



EFDA

EUROPEAN FUSION DEVELOPMENT AGREEMENT

Task Force
INTEGRATED TOKAMAK MODELLING

Remote meeting, 27 October 2010

INTEGRATED SCENARIO MODELLING, Introduction meeting 27 October

**Presented by X LITAUDON & I
VOITSEKOVITCH**

TF Leader : G. Falchetto
Deputies: R. Coelho, D. Coster

EFDA CSU Contact Person: D. Kalupin

Agenda

- **Introduction**
- **ITER ramp-up modelling- choice of plasma shape
T. Casper (30')**
- **Latest changes in the ECRH system M.
Henderson (30')**
- **Update on ITPA-IOS X. Litaudon/G. Giruzzi (15')**

- **Preparation of the ISM 2011 work-programme**
 - 3 main activities
 - 3 working session of 1 week including one joint session with IMP#3 (ETS related work)

- **New tasks have been added in 2011**
 - Comparison edge module in CRONOS with Edge 2-D
 - Modelling of JT-60SA scenario to be defined more precisely

- **Thursday 18/11 11h-12h00 CET :**
 - Seminar of K. Lackner at IRFM with video-conference : The Role of JT-60 SA in the European Programme

Remote meeting

Regular remote meeting on Wednesday morning 10h30-12h00 CET (09h30-11h00 GMT) :

- **Thursday 18/11 11h-12h00 CET :**
 - Seminar of K. Lackner at IRFM with video-conference : The Role of JT-60 SA in the European Programme

- **Wednesday 24/11 10h30-12h00 CET**
 - Preparation of working session
 - DIII-D ITPA modelling I. Voitsekovitch (tbc)
 - Status of the ISM publication on edge modelling S. Wiesen (tbc)

- **Wed 08/12 10h30-12h00 CET**
 - Wrap-up from the working session

- **Thursday 09/12 13h30-16h Presentation of Y. Kamada-san on JT-60SA (with video-conference from IRFM)**

ISM Working session

- **ISM working session date and place have been confirmed**
 - the best compromise 29 nov- 03 Dec.
 - At Culham
 - I Voitsekovitch as Local Organiser

- **for EU invitation letter to ISM working session : send e-mail to X.L & IV**
 - CEA: M. Schneider, J. Garcia, E. Nardon, X. Litaudon
 - IPP: J. Hobirk
 - FOM D. Hogeweij, J. Citrin
 - CCFE: J. Lonroth, P. Belo, F. Koechl, I. Voitsekhovitch

- **ETS Code camp, scheduled for 6-17 December 2010 in Innsbruck**

Review of the tasks within ISM activities

- **Activity-1 : Support Validation of the ETS**
- **Activity-2 : Interpretative & predictive integrated scenario modelling on existing devices**
 - Focus on JET & ASDEX-U hybrid discharges (with & without I_p overshoot)
- **Activity-3 : Predictive scenario modelling for ITER, JT-60SA, DEMO ...**
 - Focus on ITER hybrid
 - Repeat previous runs with new ECRH configuration
 - Simulation of heat transport & particle (density peaking)

Activity-1

Ref.	Task name	Start date	Involved physicist	Status/comments
ISM-P1-2010-1	Verification of ETS tool on JET ohmic pulse	March 2010	G. Pereverzev, J. Ferreira, J. Bizarro, D. Kalupin, D. Coster, I. Voitsekhovitch G. Pereverzev, J. Ferreira, J. Bizarro, D. Kalupin, D. Coster, I. Voitsekhovitch	Denis Kalupin reports on 17/09/2010- Task complete.
ISM-P1-2010-2	Verification of temperature and density transport solvers in ETS	Sept 2010	J. Ferreira, D. Kalupin, D. Coster, G. Pereverzev, I. Voitsekhovitch	
ISM-P1-2010-3	Verification of impurity solver in ETS	Sept 2010	P. Belo, I. Ivanova-Stanik, D. Kalupin, I. Voitsekhovitch	Par is contacted concerning discussion with FR about Belo's assignement to this task. SANCO runs for benchmarking.
ISM-P1-2010-4	Verification of equilibrium solver and PFDE in ETS	Sept 2010	D. Kalupin, F. Koechl, G. Pereverzev, D. Coster, I. Voitsekhovitch	Discussion within ETS team. Consideration of more advanced equilibrium solver (SPIDER?).



Activity-2

Ref.	Task name	Start date	Involved physicist	Status/comments/actions
ISM-P2-2010-00	Modelling of current ramp-up in JET, Asdex, Tore Supra	2008	F. Imbeaux, D. Hogeweij, F. Koechl, J. Hobirk	Revised 16/09/2010-sent to co-authors for comments 1. Prad profiles for ASDEX-U AUG22110 are required 2. TS40676 (ECCD)-repeat modeling with reprocess ECRH power 3. JET pulses repeat with Prad measurement profiles
ISM-P2-2010-1	JET DT extrapolation of the hybrid regime	August 2010	G. Sips, C. Challis, F. Imbeaux, G. Giruzzi, J. Garcia, I. Voitsekovitch, J. Henkins, TRANSP modelling, F. Kochl (Jetto), L. Garzotti, S. Wiessen, P. Belo	Presentation J. Garcia ISM meeting 29/Sept/2010 Ref. Scenario to be analysed with EDGE2D, SANCO + JETTO
ISM-P2-2010-2	Modelling of plasma rotation in Hybrid Scenario			Not started - low priority
ISM-P2-2010-3	Current ramp up JET discharges with li control.			Not started- low priority
ISM-P2-2010-4	Modelling of DIII-D current ramp up discharges (ITPA database)		I Voitsekhovitch, J. Hobirk, F. Imbeaux, D. Hogeweij, V. Parail, T Casper, D. Mikkelsen (T&C ITPA), G.L. Jackson, J.M. Park (DIII-D)	Check of the missing data- e-mail from I Voitsekhovitch
ISM-P2-2010-05	Current ramp-up in JET Hybrid Scenario: modelling and optimisation.		E. Joffrin, J. Garcia, D. Hogeweij, F. Koechl ,	EJ proposes the following Pulses: 76858, 77933, 77922, 77914. J. Citrin modelling of 79626/79630 (with/without overshoot low delta)

Activity-2

ISM-P2-2010-06	Modelling of JET current ramp down experiments – optimisation of flux consumption and li		P. Belo, V. Parail	Not started- low priority- Modelling of HL transition with EDGE2D (divertor heat load) r
ISM-P2-2010-07	Current profile diffusion in JET hybrid scenario			Same pulses as ISM-merge with P2-2010-05 to be carried out when ISM-P2-2010-05 is finished - Includes impurity modelling and effect on performance.
ISM-P2-2010-8	ASDEX interpretative hybrid modelling	Sept 2010	. J. Hobirk, P. Belo, J. Citrin, J. Garcia, F. Koechl, J. Lonnroth, M. Schneider, I. Voitsekhovitch	Revised 17/09/2010- sent to co-authors for comments 1) AUG data in a format of ASTRA ufiles to be provided to I. Voitsekhovitch for the preparation of input PPFs for CRONOS and JETTO. 2. AUG NBI geometry to be provided for implementation to CRONOS and JETTO.
ISM-P2-2010-9	Predictive JET /JT-60U modelling of the identity experiments	Sept 2010	V. Parail, T. Tala Y. Sakamoto, P.C. de Vries, A. Salmi	Revised 17/09/2010, start during the ISM meeting Lisbon
ISM-P2-2010-10	Impurity of JET hybrid			
ISM-P1-2010-5	Validation of Edge module SOUL 1-D edge module		F. Imbeaux, V. Parail, S. Wiesen	Request of JET pulses to validate SOUL 1-D edge module + to be extended with EDG2D comparison

Activity-3

Ref.	Task name	Start date	Involved physicist	Status/comments
ISM-P3-2010-01	Migration of 2009 ISM ITER modelling to ITM-TF Gateway	Sept 2010	I. Voitsekhovitch (for technical work), all ISM members to suggest the runs, ITM expert to help with ITM conversion tools	ITER runs have been selected + TS, JET and AUG pulse list . Task complete – information sent to P. Strand on 17/09/2010 – reply on 29/09 the task is approved and complete.
ISM-P3-2010-02	Modelling of deep pellet fuelling in ITER hybrid regime	Sept 2010	B. Pegourie, L. Garzotti,...	
ISM-P3-2010-03	Modelling of the current ramp-up to 15MA baseline scenario	2008	F. Imbeaux, D. Hogeweij, F. Koechl, J. Hobirk, T. Casper	Revised 16/09/2010 and sent to involved physics 1) define the current ramp-up parameters
ISM-P3-2010-04	ITER Hybrid 0-D modelling with HELIOS			XL check with JJ
ISM-P3-2010-05	ITER Hybrid 0-D modelling with METIS			XL check with JFA
ISM-P3-2010-06	Hybrid scenario with revised ITER ECRH antenna configuration		J. Garcia, M. Schneider, J. Citrin, F. Koechl, G. Giruzzi, G. Sips, T. Casper, E. Joffrin, J. Hobirk, I Voitsekovitch	Revised 16/09/2010 sent to involved physics Waiting for ITER-IO input
ISM-P3-2010-07	Hybrid scenario with revised ITER ECRH antenna and density		J. Garcia, M. Schneider, J. Citrin, F. Koechl, G. Giruzzi, G. Sips, T. Casper, E. Joffrin , J. Hobirk, I Voitsekovitch	Revised 16/09/2010 sent to involved physics Waiting for ITER-IO input

Activity 3

ISM-P3-2010-08	Integrated modelling of ITER H-mode scenario including impurities		S. Wiesen, P. Belo, F. Koechl, J. Lonroth, V. Parail	Action : Urgent need in discussion with ITER edge/SOL experts on ITER-ISM collaboration- ISM meeting at Cadarache in 2011 ? Involve impurity experts : L. Lauro-Taroni, M. Valisa, M. Ester , C. Angioni ?
ISM-P3-2010-09	ITER hybrid current ramp-up and free boundary equilibria calculation		D. Hogeweyj, F. Imbeaux, F. Koechl, E. Nardon, J.F. Artaud, , J. Hobirk, T. Casper	Optimise q-profile during ramp-up phase for Hybrid regime + Free boundary equilibrium calculation (link with F4E-Grant 255)
ISM-P3-2010-10	ITER hybrid MHD stability of scenario			
ISM-P3-2010-11	ITER hybrid real time profile q control		D. Moreau	
ISM-P3-2010-11	JT-60SA modelling			Task to be defined – XL in contact with Karl Lackner and Kamada-San