

Call for Participation

2010 Work Programme

**INTEGRATED TOKAMAK MODELLING TASK
FORCE**

ITER Scenario Modelling

Deadline for Responses: 21. May 2010

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This Call for Participation aims to implement the ISM-related activities under the Integrated Tokamak Modelling Work Programme for 2010 under a Task Agreement as foreseen in the new EFDA Art. 5.

1. Introduction

ITM-TF goals

The longer term goal of the ITM-TF is to provide the European fusion community with a validated suite of simulation tools for ITER exploitation and to provide the basis for a complete simulation environment for fusion plasmas generally available for use also for modelling on current devices and in support of theory and modelling in general. IMPs have dual responsibilities in that they should continue to develop and manifest the physics foundations for Integrated Modelling in standalone packages targeting the code platform environment while they are also supporting the integration efforts towards scenario modelling tools

Scientific rationale and main objectives of the ITM task force

The EFDA-Steering Committee set up a long-term European Task force (TF) on Integrated Tokamak Modelling (ITM) in 2003. The TF is in charge of “co-ordinating the development of a coherent set of validated simulation tools for the purpose of benchmarking on existing tokamak experiments, with the ultimate aim of providing a comprehensive simulation package for ITER plasmas”. The continuity of the ITM-TF is inscribed within the provisions of the new EFDA and the role of the TF leadership is detailed in EFDA (07) 33/4.4.1. “The Scientific Leader of the Integrated Modelling TF (*TF Leader*) will ensure that the overall EFDA Work Plan and Work Programme objectives are adequately translated into specific / detailed scientific and technical objectives in the development, validation and application of computational models and their integration and that these objectives are met. The TF leader can also propose activities within international collaborations and implement approved activities. The Integrated Modelling TF Leader shall report to the EFDA Leader.”

2.1 Programmatic Background

At its meeting in Prague on 12 March 2009, the EFDA Steering Committee approved elements of the EFDA 2010 Work Programme, including the Integrated Tokamak Modelling Task Force (ITM-TF) programme. Revisions of the 2010 Work Programme were approved at the EFDA SC meetings in Barcelona on 8 July 2009 (EFDA (09)41/3.3.1) and in Brussels on 6 October 2009 (EFDA (09) 42/3.2), and foresaw a stronger coordination between the activities on ITER Scenario Modelling (ISM) and the Transport code and discharge evolution Project (IMP3).

A Call for Participation in the Integrated Tokamak Modelling Activities under the EFDA 2010 Work Programme was launched on 25th October 2009, (reference JP/ag-389). The Call foresaw the ISM activity being implemented under the IMP3 responsibility. However, on reflection, it was concluded that including ISM activity under IMP3 does not ensure the necessary breadth of the ITER Scenario Modelling activities.

Thus, the Call for Participation in ITM activities is reopened for the ISM related part and Associations are invited to extend their participation in the ISM tasks and nominate candidates for the position of Coordinator of the ISM group of the Integrated Tokamak Modelling Task Force.

The ISM Coordinator will be appointed by the EFDA Leader and he/she will report directly to the Task Force leadership. The ISM Coordinator should commit at least 25% of his/her time for coordination of the ISM group. This activity is eligible for Priority Support.

2.2 Objectives

The ITER Scenario Modelling Group was established under limited scope at April 2007. It started its work by using the existing major European Modelling codes (e.g. ASTRA, CRONOS and JETTO for core plasma modelling), and aims at integrating more and more ITM modules and codes as they become available. The modelling tasks are carried out by more than one code - when possible - and code-to-code comparison is an essential aspect of this work. This method of approach provides a better confidence in the results obtained as well as a continuous improvement of the European modelling tools. Moreover, the philosophy of this activity is to take into account existing experimental results, and the models used for extrapolation to ITER scenarios are systematically tested against existing experimental data.

The activity will advance **mainly through remote collaborations** supported by collaborative working sessions. Implied in the activity is the publication of and access to the detailed simulation data for the ITM-TF and in general adherence to the procedures of the ITM-TF and where applicable proper consideration of experimental access and clearance.

In broad terms the activity will focus on

- Development of improved set of ITER reference scenarios
- Verification and Validation, Benchmarking of the ISM tool set
- Development and publication of the ITER scenario modelling database.

ISM activities should also provide a continuation/finalization effort of the 2009 activities as needed

- Systematic modelling of current ramp up/down in all reference ITER scenarios.
- Density control by pellet injection and by gas puffing.
- Impurity control in the core and SOL.

*The team should be sufficiently flexible in the organisation of the work, in order to be able to address urgent ITER issues in a rapid timescale. \

3. Work description and breakdown

3.1 Project structure & task continuity

Implementation

All software development is expected to be implemented on the ITM-TF gateway, www.efda-itm.eu, under the provisions of the [Gateway User Agreement](#). The latter was agreed to by the EFDA-SC in June 2008. The Gateway User Agreement details access and sharing mechanisms for the software developments within ITM-TF. Furthermore, the ITM-TF will provide a collaborative software development environment, based on Gforge, to support the development of individual programs and at the same time ensure that Quality Assurance and traceability criteria for the ITM project are adhered to.

Intellectual Property Rights Monitoring

In agreement with the EFDA-SC decision (June 2008), and as described in the Gateway User Agreement, the ITM-TF will monitor IPR relating to contributed codes. In particular, the ITM-TF will maintain a record of contributions made to any Software through collaborative Tasks within the ITM-TF. All such modifications remain fully available to the contributing Associate provided contributors are acknowledged though the principles stated in the ITM-TF license. A Rights of access form (attached) is required for all codes being contributed. For any given code, this document states the current list of contributors, the code's ITM-TF Responsible Officer and technical reference(s) that should be used in publications involving the code.

Coordinated efforts

Type of activity[1]	Topic, aims and intended audience[2]	Participants[3]	Length[4]	Tentative Date[5]	Tasks involved[6]
Working Session/Code Camp	<ul style="list-style-type: none"> All those involved in the ETS or ETS type workflows ISM (Core) 	20 - 30	2 weeks	28 June 2010	WP10-ITM-IMP3-ACT1 WP10-ITM-IMP3-ACT2
Working Session	Integration freeboundary equilibrium+feedback code in ETS <ul style="list-style-type: none"> IMP12 , ETS, EDRG 	25	1 week	19 July 2010	WP10-ITM-IMP12-ACT2 WP10-ITM-EDRG-ACT4 WP10-ITM-IMP3-ACT1 WP10-ITM-ISIP-ACT12
Working Session/Code Camp	<ul style="list-style-type: none"> Edge modellers ISM (Edge) Key ETS members 	10 - 20	2 weeks	27 September 2010	WP10-ITM-IMP3-ACT1 WP10-ITM-IMP3-ACT2 WP10-ITM-IMP3-ACT3

					WP10-ITM-IMP3-ACT4
Working Session/Code Camp	<ul style="list-style-type: none"> • All those involved in the ETS or ETS type workflows • ISM (Core&Edge) • Key Edge modellers 	20 - 30	2 weeks	1 November 2010	WP10-ITM-IMP3-ACT1 WP10-ITM-IMP3-ACT2 WP10-ITM-IMP3-ACT3 WP10-ITM-IMP3-ACT4

[1] Activity is either: Project Meeting, Working Session or Code Camp, or OTHER (need then further description). In this context a Code camp is a working session with ISIP support.

[2] Overview of the activity scope and aims (i.e., what should be achieved) and audience (i.e., who should participate and benefit)

[3] Indicative number of participants expected to participate

[4] Length of the activity in calendar days

[5] Indicative starting date for activity

[6] A list of tasks within ITM that are directly linked to this activity.

Resources

0.25 ppy Priority Support for the coordinating activities of ISM.

4.5 ppy Baseline Support, of which 3.37 ppy is already committed in the previous Call.

3.2 Experiment related activities

ISM will rely on a certain level of data from a few experiments (AUG, JET,...) for testing and developments purposes. For continued modelling and benchmarking for ISM, the porting of the current ISM database to the gateway would need to be finalized.

3.3 Publications

All activities in the ITM-TF are based on collaborative work involving, in most cases, several Associations providing resources and staffing to the ITM-TF through these Task Agreements.

Any manuscript intended for circulation outside the Task Force which is based on ITM related work has to be cleared by the Task Force. The following procedure applies:

1. All proposed publications, conference contributions and abstracts need to be endorsed by the Project Leader(s) under whose project(s) the main part of the work to be reported was carried out. The manuscripts, abstracts, presentations and posters must then be submitted to the TF leadership at least 14 days prior to submission deadline for review.
2. The submitting author needs to have cleared any internal review and travel authorization required by his Association by the date of seeking review by the TF leadership. In the case of a manuscript or contribution deemed important to the ITM-TF where the author fails to clear an internal review or

obtain travel authorization, the ITM-TF reserves the right to take appropriate measures to secure the publication or presentation of the material through other means.

4. Scientific and Technical Reports

4.1 Progress Reports

At the end of each calendar year, and at intermediate times where appropriate, the Task Coordinator shall present a report on activities under the Task Agreement to the EFDA Leader for his approval. These reports shall integrate the progress made by each Association on each activity, and they shall indicate the level of achievement of the objectives, the situation of the activities, the allocation of resources and recommendations for the next year when applicable. The EURATOM financial contribution will be made through the usual procedures for baseline support through the Contract of Association.

4.2 Report of achievements under Priority Support (final report and, when appropriate, intermediate reports)

Achievement of Priority Support deliverables will be reported separately to the EFDA Leader. A final report (and intermediate reports marking substantial progress in the achievement of deliverables, if the EFDA Leader so requests) shall be prepared by the Task Coordinator and submitted to the EFDA Leader. If part of or all the activities carried out relate to JET, the Associate Leader for JET will be involved in clearing the report. These reports shall include specific sub-sections for each of the Associations involved. They shall document the degree to which the deliverables in Table 4.1 have been achieved, and shall include a breakdown of expenditure for each Association, under the headings of Annex 1. The EURATOM financial contribution will be made after approval by the EFDA Leader of these reports.

Table 4.1: Task Deliverables

The monitoring of these activities will be integrated in the schedule put in place by the ITM Task Force in the existing Task Agreement following the first Call, as follows:

Title	Start date	End Date	Deliverable(s) (precise definition)	Dependent activities
Status Report A	2010-0101	2010-03-15	Status report on ISM core activities	WP10-ITM-IMP3-ACT1 WP10-ITM-IMP3-ACT4
Status Report B		2010-05-15	Status Report on ISM edge activities	WP10-ITM-IMP3-ACT1 WP10-ITM-IMP3-

				ACT4
Database release	2010-01-01	2010-06-31	ITM release of ISM database (documentation and data)	WP09- TFL2-ISM-T6 (2009)
Status Report C		2010-08-15	Status Report ISM activities (detailed plan for remainder of 2010)	WP10-ITM-IMP3-ACT1 WP10-ITM-IMP3-ACT4
Status Report D		2010-10-31	Status Report for ISM edge activities	WP10-ITM-IMP3-ACT1 WP10-ITM-IMP3-ACT4
Final report		2010-12-31	Detailed summary of ISM activities and results	WP10-ITM-IMP3-ACT1 WP10-ITM-IMP3-ACT4

5. Priority Support Expenditure Forecast

The ISM Coordinator should commit at least 25% of his/her time for coordination of the ISM group. This activity is eligible for Priority Support.

A new feature of the 2010 implementation of the ITM-TF work programme is the focused use of coordinated joint activities as integral part of the work. These joint activities will be organised in working sessions and code camps (working sessions supported by the integration team) and supported under mobility. All contributors to the Task Force are strongly encouraged to participate in relevant working sessions and code camps. For activities falling under Priority Support, participation to these joint activities is obligatory. The list of coordinated activities for the IMP3 group, tentative time and duration are provided in the table above.

For exchange of scientists between the involved Associations details of the forecast of expenditure under the Mobility Agreement is shown in Annex 2. This data shall be included in the annual Mobility Plan of the Associations .

6. Intellectual Property

The Associates shall identify, in the Task Agreement reports, all information relevant from the Intellectual Property Rights point of view. Guidelines regarding the content of this IPR chapter are given in the EFDA Explanatory Note to the Associates of 28 November 2007 (IPR report (art.5) final).

7. Quality Assurance

EFDA QA rules applicable where appropriate (EFDA-Annex QA- EFDA QA requirements for Suppliers ([EFDA_D_2AN6G6](#))).

