

2021-2025 Consortium Work Plan

Call for Participation

Work Package

Preparation of ITER Operation

Introduction and purpose of the call

In the course of the elaboration of the annual 2024 Work-Programme within the Work Package WPPrIO, **Preparation of ITER Operation**, new or extended activities have been identified by the Project Leader (PL) and endorsed at the Fusion Science Department Project Board. In this context, the 2024 Work-Programme reviewed by the EUROfusion STAC has been approved by the General Assembly held in December 2023.

The present call concerns activities covered within the Sub-Project-2 (SP-2) of WPPrIO, “Preparation of ITER first experimental campaigns” and addresses the following topics:

- (i) coordinator of a new multi-machine EUROfusion database on Infra-Red images (Topic 1),
- (ii) transport, pedestal and disruption data experts to support the extension of the existing (within WPPrIO) multi-machine EUROfusion databases (Topic 2),
- (iii) development of an integrated multi-diagnostics data analysis tool in view of ITER application (Topic 3).

When relevant these activities will be performed in strong collaboration with the other Fusion Science Department Work-Packages including the support provided by the Advanced Computing Hubs.

Further information is provided under these three identified topics as follow:

- Topic 1: It is a call for a EUROfusion multi-machine Coordinator on Infra-Red (IR) images (at a level of 2 PM/year in 2024 and 2025). The objective of the activity is to set-up a multi-machine IR database to expand the development of the IR synthetic diagnostic and to further develop wall thermal events and hot spot monitoring system in view of ITER applications. The new database will include well characterised experimental and ultimately simulated IR images. The first task will consist in proposing common definitions and data format for the images database that could be used by different EUROfusion

facilities who already exploited an IR diagnostic or by the existing simulation/analysis tools. The database could include data from tokamaks and stellarators.

- Topic 2: Three multi-machine databases are already coordinated within PrIO respectively on transport, pedestal and disruption but the respective coordinators have identified the needs to further expand the set of validated data with support provided by the local experts from the respective EUROfusion facilities. We are calling for experts (at a level of the order of 1 PM/year/facility) who should provide validated data using the format of the existing multi-machine databases on transport, pedestal or disruption (for either one or several of the EUROfusion facilities: AUG, JET, MAST-U, TCV, WEST) and who will work closely with the already nominated coordinators. It should be noted that the scientific exploitation of the databases using Artificial Intelligence techniques is covered within a separate open call (*Call for Project proposals for innovative Artificial Intelligence and Machine Learning Methods used in support of EUROfusion programme objectives*, D/DK-23-102, 01 Dec. 2023).
- Topic 3: One of the major challenges in view of preparing ITER scientific exploitation consists in developing methods and tools to provide a coherent combination of measurements from various diagnostics that can be validated on existing facilities before being transferred to ITER applications. A coherent combination of different diagnostics allows one to address various data analysis and validation challenges in a rigorous and quantified manner such as data consistency, data uncertainty and quantification, data interdependency, data reliability, data calibration. The concept of “Integrated Data Analysis and Validation” offers a unified way of combining data from various measurements that could also include modelling information to obtain well validated plasma profiles with relevant error bars. This is a long term activity that WPPrIO would like to initiate in 2024 with limited resources (at a level of 6 PM in 2024). The activity shall start with a well-focused task with direct application to the first set of diagnostics to be implemented on ITER, for instance (but not exclusively) reconstruction of the electron temperature and/or density profiles using the same unified tool for (at least) two EUROfusion facilities and application to ITER using already developed synthetic diagnostics. The tool should be machine generic and compliant to the Integrated Modelling & Analysis Suite (IMAS), using Interface Data Structure (IDS) for both experimental and simulated data.

Submission of proposals

Proposals, must be submitted through the EUROfusion Information Management System (IMS), <https://ims.euro-fusion.org/fp9/>, not later than **16 February 2024**.

The proposals shall include:

- **Indicative resources** proposed by the Beneficiary (or its LTPs) for 2024 and 2025. These must be entered directly through the online proposal form in IMS;
- **Brief description of relevant skills and experience relevant for the call**
- **A short CV for the EUROfusion multi-machine Coordinator on Infra-Red (IR) images under topic 1**
- **For the identified role please propose a named person from your Beneficiary**
- Any other supporting documents that can indicate synergies between competences required in the Call and the expertise of the proposed team.

Selection/evaluation process

If needed, during the evaluation period, the PL may contact representatives of the Beneficiaries for further clarification and for negotiation on the activities and the size of the contribution. Upon completion of the assessment, the PL will make a recommendation to the PMU including a justification for the selection of the Beneficiaries' contributions to execute the tasks within PrIO, as well as the financial resources required for this purpose.

In case of any questions concerning the selection process and procedure, please contact:

- PMU Coordination Officer: João FIGUEIREDO
- PL: Xavier LITAUDON
- PSO: Gloria FALCHETTO

Indicative Timeline of implementation

Deadline for proposals: **16 February 2024**

Evaluation, selection prior to the Fusion Science Department Project Board: **22 March 2024**