



23rd IAEA Fusion Energy Conference

11–16 October 2010

Daejeon, Republic of Korea

Organized by the
International Atomic Energy Agency

Hosted by the
Government of the Republic of Korea through its
National Fusion Research Institute

ANNOUNCEMENT AND CALL FOR PAPERS

1. INTRODUCTION

The International Atomic Energy Agency (IAEA) fosters the exchange of scientific and technical results on nuclear fusion research through the series of its Fusion Energy Conferences. The 23rd IAEA Fusion Energy Conference (FEC 2010) is aimed at providing a forum for discussing driving physics and technology issues as well as innovative aspects of direct relevance to fusion as a source of nuclear energy.

With a number of next step fusion devices being implemented, such as *inter alia* the International Thermonuclear Experimental Reactor (ITER, Cadarache, France) and the National Ignition Facility (NIF, Livermore, USA), and the need to demonstrate the technological feasibility of fusion power plants together with the economical viability of fusion energy production, the fusion community is now facing new challenges. The resolution of these challenges will dictate research orientations in the present and coming decades.

The scientific scope of the FEC 2010 is, therefore, to reflect the priorities set by this new era in fusion energy research. The conference aims to be a platform where results of research and development efforts on national as well as international fusion experiments, shaped by these new priorities, will help in pinpointing the worldwide degree of advances in fusion theory, experiments, technology, engineering, safety and socio-economics. Furthermore, the conference also aims to set these results against the backdrop of the requirements for a net energy producing fusion device and a fusion power plant in general, and to help in defining the way forward.

With the contribution of international organizations such as the ITER-IO and EURATOM as well as the collaboration of more than forty countries and several research institutes, including those working on smaller plasma devices, it is expected that this conference will, as in the past, contribute in

identifying possibilities and means for a continuous effective international collaboration embracing the overall spectrum of contributors.

The 23rd Fusion Energy Conference is being organized by the IAEA in cooperation with the National Fusion Research Institute, Yusung-gu, Daejeon, Republic of Korea. Previous conferences in this series were held in Salzburg (1961), Culham (1965), Novosibirsk (1968), Madison (1971), Tokyo (1974), Berchtesgaden (1976), Innsbruck (1978), Brussels (1980), Baltimore (1982), London (1984), Kyoto (1986), Nice (1988), Washington, DC (1990), Würzburg (1992), Seville (1994), Montreal (1996), Yokohama (1998), Sorrento (2000), Lyon (2002), Vilamoura (2004), Chengdu (2006) and Geneva (2008).

2. TOPICS

- OV Overviews
- EX Magnetic Confinement Experiments (subtopics see Annex A)
- TH Magnetic Confinement Theory and Modelling (subtopics see Annex A)
- IT ITER Activities
- IF Inertial Fusion Experiments and Theory
- IC Innovative Concepts
- FT Fusion Technology and Power Plant Design
- SE Safety, Environmental and Economic Aspects of Fusion

Papers on these topics will be considered for presentation at the FEC 2010 if clearly relevant to the development of fusion energy (see attached Scientific Guidelines for Authors – Annex A). A Programme Committee with a representative international membership will be responsible for the selection of papers, arrangements of conference sessions and the overall scientific content of the conference. The Programme Committee will meet in April 2010 at IAEA Headquarters in Vienna, Austria.

3. PARTICIPATION

All persons wishing to participate in the conference are requested to **register in advance online** under <http://www-pub.iaea.org/MTC/Meetings/Announcements.asp?ConfID=38091>. In addition they must send a completed Participation Form (Form A) to the appropriate government authority for subsequent transmission to the IAEA. **Participants will be accepted only if FORM A is transmitted to the IAEA via one of the official channels** (see section 6).

4. SUBMISSION OF SYNOPSES AND ABSTRACTS

Anyone wishing to present a paper or poster during this conference must submit **a two page synopsis and an abstract, both in electronic format** (no paper copies) directly to the IAEA. The synopses (in Portable Document Format – PDF) and abstracts **must** be submitted through the IAEA's web browser based, password protected file submission system, called **LISA** (follow carefully the Instructions for Electronic Submission of Two Page Synopses and Abstracts – Annex B).

<http://www.iaea.org/cgi-bin/lisa/start>

Authors must further submit the following forms to their appropriate government authority (see section 6) for transmission to the IAEA. Forms must be received by the IAEA by **2 April 2010**.

- Participation **FORM A**
- **FORM B** for Submission of a Paper

IMPORTANT: The electronically received two page synopsis will be considered by the Programme Committee only if the Participation Form A and Paper Submission Form B have been received by the IAEA through the representative official government channels.

Please note that registration to the LISA System is required for submission of a contribution. Authors must complete all the information required by LISA.

5. EXPENDITURES

The cost for the organization of the conference is borne by the Host Government and the IAEA.

No registration fee is charged to participants.

As a general rule, the IAEA does not pay for participants' travel and living expenses. However, limited funds are available to help meet the cost of attendance of selected specialists, mainly from developing countries with low economic resources. Generally, not more than one travel grant may be awarded to any one country.

To apply for a travel grant, please complete and send the **Grant Application FORM C** through your appropriate government authority (see section 6) together with the **Participation FORM A**, and the **Paper Submission FORM B** and other relevant material.

All forms must reach the IAEA by **2 April 2010** at the latest. Travel grants requests will **only be considered for authors of accepted papers**. Incomplete or late applications will not be considered. The grants will be lump sums usually covering **only part of the cost** of attendance.

6. CHANNELS OF COMMUNICATION

Participation FORM A, Paper Submission FORM B, and, if applicable, the Grant Application FORM C must be sent through one of the following competent official authorities: Ministry of Foreign Affairs, National Atomic Energy Authority or, for ITER participants, the ITER organization, for subsequent transmission to the IAEA.

7. POST-DEADLINE PAPERS

A limited number of papers will be considered for post-deadline acceptance. To be considered, a paper must meet the following criteria:

- It deals with subject matter appropriate for this conference.
- It presents new experimental or theoretical data, or technology development, of sufficient importance to attract wide-ranging interest among the conference participants.
- It is submitted with Paper Submission **Form B** (see section 4) and government endorsement **Form A** (see section 6).
- A two page synopsis has been sent by e-mail as a file attachment to the scientific secretariat, IAEA, before **17 September 2010** e-mail: physics@iaea.org (**PDF files only**).

The Programme Committee will meet on **11 October 2010** to consider post-deadline submissions. Authors will be notified promptly about the acceptance or rejection of their papers through announcements posted at the conference site and at the secretariat. Post-deadline papers' authors should be prepared to provide either an oral presentation or a poster. Time will be made available for three post deadline oral presentations. The manuscripts of post-deadline contributions are to be included in the proceedings and must follow the same guidelines as for regular papers (see section 8(b) below).

8. PAPERS AND CONFERENCE PROCEEDINGS

(a) Acceptance of papers

Authors will be notified by email by **May 2010** whether their papers have been accepted for oral presentation or for poster presentation and will be informed of the assigned paper number and session of presentation.

(b) Submission of full manuscripts

Full manuscripts shall be submitted through the LISA system. Specifications for the layout and electronic format of the full manuscripts and for the preparation of posters will be sent to all main authors of accepted papers. These specifications will also be posted on the FEC 2010 web site when available. The full manuscripts **must** be submitted through LISA in the same way as the two page synopses (see Annex B). LISA will be reopened for submission of accepted papers on **23 August 2010**. The deadline for electronic submission of the full papers in PDF is **24 September 2010**. The IAEA will not accept papers sent after the deadline, any subsequent submission by email will not be accepted.

The specifications and instructions for preparing the full manuscripts will be posted on the conference website along with the page limits by **May 2010**:

<http://www-pub.iaea.org/MTCD/Meetings/Announcements.asp?ConfID=38091>

IMPORTANT: The system for electronic collection of papers, LISA, is the sole mechanism for submission of papers for the FEC 2010. Historically, up to 70% of all papers are submitted during the last week of the open period. Due to the increased volume of traffic and data on the server the probability for inconveniences with the system is expected to increase and it may be necessary to attempt upload several times. Authors are therefore encouraged to submit papers as early as possible.

(c) Publication of proceedings

The papers will be published by the IAEA as unedited proceedings in electronic format on CD-ROM and on the IAEA Physics Section web site by March 2011. Please note that material which was not presented at the conference orally or by poster will not be included on the proceedings.

<http://www-naweb.iaea.org/iaea.org/naweb/physics/index.htm>

(d) Submissions of contributed papers to Nuclear Fusion

Authors of accepted papers for presentation at the conference are encouraged to submit their papers to the journal Nuclear Fusion (NF), in addition to the submission for the sake of producing conference proceedings. The manuscripts must contain original work and should omit, or only briefly mention in the introduction, material that has already been published. Papers should be suitable in terms of style and content for a high quality scientific journal and will be subject to the normal double-referee peer-review procedure of NF. All communications with the authors regarding details for publication and charges will be handled by the Nuclear Fusion office.

(e) Overview papers and Summaries

Authors of manuscripts for overview papers and conference summary papers are kindly requested to submit their papers for publication in a special edition of the journal Nuclear Fusion to appear in mid 2011.

(f) Page limits

Summaries: 20 pages

Overviews: 12 pages

Orals: 8 pages

Posters: 8 pages

9. WORKING LANGUAGE

The working language of the conference is English. All communications, synopses, abstracts and full manuscripts must be sent to the IAEA in English.

10. DISTRIBUTION OF DOCUMENTS

The preliminary programme and the book of abstracts will be posted on the FEC 2010 web site. The electronic version of the final programme will be available by **September 2010**. The final programme booklet and the hard copy of the book of abstracts will be made available to participants upon registration at the conference location, the Daejeon Convention Centre. The electronic version of the preprints will be made available on the IAEA ftp server to download and also at the conference computers. **Printed hard copies of papers will not be provided by the IAEA.**

11. CONFERENCE WEB SITE

Participants should visit the conference web sites regularly to check for new or updated information. The conference web site addresses are:

IAEA: <http://www-pub.iaea.org/MTCD/Meetings/Announcements.asp?ConfID=38091>
IAEA/LISA: <http://www.iaea.org/cgi-bin/lisa/start>
(LISA open for electronic submission of: two page synopses and abstracts
(**1 March – 2 April 2010**) and full manuscripts (**23 August – 24 September 2010**))

Local conference site issues: <http://www.fec2010.kr>

The following information will be posted on the FEC 2010 web site:

December 2009	Conference announcement and annexes; Forms A,B and C
December 2009	Instructions for submission of two page synopses and abstracts
December 2009	Sample two page synopsis and templates (Word, LaTeX)
April 2010	General information on conference site issues, hotel reservation form
May 2010	Notification of Authors (through LISA)
May 2010	Author instructions for full manuscripts
May 2010	Preliminary programme
September 2010	List of Satellite meetings
September 2010	Final programme and book of abstracts
March 2011	Conference Proceedings

12. DEADLINES/TIME SCHEDULE

1 March - 2 April 2010	Electronic submission of abstracts and two page synopses (LISA open)
2 April 2010	Submission of Forms A, B and C to the IAEA through official channels

16 August 2010	Hotel reservations
23 August-24 Sept.2010	Submission of full manuscripts (LISA open)
13 September 2010	Registration of satellite meetings
17 September 2010	Submission of post-deadline papers (2-page synopses)
11 October 2010	Conference commences
11 October 2010	Evaluation of post-deadline papers (PC)
16 October 2010	Conference ends

13. ACCOMMODATION

Detailed information on accommodation and other items will be available in April 2010 on the IAEA conference website: <http://www-pub.iaea.org/MTCD/Meetings/Announcements.asp?ConfID=38091> as well as under the local conference website: <http://www.fec2010.kr>.

14. VISA

The participants are responsible to take any steps in order to request for a visa to enter the Republic of Korea and submit the necessary application to the nearest diplomatic or consular representative of the Republic of Korea as soon as possible.

15. EXHIBITIONS

Space will be available for commercial vendors' displays/exhibits during the conference (further information will be given at a later date). Interested parties are requested to contact the local organizing committee:

Email: fec2010@nfri.re.kr

Website: <http://www.fec2010.kr>

16. SATELLITE MEETINGS

Deadline for Booking Requests: **13 September 2010.**

Contact details for reservations will be available soon on the conference web site.

17. CONFERENCE SECRETARIAT

Scientific Secretariat of the Conference:

Scientific Issues (submission of two page synopses, abstracts and full manuscripts, conference programme)

Email address for paper submission: physics@iaea.org

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Website: <http://www.fec2010.kr>

Travel Agency (Hotel Reservations and Side Tours):

E-mail: fec2010@nfri.re.kr

Website: <http://www.fec2010.kr>

ANNEX A - SCIENTIFIC GUIDELINES FOR AUTHORS

1. Papers must present original and previously unreported work on any of the conference topics listed below. In particular, papers on subjects covered by the same authors at previous IAEA conferences must only contain results obtained since those already reported, and this should be indicated in the extended synopsis.
2. The Programme Committee will base its decision to include papers in the conference on the two page extended synopsis provided. This should therefore outline, in sufficient detail, the purpose of the work and the results obtained.
3. Detailed work specific to diagnostics physics should not be submitted to this conference.
4. General engineering work not specific to fusion should not be submitted to this conference.
5. Topical Areas:
 - OV Overview
 - EX Magnetic Confinement Experiments
 - C: Confinement
 - S: Stability
 - W: Wave–plasma interactions – current drive, heating, energetic particles
 - D: Plasma–material interactions – divertors, limiters, SOL
 - TH Magnetic Confinement Theory and Modelling
 - C: Confinement
 - S: Stability
 - W: Wave–plasma interactions – current drive, heating, energetic particles
 - D: Plasma–material interactions – divertors, limiters, SOL
 - IT ITER Activities
 - IF Inertial Fusion Experiments and Theory
 - IC Innovative Confinement Concepts
 - FT Fusion Technology and Power Plant Design
 - SE Safety, Environmental and Economic Aspects of Fusion

In the case of EX and TH the author shall indicate a single main subtopic for the paper.

6. Overview papers will be considered in the following categories:
 - An overview of a number of presentations from a major facility;
 - An overview of studies in a topical area.
7. The following guidelines can be followed to determine whether papers including discussions of new fusion concepts should be included under EX, TH, or IC. If the purpose of the paper is primarily to expose a new fusion concept, it should be identified as IC even if a moderate amount of theory and/or data are included. If a paper primarily presents new theory, it should be identified as TH. If it primarily presents new experimental results, it should be identified as EX. The Programme Committee may indicate an appropriate topic for the paper in cases of ambiguity or mismatch.

ANNEX B - INSTRUCTIONS FOR ELECTRONIC SUBMISSION OF TWO PAGE SYNOPSES AND ABSTRACTS

Anyone wishing to present a paper at FEC 2010 is requested to submit a **two page synopsis** (to be used by the Programme Committee for paper selection) and a **short abstract** (to be used for the Book of Abstracts) to the IAEA not later than **2 April 2010**.

(a) Web Browser Based File Transmission

The two page synopses and the abstracts **must** be submitted in **electronic format** (no paper copies should be submitted). For the submission of the synopses and abstracts the IAEA will provide a web browser based, password protected file submission system called LISA (Lightweight Interactive Storage Application). The two page synopses and abstracts **must** be submitted through LISA. **Submission by e-mail, on CD-ROM or floppy, or as paper copies will not be accepted.**

LISA will be operational from **1 March to 2 April 2010** for abstract and synopsis submission. LISA can be accessed using a web browser through the following Internet address:

<http://www.iaea.org/cgi-bin/lisa/start>

Authors will be guided through LISA with step-by-step instructions. Access to LISA is password protected. First time login requires a **common password** which will be communicated to scientists potentially interested in submitting a paper; to the members of the International Fusion Research Council, and to the members of the Programme Committee. Interested persons who do not receive this information should contact the IAEA Scientific Secretariat, e-mail: physics@iaea.org providing the following information: (i) in the subject line: FEC 2010 LISA access; (ii) in the body text: full name, affiliation, full address and e-mail address (no file attachment, not other information).

In the course of the first login every author has to define his/her **individual password**. This password is needed for any subsequent login to submit author information, abstracts, two page synopses and, from 23 August through to 24 September 2010, the full manuscripts of accepted papers.

In addition to the individual password you will be asked to provide your e-mail address, which will act as the **"user name"** of your LISA "account". **Do not forget the e-mail address (your "user name") you chose for your first login and your chosen individual password!** Within one LISA account ("user name") you may submit information for different papers. Please do not create new accounts to submit papers for the same main author. **Make sure that you provide the email address of the first author for receiving further electronic notifications. If you are submitting several papers from different authors please create an account for each author and use the relevant authors email address as the "user login". You may indicate your email address on the second email field when LISA asks.**

If you experience difficulties when uploading the synopsis (see the next section, (b) Electronic Format) and need to retry or if you want to change the information you have already submitted, you may visit LISA again up to **2 April 2010**. However, you should note that no more than 25 uploads of the same abstract or synopsis can be made.

(b) Electronic Format of Two Page Synopses and Abstracts

Two Page Synopsis: Portable Document Format (PDF) or, in exceptional cases when an author is not able to produce a usable PDF file, **PostScript (PS)** format, will be the required format for submission of the two page synopses (see layout specifications below). No other formats will be accepted. Instructions on how to produce PDF or PS files will be posted on the FEC 2010 web site. LISA will check your uploaded PDF or PS file(s), as past experience has shown that PDF and PS files may contain errors and may not show up correctly on different computers. LISA will inform authors of any errors and their reasons; and it may be necessary to prepare and resubmit a new PDF or PS file (please consider the maximum limit of 25 uploads per contribution).

Abstract: All information required for the short abstract and the abstract text must be typed into **special text boxes** provided by LISA. Please note: (i) these text boxes provide only limited space that

cannot be exceeded (2400 characters including spaces); text exceeding the space limit will be truncated; (ii) mathematical characters and expressions, Greek or other symbols, and superscripts or subscripts may not be used in the abstract text boxes; use, for example, “beta” instead of “ β ”, “n(e)” instead of “ n_e ”, etc. The input provided in the text boxes will be used for producing the Book of Abstracts.

(c) Specifications for the Layout of the Two Page Synopsis and Sample for Abstract Submission

Two Page Synopsis:

- Page size: A4 (297 mm by 210 mm) – vertical orientation
- Full margins (left/right/top/bottom): 25 mm
- Layout: single-spaced, one additional line between paragraphs
- Alignment: left
- Font: Times New Roman only
- Title: 14-point size, bold, first letter in capitals, first letter of each subsequent word in capitals except for articles and propositions
- Authors: 12-point size
- Affiliation and e-mail address: 12-point size
- Text: 12-point size
- Length: maximum 2 pages

SAMPLE FOR ABSTRACT SUBMISSION

All information needed for the short abstract must be typed into text boxes provided by LISA.
Example:

Paper Title

The Spherical Tokamak Programme at Culham

Author: Family Name, Initials (only the main author's name should be given)

Sykes, A.

Affiliation of Main Author (including city and country)

Euratom-UKAEA Fusion Association, Culham, United Kingdom

E-mail Address of Main Author

alan.sykes@ukaea.org.uk

Abstract Text: Enter the abstract in one continuous paragraph (maximum 2400 characters including spaces); text exceeding the space limit will be truncated. Do not use mathematical characters or expressions, Greek or other symbols, and superscripts or subscripts. The size of the text box cannot be exceeded.

The spherical tokamak (ST) is the low aspect ratio limit of the conventional tokamak and appears to offer attractive physics properties in a simpler device. The START (Small Tight Aspect Ratio Tokamak) experiment provided the world's first demonstration of the properties of hot plasmas in an ST configuration and was operational at Culham from January 1991 to March 1998, obtaining plasma currents of up to 300 kA and pulse durations of ~50 ms. Its successor, MAST, is nearing completion and is a purpose built, high vacuum machine designed to have a tenfold increase in plasma volume with plasma currents of up to 2 MA. Current drive and heating will be by a combination of induction-compression as on START, a high performance central solenoid, with 1.5 MW ECRH and 5 MW of NBI. The promising results from START are reviewed and the many challenges posed for the next generation of purpose built STs (such as MAST) are described.