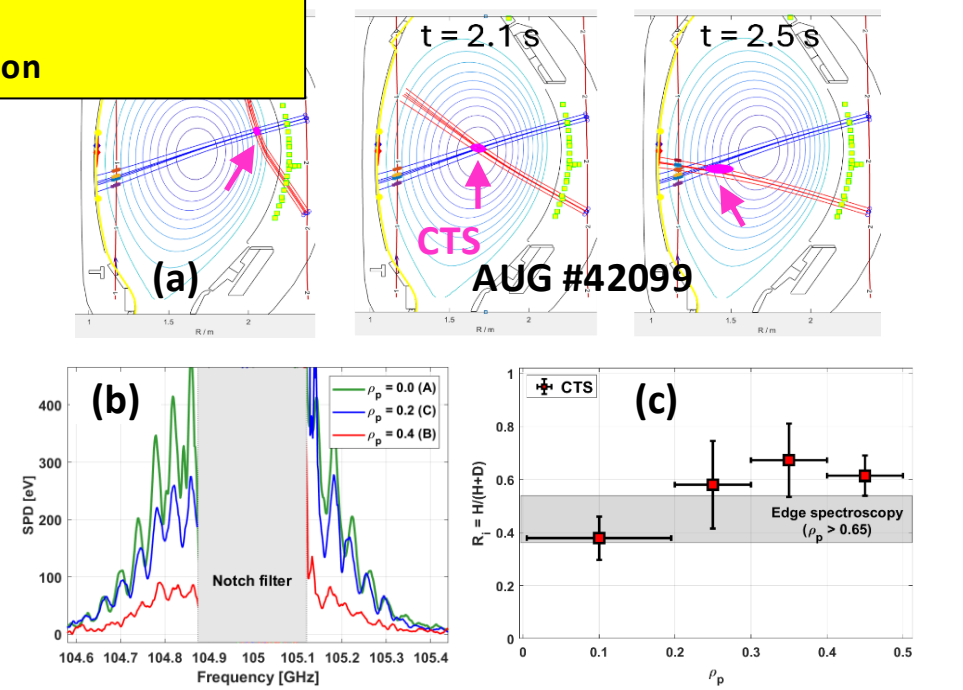
J. Rasmussen (DTU), S.B. Korsholm (DTU), P. Schne
Weiland (IPP), P. Lang (IPP) et al. jeras@fysik.dtu.dk

- **Scientific Background & Objectives**

Spatially resolved hydrogen isotope ratios were measured at the core of H-mode plasmas *for the first time* with CTS in the ECRH-heated AUG #42099 (Fig.). We will extend this to other fuelling schemes to assess D/H ratios, D/H transport, ion heat transport (T_i vs. ρ), and their impact on L-H threshold to

- Provide the first spatially resolved measurements of n_D/n_H in low-collisionality H-mode plasmas for different H/D fuelling schemes (valves, NBI, pellets)
- Quantify convective and diffusive core transport coefficients for hydrogen isotopes in ITER-/DEMO-relevant H-mode discharges
- Quantify the impact of *core* D/H ratio on the L-H power threshold and confinement

Study is linked to RT01 D01 + D02, RT04 D09, RT05 D1, RT06 D4+D5



(a) CTS measurement volume (magenta ellipsoid) in the ECRH-heated AUG #42099. (b) Example resulting CTS spectra; spectral "wiggles" are separated by ω_{ic}, providing sensitivity to H/D. (c) Mean resulting H/D ratios from CTS.

- **Experimental Strategy & constraints**
  - B = 2.65 T for CTS, line-integrated $n_e \approx 4 \times 10^{19}$ m^{-2}
  - ≥2.5 MW ECRH for low ν*, 2.5 MW NBI + pellets for core fuelling + H-mode
  - Heating power ramp to assess impact of D/H on L-H threshold
  - Sweep CTS volume from ρ = 0.1 → 0.6 to get n_H/n_D profiles
  - Gyr 6, 7, 8 for CTS at 105 GHz + new CTS fast digitizer
  - Gas: D with minority H, including cleaning discharge

Proposed pulses

Device	# Pulses/Session	# Development
AUG	7	1

#007-Triangularity dependence of H mode power threshold scaling and pedestal tungsten transport

- **Proponents and contact person:** J. Morales, A. Fil, J. Hillairet, J. Cazabonne, A. Ekedahl, P Devynck, R. Guirlet, P. Manas, P. Maget, L. Vermare, P. Hennequin (LPP), A. Grosjean (UTK)
  Contact person: *jorge.morales2@cea.fr*

Updated consideration:
P2-WEST

- **Scientific Background & Objectives**
  - Determine H mode power threshold scaling at different triangularities in torque-free electron heated plasmas
  - Impurity contamination depends on pedestal transport in L and H modes, with a role of plasma triangularity in the pedestal shape characteristics
  - Tungsten transport will be investigated using low power ICRH modulations and LBO for different shaping and input powers
  - RT deliverables: D2, D5

- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - Power scan in the H-mode transition vicinity (P_{sep}~3MW on WEST) with different triangularities : LHCD + ICRH + ECRH systems
  - Impurity source via low power ICRH modulation (~500 kW) or LBO
  - Impurity transport evaluated by amplitude and phase signals on bolometry/VUV lines
  - DBS, ECE, TS, LP, interferometry, bolometry, VUV, SXR, visible spectroscopy, as essential diagnostics, ME-SXR, ME-HXR

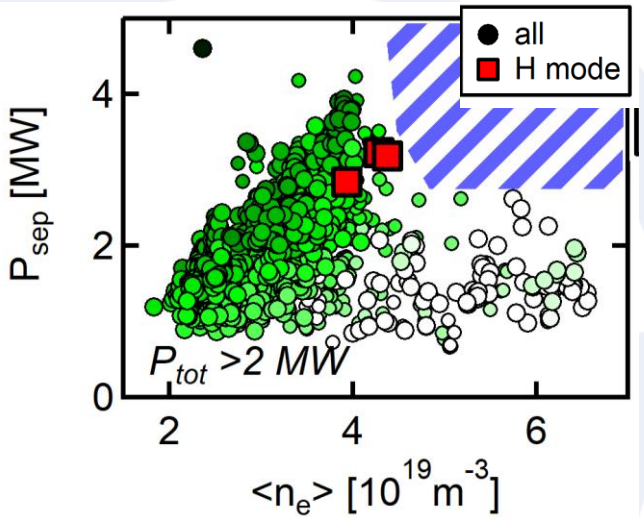


Fig.: P_{sep} as a function of density in WEST database, blue area to be addressed with ECRH

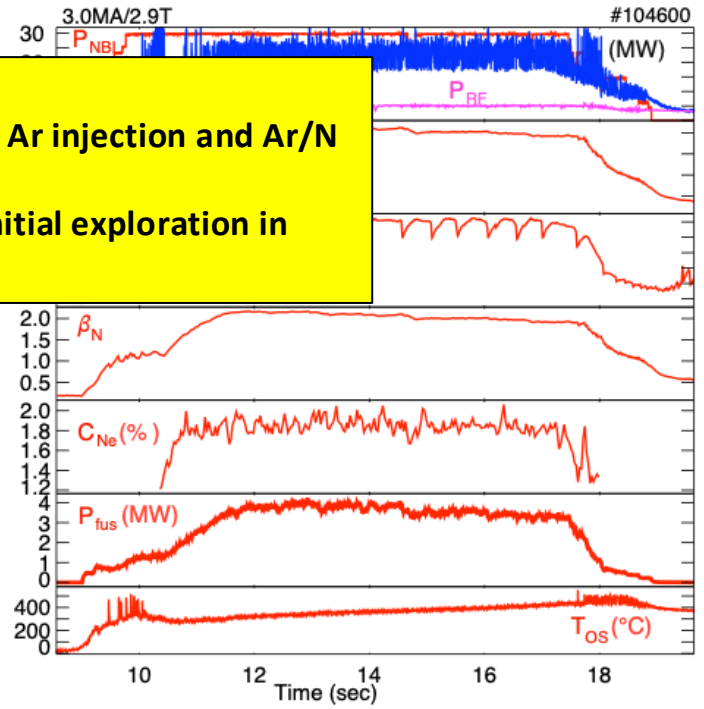
Proposed pulses

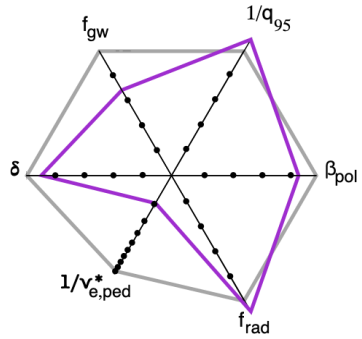
Device	# Pulses	# Develop
WEST	15	3

#008-Core-edge integrated scenario for IBL in AUG and TCV in support of the JET IBL results

Updated consideration
P1-2027-TCV: Focusing on Ar injection and Ar/N comparison
P1-2027-AUG: based on initial exploration in 2026

- **Proponents and contact person:**
- C. Giroud, B. Labit and others
- **Scientific Background & Objectives**
  - JET ITER baseline achieved best integrated scenario w
    N and Ar.
  - **RT01 Scientific Objectives:**
    - D3 - Determine the impact of different impurity mixes for partially detached divertors in high power operations in view of ITER radiative scenarios
    - D5 - Quantify pedestal transport and screening of impurities in conditions relevant for next-step fusion devices
  1) **Test the physics identified to be a play in the core-edge-SOL** integration in JET ITB (expected also in AUG) (different imp. , mix)
  2) **Complement information obtained on JET such as the impact of fuelling pellets** (M. Valovic) in detached plasmas
  3) **Obtain additional information no avail on JET: W wall erosion**
  4) **Compare plasma shape between AUG/JET/TCV and assess potential effects**
- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - Start from ITER baseline for AUG and PEX H-mode for TCV
  - Establish or re-use Ar-seeded ITER baseline
  - Scan Ar up to partial detachment with different throughput (impact on confinement, pedestal pressure, ELM size changes, Elm freq, distance from H to L back transition)
  - Similar assess Ne or Ar/Ne
  - Pellets in partially detached plasma (AUG)





C. Giroud, IAEA FEC 2025

Proposed pulses

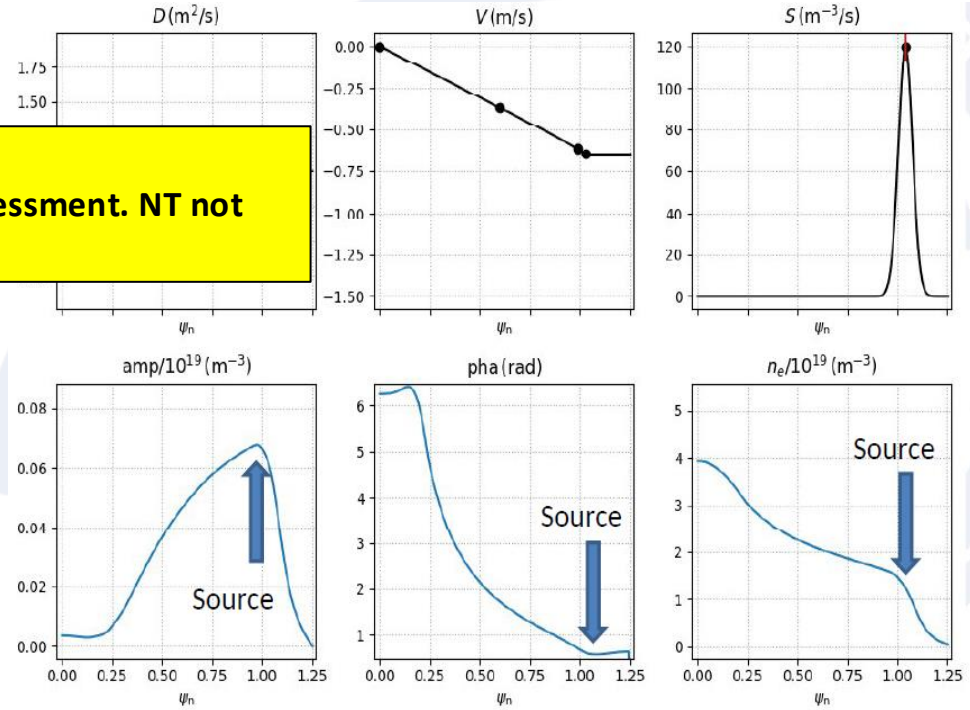
Device	# Pulses/Session	# Development
AUG	20	5
MAST-U		
TCV	30	←
WEST		

#009-Electron particle and heat transport in long-pulse WEST plasmas

- **Proponents and contact person:**
- Tuomas.Tala@vtt.fi + 10 others

Updated consideration:
Waiting for recent results assessment. NT not within RT01 priorities

- **Scientific Background & Objectives**
  - Use WEST unique capability for simultaneous measurement of D_e and χ_e is proposed here as one part of the experiment.
  - WEST has the capability to exploit multiple modulation frequencies both with gas puff modulation and ECRH modulation which makes ultimately the determination of the transport coefficients much more robust and accurate. The data here will be useful for RT-04 density control and they are a part of the team
  - Validation of GENE gyro-kinetic code against the core electron particle transport coefficients, providing best possible data to TSVV-A and TSVV-H



- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - The following physics scans are planned:
  - ECRH power scan to compare D_e and χ_e in different collisionality regime
  - triangularity scan (up to negative triangularity). The negative triangularity part could be performed also within RT-02 negative triangularity program as part of its detailed physics studies
  - isotope scan between D and H to quantify the dependence of both particle and heat transport on the isotope
  - temperature and q-profile scan to compare inward convection against theory (thermo pinch and curvature pinch)

Proposed pulses for 2026-2027

Device	# Pulses/Session	# Development
AUG		
MAST-U		
TCV		
WEST	40	0

#010-Flows and turbulence approaching the L-H transition

- **Proponents and contact person:** laure.vermare

Updated consideration:
TFL to discuss with the SCs about the needs for a conclusion

- **Scientific Background & Objectives**

Difference on Ip sensitivities of Er profile and GAMs amplitude between WEST and TCV points an interesting link between Er shear, turbulence and flow generation

- Explore high plasma current with increased power in Unfav. in WEST (since this case is the case different from other machines) and in both fav/unfav in TCV to collect turbulence and GAMS measurements in addition to Er profile
- Change the turbulence regime in WEST to reach regime closer to TCV TEM dominated regime

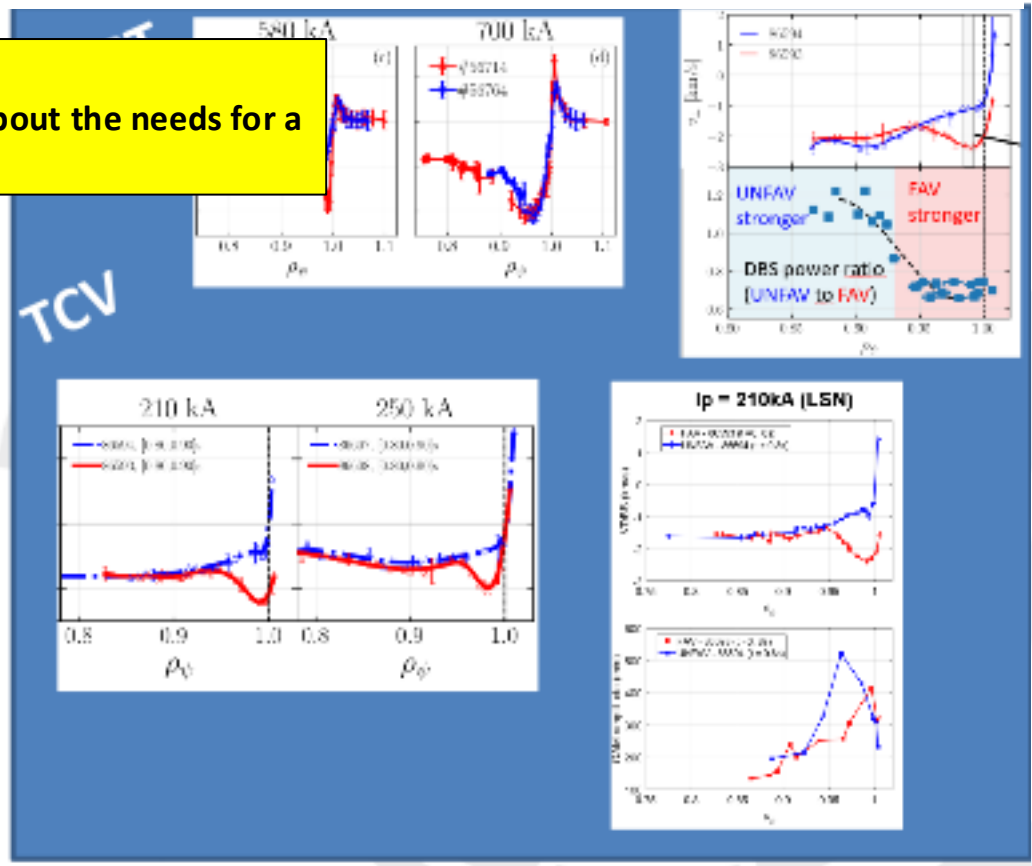
- **Experimental Strategy/Machine Constraints and essential diagnostic**
- WEST:

✓ USN high Ip, density scan and power scan (LH + ICRH and ECRH when available)

✓ Trying to change turbulence regime increasing Zeff (light impurity injection) and density gradient (pellet)

- TCV :

✓ High Ip power scan (NBI and ECRH) with turbulence & GAMs measurements



Proposed pulses

Device	# Pulses/Session	# Development
TCV	16	
WEST	20	

JET RT01 A&M priorities

- JET-ITER Baseline scenario with seeding do represent an important asset to be put at high scientific maturity level
- We have tried to keep adequate resources throughout the years
- On this respect priorities should be given to:
  - A first version of integrated modelling (COCONUT) of ITER baseline validated against experimental data and test if trends from experiment can be reproduced adequately
  - Continuation of edge modelling: impact of wide frid, DT, N and Ar, SOL and $n_{e,sep}$ changes with impurities
  - **JOREK** simulations of seeding effect on ELM/no-ELM domain assess and corresponding instabilities
  - Completion of work on W erosion and transport following presentation at IAEA 2025

