WPTE programme for the Campaigns in 2024:
Overview of research topics and categories of required competencies

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Introduction

This Annex presents the scientific programme of WP TE for 2024. This includes running experimental campaigns on four devices (AUG, TCV, MAST-U and WEST) as well as performing analysis and modelling for 2024 and past campaigns. This call includes in particular the data analysis and modelling of the JET campaigns (C44/C45/C46/C47 and C45b). The continuation of work related to the JET DTE2 campaign is also welcome. In addition, this call also covers specific JET data validation tasks. This Annex should be used as a reference to answer the present Call for Participation.

The WP TE scientific programme relevant for this Call is structured in 9 Research Topics (RT), keeping the same structure as for 2023.

For each Research Topic, you will find listed in this Annex:

- the related Mission of the EUROfusion roadmap
- the reference WP TE Task Force Leaders (TFL)
- the Research Topic Coordinators in charge
- the associated scientific objectives to be addressed
- An indicative number of pulses for each of the RT. Note that this number is only indicative at this stage, and could be updated following the General Planning Meeting foreseen on November 23, 2023. In addition, shot allocation might be reviewed as campaign progresses to cope with possible machine availability as well as urgent scientific priorities.

In addition to the 9 Research Topics mentioned above, 2 JET specific additional RTs, coordinated by the WPTE TFLs, have been created :

- RT-10 : JET data validation
- RT-11: the continuation of JET DTE2 data analysis and modelling (including M18-** and M21-** experiments executed in the C45/C46(DTE3)/C47/C45B campaigns)

An overview of the RT for the 2024 WP TE programme can be found in Table 1.

You will also find in Table 2 the 4 categories of competencies to be used in IMS (IMS tag), to indicate whether your expertise lies in diagnostic operation, data analysis and interpretation, modelling, data validation for JET or in another area.

You will find detailed instructions on how to answer the present Call for Participation under IMS in **Annex 3**. From the scientific side, the proponents should provide a work plan for each Research Topic / WP TE device they would like to contribute to.

Please note that the **work plan** you provide is the **main element** for WP TE to assess your participation. It should be complete though concise (typically ~2-3 sentences for each Research Topic / device where you would like to contribute). It should mention which physics issue this would address, in relation to the scientific objectives of the RT listed in this annex.

We therefore kindly ask the proponents to carefully read the description of the Research Topics in this Annex and to refer to it when elaborating their work plan. Indications on the quality level expected for the work plans are given in Annex 3.

Concerning the scientific priorities of the RT, you will find additional information in the slides that will be presented at the WP TE Programme Meeting, to be held on November 23, 2023. Those slides will be posted on the WP TE wiki in the meetings section.

Please note that contributions addressing issues raised by the new ITER baseline are encouraged and that this should be indicated in your work plan when applicable. You can use as a reference the document on “The new ITER Baseline, the associated Research Plan and Open R&D issues“ presented by A. Loarte

(IO) in October 2023, which can be found on the WP TE wiki: https://wiki.euro-fusion.org/images/1/13/Loarte_20231024.pdf.

Contributions extrapolating findings from present WP TE devices to next step fusion devices, such as ITER and DEMO, are also encouraged .

If you have any further questions about a particular Research Topic, please contact the reference TFLs and the Research Topic Coordinators.

List of Research Topics and IMS tags

The ***IMS tag (3rd column)*** refers to "step 2: select campaign/experiments" in the guidelines to reply to the Call in IMS (Annex 3).

	Research topic	Title	IMS tag
Mission 1	RT-01	Core-Edge-SOL integrated H-mode scenario compatible with exhaust constraints in support of ITER	RT01
	RT-02	Physics understanding of alternatives to Type-I ELM regime	RT02
	RT-03	Strategies for disruption and run-away mitigation	RT03
	RT-04	Physics-based machine generic systems for an integrated control of plasma discharge	RT04
	RT-08	Physics and operational basis for high beta long pulse scenarios	RT08
	RT-09	Physics understanding of energetics particles confinement and their interplay with thermal plasma	RT09
Mission 2	RT-05	Physics of divertor detachment and its control for ITER, DEMO and HELIAS operation	RT05
	RT-06	Preparation of efficient Plasma Facing Components (PFC) operation for ITER, DEMO and HELIAS	RT06
	RT-07	Physics understanding of alternative divertor configurations as risk mitigation for DEMO	RT07
JET specific	RT-10	JET data validation	RT10
JET DTE2	RT-11	Analysis and modelling of DTE2 related experiments on JET	RT11

Table 1: List of Research Topics for the 2024 WP TE scientific programme. The Missions 1 and 2 refer to the missions of the EUROfusion Roadmap.

List of competencies and IMS tags

Type of expertise	IMS Tag
Diagnostic operation	DO
Data analysis and interpretation	DAI
Modelling expertise	MOD
JET Data Validation	VAL

Other	OTH

Table 2: List of competencies to be used as tags under IMS.

Categories of competencies for IMS

Please use the competencies listed in Table 2 to describe your work plan in IMS, in terms of diagnostic operation, data analysis and interpretation, modelling, JET data validation or other activity.

Diagnostic operation

Please note that WP TE will support work for diagnostics or sub systems operation only for the systems which are not included as part of the device operational costs.
If you plan to operate or support the operation of a diagnostic that is not included in the device operational costs, but will be useful to a Research Topic, please state your expertise in your work plan, providing details on what your work will include.
Please contact the WPTE TFLs if you are uncertain that the diagnostic support you propose is eligible for funding.

Data analysis and interpretation

Please describe in your work plan the data analysis and interpretation that you can perform for the specific Research Topic and Scientific Objectives, as listed in this Annex. You should identify the diagnostic data you will contribute to analyse (e.g. spectroscopic measurements), the type of analysis and interpretation you will contribute to (e.g. addressing pedestal physics).

Modelling Expertise

Please describe your expertise and include in your work plan the type of modelling you can perform for the specific Research Topic and Scientific Objectives, mentioning also the modelling codes that you will use.

JET data validation Expertise

Please describe your expertise and include in your work plan the type of data validation you would perform for JET within the selected diagnostics (see list in RT10 description) .

Other

You can use this category if none of the above applies to your work plan or if you are a pre-selected RTC.

RT-01: Core-Edge-SOL integrated H-mode scenario compatible with exhaust constraints in support of ITER

Mission: M1.1
TFLs: N. Vianello, B. Labit
Coordinators: C. Giroud, L. Frassinetti, S. Wiesen, D. King

Scientific objectives

#	
D1	Develop and understand stationary H-mode scenario at low collisionality and with dominant electron heating
D2	Provide physics-based cross-field transport coefficients to TSVVs (1, 3, 4 and 11) for turbulence modelling
D3	Determine the impact of different impurity mixes for partially detached divertors in high power operations in view of ITER radiative scenarios
D4	Assess pedestal performances in condition closer to future devices including large SOL opacity, low pedestal collisionality, peeling limited plasma
D5	Quantify impurity screening for high temperature pedestals

Number of discharges Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 23rd 2023.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2024	10	100	30	15

Competences

A non-exhaustive list of requested competencies is given hereafter .

Data analysis and Interpretation

MHD spectrum and mode structure; Kinetic profiles pedestal and SOL (ne, Te, Ti), Pellet injection/ablation; Bolometer/AXUV; IR thermography; Active and Passive spectroscopy; Light and Heavy impurity transport and concentration; Visible and Multiwavelength Cameras, Real time control (development, analysis,…); Fluctuation diagnostics (PCI, (C)ECE, DBS, Correlation reflectometry, Li-Be, He-Beams),…

Modelling

Pedestal stability (EPED, EUROPED, ELITE, MARS,…); SOL fluid (SOLPS, SOLEDGE2D, EMC3,…); SOL turbulence (GBS, TOKAM3X, HESEL,…); Core GK analysis (GENE, GS2, GKW, Qualikiz,…); Pedestal GK analysis (GENE, GS2, GKW,…); Nonlinear MHD (JOREK, NIMROD, MEGA,…); Interpretative (IMEP, JINTRAC, ETS, ASTRA, RAPTOR, METIS, TRANSP, JETTO, Coconut,…); Material migration (ERO2.0, Walldyn, …); PIC SOL and core codes (BIT1, SPICE, EPOCH, …); Momentum transport modelling & analysis.

RT-02: Physics understanding of alternatives to Type-I ELM regime

Mission: M1.1
TFLs: B. Labit, D. Keeling
Coordinators: M. Dunne, M. Faitsch, O. Sauter, E. Viezzer

Scientific objectives

#	
D1	Quantify turbulent and MHD driven transport in the vicinity of the separatrix and implications for predictions for ITER and DEMO
D2	Quantify first wall load in no-ELM scenarios and provide model for SOL transport extrapolation
D3	Extend the parameters space of no-ELM scenarios to large P_{sep}/R and/or pedestal top collisionallities relevant for ITER and DEMO
D4	Determine the key physics mechanisms regulating edge transport in order to access no-ELM regimes
D5	Determine access window and physics understanding for RMP ELM suppression and its compatibility with ITER FPO scenarios
D6	Quantify the overall performance of negative triangularity plasmas in view of DEMO

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 23rd 2023.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2024	0	200	50	15

Competences

A non-exhaustive list of requested competencies is given hereafter :

Data Analysis and Interpretation

MHD spectrum and mode structure; RMP coils; CXRS; Bolometer/AXUV; (C)ECE ; IR thermography; Reflectometry; Fast-ions (FILD, FIDA,,..); Passive spectroscopy; Gas puff imaging; Langmuir probes; Reciprocating probe (midplane, X-point,RDPA…); Visible fast imaging; ECE imaging; Beam emission spectroscopy (BES); Tangential phase contrast imaging; Real time control (development, analysis,..); Lithium beam; HXR/ SXR (including GEM); Doppler reflectometry: DOPL, RIC/RFL,PREF, DBS,…

Modelling

Pedestal stability (EPED, EUROPED, ELITE, MARS…); Improved or RT equilibrium reconstruction (CLISTE, CHEASE, CREATE-NL,…); MHD stability (MISHKA, KINX, VMEC, CASTOR, LIGKA…); SOL fluid (SOLPS, SOLEDGE2D, EMC3,…); SOL turbulence (GBS, TOKAM3X, HESEL, …); Core GK analysis (GENE, GS2, GKW,…); Pedestal GK analysis (GENE, GS2, GKW,…); Nonlinear MHD (JOREK, NIMROD, MEGA,…); Interpretative (IMEP, JINTRAC, ETS, ASTRA, RAPTOR, METIS, TRANSP, …); MHD: plasma response to RMP (GPEC, MARS-F, VMEC,…)

RT-03: Strategies for disruption and run-away mitigation

Mission: M1.1
TFLs: A. Hakola, M. Baruzzo
Coordinators: U. Sheikh, C. Reux, O. Ficker, ITER Organization

Scientific objectives

#	
D1	Optimize disruption mitigations by single and multiple shattered pellet injection (SPI) at high plasma current and energy content in an all-metal environment to validate the ITER disruption mitigation strategy
D2	Quantify the required neon quantity for SPI into dilution cooled plasmas for sufficient thermal and current quench mitigation in ITER and the synchronisation requirements for dual deuterium/neon SPI in ITER
D3	Characterize/optimize the RE impact mitigation schemes and flushing effect with different deuterium injections techniques
D4	Determine the physics mechanisms generating run-away electrons in the current quench and in the plasma start-up phase
D5	Interpretative modelling of disruption mitigation dynamics (TSVV-8, TSVV-9) and prediction for ITER
D6	Quantify the radiation asymmetry during disruption mitigation with SPI
D7	Validate the modelling of image currents in conducting structures during disruption with halo current measurements

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 23rd 2023.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2024	10	150	0	30

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

MHD spectrum and mode structure; Bolometer/AXUV; (C)ECE; Kinetic profiles (Thomson scattering, Li-Be, He-beam), IR thermography; Reflectometry; Passive spectroscopy; (Visible)fast imaging; ECE imaging; VUV spectroscopy; MSE; Lithium beam; HXR/ SXR (including GEM); Reflectometry: DOPL, RIC/RFL,PREF, DBS,…; MANTIS/MWI filtered imaging analysis; Fast Interferometry; Impurities spectroscopy analysis (W, divertor, Visible, VUV…)/DSS; Bremsstrahlung; Thomson Scattering; RF Antenna; RE energy spectra from gamma-ray/hard X-rays

Modelling
Nonlinear MHD (JOREK, NIMROD, MEGA, ...); RE impact (ERO, MEMOS, GEANT4, ...); RE modelling (LUKE, GO, STREAM, DREAM, SOFT, KPRAD, R5X2, SOFT....)

RT-04: Physics-based machine generic systems for an integrated control of plasma discharge

Mission: M1.1, M1.3, M2.1
TFLs: M. Baruzzo, B. Labit
Coordinators: A. Mele, L. Piron, C. Vincent

Scientific objectives

#	
D1	Develop MIMO (Multi-Input Multi-Output) state-observers for e.g., radiative detachment control on different devices
D2	Develop machine independent strategies for the H-mode entry and exit and off-normal events supported by modelling.
D3	Develop and test disruption avoidance schemes and apply them on several different devices
D4	Develop robust strategies to optimize error field corrections supported by modelling
D5	Optimize plasma start-up and current ramp-up schemes supported by modelling in ITER like scenarios

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 23rd 2023.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2024	20	100	25	30

Competences

A non-exhaustive list of requested competencies is given hereafter :

Data Analysis and Interpretation
MHD spectrum and mode structure; RMP coils; CXRS; IR thermography; Visible fast imaging; Beam emission spectroscopy (BES); Real time control (development, analysis,..); HXR/ SXR (including GEM); Doppler reflectometry: DOPL, RIC/RFL,PREF, DBS,...; MANTIS/MWI filtered imaging analysis; Impurities spectroscopy analysis (W, divertor...)/DSS; Pellet injection/ablation, Bolometer/AXUV, ECE, LP, Reciprocating Probe, Kinetic Profiles, Impurity spectroscopy analysis

Modelling
Pedestal stability (EPED, EUROPED, ELITE, MARS...); Improved or RT equilibrium reconstruction (CLISTE, CHEASE, CREATE-NL,....); MHD stability (MISHKA, KINX, VMEC, CASTOR, LIGKA...); ECRH/ECCD/Current

drive (PION, TORAY, TORBEAM, CQL3D, C3PO, LUKE, NUBEAM, RABBIT, ASCOT, LOCUST, EPOCH,...); Interpretative (IMEP, JINTRAC, ETS, ASTRA, RAPTOR, METIS, TRANSP, ...); Breakdown, burnthrough, ECWC (TOMATOR-1D, BKD0, GRAY, RAPTOR, EPOCH, ...); RE modelling (LUKE, GO....); MHD (N)TM dynamics (NTMwf,...); Machine Learning, Plasma transients analysis

RT-05: Physics of divertor detachment and its control for ITER, DEMO and HELIAS operation

Mission: M2.1
TFLs: N. Vianello, E. Tsitrone
Coordinators: M. Bernert, S. Henderson, H. Reimerdes, N. Fedorczak

Scientific objectives

#	
D1	Characterize detachment access and core plasma performance in scenarios using different fuelling schemes, different impurity mixtures
D2	Development of reduced physics model which can be included in radiative detachment control schemes or extrapolations to DEMO/ITER
D3	Quantify edge-SOL particle and heat transport, including the interaction with neutrals, above and below the X-point under detached conditions
D4	Assess the compatibility and stability with X-point radiator regimes with confinement
D5	Quantify the degree of ELM heat load mitigation achievable by impurity seeding, investigating the dependences on relevant machine parameters
D6	Assess the evolution of detachment under slow transients (L-H transitions, sawtooth, loss of impurity seeding)

Number of discharges (TCV, MAST-U & WEST) or sessions (JET)

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 23rd 2023.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2024	20	200	50	30

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

MHD spectrum and mode structure;Pellet injection/ablation; CXRS; Bolometer/AXUV; IR thermography; Passive spectroscopy; Gas puff imaging; Langmuir probes; Reciprocating probe (midplane, X-point,RDPA...); Visible fast imaging; Helium beam; Real time control (development, analysis,..); VUV spectroscopy; Lithium beam; MANTIS/MWI filtered imaging analysis; Impurities spectroscopy analysis (W, divertor…)/DSS; Edge Transport & ELM (buffering) analysis; Neutral Pressure analysis

Modelling

Pedestal stability (EPED, EUROPED, ELITE, MARS…); Improved or RT equilibrium reconstruction (CLISTE, CHEASE, CREATE-NL,….); SOL fluid (SOLPS, SOLEDGE2D, EMC3,…); SOL turbulence (GBS, TOKAM3X, HESEL, …); Interpretative (IMEP, JINTRAC, ETS, …); ICRF coupling (EVE-AQL, PION, TORIC-SSFPQL, …); LH coupling; Impurity transport (STRAHL,…); Plasma transients analysis

RT-06: Preparation of efficient Plasma Facing Components (PFC) operation for ITER, DEMO and HELIAS

Mission: M2.2
TFLs: E. Tsitrone, A. Hakola
Coordinators: Y. Corre, K. Krieger, A. Widdowson

Scientific objectives

#	
D1	Quantify local power load distributions on castellated and shaped PFCs for ITER and DEMO, including melting situations using experimental data and predictive modelling
D2	Assess the impact of sustained high power / high particle fluence plasma exposure of metallic PFCs on thermo-mechanical properties of PFC as well as plasma operation
D3	Quantify material erosion sources from metallic walls under ITER relevant plasma conditions (including high power and impurity seeding plasmas) and determine material migration pathways
D4	Quantify fuel retention in devices with metallic walls, with a focus on long pulse operation (using recent fuel retention diagnostic upgrades such as laser-based diagnostics where available)
D5	Determine fuel-removal and conditioning efficiencies in metallic devices in conditions relevant for ITER PFPO and extrapolate to DEMO
D6	Quantify the balance between gross and net erosion of W under different operational conditions

Number of discharges Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 23rd 2023.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2024	30	0	0	105

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

CXRS, LID-QMS, Bolometer/AXUV, IR thermography, Reflectometry, Passive Spectroscopy, LP, Divertor Manipulator, Reciprocating Probe, Visible Fast imaging, Real time control, Barometry, optical penning, RGA, VUV spectroscopy, NPA, RFA, Li-Beam, HXR/SXR, Impurities spectroscopy, Calorimetry, Fast Interferometry

Modelling

Field line tracing code (PFCflux, SMARDA, SMITTER), MHD stability (MISHKA, KINX, VMEC, CASTOR, LIGKA...), SOL fluid (SOLPS, SOLEDGE2D, EMC3,...), ECRH/ECCD/Current drive (PION, TORAY, TORBEAM,...), LH coupling, Melting PFC (ERO, ERO2.0, MEMOS, ...), Material migration (ERO, ERO2.0, Walldyn ...), PIC SOL and core codes (BIT1, SPICE, EPOCH ...)

RT-07: Physics understanding of alternative divertor configurations as risk mitigation for DEMO

Mission: M2.3
TFLs: A. Hakola, E. Tsitrone
Coordinators: C. Theiler, K. Verhaegh, D. Brida

Scientific objectives

#	
D1	Determine detachment onset, radiated power fractions, and core compatibility in H-mode for the alternative divertor configurations (ADCs) and characterize ELM activity in view of pedestal, heat flux and control in ADCs
D2	Characterize possible benefits of the snowflake configuration for X-point radiation stability and dissipated power in H-mode
D3	Quantify the degree of ELM heat load mitigation achievable by impurity seeding, investigating the dependences on relevant machine parameters
D4	Evaluate reduced SOL models against ADCs

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 23rd 2023.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2024	85	200	75	0

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

Bolometer/AXUV/RADCAM; IR thermography; Passive spectroscopy; Gas puff imaging; Langmuir probes; Reciprocating probe (midplane, X-point, RDPA…); Visible fast imaging; Real time control (development, analysis,..); Coherence imaging; MANTIS/MWI filtered imaging analysis; Impurities spectroscopy analysis (W, divertor…)/DSS; Divertor Thomson, IRVB analysis, Integrated Data Analysis (IDA), Equilibrium design (FIESTA modelling),

Modelling

SOL fluid (SOLPS, SOLEDGE2D, EMC3,…); SOL turbulence (GBS, TOKAM3X, HESEL, …); Interpretative (IMEP, ETS, ASTRA, RAPTOR, METIS, TRANSP, …); DIV1D/SD1D/SPLEND1D

RT-08: Physics and operational basis for high beta long pulse scenarios

Mission: M1.3
TFLs: D. Keeling, M. Baruzzo
Coordinators: A. Bock, F. Auriemma, C. Piron

Scientific objectives

#	
D1	Develop scenarios to assess the flux pumping mechanism efficiency
D2	Quantify the compatibility of high β long pulse with mitigated ELMs and/or with exhaust in metallic wall devices
D3	Characterize the fast and thermal ion transport together with the ExB, magnetic shear, turbulence conditions in steady-state scenarios at high-q
D4	Develop projection schemes of long pulse at high beta as a potential reactor scenario
D5	Develop an intrinsically steady state solution at high β_N (>3) in terms of q/pressure profile and stability. Compare it with other existing solutions in view of its application to JT-60SA and DEMO

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 23rd 2023.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2024	10	210	60	15

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

MHD spectrum and mode structure; CXRS; (C)ECE ; Reflectometry ; Fast-ions (FILD, FIDA,,..); Beam emission spectroscopy (BES); MSE; Lithium beam; HXR/ SXR (including GEM); Doppler reflectometry: DOPL, RIC/RFL,PREF, DBS, Bolometry, SAMI, Fast Ion Diagnostic (FIDA)

Modelling

Improved or RT equilibrium reconstruction (CLISTE, CHEASE, CREATE-NL,....); MHD stability (MISHKA, KINX, VMEC, CASTOR, LIGKA...); SOL fluid (SOLPS, SOLEDGE2D, EMC3,...): Core GK (GENE, GS2, GKW,...); ECRH/ECCD/Current drive (PION, TORAY, TORBEAM, CQL3D, C3PO, LUKE, NUBEAM, RABBIT, ASCOT, LOCUST, EPOCH,...); Interpretative (IMEP, ETS, ASTRA, RAPTOR, METIS, TRANSP, JETTO, JINTRAC...); ICRF coupling (EVE-AQL, PION, TORIC-SSFPQL, ...); LH coupling; W sources and transport (SOLEDGE-ERO), Reduced transport model (TGLF/MMM)

RT-09: Physics understanding of energetics particles confinement and their interplay with thermal plasma

Mission: M1.2
TFLs: D. Keeling, M. Baruzzo
Coordinators: J. Galdon, Y. Kazakov, A. Jansen van Vuuren, R. Ochoukov

Scientific objectives

#	
D1	Provide high quality diagnostic information for the characterization of confined and lost fast ions in plasmas relevant for ITER and JT60-SA
D2	Quantify ion heating and core turbulence stabilization by ICRF-generated fast ions in view of ITER and DEMO
D3	Quantify the impact of fast ions and fast ion MHD driven instabilities on core transport
D4	Integrate the available heating, fast-ion and transport modelling tools for interpretation of experimental results in view of ITER and DEMO
D5	Quantify fast-ion losses and associated heat load from edge perturbations (ELMs and RMPs)
D6	Quantify neutral beam current drive and make predictions for ITER
D7	Identify AE control actuators and preliminary assess for ITER

Number of discharges

Indicative number of pulses per device and RT, subject to revision following WP TE Programme Meeting on November 23rd 2023.

	AUG	TCV	MAST-U	WEST
	Shots	Shots	Shots	Shots
2024	0	90	40	0

Competences

A non-exhaustive list of requested competencies is given hereafter:

Data Analysis and Interpretation

MHD spectrum and mode structure; RMP coils; CXRS; (C)ECE; IR thermography; Reflectometry ; Fast-ions (FILD, FIDA,,..); Poloidal correlation reflectometry; Proton detector; TAE antenna measurements ; Faraday cups; Gamma-ray spectroscopy, Fluctuation diagnostic (BES, TPCI…),ECCD/ECRH, MSE, HXR/SXR, Gamma ray spectroscopy, Faraday cups, TAE antenna, Ion concentration, Neutron detector, NPA

Modelling

Pedestal stability (EPED, EUROPED, ELITE, MARS…); Improved or RT equilibrium reconstruction (CLISTE, CHEASE, CREATE-NL,….); MHD stability (MISHKA, KINX, VMEC, CASTOR, LIGKA…); Core GK (GENE, GS2, GKW,…); Nonlinear MHD (JOREK, NIMROD, MEGA,…); Interpretative (IMEP, ETS, ASTRA, RAPTOR, METIS, TRANSP, …); MHD: plasma response to RMP (GPEC, MARS-F, VMEC,…); Fast ion orbits, resonances, distribution function (ASCOT, NUBEAM, EBdyna,…); Synthetic Fast ions diagnostics (FIDASIM, FILDSIM, GENESIS, …); Velocity-space tomography with FIDA

RT-10: JET Data Validation

TFLs: N. Vianello, D. Keeling

Scientific objectives

#	
D1	Provide high quality validated data from JET experiments

Please indicate the time you would like to provide for JET data validation for the diagnostics listed below (corresponding to the JET Reqco list). The detailed list of competences requested is indicated in the table below.

Process	Sub-process
Bolometry	Tomography reconstruction
	Divertor
CXRS	Edge CX
	Main CX
	Impurity Ion Temperature (KS5)
	CHEAP Ion Densities (KS5)
Divertor IR	All KL cameras
	KL11 tomography
ECE	KK3

Interferometry	
KY6	Slow
	Fast
KT3	All (KT3a, b,c …)
EFIT	Fast
	Constrained
HRTS	"standard"
	LTT
Langmuir	KY4D
Reflectometer	KG10
Neutron spectroscopy	All (KM7, KM12 KM14, KM13, KM9, KM11….)
Gamma ray	(KM6, KN3G)
Toroidal Alfvén Eigenmodes	KC1T
TRANSP	Interpretative transport modelling

Table 3 : list of JET diagnostic eligible for data validation under RT10

RT-11: Analysis and modelling of DTE2 related experiment on JET

TFLs: D. Keeling, M. Baruzzo

Scientific objectives

#	
D1	Continue the analysis and modelling of the JET experiments related to DTE2

Your work plan should be focused on data analysis and modelling of former JET experiments (M18-*/M21-*) executed also during C44/C45/C46(DTE3)/C47 and C45b campaigns. Please ensure to indicate in the work-plan the name of the experiment your are applying to (e.g. M21-03, M21-01 etc). Analysis for past WPTE experiments in DTE3 (RT22-xx with xx from -01 to -09) should be submitted under the relevant RT-xx