04th- 06th November 2025

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

B. Labit

On behalf of WPTE TFLs
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Research Topic Coordinators
C. Giroud, L. Frassinetti, S. Wiesen, M. Cavedon

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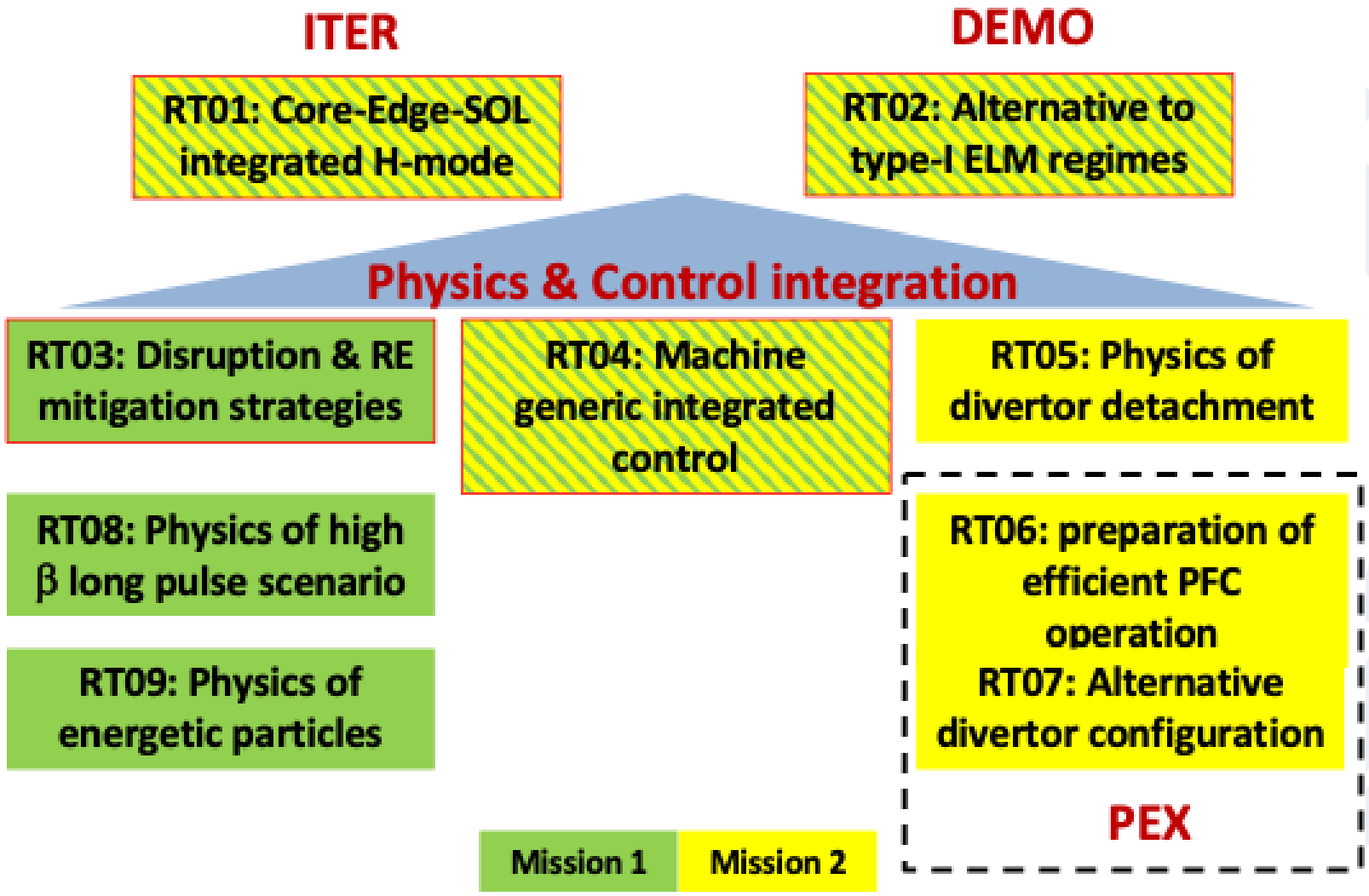
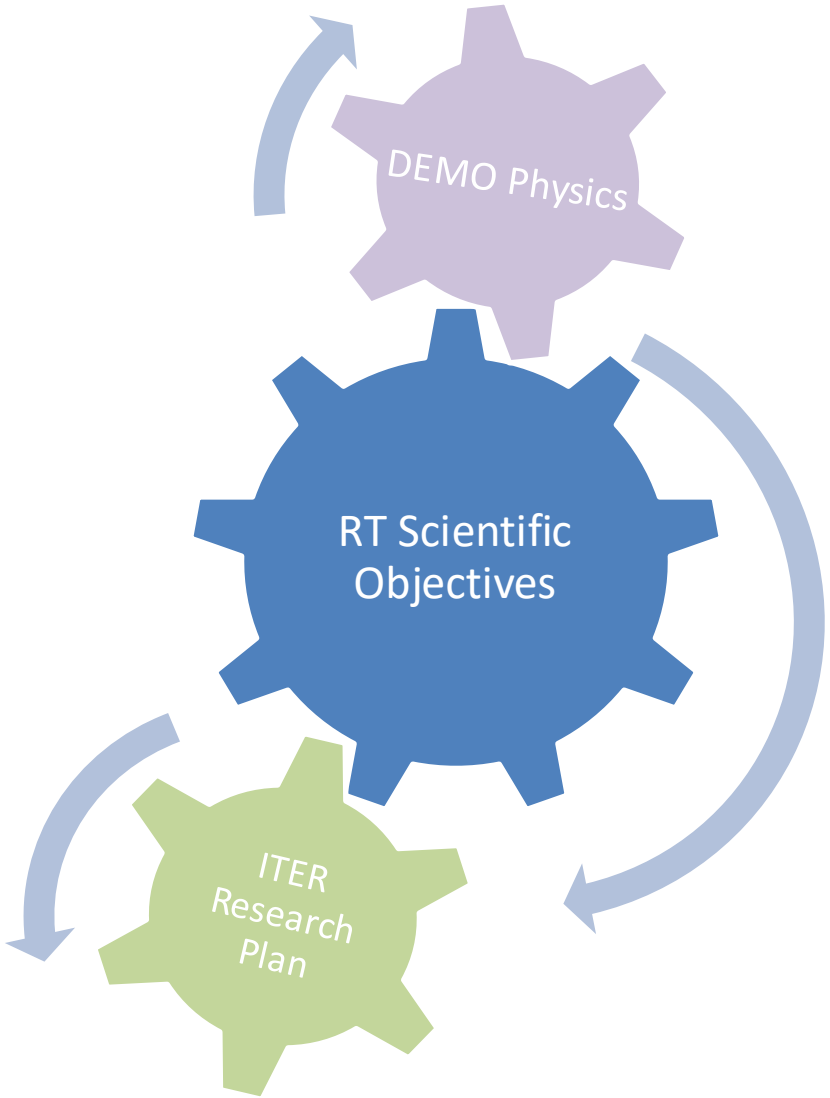
Introduction

- RT01 is linked to the exploitation of the scenarios and exploration of the physics mostly linked to ITER operation also in view of ITER re-baselining



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

Provisional fraction for 2026-27				
RT	AUG	MAST-U	TCV	WEST
RT01	10	10	10	2

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

RT-01 block of activities

BLOCK 1
ITER baseline scenarios

Objectives: D1, D2, D3, D4

Machines: JET, AUG, TCV

BLOCK 2
low ν^* 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 intrisic torque

Objectives: D2

Machines: AUG, TCV, MAST-U

Summary of proposals (10)

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

Scientific Objectives and Machine Time

#	Scientific Objectives for 2026-2027	SSRL (to be re-evaluated at the end of 2025)
D1	Develop and understand stationary H-mode scenario at low collisionality and with dominant electron heating	Mature (needs underpinning)
D2	Provide physics-based cross-field transport coefficients for heat, fuel particles and impurities to TSVVs for turbulence modelling	Judgmental
D3	Determine the impact of different impurity mixes for partially detached divertors in high power operations in view of ITER radiative scenarios	Mature (needs underpinning)
D4	Assess pedestal performances in condition closer to future devices including large SOL opacity, low pedestal collisionality, peeling limited plasma	Mature (needs underpinning)
D5	Quantify pedestal transport and screening of impurities in conditions relevant for next-step fusion devices	Judgmental

	AUG		TCV		MAST-U	WEST	
	2026	2027	2026	2027	2026	2026	2027
Tentative allocation	24	30	70	110	16	15	0
Total proposed	156		167		36	78	
Scientific/dev.	127/29		157/10		36/0	75/3	

Power and size dependence of the density limit

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

Not addressing specific objectives but clear addresses an open question raised by the DEMO central team

Will help to validate theoretical predictions

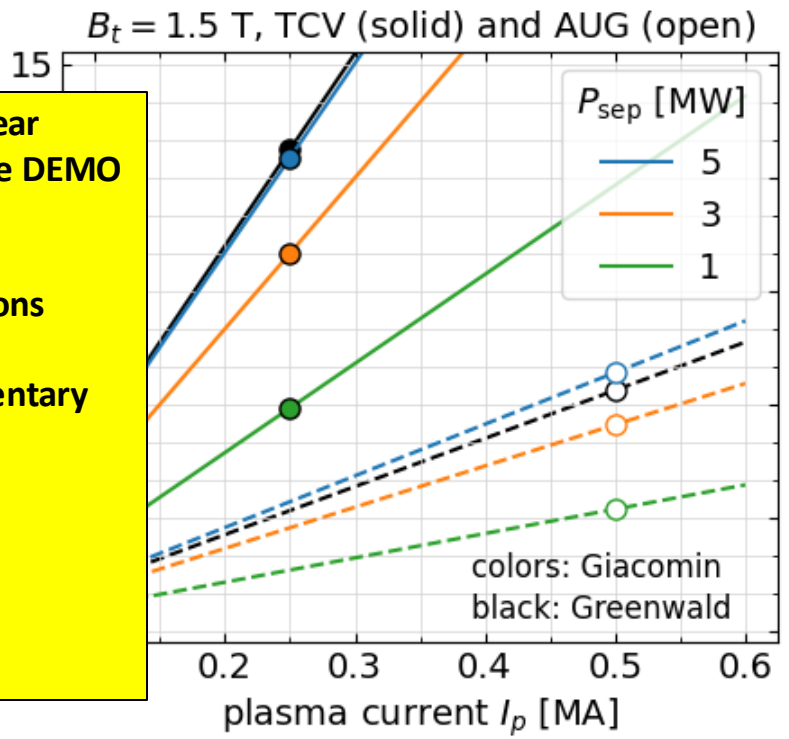
AUG: Well focused proposal – complementary to internal proposal

TCV: needs new gyrotron

P1-2026-TCV
P1-2027-AUG

- **Scientific Background & Objectives**
  - Recent density limit expressions [Giacomin 202
    have a power dependence, and field/current/s
    Greenwald → strong implications for future re
  - Objectives:
    - Find the density limit (DL) at different heating po
      same magnetic field (1.5 T) and q_{95}, focusing on d
    - 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	-	-

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

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

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

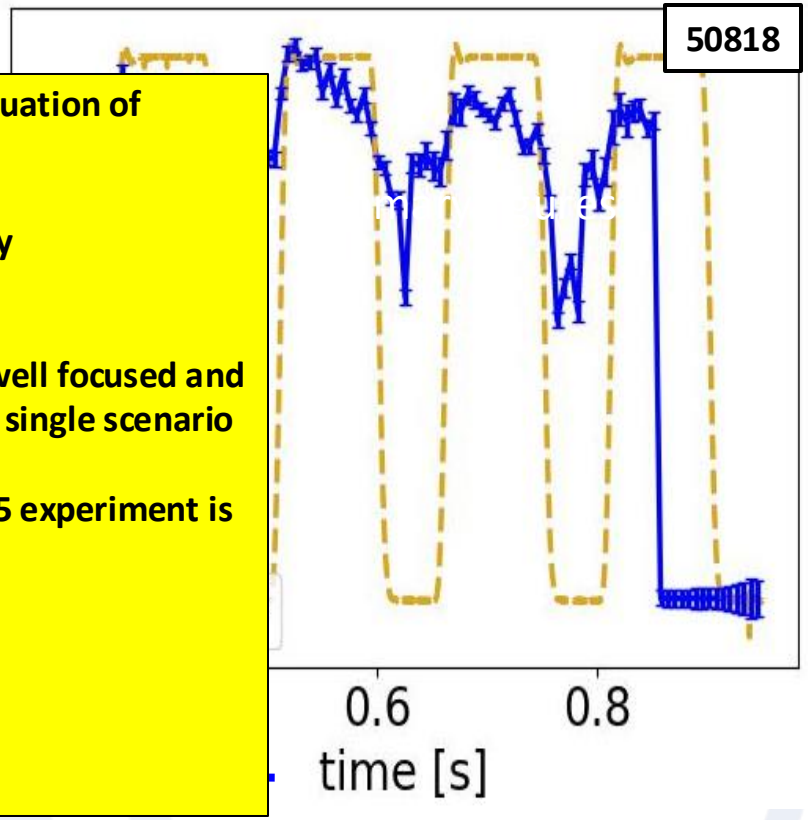
Addressing Sci. Obj. 2 and continuation of previous effort

AUG: too large request to be fully accommodated

TCV: experimental strategy not well focused and require refinements – focus on a single scenario

MAST-U: assessment of late 2025 experiment is needed

P1-2026-MAST-U
P1-2026-TCV
P1-2027-TCV
P1-2027-AUG



- **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		

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 pedes
    - Quantify in low ν* plasmas:
      - Pedestal structure
      - Pedestal transport (fluctuations measurements)
      - Fuelling (neutral density, ionizations rate), at leas
- **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

Addressing Sci. Obj 1

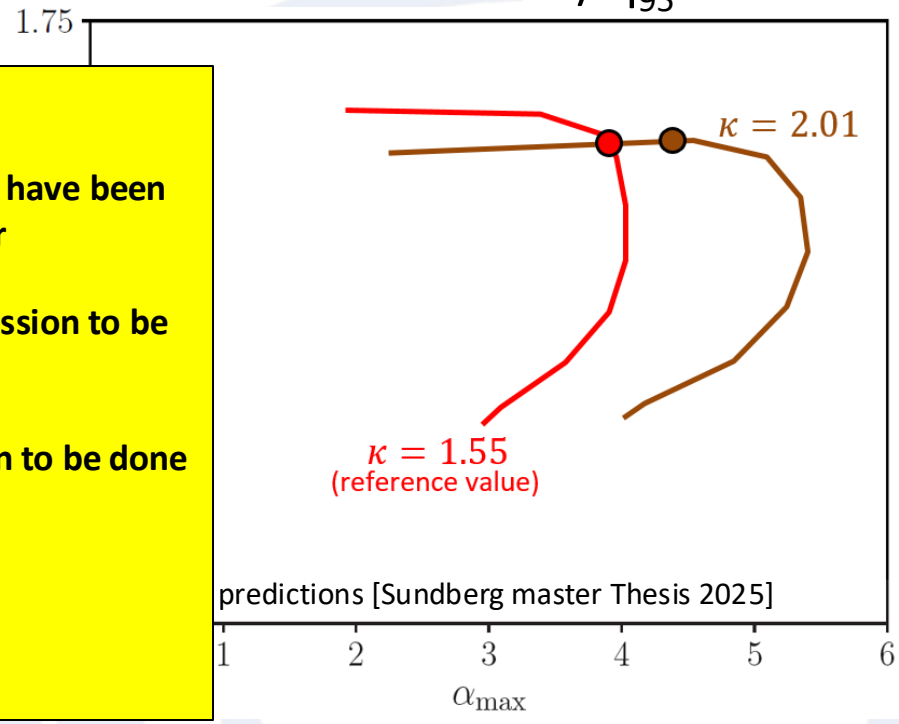
AUG: experiments planned this year have been cancelled – Issue with lower divertor

MAST-U: assessment of late-2025 session to be done

TCV: assessment of late-2025 session to be done

P1-2026-MAST-U
P1-2026-AUG
P1-2026-TCV
P1-2027-TCV

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



Proposed pulses

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

Underpin impurity temperature screening conditions at the periphery of AUG plasmas

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

Addressing Sci. Obj. 5 and ongoing effort

Nice results obtained in 2025

Shot request too large wrt machine time

P1-2026-AUG
P1-2027-AUG

Scientific Background & Objectives

- In the last AUG campaign, demonstrated controlled tun
very high performance improved H-mode scenario pulse
- 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

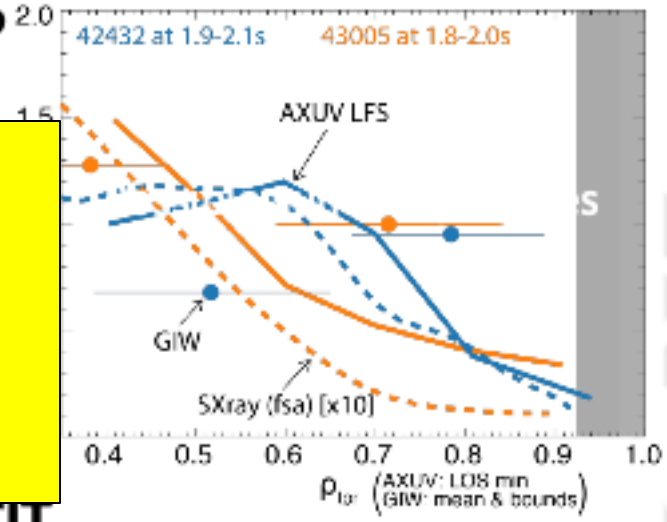
➢ Attempt to obtain stronger outward convection for W (and potentially extend further out) by operating at a lower plasma current of 800kA with an overshoot at 1MA

➢ 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



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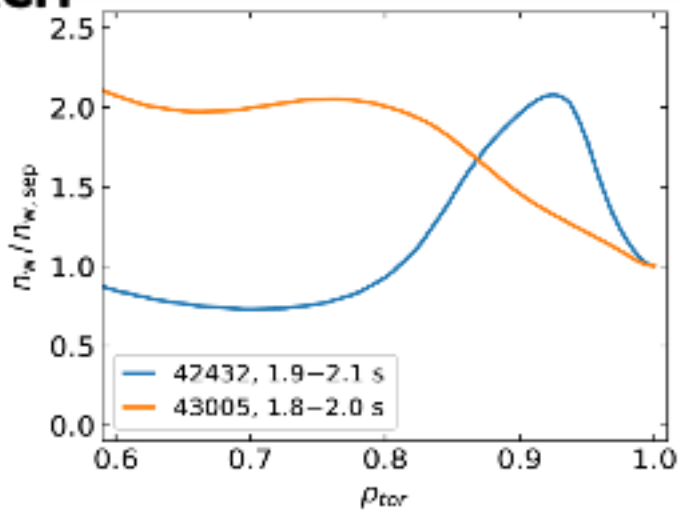


Proposed pulses

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

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

- **Scientific Background & Objectives**

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

AUG

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

TCV

- Identify $n_{e,min}$ (if it exists) and dependencies
- Study the P_{LH} scaling with B_{pol} (at least 4-5 different current va
- 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

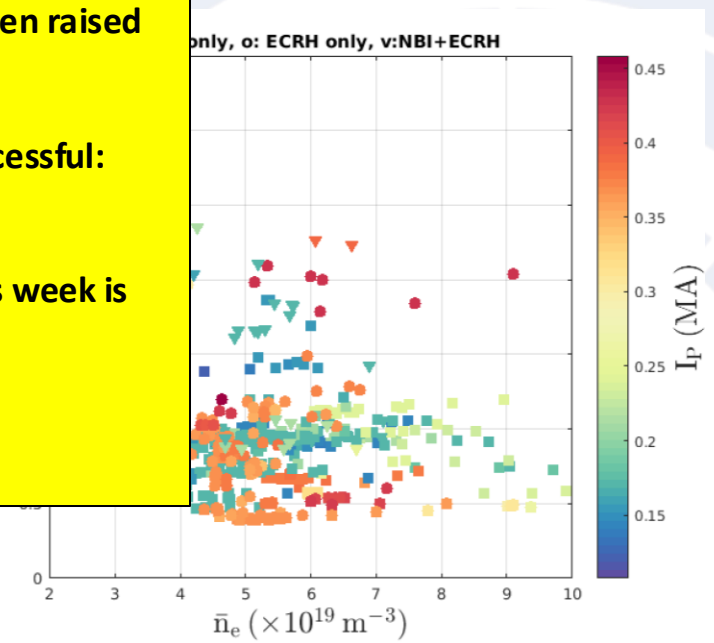
Not addressing specific Sci. Obj but L-H threshold dependance on Bpol has been raised by EF DEMO Central Team

AUG: 2025 experiments were not successful: high enough density not reached

TCV: Assessement of experiments this week is needed

P1-2026-AUG
P2-TCV

Fig 1: available TCV pedestal database.



Proposed pulses

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

Hydrogen isotope transport in low-collisionality H-mode plasmas

- **Proponents and contact person:**

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

Addressing Sci. Obj. 1, 2

Good progress in 2025

Priority should be evaluated wrt other request for Hydrogen plasmas

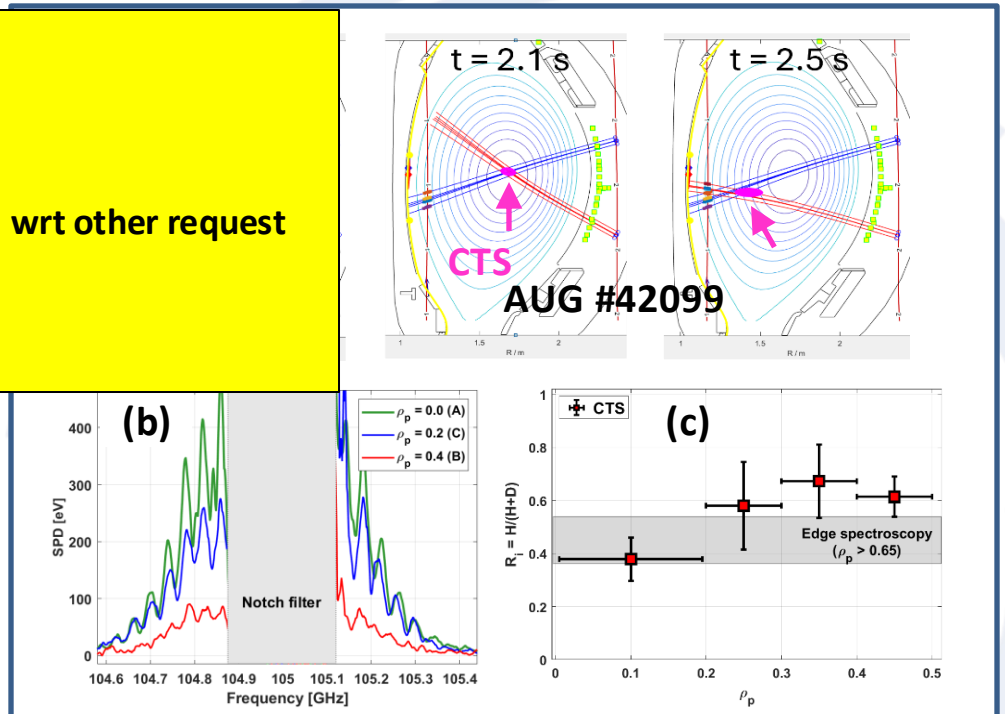
P1-2026-AUG

- **Scientific Background & Objectives**

Spatially resolved hydrogen isotope ratios were me
H-mode plasmas *for the first time* with CTS in the E
#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

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*

- **Scientific Background & Objectives**
  - Determine H mode power threshold scalin
    free electron heated plasmas
  - Impurity contamination depends on pede
    role of plasma triangularity in the pedesta
  - Tungsten transport will be investigated us
    for different shaping and input powers
  - RT deliverables: D2, D5

- **Experimental Strategy/Machine Constra**
  - Power scan in the H-mode transition vicin
    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

Partly addressing Sci. Obj. 5

Clarification asked: how the path to 2nd stability opens with delta, are large delta possible on WEST?

ECRH not yet available on WEST

Experimental strategy should be prioritized with 15 shots requested

And why WEST actually? A lot has been investigated on AUG

P2-WEST

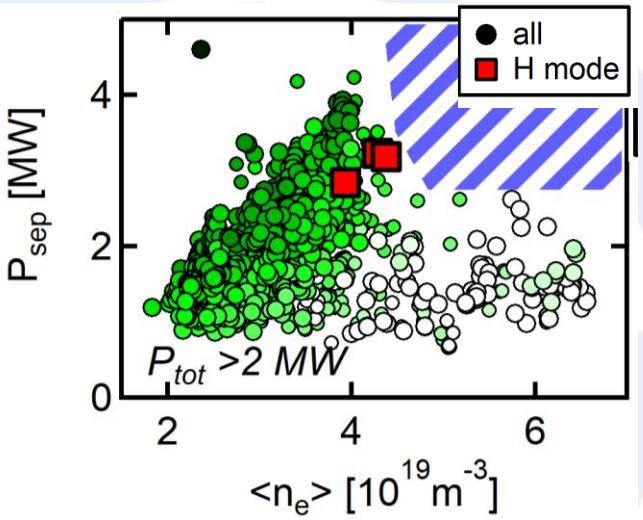


Fig.: P_{sep} as a function of density in WEST database, blue area to be addressed with ECRH

Proposed pulses

Device	# Pulses	# Develop
WEST	15	3

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

- **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 fo
      divertors in high power operations in view of ITER radiati
    - D5 - Quantify pedestal transport and screening of impuri
      for next-step fusion devices
  1) **Test the physics identified to be a play in the core-**
     JET ITB (expected also in AUG) (different imp. , mix
  2) **Complement information obtained on JET such as**
     pellets (M. Valovic) in detached plasmas
  3) **Obtain additional information no avail on JET: W w**
  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)

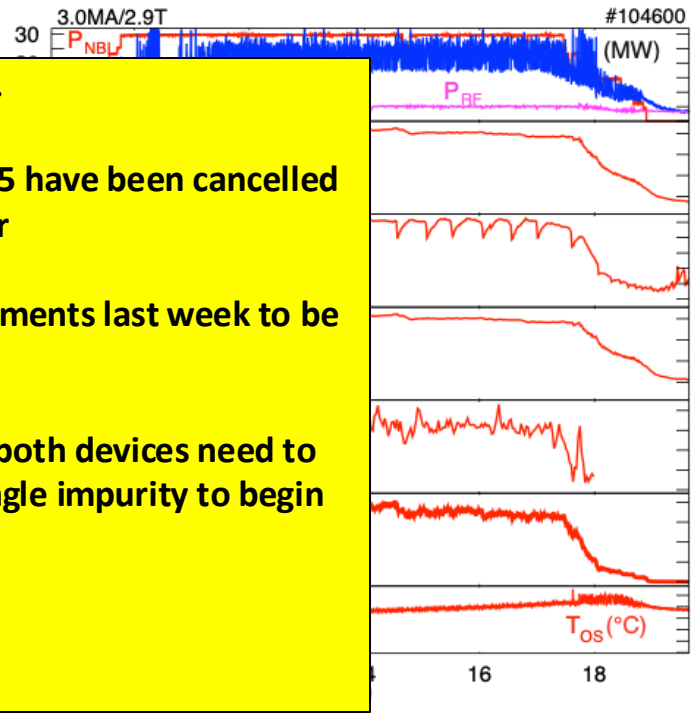
Addressing Sci. Obj. 2, 3, 4

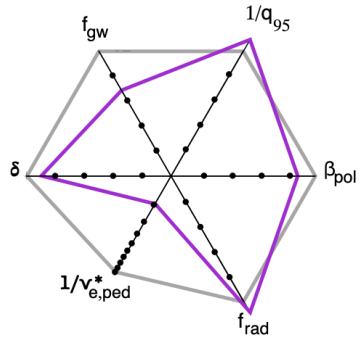
AUG: experiments for 2025 have been cancelled – Issue with lower divertor

TCV: assessment of experiments last week to be done

Experimental strategy on both devices need to be refined, focusing on single impurity to begin

P1-2026-TCV
P1-2027-TCV
P1-2027-AUG





C. Giroud, IAEA FEC 2025

Proposed pulses

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

Electron particle and heat transport in long-pulse WEST plasmas

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

- **Scientific Background & Objectives**
  - Use WEST unique capability for simultaneous mea
    is proposed here as one part of the experiment.
  - WEST has the capability to exploit multiple modul
    with gas puff modulation and ECRH modulation w
    the determination of the transport coefficients m
    accurate. The data here will be useful for RT-04 de
    are a part of the team
  - Validation of GENE gyro-kinetic code against the c
    transport coefficients, providing best possible data
    H

- **Experimental Strategy/Machine Constrai**
  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)

Addressing Sci. Obj. 5

Focus on ECRH power scan (once gyrotrons ready)

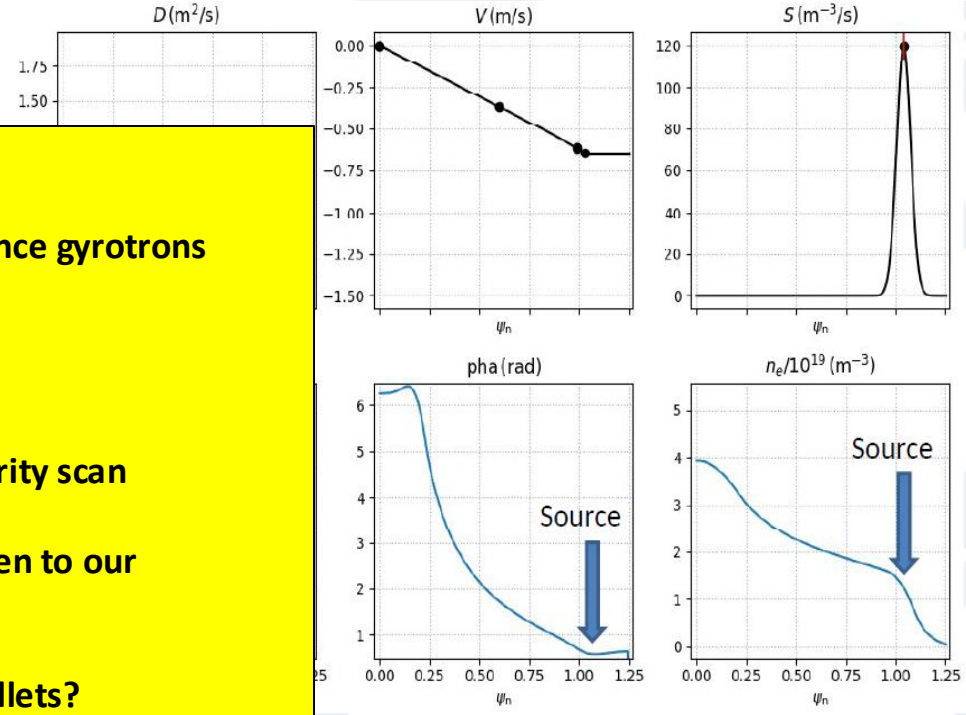
Is ECRH modulation feasible?

Reduced priority on triangularity scan

Hydrogen plasmas not foreseen to our knowledge

No particle transport from pellets?

P1-2026-WEST



pulses for 2026-2027

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

Flows and turbulence approaching the L-H transition

- **Proponents and contact person:** laure.vermare
- **Scientific Background & Objectives**

Difference on Ip sensitivities of Er profile a
between WEST and TCV points an interesti
shear, turbulence and flow generation

- Explore high plasma current with increased po
(since this case is the case different from other
fav/unfav in TCV to collect turbulence and GAM
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 :

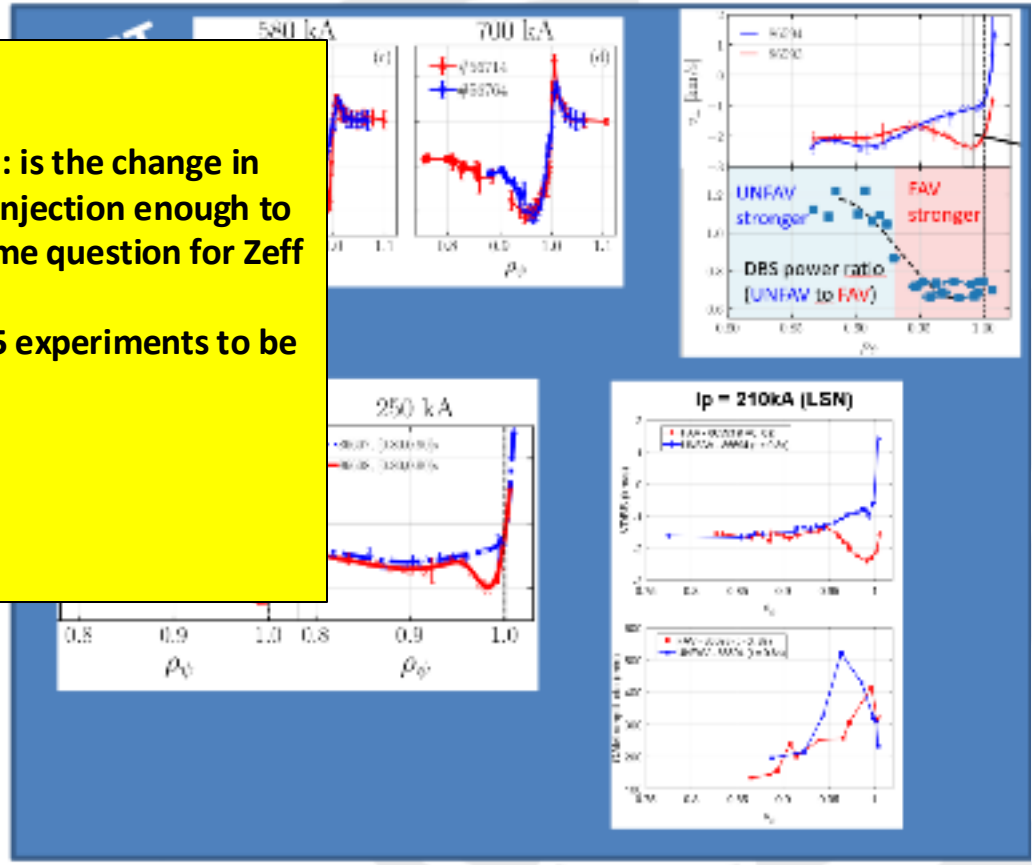
✓ High Ip power scan (NBI and ECRH) with turbulence & GAMs measurements

Addressing Sci Obj 2

WEST: clarifications required: is the change in density gradient with pellet injection enough to change from ITG to TEM? Same question for Zeff

TCV: assessment of late-2025 experiments to be done

P1-2026-TCV
P1-2027-TCV
P2-WEST



Proposed pulses

Device	# Pulses/Session	# Development
TCV	16	
WEST	20	

Summary of assessment

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

Summary of P1 proposals

	AUG		TCV		MAST-U	WEST	
	2026	2027	2026	2027	2026	2026	2027
Low nu* H-mode physics	#3		#3	#3	#3		
Core-edge integrated scenarios		#8	#8	#8			
Impurity screening	#4	#4					
Core transport	#5, #6	#1	#10, #1, #2	#10, #2	#2	#9	
Total # of scientific pulses	29	27	70	57	36	40	
Provisional shot allocation	24	30	70	110	16	15	0

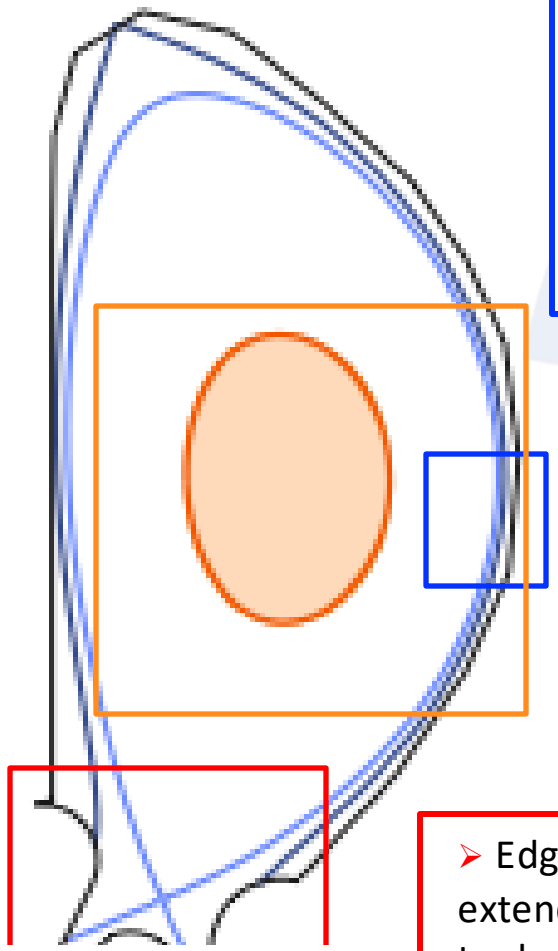
P2 proposals will probably find experimental time on TCV

Analysis and Modelling for the JET-ITER baseline

- Impurity content
  - INDICA:
- MHD main ramp-up and termination
- confinement scaling of seeded plasmas

- TRANSP
- FACIT NEO
- JINTRAC-Coconut. With possibly SOLPS-NN tools if avail.
- Core modelling :
  - JINTRAC-TGLF
  - TGLF ASTRA

Synthetic diagnostic for validation
- Zeff profiles
- KS3
- KL11
- KT2



- MISHKA, CASTOR EUROPED also used in JINTRAC
- Apply model Saarelma
- GK GENE
- Pre-ELM MHD activity
- Fluctuation pedestal
- Impurity screening

- GRILLIX
- **JOREK**
- **Exp: assessment wall flux LP , turbulence LP div.**
- **HERMES3.0**
- **ERO2.0**
- separatrix and SOL conditions
- Erosion at wall

- Edge modelling with SOLEDGE3X, SOLPS-ITER , SOLPS-ITER extended grid (DT, other impurity) EDGE2D, SOLPS-ITERNN tools
- ERO2.0
- HPI2 and HPI2-NN

Unique scenario fulfilling major ITER requirements
–> ideal for code validation

A&M needs for RT-01

- JET (low nu* part)
  - Very high priority: GK analysis in the pedestal (GENE or similar) in D, D/T and T
  - High priority:
    - JOREK (to continue H. Nyström work)
    - Pedestal stability (MISHKA, Europed…)
    - Core-pedestal integrated modelling
    - Experimental data analysis: TS, Li-beam, refl., CX…
    - Pre-ELM MHD activity
  - Low priority: IR, bolometry
- MAST-U
  - GK analysis in the pedestal (GENE or similar)
  - Pedestal stability (MISHKA, Europed…)
  - Profile analysis: TS, CX…
  - Pre-ELM MHD activity
  - SOL: neutral density and ionizations rates (HVS) , α_t, T_e^{sep} and n_e^{sep}…
  - Turbulence: BES, DBS, Doppler refl.
  - Target and divertor data (LPs, camera)
  - TRANSP and JINTRAC (critical for momentum transport)
  - Equilibrium: EFIT+MSE data
  - MARS-K/Q, GPEC/Pent and Neo2 for NTV
  - Gyro-kinetic codes (STELLA, GENE, GKW) validation against momentum diffusion. Reduced transport model validation, e.g. TGLF

A&M needs for RT-01

- TCV
  - Pedestal stability (MISHKA, Europed…)
  - Profile analysis: TS, CX…
  - Pre-ELM MHD activity
  - GENE: pedestal transport and up-down asymmetry torque
  - SOL: neutral density and ionizations rates (MANTIS), α_t, T_e^{sep} and n_e^{sep}…
  - Turbulence and Er: SPR, THB, DBS, GPI
  - Target and divertor data (LPs, camera)
  - ASTRA
  - GYSELA, SOLEDGE3X for Er well part.
  - GENE-X for SOL studies at low and high nu*
- WEST
  - DBS, Fast sweep reflectometry, TS, probes, Core and edge profile reflectometry, ECE, Thomson, 2D X-ray spectrometer (Ti, rotation), Doppler, SMBI
  - GYSELA, SOLEDGE3X for Er well part.
  - Edge neutral fuelling profile calculations using SOLEDGE with EIRENE
  - GENE analysis of particle and heat transport for the particle transport experiment
  - GENE-X
  - Integrated transport modelling (HFPS) for particle and electron heat transport coefficients to validate models (TGLF, QuaLiKiz)

A&M needs for RT-01

- AUG
  - Diagnostics: TS, CX, Li-beam, IDA divertor & limiter spectroscopy, LBO, bolometry, soft X-ray, profile reflectometry
  - FACIT and NEO for neoclassical transport, TGLF for turbulent transport
  - Pedestal stability (MISHKA, Europed…)
  - high frequency RMP coil modulation
  - MARS-K/Q, GPEC/Pent and Neo2 for NTV
  - Gyro-kinetic codes (STELLA, GENE, GKW) validation against momentum diffusion. Reduced transport model validation, e.g. TGLF
  - ASTRA, TRANSP and JINTRAC (critical for momentum transport)
  - SOL: neutral density and ionizations rates (MANTIS), α_t, T_e^{sep} and n_e^{sep}…
  - Turbulence: THB, reflectomerty
  - Target and divertor data (LPs, camera)