EUROfusion

04th November 2025

RT-02 "Physics understanding of alternatives to Type-I ELM regime" Discussion about proposals and allocated priorities for 2026-2027

B. Labit

On behalf of WPTE TFLs
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Research Topic Coordinators
E. Viezzer, M. Faitsch, O. Sauter

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Introduction

ITER

RT01: Core-Edge-SOL integrated H-mode

DEMO

RT02: Alternative to type-I ELM regimes

Physics & Control integration

RT03: Disruption & RE mitigation strategies

RT04: Machine generic integrated control

RT05: Physics of divertor detachment

RT08: Physics of high β long pulse scenario

RT09: Physics of energetic particles

RT06: preparation of efficient PFC operation

RT07: Alternative divertor configuration

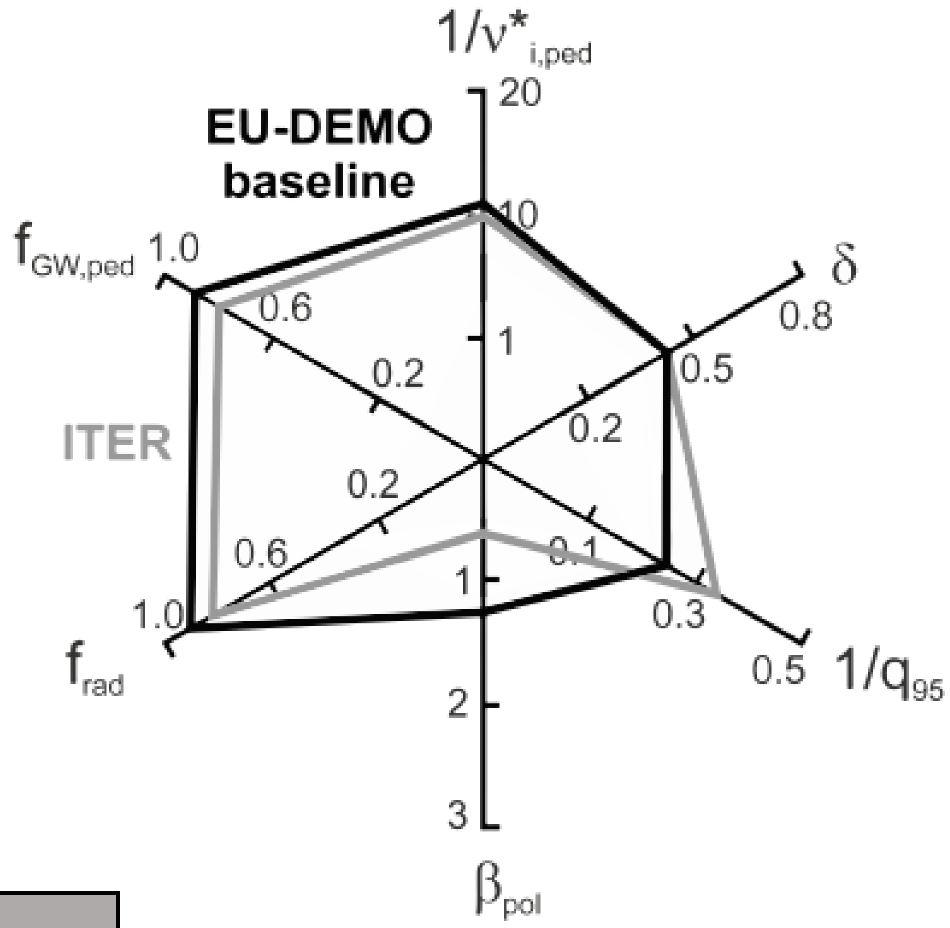
PEX

Mission 1 | Mission 2

Introduction

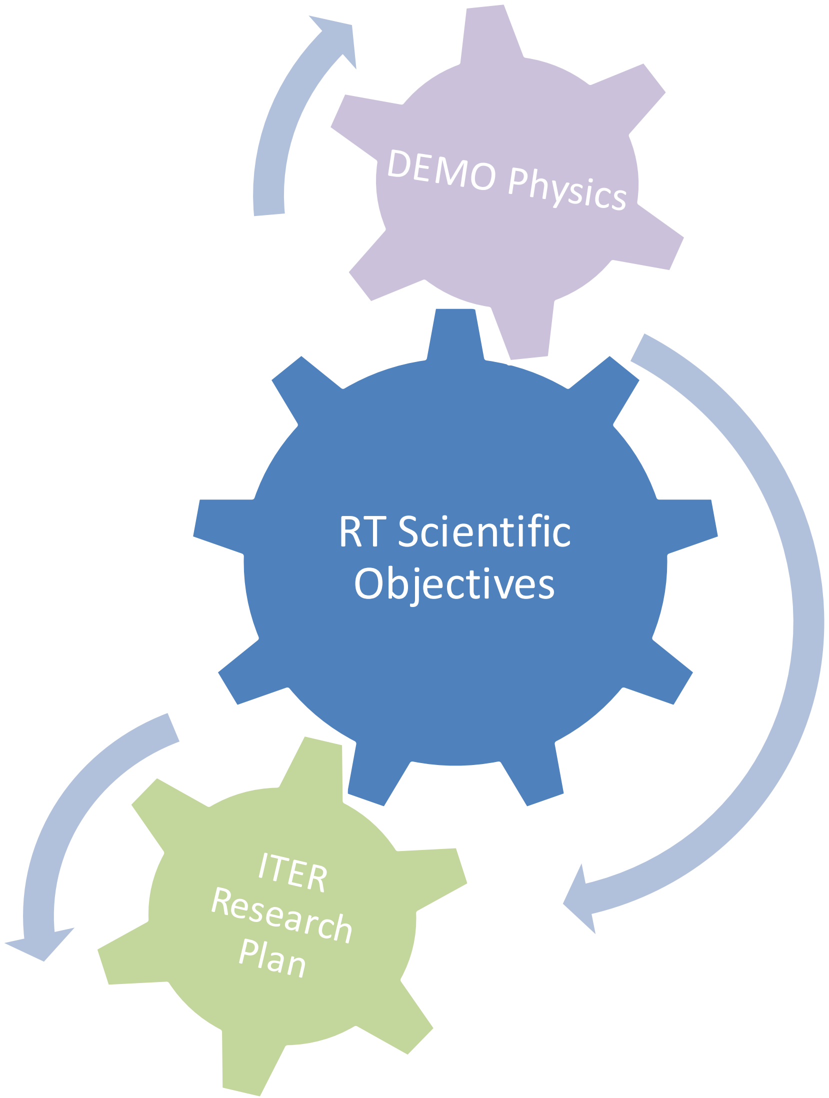
EUROFusion Grant Deliverable

TE.D.1 9	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



Provisional fraction for 2026-27				
RT	AUG	MAST-U	TCV	WEST
RT02	7	15	10	2

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

Summary of proposals (25)

No	RT	Proposal name	Proposer
11	RT02	NT in AUG: low q95 operation	Branka Vanovac
12	RT02	Improved confinement in NT AUG through stronger shaping?	Branka Vanovac
13	RT02	Comparative Study of Negative Triangularity performance in TCV, DIII-D, ASDEX Upgrade (AUG)	Branka Vanovac
14	RT02	Characterization of edge fluctuations for NT plasmas with ballooning modes	Margherita Ugoletti
15	RT02	Turbulent Edge/SOL Transport in EDA Regimes	Miriam La Matina
16	RT02	ELM control by RMPs in low aspect ratio	David Ryan
17	RT02	QCE exploitation: high current / low safety factor	Mike Dunne
18	RT02	QCE exploitation: seeding and detachment	Michael Faitsch
19	RT02	Power threshold density minimum in I-mode and edge ion heat flux scaling	Michael Komm
20	RT02	I-mode detachment: access and operational window with Ar and Kr	Daniel Fajardo
21	RT02	Bt scaling of I-modes on WEST and AUG	John Rice
22	RT02	QCE exploitation: shaping scans	Andrés Miller
23	RT02	Edge turbulence characterization in Type I ELMy H-mode, QCE and mixed regimes	Alysée Khan
24	RT02	EDA H-mode QCM reflectometry measurement	Mário Vaz
25	RT02	Negative triangularity in conventional vs spherical tokamaks	Diego Jose Cruz Zabala
26	RT02	Detached high-power L-Mode negative-triangularity reactor relevant scenarios	G. Durr-Legoupil-Nicoud
27	RT02	Fast-ion transport in real- and velocity-space in negative triangularity	Jesper Rasmussen
28	RT02	Development of Quiescente H-mode (QH mode)	Eli Viezzer
29	RT02	Impact of triangularity in I-mode and L-I-H transitions	Mário Vaz
30	RT02	Towards long-pulse operation in negative triangularity plasmas	Jorge Morales
31	RT02	Neon transport in EDA H-mode pedestals	Tabea Gleiter
32	RT02	Impurity transport dependence on negative and positive triangularity	Jorge Morales
33a	RT02	EDA H-mode development in AUG and TCV	Luís Gil
~~33b~~	~~RT02~~	~~Detachment control in EDA H-mode~~	~~Luis Gil~~
34	RT02	Impact of resonant field amplification (RFA) on edge magnetic structure and ELM control in high-beta plasmas	Yunfeng Liang
35	RT02	High performance negative triangularity plasma in WEST	Olivier Sauter

Summary of proposals

NT (10)	QCE (4)	EDA (4)	QH (1)	RMP (2)	I-mode (4)	Others (0)

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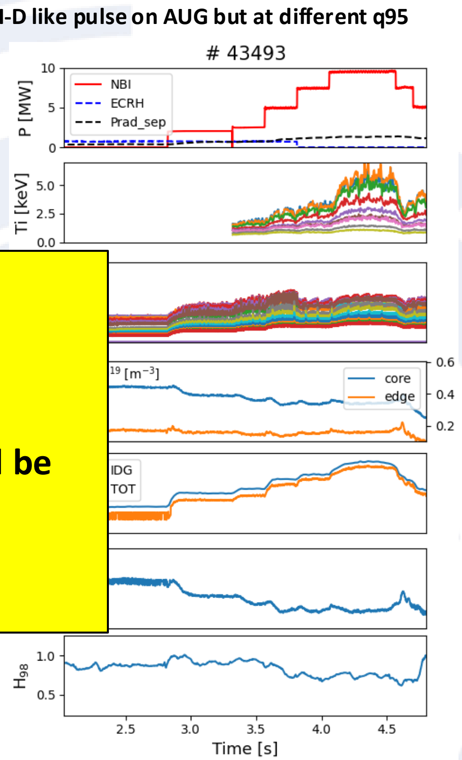
Scientific Objectives and Machine Time

	Scientific Objectives for 2026-2027	SSRL (to be re-evaluated at the end of 2025)
D1	Quantify turbulent and MHD driven transport in the vicinity of the separatrix and implications for predictions for ITER and DEMO	Exploratory
D2	Quantify first wall load in no-ELM scenarios and provide model for SOL transport extrapolation	Judgmental
D3	Extend the parameters space of no-ELM scenarios to large P_{sep}/R and/or pedestal top collisionallities relevant for ITER and DEMO	Mature - needs underpinning
D4	Determine the key physics mechanisms regulating edge transport in order to access no-ELM regimes	Judgmental
D5	Quantify the level of ELM mitigation with 3D fields **in low torque plasmas and its impact on W transport**	Judgmental
D6	Quantify the overall performance, **primarily improved confinement**, of negative triangularity plasmas in view of next-step devices	Mature - needs underpinning

	AUG		TCV		MAST-U	WEST	
	2026	2027	2026	2027	2026	2026	2027
Tentative allocation	30	22	80	110	32	0	15
Total proposed	188		381		76	210	
Scientific/dev.	180/8		280/101		70/16	220/10	

AUG: Low q_{95} operation in NT

- **Proponents and contact person:**
  - B Vanovac, J Hobirk, T Pütterich, M Dunne, M Faitsch, O Nelson, O Sauter
- **Scientific Background & Objectives**
  - Establish low q 95 scenario
  - Important for comparison of performance/confinement between similar size machines AUG & DIII-D
  - Bt = -1.8 T and ~ -1.5 T to access low q_{95} ~ 3 at 600 kA. Therefore low B_t is needed.



Addressing Sci. Obj. 6

Continuation of 2025 effort

ECRH scheme at 1.5 T should be assessed

P1-2026-AUG

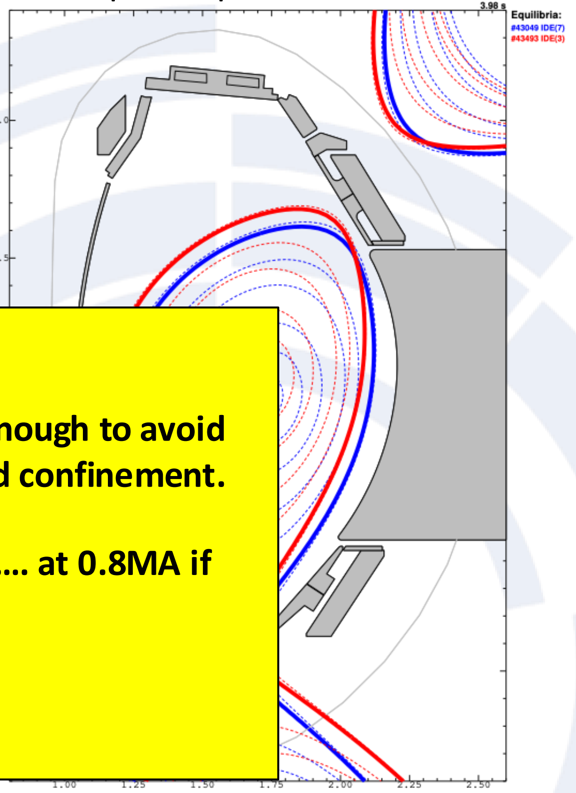
- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - Start with established 1.8 T scenario on AUG
  - Establish if the ECRH is possible to use at B_t ~ -1.5 T
  - Use ICRH if needed
  - Profile and turbulence diagnostics
  - This development would contribute to the proposal comparing AUG/DIII-D/TCV tokamaks

Proposed pulses

Device	# Pulses/Session	# Development
AUG	7	included
MAST-U		
TCV		
WEST		

AUG: Confinement studies in NT with stronger shaping

AUG shape development in 2025



- **Proponents and contact person:**
  - B Vanovac, O Nelson, O Sauter, J Hobirk, T Pütterich, M Dunne, M Faitsch, P Mantica, A Mariani
- **Scientific Background & Objectives**
  - Establish stronger shaping compared to the 2025 NT campaign.
  - Possible approach is through shaping ramps
  - If achieved, does this stronger shaping has a significant impact confinement?

Addressing Sci. Obj. 6

Current NT shapes in AUG are enough to avoid H-mode but not to see improved confinement.

So more shaping is worth doing.... at 0.8MA if possible...

P1-2026-AUG

- **Experimental Strategy/Machine Constraints an essential diagnostic**
  - Start from a 2025 reference
  - Perform shaping ramp of the X-point triangularity at fixed upper triangularity
  - Apply 'feedback' control on shaping at NBI power steps to prevent hitting the upper PSL due to Shafranov shift

Proposed pulses

Device	# Pulses/Session	# Development
AUG	10	included
MAST-U		
TCV		
WEST		

Comparative study of NT performance in TCV, DIII-D and AUG

- **Proponents and contact person:**
  - B Vanovac, O Nelson, O Sauter, J Hobirk, T Pütterich, K Thome, M Dunne, M Faitsch, P Mantica, A Mariani
- **Scientific Background & Objectives**
  - Establish the role that wall materials play in ELM-free access and performance in NT scenarios
  - Evaluate an impact that Er formation plays in determining whether NT plasmas enter H-mode
  - Establish the degree of similarity in confinement levels at similar target plasma conditions - if they differ find the reasons
  - Find which triangularity plays a crucial role and if it is machine specific; top, bottom or both
  - Understand if the the dominant turbulence (ITG, TEM, MTM) differ between NT plasmas in DIII-D and AUG

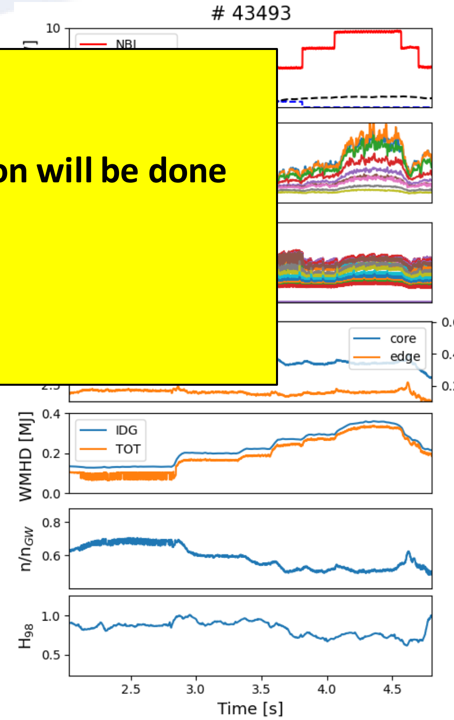
- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - Perform 'identity' experiments in AUG/DIII-D-TCV
  - Systematically vary upper and lower triangularity while fixing elongation and X-point position in TCV and DIII-D (in AUG this is likely not possible)
  - Conduct power scans and vary heating composition (ECRH vs. NBI)
  - Profile and turbulence diagnostics on all machines

Addressing Sci. Obj. 6

It is assumed that the comparison will be done for shapes developed in #012

P1-2026-AUG: reduced budget
P1-2026-TCV

DIII-D like pulse on AUG but at different q95



Proposed pulses

Device	# Pulses/Session	# Development
AUG	15	included
MAST-U		
TCV	15	included
WEST		

Characterization of edge fluctuations for NT plasmas with ballooning modes

- **Proponents and contact person:**
- margherita.ugoletti@igi.cnr.it, M. Agostini, M. La Matina, T. Bolzonella, L. Pigatto, B. Labit, P. Hennequin, S. Rienaecke… van Rossem, W. Yinghan

Addressing Sci. Obj. 1, 6

Can USN full NT be done in TCV?

Some experiments were done in the internal programme: what is missing?

PB/P2-TCV

- **Scientific Background & Objectives**

Negative triangularity (NT) achieves H-mode level core performance wit… edge, making it attractive for future fusion reactors

- *Ballooning mode instability in NT:* In NT configurations, ideal ballooning modes de… lower pressure gradients compared to PT, preventing the formation of the edge transp… (ETB) and suppressing H-mode.
- **Diagnostics and goals:** The Thermal Helium Beam (THB) diagnostics at TCV will be used to measure electron density, temperature, and filamentary structures, aiming to understand how plasma fluctuations change with plasma shaping

- **Experimental Strategy/Machine Constraints and essential diagnostic**
- Perform a scan in δ top in LSN on a shot-to-shot basis. Repeat the scan in δ bottom in USN to observe any differences. If there are no significant differences, prefer USN for compatibility with DBS and SPR. (5 shots)
- For each shot, apply a discrete ramp of NBI-1. Repeat the THB measurements during the various NBI-1 steps. (10 shots)
- Repeat most interesting shape with GPI mid-plane and SPR/DBS (10 shots).
- Note that the modification of δ is limited by the THB coverage.

THB is an essential diagnostic.

Proposed pulses

Device	# Pulses/Session	# Development
AUG		
MAST-U		
TCV	25	10
WEST		

Turbulent Edge/SOL Transport in EDA Regimes

- **Proponents and contact person:**
  - Miriam La Matina (miriam.lamatina@igi.cnr.it)
  - Matteo Agostini
  - Margherita Ugoletti
  - Benoît Labit
  - Michael Griener
  - Mack Van Rossem
  - Pascale Hennequin
  - Sascha Rienäcker

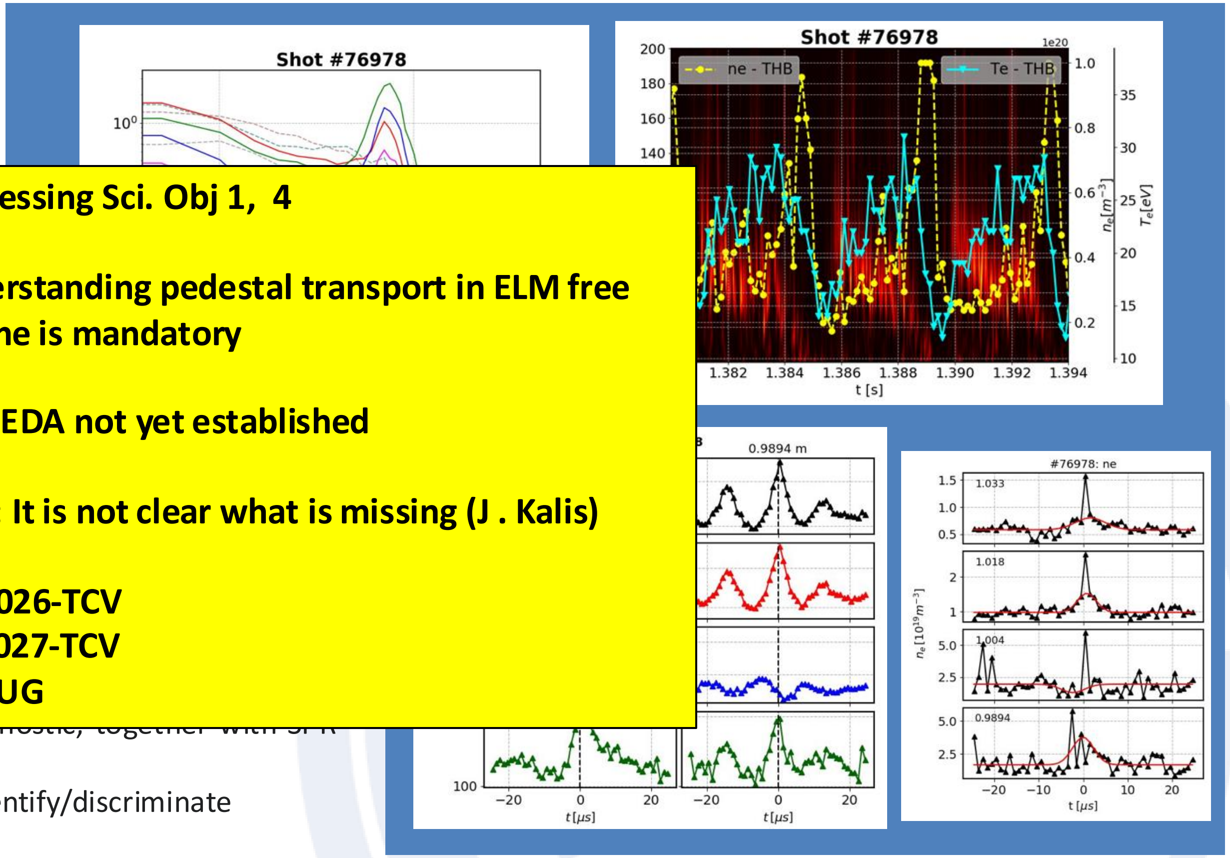
- **Scientific Background & Objectives**

Investigate turbulence activity and transport to identify their key characteristics and unders[...] shape and stability properties of the pedestal in the EDA regime, specifically detecting and [...] the edge region, like the QCM using as primary diagnostic the Thermal Helium Beam (THB) diagnostic, together with SPR diagnostic and DBS diagnostic that will be used to:

  - Characterize the fluctuation activity across the pedestal and the separatrix to better identify/discriminate instability regimes, reconstructing the electron temperature and density fluctuations;
  - Characterize of edge instabilities, including QCM modes;
  - Characterize the SOL filaments;

- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - Perform parameter scans: heating power, plasma density) (around 4 pulses for each scan)
  - Vary the plasma shape and study its influence on the regime and ELM avoidance (4 pulses)
  - Execute stationary discharges with optimized diagnostic settings for detailed characterization of plasma (4 pulses)

Required non-standard diagnostics: THB, SPR and DBS



Addressing Sci. Obj 1, 4

Understanding pedestal transport in ELM free regime is mandatory

TCV: EDA not yet established

AUG: It is not clear what is missing (J . Kalis)

PB-2026-TCV
P1-2027-TCV
P2-AUG

Proposed pulses

Device	# Pulses/Session	# Development
AUG	15	0
MAST-U		
TCV	20	0
WEST		

Exploration of RMP ELM mitigation and suppression in tight aspect ratio geometry

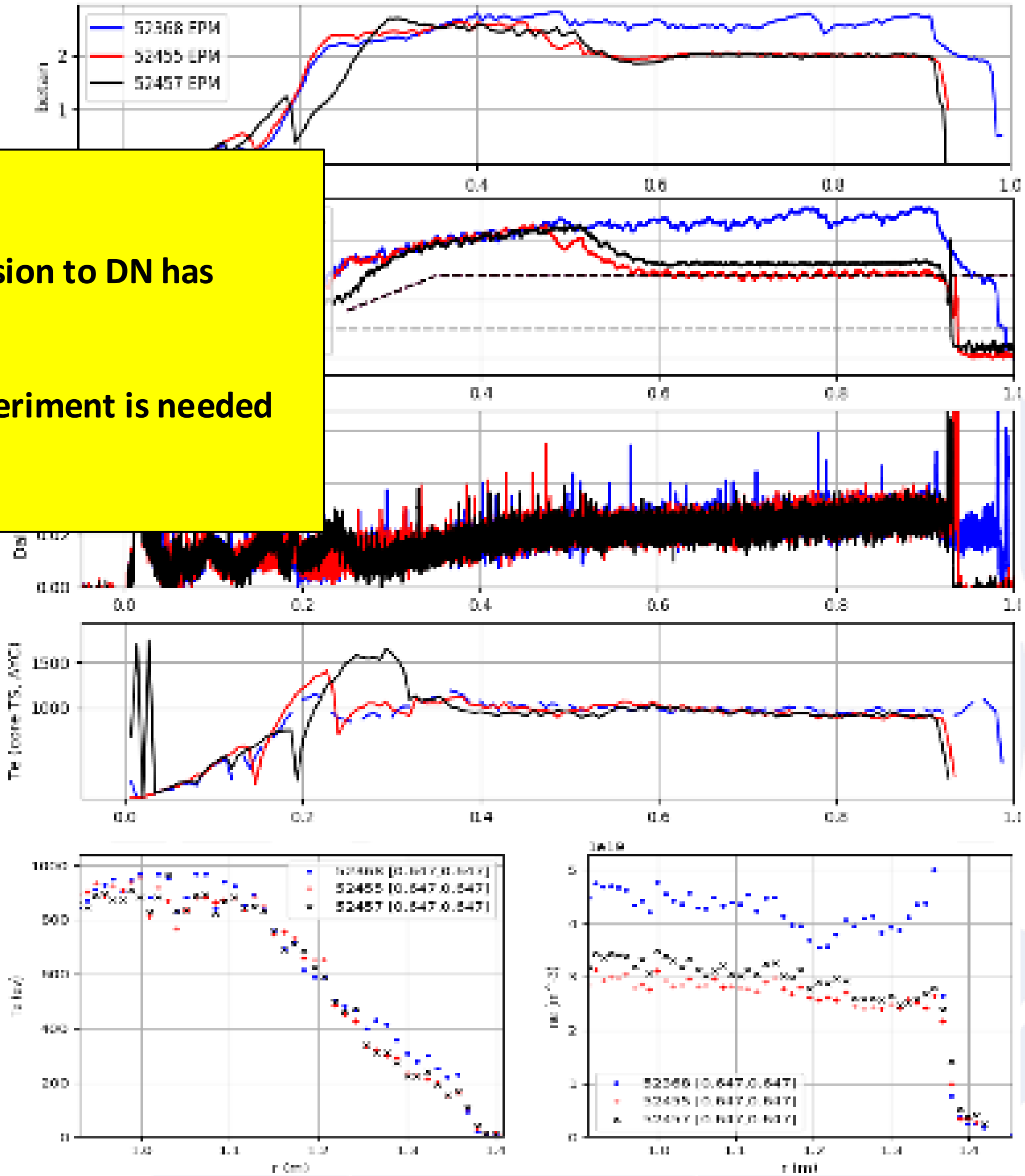
- **Proponents and contact person:**
  D A Ryan (David.ryan@ukaea.uk)
- **Scientific Background & Objectives**
  - ELM suppression recently discovered on MAST
  - Refine recently discovered n=3 suppression sce
  - Quantify suppression access windows
  - Expand suppression regime from lower single null to double null
  - Establish suppressed scenario with Super-X divertor
- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - Strategy is to first recover the ELM suppressed regime, then scan the fueling rate and q95 to improve the scenario robustness
  - With a more robust suppression scenario, we will then transition the scenario from LSN to DN, and separately from conventional divertor to SXD.
  - MSE diagnostic will be essential for accurate q profile reconstructions, and CXRS will be needed for rotation measurements.

Addressing Sci. Obj. 5

Due to time constrain, extension to DN has priority compared to SXD

Assessment of late-2025 experiment is needed

P1-2026-MAST-U



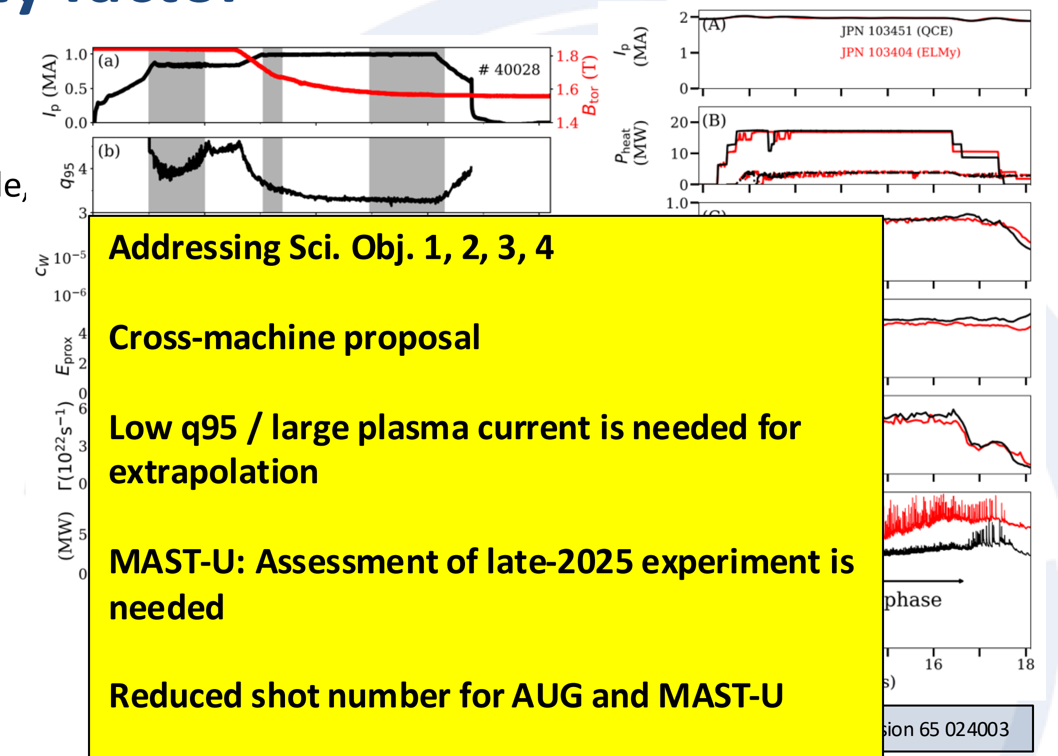
Device	# Pulses/Session	# Development
MAST-U	8/1	8/1

QCE exploitation: high current / low safety factor

- **Proponents and contact person:**
  - Michael.Faitsch@ipp.mpg.de, Mike.Dunne@ipp.mpg.de, Andres.Miller@ipp.mpg.de, Benoit.Labit@epfl.ch, samuli.saarelma@ukaea.uk, et al.

- **Scientific Background & Objectives**
  - QCE is well established scenario in AUG, TCV and now JET as of 2022 – has proven difficult to establish at highest currents
  - Evaluating access to regime at high current needed for extrapolation to next-step devices
  - Develop regime in three different devices would allow validation of theoretical and numerical models for global and local stability as well as estimates for increases in particle transport associated with absence of ELMs
  - Test ability to simultaneously achieve high shaping to avoid ELMs and operate in high current

- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - Develop QCE regime by using high shaping while pushing I_P to greater than 1 MA on AUG and MAST-U and to greater than 210 kA on TCV
  - On AUG, develop the QCE in USN to exploit new divertor and new shaping capabilities
  - Main diagnostics are all available edge and divertor diagnostics, e.g. edge/core/divertor TS, lithium beam, thermal helium beam, CXRS, LPs, IR, manometer, bolometer, in-situ Penning gauges; on MAST-U, HSV camera



Addressing Sci. Obj. 1, 2, 3, 4

Cross-machine proposal

Low q95 / large plasma current is needed for extrapolation

MAST-U: Assessment of late-2025 experiment is needed

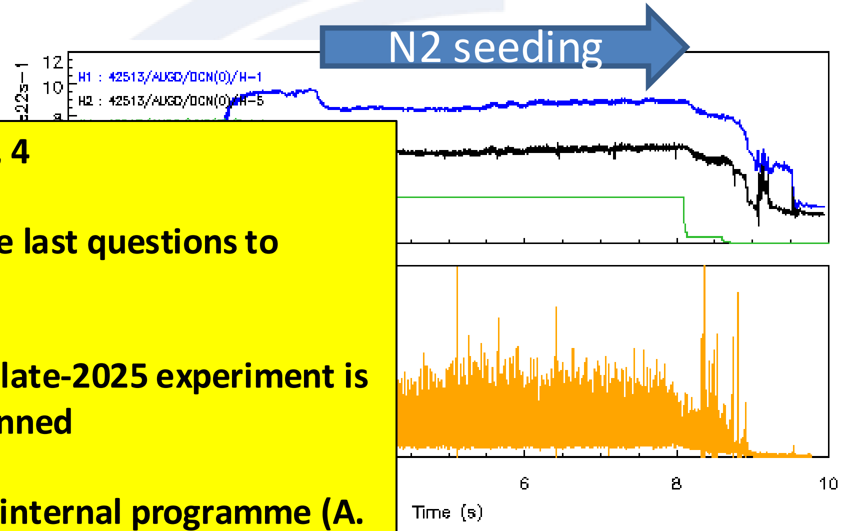
Reduced shot number for AUG and MAST-U

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

		…pment
MAST-U	12	-
TCV	20	-
WEST	-	-

QCE exploitation: seeding and detachment

- **Proponents and contact person:**
  - Michael.Faitsch@ipp.mpg.de, Mike.Dunne@ipp.mpg.de, Benoit.Lab samuli.saarelma@ukaea.uk, et al.



- **Scientific Background & Objectives**
  - Despite the high separatrix density and broad powe length, the divertor is not naturally detached in QCE
  - Dedicated seeding and detachment studies:
  - Nitrogen seeding to
    - characterize QCE access under seeded conditions (Zeff dependence of coll. vs ideal ballo
    - document filament behavior under seeding and buffering fractions

- **Experimental Strategy/Machine Constrai essential diagnostic**
  - Use a robust QCE scenario and add seeding (N2 (AUG, TCV & MAST-U); Ar and (AUG)
  - Main diagnostics are ELM/filament monitors, LPs to characterize divertor impact, all edge fluctuation measurements, bolometers

Addressing Sci. Obj. 1, 2, 4

Detachment is one of the last questions to answer for QCE

MAST-U: Assessment of late-2025 experiment is needed, if seeding is planned

TCV: Similar proposal in internal programme (A. Stagni) in late 2025 – Coordination

TCV: Extension to Ar?

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

	ession	# Development
AUG	12	-
MAST-U	8	-
TCV	20	-
WEST	-	-

Power threshold density minimum in I-mode and edge ion heat flux scaling

Addressing Sci. Obj. 3

Similar proposal as for 2025 Campaign

Not our priority for I-mode studies - missing time

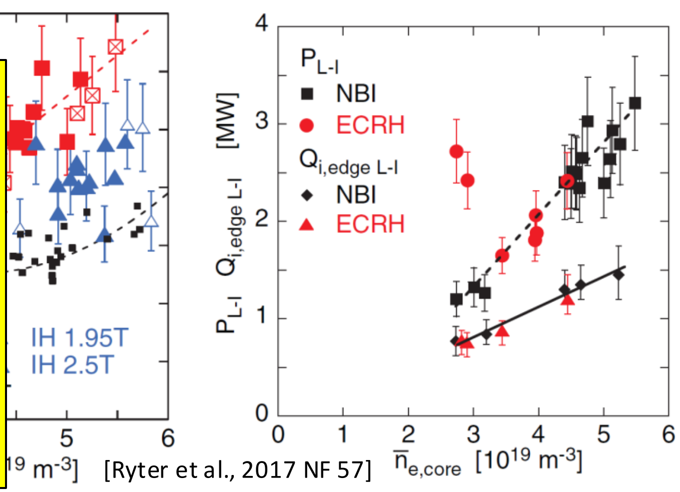
P2-AUG

Proponents and contact person:

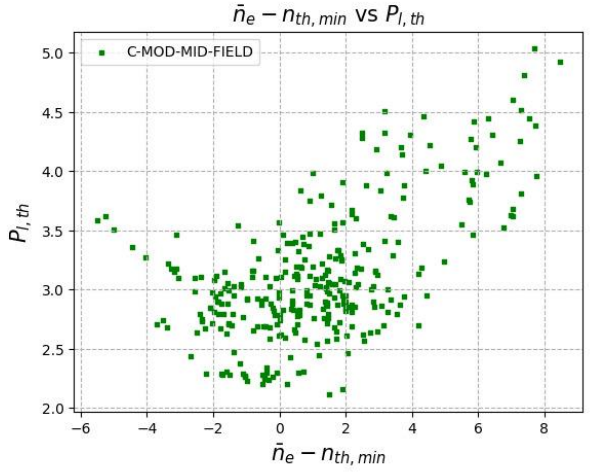
Jan Cecrdle (cecrdle@ipp.cas.cz), M. Komm, D. Silv
Cavallaro, O. Grover, T. Happel, B. Vanovac, L. Gil

Scientific Background & Objectives

- I-mode access in high density devices (COM difficult
- A minimal requirement I-mode access scalin should be established
- Objectives:
  - Conduct measurements of L-I threshold powers at low densities (in a range around 3.5e19 m^{-3}) (AUG)
  - Increase the amount of $Q_{i,edge}$ data at L-I transition to infer scalings
  - Construct a low requirement I-mode threshold scaling



[Ryter et al., 2017 NF 57]



Experimental Strategy/Machine Constraints and essential diagnostics

The experimental strategy applies to all proposed densities (5 density levels around 3.5e19 m^{-3} each repeated twice with different X-point positions):

•First phase: After reaching flat-top phase (2 s < t < 4 s) Ramp up ECRH power by 200 kW increments to find I-mode threshold

•Further increase power to find H-mode thresholds if possible

•Second phase: (4 s < t) switch of ECRH and repeat the first phase procedure with NBI until ramp-down

During the ECHR phase NBI blips will be utilized for Ti data acquisition

Proposed pulses

Device	# Pulses	# Dev.
AUG	10	

#019

I-mode detachment: access and operational window with Ar and Kr

- **Proponents and contact person*:**
  - Daniel Fajardo*
  - Davide Silvagni
  - Clemente Angioni
  - Luis Gil
  - Ondrej Grover
  - *et al…*

Addressing Sci. Obj. 3

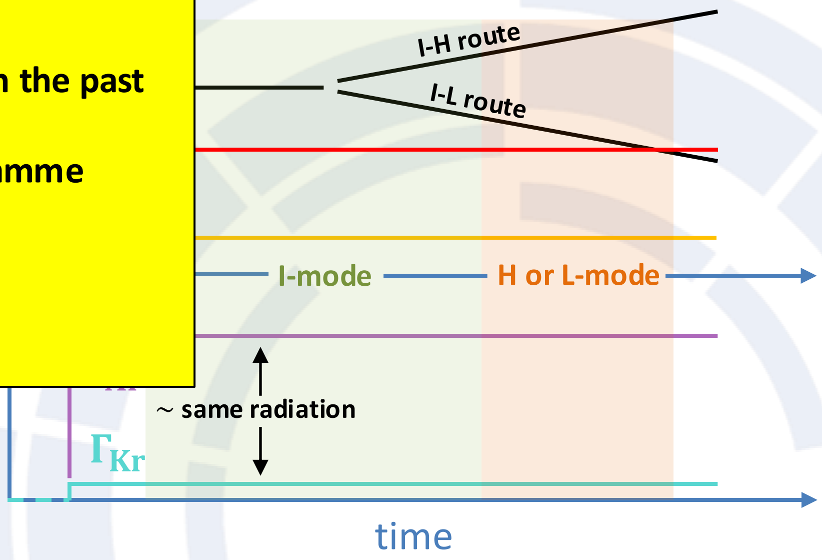
Detachment was an issue of I-mode in the past

Nice progress made in internal programme

Clear proposal

P1-2027-AUG

- **Scientific Background & Objectives**
  - Background: experiments during the 2025 AUG detached scenario at high heating power and h suspected to be in the I-mode regime
  - Objectives:
    - Map the operational window of the detached Ar-seeded I-mode
    - Establish a detached Kr-seeded I-mode (same radiation at lower Zeff/dilution)
    - Map the operational window of the detached Kr-seeded I-mode



- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - Starting from reference AUG #42734, perform NBI power ramps until I-mode is lost (ramp up until I-H transition, down until I-L transition)
  - Change Ar to Kr, adjusting the seeding rate for a similar radiated power. Once Kr scenario is established, perform similar power ramps as with Ar
  - Diagnostics:
    - Detachment: Langmuir probes, infrared cameras
    - Weakly coherent mode: reflectometer, CECE, thermal He beam
    - Confinement regime: edge Er (Doppler reflectometer), edge CXRS

Proposed pulses

Device	# Pulses/Session	# Development
AUG	10	2
MAST-U	-	-
TCV	-	-
WEST	-	-

#020

Bt scaling of I-mode access, confinement and local operating space

Contact person: John Rice (rice@psfc.m

- **Other Proponents** Amanda Hubbard (MIT PSFC), Andres Miller, Grover, T. Happel, D. Fajardo (IPP Garching), Laure Vermare (Ec Morales, Clarisse Bourdelle, Patrick Mage

Scientific Background & Objecti

- Current EU-US I-mode dataset has strong correlation between Bt ar extrapolations to future devices uncertain. SepOS dat
- Aim to demonstrate stationary I-modes at a range of Bt up to 3.5 T or at 3.7 T on WEST.
- Will add these to EU-US I-mode database and derive improved confin Bt and device size, for extrapolation to future devices.

Addressing Sci. Obj. 3

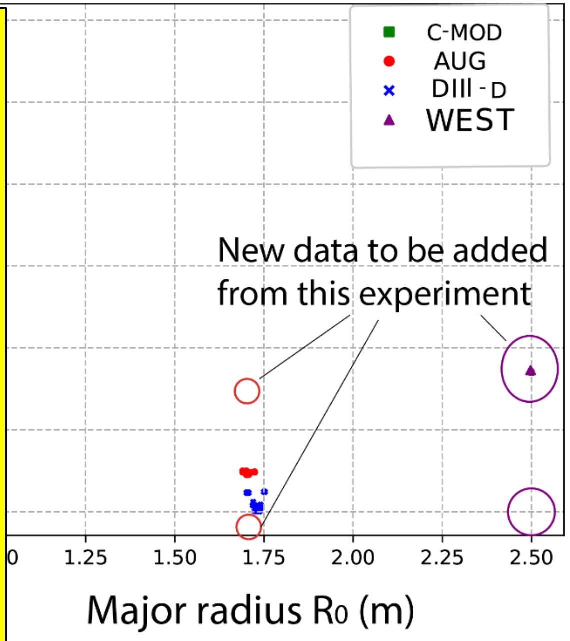
Assessing power threshold for I-mode is not a priority for WPTE compared to detachment

AUG: no ECRH scheme for operation at 3.5 T -> Might be a problem

WEST: is operation at 2T demonstrated?

WEST: final assessment will depend on the outcome of session next week

P2-AUG
P2-WEST



Experimental Strategy /Machine Constraints and es

AUG:

- Use shape from 2.5 T I-mode discharges. Fix Ip 0.8 MA and ta
- Scan B_T. **Top priority to use newly available 3.5 T** (or highest that engineering analysis allows). At each field, need 2-3 discharges: Ramp to determine L-I and I-H thresholds, long stationary steps for confinement analysis.
- Lower priority 1.9 T, if shots allow repeat 2.5 T for check of consistency.

WEST

- Start with existing transitions/candidate I-modes (Vermare et al NF 2022): **USN, 3.7 T, 500 kA, n_e~4.5x10^{19} m^{-3}**.
  Step or ramp LH power to find L-I, I-H thresholds. + use maximum ECH if avail.
- Scan target n_e down, then up and down to determine n_e for minimum P(L-I), scaling.
- A 2nd session would enable comparison at 2.0 T, improve scalings.
  Pedestal, turbulence diagnostics (eg ETS, DBS, reflectometer) are key on both tokamaks.

Device	# Pulses/Session	# Development
AUG	6-9 pulses	
MAST-U		
TCV		
WEST	40 pulses/2 sessions	

#021

QCE exploitation: disentangle role of shaping parameters on regime access

Contact person: Andrés Miller (andres.mill

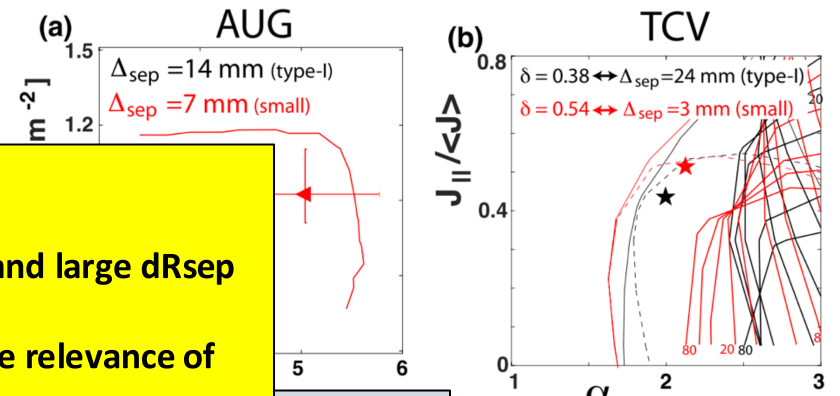
Co-proponents: Michael Dunne (mike.dunne@ipp.mpg.de), Ber
Michael Faitsch (michael.faitsch@ipp.mpg.de), Jörg Hobirk (jorg
Giannone (louis.giannone@ipp.mpg.de)

Addressing Sci. Obj. 1,3, 4

ITER will operate at high kappa and large dRsep

Will be a nice confirmation of the relevance of the shaping parameter Sd

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

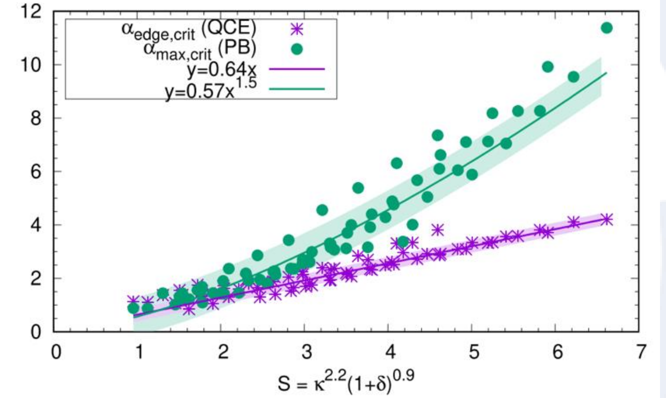


Fusion 59 086020

- **Scientific Background & Objectives**
  - Attractive alternative to the Type-I ELMy H-mode – high performance
  - The regime has now been robustly established on AUG, shaping and high n_{sep} – impact of different shaping para

Goal: Disentangle impact of δ and κ from dR_{sep} in access to QCE

- On both AUG and TCV, scan shaping parameters at different values of dR_{sep} to identify QCE regime access condition
- Study impact of different shaping parameters on stability to PBMs and KBMs and compare this with IPED modeling (MISHKA/HELENA)
- Evaluate impact of shaping parameters on pedestal structure and performance



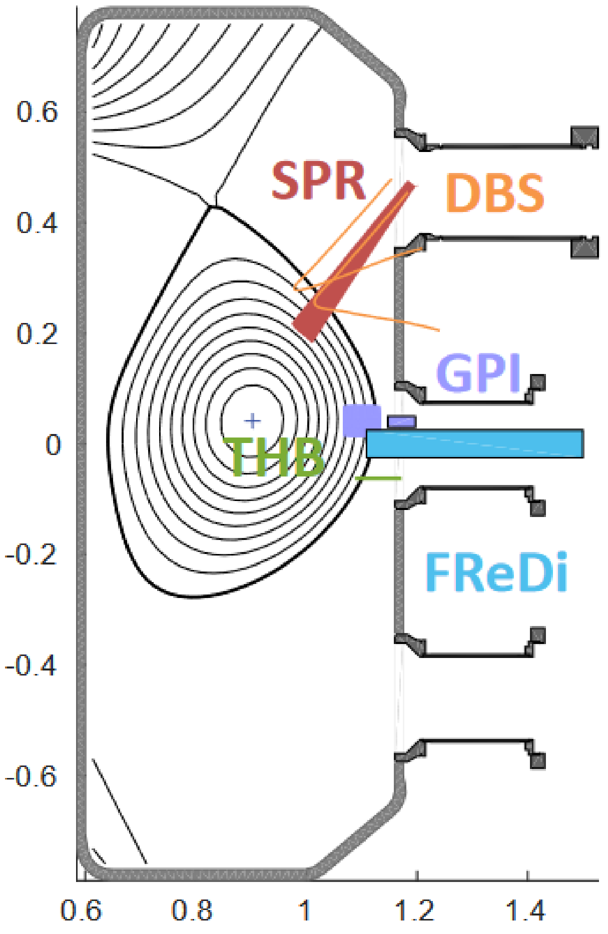
M. Dunne et al 2024 Nucl. Fusion 64 124003

- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - Low I_P scenarios and new machine capabilities to allow for flexibility in varying shaping parameters independently (not possible until recently)
  - Dedicated scans in δ and κ at different values of dR_{sep} on both AUG and TCV
  - Main diagnostics are magnetics, ELM/filament monitors, Thomson scattering, and edge fluctuation measurements are desired

Proposed pulses

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

Edge turbulence characterization in Type I ELMy H-mode, QCE and mixed regimes



Proposed pulses

Device	# Pulses/Session	# Development
TCV	18	5

Proponents and contact perso

- Alysée Khan (alysee.khan@epfl.ch)
- Olivier Février (olivier.fevrier@epfl.ch
- Christian Theiler (christian.theiler@ep

Addressing Sci. Obj. 1, 4

Continuation of ongoing effort to understand turbulent transport in pedestal and SOL for QCE

The new probe will allow Ti measurements (among others)

P1-2026-TCV
P1-2027-TCV

Scientific Background & Objec

- **Type-I ELMy H-mode** and **quasi-continuou** different pedestal turbulence, with transiti instabilities
- **Fuelling** and **triangularity** strongly affect the nature of the turbulence, yet this dependence remains poorly understood despite its close link to heat and particle loads on plasma-facing components

➢ **The objective is to characterize the pedestal turbulence in Type-I ELMy H-mode, QCE, and mixed regimes.**

Experimental Strategy and essential diagnostics

- **Parameter scan** at two fueling levels and three triangularities in Upper Single Null configuration (18 shots, 5 for development)
- **Multi-diagnostic approach** for pedestal turbulence characterization: GPI, SPR, DBS, THB, FReDi
- **Stability analysis** of peeling and peeling–ballooning modes

Characterization of edge dynamics in EDA H-mode

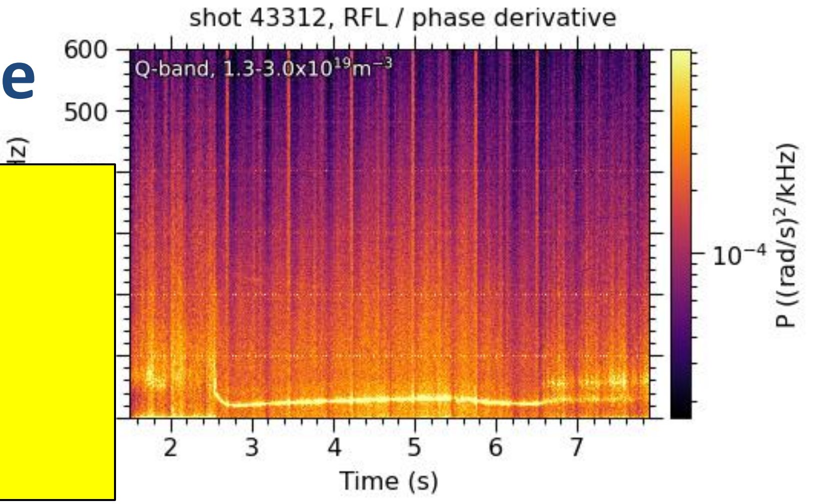
- **Proponents and contact person:**
- Mário Vaz (mariovaz@tecnico.uli
  C. Silva, G. D. Conway, J. Schellpfe
  Birkenmeier, X. Liu

Addressing Sci. Obj. 1, 2, 4

The experimental strategy is not clear

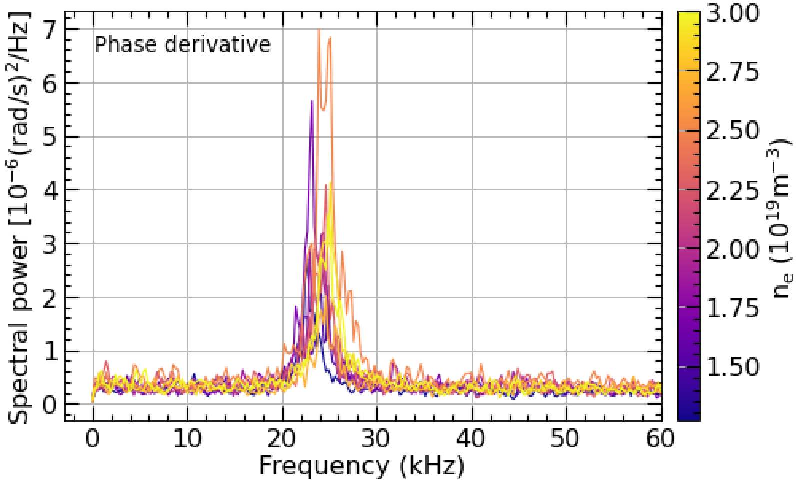
What is missing? (J. Kalis, G. Grenfell,…)

PB/P2-AUG



- **Scientific Background & Objectives**

  The EDA H-mode is a promising no-ELM regime, where the QCM plays a major role in enhancing transport. Yet, contradictory measurements of the QCM position and propagation velocity exist at both C-mod and AUG. This work will:
  - Characterize the edge dynamics (inc. QCM)
  - Compare results with turbulent simulations/other diagnostics



- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - High density, high triangularity discharges with dominant ECRH heating + NBI for extra power and CXRS
  - Stationary discharges for hopping characterization
  - Discharges in pairs to allow complete usage of reflectometry systems

Proposed pulses

Device	# Pulses/Session	# Development
AUG	6	<- Included

#024

Negative triangularity in conventional vs spherical tokamaks

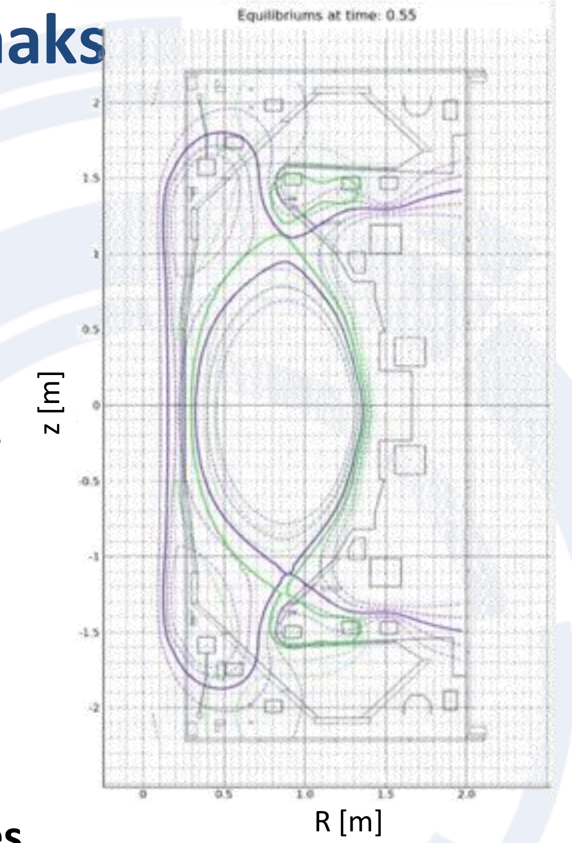
- **Proponents and contact person:**
  D.J. Cruz-Zabala (dcruz3@us.es), P. Cano-Megias, C. Vincent, E
  J. Galdón-Quiroga, S. Henderson, O. Myatra, A.O. Nelson, S. Saare
- **Scientific Background & Objectives**
  - Negative triangularity (NT) in combination with spheric … O →
    compact configuration with relaxed heat exhaust requ
  - Theoretical studies suggest a possible degradation of N … **eriments**
    are needed to confirm/refute predicted transport cha
  - Following first **ST-NT** plasma experiments in MAST-U[2] (… on in
    physics studies (**#52384**, see figure)
- **Objectives:**
  - **Experimentally address** the impact of aspect ratio on N
    - Is NT in STs feasible at MAST-U B_t?[3]
    - Characterize transport and stability in STs NT → Which turbulence mechanism is dominant?
  - **Compare** NT performance in **three different machines** (TCV, MAST-U, SMART).
  - Assess **ELM-suppression** characteristics of NT plasmas in STs
  - Study **power degradation** in NT plasmas
- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - **In MAST-U,** start from NT scenario developed by C. Vincent et al during the internal campaign.
    Then, scans in power, density, torque and triangularity (if possible)
  - **In TCV, take advantage** of the **shape capabilities** to develop NT plasmas as similar as possible
    to the ones at **MAST-U** and **SMART**
  - **Matching discharges** in **PT** to evaluate performance of **NT**
  - **Essential diagnostics**: TS, ECE, CXRS, turbulence diagnostics, FILD

Addressing Sci. Obj. 6

The benefit of NT might "disappear" at low A for TEM dominated turbulence and a demonstration of this would reinforce our understanding of NT confinement

MAST-U: a session is supported but lower priority wrt other RT02-P1-2026

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



Proposed pulses

Device	# Pulses/Session	# Development
AUG		
MAST-U	20	0
TCV	15	15
WEST		

Detached high-power L-Mode negative-triangularity reactor relevant scenarios

- **Proponents and contact person:**
  - Garance Durr-Legoupil-Nicoud garance.durr-legoupil-nicoud@epfl.ch
  - O. Février, J. Morales, S. Coda, O. Sauter, H. Reimerdes, C. Theiler

- **Scientific Background & Objectives**

Negative triangularity (NT) may bring H-mode grade confinement in L-Mode operation, m it an attractive solution for a reactor.

This proposal aims to pursue the investigation and characterization of NBH-heated NT scenario, i particular from the point of view of core-edge integration (operation with a detached divertor)

→ Continue, in TCV, developing a high-power NT L-mode scenario which power-exhaust compatible an reactor relevant
  - ➢ Extend heating scheme to ECRH, pushing triangularity to stronger values (avoid H-Mode)
  - ➢ Use rt-beta control to maintain high β_N

→ Perform detachment studies in these scenarios using N_2 injection at various levels of power. Assess the achievement of X-Point Radiator Regime. Investigate the nitrogen penetration in the core and thus core-edge compatibility (effect of detachment on confinement). In a second phase, other impurities could be attempted.

Can a fully detached NT L-mode matching H-mode PT performances be obtained on TCV *[Durr-Legoupil-Nicoud'EPS25, Février'IAEA25]*? On WEST ?

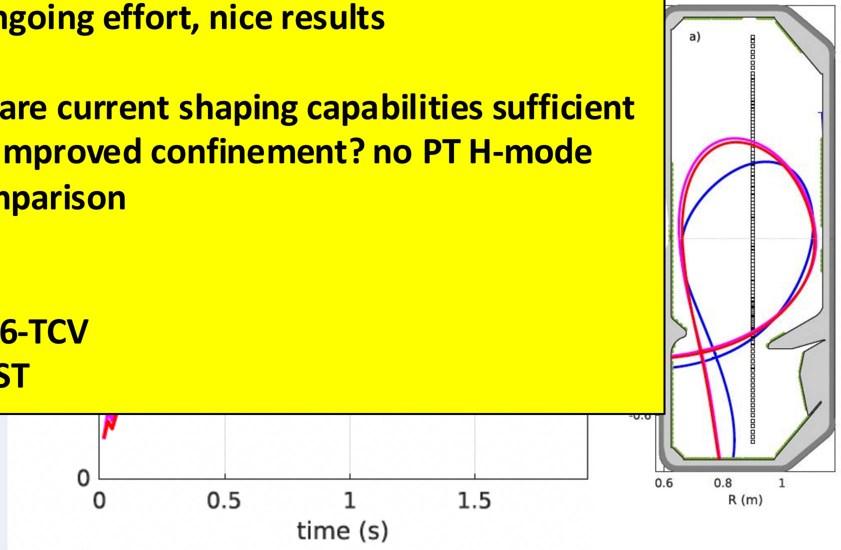
- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - TCV
    - → N_2 seeding ramps with NBI and ECRH (X3) in NT plasma: multiple input power levels, N_2 seeding at different rates
    - → Essential diagnostics: edge diagnostics (IR,LP,etc) and CXRS
  - WEST
    - → NT scenario, ECRH/LHCD/ICRH

Addressing Sci. Obj. 6

TCV: ongoing effort, nice results

WEST: are current shaping capabilities sufficient to see improved confinement? no PT H-mode for comparison

P1-2026-TCV
P2-WEST



Proposed pulses

Device	# Pulses/Session	# Development
AUG		
MAST-U		
TCV	20	20
WEST	15	5

Fast-ion transport in negative triangularity

- **Proponents and contact person:**

J. Rasmussen, L. Meier, S. K. Nielsen, S. B. Kor
M. Salewski, (DTU), L. Porte (EPFL) jeras@fysi

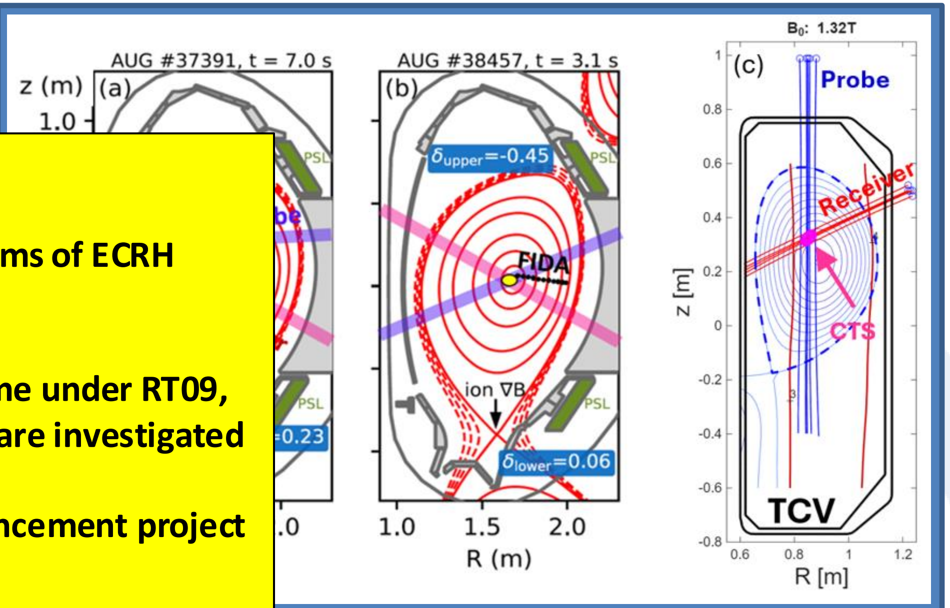
Addressing Sci. Obj. 6

AUG: demanding proposal in terms of ECRH settings

TCV: might find experimental time under RT09, where effects of NT on FI losses are investigated

TCV: CTS is an EUROfusion Enhancement project

PB/P2-AUG
PB/P2-TCV



eometries for (a) edge and (b) core n AUG δ < 0 plasmas [T. Happel+ 2023 NF] and comparison to one of the AUG FIDA views (with angle to ***B*** of $\varphi \approx 12^{0}$). (c) Example CTS geometry for the new TCV CTS diagnostic ($\varphi \approx 75^{0}$).

- **Scientific Background & Objectives**

Recent results from DIII-D, TCV, and AUG show co results on fast-ion transport in δ < 0 plasmas. It is understanding of this as part of assessing neg. tria contender for power plant operation. To this end,

- Quantify fast-ion transport vs. δ < 0 at multiple plasma locat confined+lost fast-ion diagnostics on AUG/TCV, including new TCV CTS diagnostic (Figure)
- Identify evidence of anomalous transport and impact of Alfven Eigenmodes on fast ions in δ < 0 plasmas
- Quantify core/edge turbulence and fast-ion diffusion vs. δ < 0 across devices for comparison to existing δ > 0 discharges

Proposal is connected to RT02 D6 (confinement in neg. triangularity) + RT09 D1–D3 (fast-ion transport)

- **Experimental Strategy & constraints**

- Matched triangularity scan at AUG+TCV down to <δ> ≈ −0.2 + further scan at TCV to <δ> ≈ −0.6
- Fast-ion measurements at AUG+TCV using CTS, FIDA, FILD, NPAs where available
- NBI with on- and off-axis deposition to vary fast-ion distr. function and location
- ICRH (AUG) or NBI2 (TCV) to drive Alfven Eigenmodes unstable
- 3 ECRH lines for CTS at AUG, 2 lines at TCV

Proposed pulses

Device	# Pulses/Session	# Development
AUG	6	3 (of the 6)
TCV	8	1 (of the 8)

#027

Development of stationary QH-mode with co-current beams

- **Proponents and contact person:**
  E. Viezzer evieзzer@us.es, S. Saarelma, E. R. Solano, J. Hobirk
  R. Ernst, L. Gil, P. Cano Megias, A. Pau, A Cathey

- **Scientific Background & Objectives**
  - Future fusion devices need to avoid high confinement c
    no-ELM regimes are considered as alternative
  - **Demonstrate compatibility of stationary QH-mode**
  - **Establish stationary QH-mode, low ν_{ped}***
    - Characterize parameter dependencies of QH-mode
    - Analyze pedestal structure and stability and compar
    - Quantify effect of rotation on EHO
    - Study role of q_{95} for accessing sustained QH-mode
    - Study impact of edge ECCD on EHO and ELMs
    - Test and further develop models for EHO

Addressing Sci. Obj. 1, 3, 4

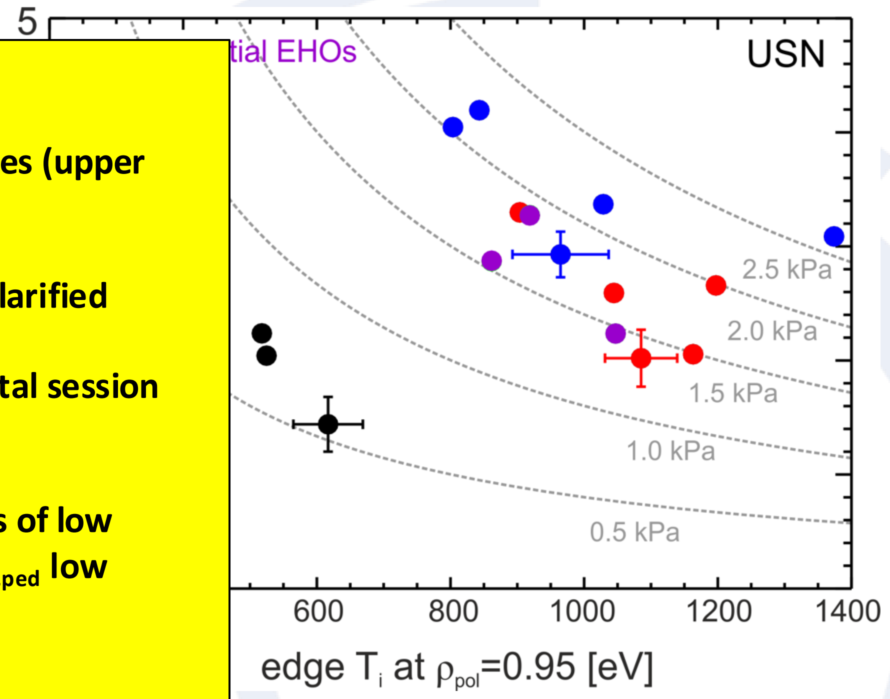
AUG:Issues with machine capabilities (upper cryo) in 2025 are acknowledged.

AUG: Experimental strategy to be clarified

MAST-U: Assessment of experimental session later this year to be done

Will help understanding the physics of low collisionality pedestals even if at $f_{G,ped}$ low compared to ITER

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



- **Experimental Strategy/Machine Constraints &**

  AUG: co-Ip NBI
  - Low collisionality USN scenario, high δ with cryo-pump
    boronization essential. Develop USN, DN, LSN flips.
  - Subset of pulses with edge ECRH at 105 GHz to drive edge ECCD (#41229, #41231). Scan in edge rotation (tangential vs. radial beams, MPs, NBI vs wave heating)
  - Explore changes between LSN and USN to decrease density, RMP during L-mode?

  MAST-U:
  - High temperature pedestal reference scenario (#49360), use new cryopump. Fresh boronization essential.
  - Change plasma rotation using RMP coils.
  - At best I_p value, B_t scan. Gas scan.

  Common to both:
  - Scan in heating power, q95 via I_p scan, outer gap.
  - Profile and fluctuation diagnostics essential to characterize QH-mode pedestal and EHO

d pulses

Device	# Pulses/Session	# Development
AUG	30 pulses	15
MAST-U	8 pulses/1 session	8 pulses 2025
TCV		
WEST		

Impact of triangularity in I-mode and L-I-H transitions

- **Proponents and contact person:**
- Mário Vaz (mariovaz@tecnico.ulisbo
  Silva, G. D. Conway, D. Silvagni, A. Hu

- **Scientific Background & Objectives**
  Plasma shaping is known to strongly influen
  and accessibility of both H- and I-modes, ye
  not been investigated in I-modes at AUG.
  Objectives:
  - Assess the impact of triangularity on I-mode **access** and **performance**
  - Characterize edge dynamics in strongly shaped I-modes
  - Assess the impact of density on I-mode access and performance in strongly shaped plasmas

Addressing Sci. Obj. 1, 3, 4

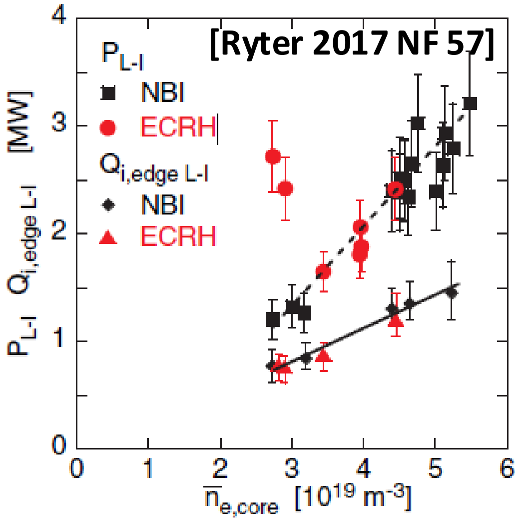
Strategy to be clarified: scan values in both delta and density?

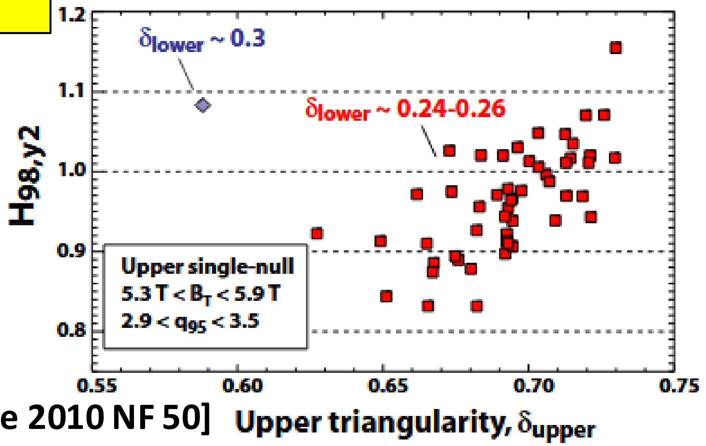
P_{L-I} is not a top priority for WPTE

Limited amount of time

P2-AUG

- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - High triangularity discharges with dominant ECRH heating + NBI for extra power and CXRS
  - Shots is unfavorable $B \times \nabla B$ drift configuration and upper-single null
  - A total of 8 shots is proposed:
    - 2 delta values X 4 densities





[Whyte 2010 NF 50]

Proposed pulses

Device	# Pulses/Session	# Development
AUG	8	<- Included

Towards long-pulse operation in negative triangularity plasmas

- **Proponents:** Jorge Morales, Antonia Frank, Patrick Maget, Pie
Fil, Rémi Dumont, Alessandro Marinoni, Olivier Sauter, Olivie
person: jorge.morales2@cea.fr

- **Scientific Background & Objectives**

Negative triangularity (NT) scenarios are suitable candidates fo
regarding core-edge integration. However, long-pulse operation
fusion power plants. The objectives are:

  - Determine the conditions required to achieve zero loop v
  - Assess whether a NT compared to a positive triangularity
hinders access to non-inductive regime
  - For NT plasmas, evaluate the difference in current drive e
two pairs of systems: ECCD+LHCD (WEST) and ECCD+NBI (

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

To facilitate the comparison between WEST and TCV, we will r
developed in WEST on TCV. At the same time, we will program an ECCD-only phase at the beginning of the discharges to have a time period where the heating systems are the same in both devices (if possible, at the same injected power).

WEST:
- Start with already developed NT scenarios at 300kA and low density (#60845). The maximum LHCD injected power was 1.5 MW (minimum Vloop achieved was 200mV).
- Perform different scans in injected power, density and Ip to minimize the loop voltage.
- In a second session, perform similar scan in reference PT plasmas.

TCV:
- Start from already developed non-inductive scenario in TCV (e.g. #87527)
- With WEST-like shape, perform similar scan in power, density and Ip.
- In a second session, perform similar scan in reference PT plasmas.

Essential diagnostics: loop voltage measurements, kinetic profiles (TS, ECE)

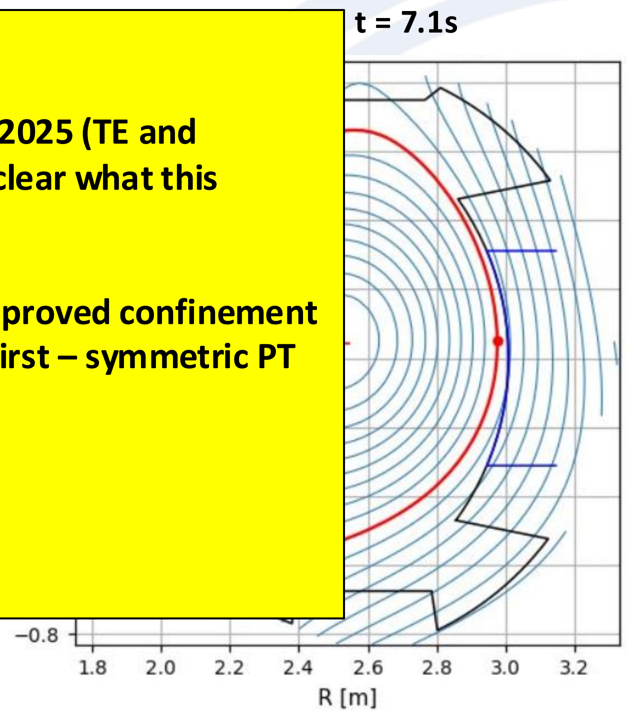
Addressing Sci. Obj. 6

TCV: a lot has been done in 2025 (TE and internal programme) – not clear what this proposal brings more

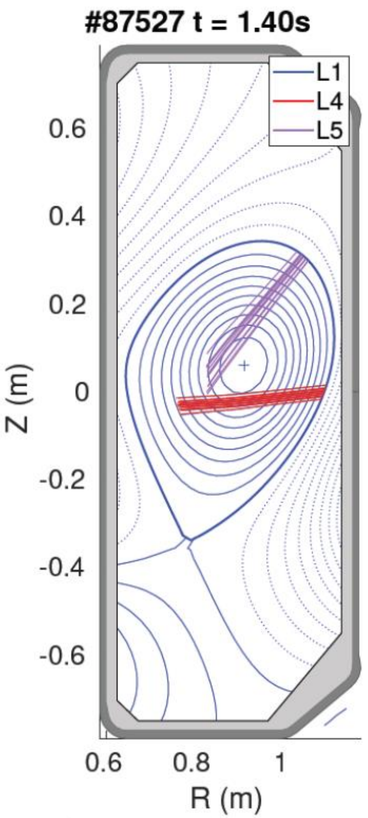
WEST: more shaping and improved confinement needs to be demonstrated first – symmetric PT shape looks impossible

P2-WEST
P2-TCV

WEST



TCV



Proposed pulses

Device	# Pulses/Session	# Development
TCV	50/2	15
WEST	40/2	5

#030

Neon transport in EDA H-mode pedestals

Background:

- New framework at AUG disentangling the D and v transport coefficie… …dented radial resolution and uncertainty quantification
- Determination of neoclassical and anomalous contributions by comp… …ulations

…8275.
…sion 50, 095010.

Addressing Sci. Obj. 1, 4

Diagnostic issues from past experiments are acknowledged

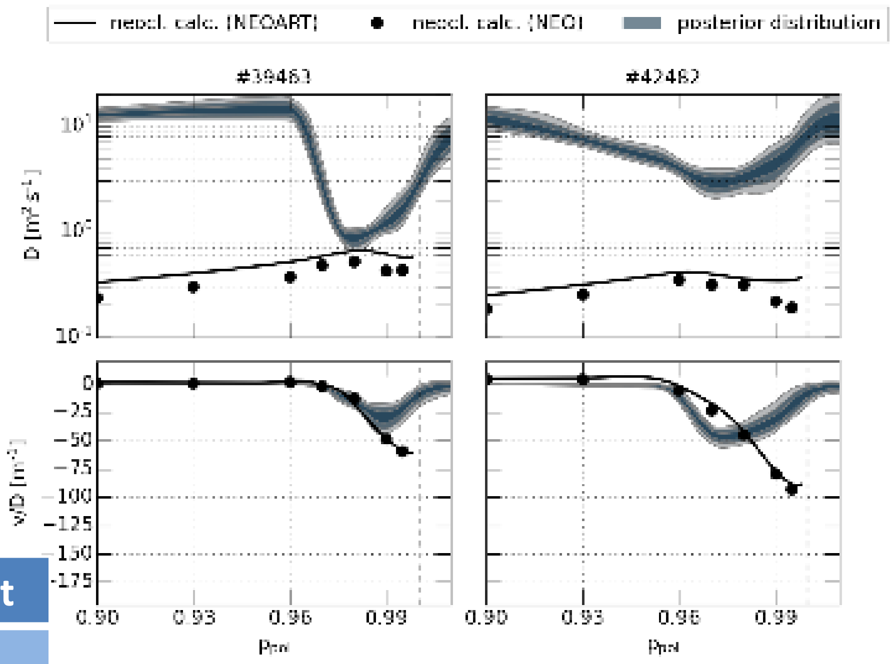
Will complement QCE and RMP data

P1-2026-AUG

Result for QCE discharges: significant anomalous diffusion in the pedestal, explaining beneficial impurity behavior at AUG

Result for the EDA H-mode: inconclusive

- Different findings in different discharges caused by poor data quality (see figure)
- Some discharges close to QCE with broad-band QCM



Proposal:

- Repeat of stationary EDA H-mode discharges with better data quality
- Examine changes in impurity transport along a stepwise transition from QCE to EDA

Device	# Pulses/Session	# Development
AUG	3	3

#031

Impurity transport dependence on negative and positive triangularity

- **Proponents and contact person:**

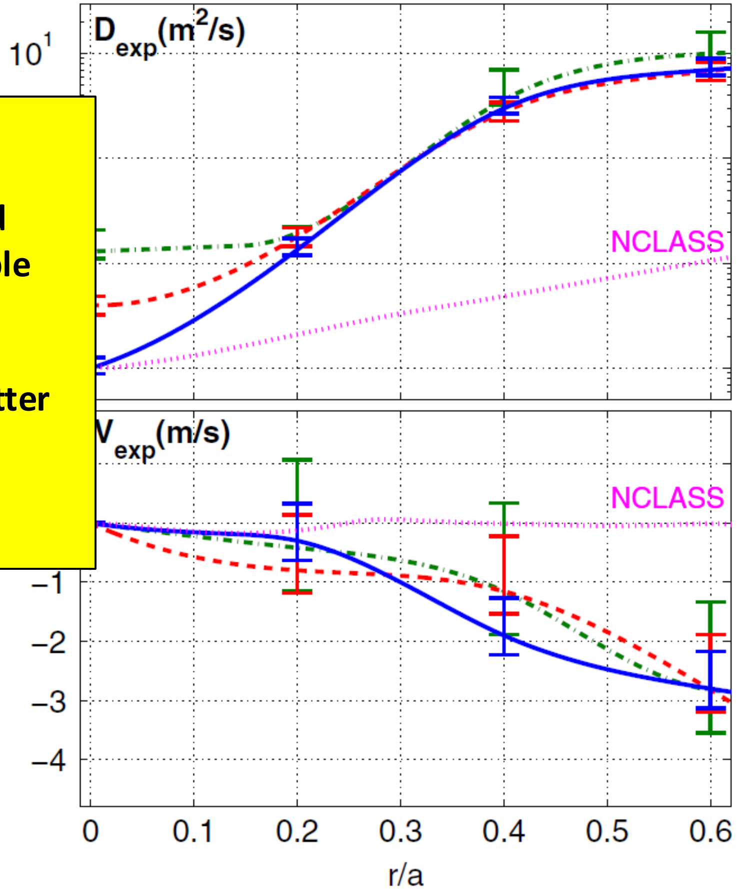
J. Morales, R. Guirlet, P. Manas, P. Maget, T. Barbu
Marinoni, O. Sauter, O. Février
Contact person: *jorge.morales2@cea.fr*

Addressing Sci Obj 6, 4

Not clear why WEST should be better placed than AUG. PT flipped shape not really feasible

Improved confinement on WEST not demonstrated: shaping capibilities to be better evaluated

P2-WEST



[Villegas, PRL 2010]

- **Scientific Background & Objectives**
  - Tungsten contamination in core must be mi
  - Negative triangularity plays a role in confine
  - Objectives :
    - ***Compare impurity (W, Ni) transport in NT and PT configurations***
    - ***Compare role of triangularity in various heating scenarios***
- **Experimental Strategy/Machine Constraints and essential diagnostics**
- L-mode plasma with Laser Blow Off (LBO) for W and Ni injections. Also, ICRH modulations can be used to produce a transient W sources.
  - *Ohmic and LHCD / ECRH / ICRH heated plasmas*
  - *Pairs of similar pulses in NT and PT*

  For each different heating mix and plasma shape perform a power and a density scan
- **Essential diagnostics:** VUV spectroscopy, soft x-rays, multi energy soft x-rays, bolometer, ECE, Thomson scattering and edge reflectometry

Proposed pulses

Device	# Pulses/Session	# Develop
WEST	40 / 2	

#032

EDA H-mode development in AUG and TCV

- **Proponents and contact person:**

L. Gil (luis.gil@tecnico.ulisboa.pt), B. Labit, M. Vaz, M. Faitsch, O. Sauter,

- **Scientific Background & Objectives**
  - EDA H-mode: promising no-ELM regime in several devices, but cru
  - Main AUG objectives:
    - Develop similar EDA scenarios at different magnetic field
    - Understand effect of B_t/ρ^* on EDA access, dynamics, and performance
  - Main TCV objectives:
    - Achieve and explore unequivocal EDA H-modes in TCV for the first time
    - Understand effect of shaping on EDA access, dynamics, and performance
  - Cross-machine objectives:
    - Bridge EDA experiments between devices of different size (incl. JET)
    - Build a unified understanding of EDA H-mode physics

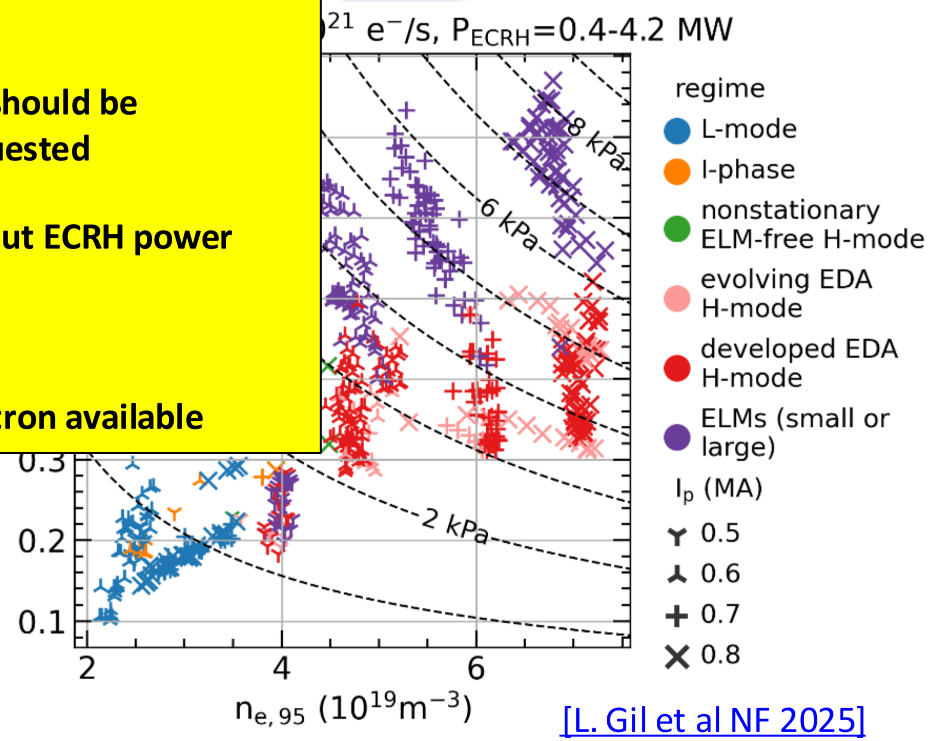
- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - AUG:
    - High δ, ICRH+NBI power ramps at different B_t
    - Vary I_p, fueling, … to match (non-)normalized parameters (e.g. q_{95}, $n_{e,sep}$, …)
    - Stationary discharges for detailed characterization
  - TCV:
    - High δ discharges predominantly heated by ECRH (X3)
    - If regime is found - parameter scans (incl. shape)
    - Stationary discharges for detailed characterization

Addressing Sci. Obj. 3

AUG: experimental strategy should be prioritized with 10 shots requested

TCV: was accepted for 2025 but ECRH power was missing

P1-2027-AUG
P1-2026-TCV: once new gyrotron available



[L. Gil et al NF 2025]

Proposed pulses

Device	# Pulses/Session	# Development
AUG	10	
TCV	10 pulses + 40 if regime is found	

#033

Impact of resonant field amplification (RFA) on edge magnetic structure and ELM control in high-beta plasmas

Preparation for JT-60SA exploitation

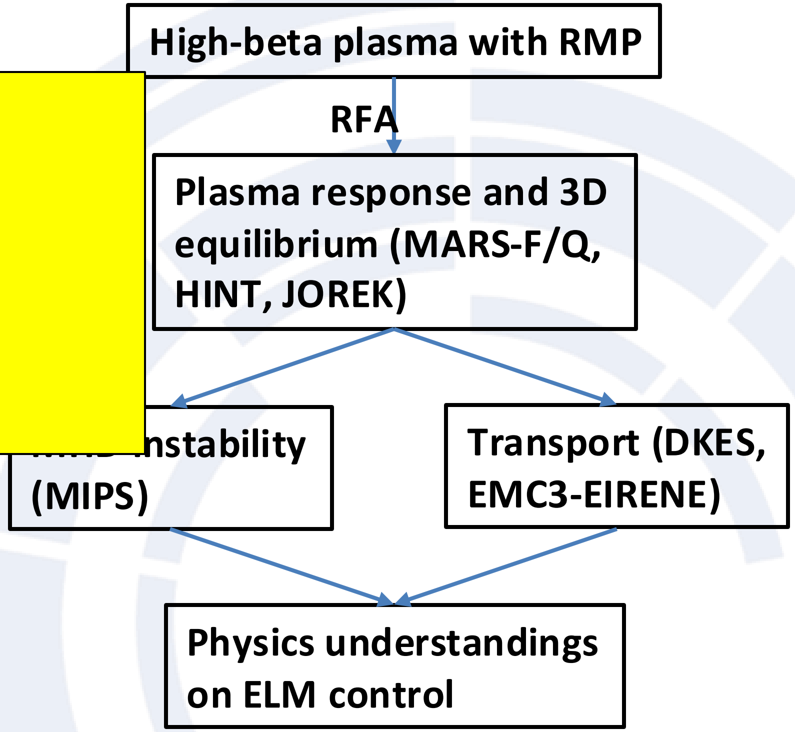
(Partly) addressing Sci. Obj 5

Strategy not clear

Missing time

P2-AUG
P2-MAST-U

- **Proponents and contact person:**
  - Yunfeng Liang, y.liang@fz-juelich.de
- **Scientific Background & Objectives**
  - It is necessary to investigate the characteristics of changes of edge magnetic structure and transpor the purpose of understanding physics mechanism experimental strategies for ELM control;
  - Measure and simulate plasma response due to RF plasmas for different beta and RMP configurations;
  - Measure and simulate RFA-induced changes of edge magnetic structure, pressure, bootstrap current and divertor heat load, investigate their relations to ELM control;
  - AUG: compare different physics mechanisms of ELM suppression in high-beta and low-beta plasmas, prepare for upcoming JT-60SA ELM control study;
  - MAST-U: explore effective strategy to achieve full ELM suppression in spherical tokamak by taking advantages of RFA effect in high-beta plasmas using different RMP configurations.
- **Experimental Strategy/Machine Constraints and essential diagnostic**
  - AUG:
    - Establish conventional and hybrid ELMy H-mode plasmas with different beta;
    - For each pulse, apply n=1 or n=2 RMP, scan coil phasing during the discharge.
  - MAST-U:
    - Establish target ELMy H-mode plasmas with different beta;
    - Double-row RMP configuration: apply n=1 & 2 RMP, for best and worst coil phasing (predicted by MARS-F modeling) respectively;
    - Single-row (lower-row) RMP configuration: apply n=1, 2 and 4 RMP.
  - Essential diagnostics: magnetic diagnostics, TS, CXRS, MSE, IR cameras.



Proposed pulses

Device	# Pulses/Session	# Development
AUG	10	
MAST-U	14	
TCV		
WEST		

High performance negative triangularity plasmas in WEST

- **Proponents and contact person:**
- Olivier.Sauter@epfl.ch et al

- **Scientific Background & Objectiv**
  - A comprehensive Negative Triangularity c

- **Experimental Strategy**
- WEST:
  - Power degradation of confinement (engi
  - Detachment/radiative mantle access at high aux power (w/ and w/o impurity seeding)
  - Density limit at high aux power
  - Tungsten transport
  - Power fall-off length in the Scrape-Off Layer
- TCV:
  - Reproduce WEST best results to test aspect ratio, wall, heating mix effects and provide extensive basis for model validation

Addressing Sci. Obj. 6

WEST: NT benefits are expected to be the same at large aspect ratio compared to "normal" aspect ratio (TEM or ITG).

WEST: W transport can be investigated in AUG

WEST: Density limit needs large additional power which is not (yet) the case

P2-WEST
P2-TCV

pose a focused
ted long campaign on
as was performed at
or armor campaign

Proposed pulses

Device	# Pulses/Session	# Development
AUG		
MAST-U		
TCV	20	20
WEST	5 days	Incl. 1 day contingency

Summary of proposals

No	RT	Proposal name	Proposer	Priority
11	RT02	NT in AUG: low q95 operation	Branka Vanovac	P1-2026-AUG
12	RT02	Improved confinement in NT AUG through stronger shaping?	Branka Vanovac	P1-2026-AUG
13	RT02	Comparative Study of Negative Triangularity performance in TCV, DIII-D, ASDEX Upgrade (AUG)	Branka Vanovac	P1-2026-AUG / P1-2026-TCV
14	RT02	Characterization of edge fluctuations for NT plasmas with ballooning modes	Margherita Ugoletti	PB/P2
15	RT02	Turbulent Edge/SOL Transport in EDA Regimes	Miriam La Matina	P2-AUG / P1-2027-TCV
16	RT02	ELM control by RMPs in low aspect ratio	David Ryan	P1-2026-MAST-U
17	RT02	QCE exploitation: high current / low safety factor	Mike Dunne	P1-2026-AUG / P1-2026-TCV / P1-2026-MAST-U / P1-2027-TCV
18	RT02	QCE exploitation: seeding and detachment	Michael Faitsch	P1-2026-AUG / P1-2026-TCV / P1-2027-TCV / P2-MAST-U
19	RT02	Power threshold density minimum in I-mode and edge ion heat flux scaling	Michael Komm	P2-AUG
20	RT02	I-mode detachment: access and operational window with Ar and Kr	Daniel Fajardo	P1-2027-AUG
21	RT02	Bt scaling of I-modes on WEST and AUG	John Rice	P2-AUG / P2-WEST
22	RT02	QCE exploitation: shaping scans	Andrés Miller	P1-2026-AUG / P1-2026-TCV / P1-2027-TCV
23	RT02	Edge turbulence characterization in Type I ELMy H-mode, QCE and mixed regimes	Alysée Khan	P1-2026-TCV / P1-2027-TCV
24	RT02	EDA H-mode QCM reflectometry measurement	Mário Vaz	PB/P2-AUG
25	RT02	Negative triangularity in conventional vs spherical tokamaks	Diego Jose Cruz Zabala	P1-2026-MAST-U / P1-2027-TCV
26	RT02	Detached high-power L-Mode negative-triangularity reactor relevant scenarios	G. Durr-Legoupil-Nicoud	P1-2026-TCV / P2-WEST
27	RT02	Fast-ion transport in real- and velocity-space in negative triangularity	Jesper Rasmussen	PB/P2-AUG / PB/P2-TCV
28	RT02	Development of Quiescent H-mode (QH mode)	Eli Viezzer	P1-2027-AUG / P1-2026-MAST-U
29	RT02	Impact of triangularity in I-mode and L-I-H transitions	Mário Vaz	P2-AUG
30	RT02	Towards long-pulse operation in negative triangularity plasmas	Jorge Morales	P2-WEST / P2-TCV
31	RT02	Neon transport in EDA H-mode pedestals	Tabea Gleiter	P1-2026-AUG
32	RT02	Impurity transport dependence on negative and positive triangularity	Jorge Morales	P2-WEST
33	RT02	EDA H-mode development in AUG and TCV	Luís Gil	P1-2027-AUG / P1-2026-TCV / P1-2027-TCV
34	RT02	Impact of resonant field amplification (RFA) on edge magnetic structure and ELM control in high-beta plasmas	Yunfeng Liang	P2-AUG / P2-MAST-U
35	RT02	High performance negative triangularity plasma in WEST	Olivier Sauter	P2-WEST/ P2-TCV

Summary of P1 proposals

	AUG		TCV		MAST-U	WEST	
	2026	2027	2026	2027	2026	2026	2027
QH		#28			#28		
QCE	#17, #18, #22		#17, #18, #22, #23	#17, #18, #22, #23	#17		
NT	#11, #12, #13		#13, #26	#13, #25	#25		
EDA	#31	#33	#33	#15, #33			
I-mode		#20					
RMP					#16		
Scientific pulses requested	63	53	80	98	48		
Provisional shot allocation	30	22	80	110	32		15?

One shot-day proposed for NT-AUG

This session could be kept following I-mode experiments next week

RT02: analysis and modelling needs

- Interpretive pedestal analysis:
  - Profile analysis (all devices), (routinely done, maybe still needs staffing at JET)
  - Linear MHD stability (ideal + extended) for all regimes (underway)
  - 3D stability analysis (CASTOR3D workflow in place)
  - Local ballooning analysis (routinely done, maybe needs staffing)
- Pedestal transport analysis:
  - Interpretive
    - Needs workflow development (TRANSP/ASTRA)
    - Testing of quasi-linear models could be prioritized
  - Transport simulations (all regimes)
    - Perhaps needs substantial investment of person/computing power resources
    - GRILLIX/GENE-X/other? (GRILLIX for AUG point being finalised)
  - Impurity transport analysis and modelling

RT02: analysis and modelling needs

- Core/global plasma:
  - GENE for NT (underway: Balestri, Merlo, Mariani, ...)
  - JOREK-GK (underway: M. Bécoulet)
  - TRANSP @ JET for NT and extended QCE data set (H-factor, core confinement)
  - Impurity transport analysis and modelling
- Div/SOL:
  - SOLPS for QCE/NT comparison for SOL radial gradients (partially ongoing (underway: Carpita, Rubino)
  - ERO wall erosion at JET (underway: Cal)
  - SOL gradient length analysis (all regimes)