EFDA
EUROPEAN FUSION DEVELOPMENT AGREEMENT

Task Force
INTEGRATED TOKAMAK MODELLING

INTEGRATED SCENARIO MODELLING:
ISM news and preparation to coming ISM Working Session, March 11-15 2013

Presented by I. VOITSEKHOVITCH and J. GARCIA

TF Leader : G. Falchetto
Deputies: R. Coelho, D. Coster
EFDA CSU Contact Person: D. Kalupin

Agenda of this meeting

1. ISM news, preparation to coming ISM working session March 11-15 2013 (Irina Voitsekhovitch and Jeronimo Garcia)

2. Turbulent transport analysis of JET H-mode and hybrid plasmas using QuaLiKiz, TGLF and GLF23 models: first results (Benedetta Baiocchi)

3. Discussion on integrated core-pedestal-SOL modelling including impurity for H-mode ITER scenario (Irena Ivanova-Stanik, Florian Köchl, Irina Voitsekhovitch, ...)

ISM working sessions

- 1st ISM working session will take place 11-15 March at EFDA-Garching (joint with ITM CC)

  ETS training (1st week of CC): Yu. Baranov, A. Figueiredo, I. Ivanova-Stanik, R. Stankiewicz I. Voitsekhovitch

- 2nd working session: 3-7 June, Cadarache, joint ISM - IO meeting on integrated modelling.

- 3rd working session: end of October/November, place to be decided

ITM Code Camps

➢ **March 4 – 15, IPP-Garching (2nd week is joint with ISM WS)**

➢ **April 15 – 26, CIEMAT, Madrid**

➢ **July 8 – 19 (after EPS), Helsinki**

➢ **September 9 – 20, Ljubljana**

➢ **Dates and place for the 5th CC is under discussion**

Provisional dates for ISM remote meetings in 2013

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

- ➢ 10 April (IOS ITPA rehearsals, ...)
- ➢ 24 April (7th IEEE TM rehearsal, ...)
- ➢ 22 May
- ➢ 26 June (EPS rehearsals, ...)
- ➢ then EPS, Code Camp , vacations ...
- ➢ 18 September

ISM mobility visits to JET

- ➤ **I. Ivanova-Stanik, February 18-22, ITER modelling with COREDIV**

- ➤ **S. Moradi, April 15-26, to work with L. Garzotti on GYRO simulations for JET hybrid scenarios – this visit will be under JET Task 13-17**

Conferences/meetings:

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➢ **IOS ITPA, April 15-18 2013, Cadarache**

    - D. Hogeweij et al, (a) Current ramp up modelling for ITER hybrid scenario; (b) first results of the C-Be-W modelling (George Sips's request)

    - I. Voitsekhovitch et al, Particle transport: sensitivity studies

    - J. Garcia et al, Role of fast ions in Hybrid Scenario

➢ **7th IAEA TM on Steady State Operation of Magnetic Fusion Devices, May 14-17 2013, Aix en Provence, France. Deadline: 15th February (abstract), 1st May (poster), 25th April (paper with referee)**

    - J. Garcia / J. Citrin et al, Modelling of ITER hybrid scenario (?)

➢ **20th Topical Conference on Radio Frequency Power in Plasmas, June 25-28 2013, Sorrento, Italy. Abstract deadline: 5th April 2013**

    - E. Barbato et al, LHCD/NBI modelling for JET plasmas

Conferences/meetings:

- ➢ **40th EPS conference on Plasma Physics, July 1-5 2013, Espoo, Finland. Deadlines: 23rd February (abstract), 15th June (poster, oral), 2nd June (paper)**

  - A. Figueiredo et al, Modelling of JET hybrid scenarios with the European Transport Solver

  - B. Baiocchi et al, Turbulent transport analysis of JET H-mode and hybrid plasmas using QuaLiKiz TGLF and GLF23 (C wall)

  - F. Köchl et al, Integrated core+edge+MHD modelling of ELM mitigation at JET

  - P. Siren et al, Current profile modelling in JET and JT-60U identity plasma experiments

- ➢ **PLASMA-2013 International Conference on Research and Applications of Plasmas, September 2-6 2013, Warsaw, Poland. Abstract deadline: 17th March 2013**

  - I. Ivanova-Stanik et al, Modelling of impurity transport with ETS

➢ **14th International Workshop on H-mode Physics and Transport Barriers , October 2013, Japan**

- **Dick Hogeweij et al Modelling of current ramp up / down**

- **Jeronimo Garcia et al Comparison of JET/JT60U shots**

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CEA:

Garcia Jeronimo (11 – 15 march 2013)
Baiocchi Benedetta (11 – 15 march 2013)
Litaudon Xavier (11 – 15 march 2013)
Basiuk Vincent (3 – 15 march 2013)

CCFE:

Voitsekhovitch Irina (11 – 15 march 2013)
Baranov Yuri (11 – 15 march 2013)

IST:

Ferreira Jorge (3 – 15 march 2013)
Figueiredo António (3 – 15 march 2013)
Nabais Fernando (3 – 15 march 2013)
Bizarro Joao (3 - 15 march 2013)

IPPLM:

Ivanova-Stanik Irena (3 – 15 march 2013)
Stankiewicz Roman (3 – 15 march 2013)

OAW:

Köchl Florian (11-15 March 2013)

ENEA:
Barbato Emilia (11-15 march, 2013)
Nowak Silvana (11-15 march 2013)

IPP-Garching:
Fable Emiliano (3-15 march 2013)

T2. ETS validation and application of ITM workflows to physics studies:

a. Modelling of ITER scenarios with ETS workflows, based on the existing scenario developed with CRONOS, JETTO and ASTRA (in collaboration with IMP12, IMP3, IMP4 and IMP5) V. Basiuk, J. Garcia

- selection of ITER scenario based on CRONOS run, preparation of input CPO

b. Effect of NTM on transport and confinement in Hybrid Scenarios (JET, ASDEX-Upgrade or ITER discharges (in collaboration with IMP12-ACT1, IMP3-ACT1)) S. Nowak, O. Sauter, A. Merle, V. Basiuk, D. Kalupin

- NTM simulations for JET HS 76791 and 75225, estimation of island width;
- predictive simulations with NTM module for JET shots
- simulations for AUG if data are available

T2. ETS validation and application of ITM workflows to physics studies:

c. Core impurity transport and radiation in JET (C & ILW) and ASDEX-Upgrade (W wall) (in collaboration with IMP3-ACT1)

- JET HS 82794: preparation of CPO (D & V included) from JETTO/SANCO run, ETS validation against experimental data, comparison with SANCO

Yu. Baranov, I. Ivanova-Stanik, J. Ferreira, D. Kalupin

T2. ETS validation and application of ITM workflows to physics studies:

d. Self-consistent (Te, Ti, ne, j) predictive modelling for JET plasmas with the ETS

- ETS simulations for 77922 with Bohm-gyroBohm model (Te, Ti, j simulations)
- modelling for 77922 including particle transport
- test of other transport models (ETAIGB, …)
- similar simulations for 79635

A. Figueiredo, J. Ferreira, D. Kalupin, V. Basiuk, X. Litaudon

T2. ETS validation and application of ITM workflows to physics studies:

e. Equilibrium and MHD stability simulations (task continuation)

- ETS FREEBIE simulations

J. Urban, V. Basiuk, ...

- MHD stability analysis of JET and ASDEX-Upgrade discharges with MARS-F – free boundary equilibrium, ideal stability threshold

D. Yadykin, F. Nabais ...

1. **Turbulent transport analysis with TGLF, QualiKiz, GLF23 for JET hybrids**

    B. Baiocchi, J. Garcia

2. **Current ramp down modelling, finalisation of publication**

    J. Bizarro, I. Voitsekhovitch

3. **LHCD/NBI simulations for JET plasmas (C wall, task continuation)**

    E. Barbato, I. Voitsekhovitch

4. **Comparison and modelling of JT-60U and JET plasmas in typical operational domains (signed Proposal Document Sheet EU11-02).**

    J. Garcia, B. Baiocchi, E. Barbato

1. **Predictive density modelling with first principle models for ITER (ISM IOS-ITPA presentation)**

   - sensitivity study for ITER H-mode scenario with GLF23
       $\alpha E=0$, 0.5 with $\beta e=0$
       $\beta e=1$ with $\alpha E=1$

   - effect of impurities on fusion performance

   F. Köchl, I. Voitsekhovitch, B. Baiocchi, J. Garcia, I. Ivanova-Stanik, R. Stankiewicz, E. Fable

2. **ITER scenario modelling with METIS including simulation of the real time control of the fusion burn**

   X. Litaudon, J. Garcia

4. **1D JT-60SA scenario modelling: implementation of the JT-60SA H&CD configuration (NBI, ECRH) in EU transport codes. Predictive scenario modelling with transport models validated in ISM-ACT2**

   X. Litaudon, J. Garcia, E. Barbato, E. Fable, C. Angioni

5. **DEMO modelling using ITM Kepler workflows, in coordination with EFDA PPPT Work Programme (in collaboration with IMP3-ACT1-T9]**

   R. Stankiewicz, I. Ivanova-Stanik, B. Baiocchi, J. Garcia, C. Reux