TO: Executive Secretaries of the US-Japan Fusion Research Collaboration

FROM: Steering Committee, US-Japan Joint Institute for Fusion Theory (JIFT)

DATE: April 1, 2011

SUBJECT: JIFT Annual Report of Activities for 2010-2011

CONTENTS:

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Annual Report of Activities

US-Japan Joint Institute for Fusion Theory

April 1, 2010–March 31, 2011

JIFT Steering Committee

Co-Chairmen: R. Horiuchi and J. W. Van Dam

Co-Executive Secretaries: H. Sugama and F. L. Waelbroeck

April 1, 2011

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1. *INTRODUCTION*

The Joint Institute for Fusion Theory (JIFT) is one of the three programs through which the US-Japan Fusion Research Collaboration is organized. The other two programs are the Fusion Physics Planning Committee (FPPC) and the Fusion Technology Planning Committee (FTPC).

The distinctive objectives of the JIFT program are (1) to advance the theoretical understanding of plasmas, with special emphasis on stability, equilibrium, heating, and transport in magnetic fusion systems; and (2) to develop fundamental theoretical and computational tools and concepts for understanding nonlinear plasma phenomena. These objectives are pursued through collaborations between U.S. and Japanese scientists by means of two types of exchange program activities—namely, workshops and exchange visitors.

Each year the JIFT program usually consists of four topical workshops (two in each country) and six exchange scientists (three from each country). So far, during its 29 years of successful operation, JIFT has sponsored 172 long-term visits by exchange scientists and 106 topical workshops.

- The *workshops* typically have an attendance of 15–30 participants, of whom usually three to seven scientists (depending on the particular workshop) travel to the workshop from the non-host country. Scientists from countries other than the U.S. and Japan are also often invited to participate in JIFT workshops, either as observers or multi-laterals.
- Of the approximately three *exchange visitors* in each direction every year, one—called the "JIFT Visiting Professor"—is supported by the host country, while the others—called "Exchange Scientists"—are supported by the sending country. The visits of the Exchange Scientists usually last from several weeks to two or three months in duration, whereas the Visiting Professors normally stay for the period of three months.

The topics and also the participating scientists for the JIFT exchange visits and workshops are selected so as to have a balanced representation of critical issues in magnetic fusion research, including both fundamental problems as well as questions of near-term significance, and also to take into account the specific capabilities and interests of both countries. The Japanese and US members of the JIFT Steering Committee agree together on the appropriateness of proposed topics before recommending them.

2. *SUMMARY OF COMPLETED ACTIVITIES (2010-2011 PROGRAM)*

Almost all of the activities in the two categories—workshops and personal exchanges—that had been scheduled for the 2010-2011 JIFT program were carried out during the past year. Three workshops were successfully held, in addition to the JIFT Steering Committee meeting. In the category of personal exchanges, two Visiting Professors and three Visiting Scientists made exchange visits. Summary reports about JIFT activities for 2010-2011 are given below.

A. 2010-2011 Workshops

Japan to US:

JF-1 ***Development of Simulation Science in Plasma Physics***
Organizers: Alex Arefiev (IFS) and Hiroaki Ohtani (NIFS)
Location: Hyatt Regency Hotel, Chicago, Illinois
Dates: November 12-13, 2010
Summary:

The workshop was the third in a series aimed at enhancing US-Japan research collaborations in the area of fusion plasma simulation research. This specific workshop was focused on development of fundamental computational tools for understanding complex plasma phenomena. Talks were presented by 9 scientists from the US and 9 from Japan. The 18 presentations at the workshop covered a range of subjects related to advanced simulation methods and modeling about Hybrid Kinetic-MHD model, arbitrary curvilinear coordinate particle-in-cell (PIC) code, PIC code with adaptive mesh refinement, PIC code developed for graphical processing units, PIC code with full-implicit method, integrated simulation code, interlocked simulation code, gyrokinetic PIC

code, hybrid simulation code of binary collision and molecular dynamics simulation. These methods were developed for the investigation of fusion plasma, space plasma, fast ignition, and related subjects. Investigations of Resonant Magnetic Perturbation penetration, shock waves, Electron Temperature Gradient modes, and current interchange tearing modes were also reported. Virtual-reality technology was described as one of the useful methods for analyzing simulation data. The history and results from simulation research at NIFS were summarized. A follow-up workshop is planned for December 2011, to follow the 2011 International Toki Conference.

Related publications:

Most of the presentation materials are posted on the web site at http://w3fusion.ph.utexas.edu/~jift2010/.

Participants at the JIFT Workshop on Development of Simulation Science in Plasma Physics (November 2010, Chicago, USA).

JF-2 ***Theory and Simulation on Short-Pulse Laser Plasma***

Organizers: Richard Town (LLNL) and Hitoshi Sakagami (NIFS)
Location: Lawrence Livermore National Laboratory, Livermore, CA
Dates: November 15-17, 2010
Summary:

The workshop featured talks presented by scientists from the US (5 talks), Japan (5 talks), and the European Union (3 talks). A total of 23 participants attended the workshop: 15 from US, five from Japan, and three from EU. The 13 presentations at the workshop covered a range of subjects related to theory and simulation research efforts for inertial fusion energy and fast ignition. Specific topics included short-pulse laser plasma interactions, radiation-hydrodynamics for implosion, fast electron generation, fast electron transport, and high energy density physics. This workshop was held immediately following the 52nd Annual Meeting of the APS Division of Plasma Physics (November 8-12, Chicago, IL, http://www.aps.org/units/dpp/meetings/dpp10/). In the summary session, we discussed about consecutive workshops and agreed on workshops to be held in March 2012 in Osaka, Japan, and then in November 2012 in California, US.

Related publications:

The presentations of all of the participants will be uploaded on the workshop's web site as soon as possible.

JF- ***JIFT Steering Committee Meeting***

Organizers: Ritoku Horiuchi (NIFS) and James W. Van Dam (IFS)
Location: Hyatt Regency Hotel, Chicago, Illinois
Dates: November 8, 2010
Summary:

Participants at the Steering Committee meeting reviewed the status of JIFT activities for 2010-2011 and discussed recommendations for exchange activities during 2011-2012.

US to Japan:

JF-8 ***Integrated Modeling and Simulation in Toroidal Plasmas***
Organizers: Atsushi Fukuyama (Kyoto) and Paul Bonoli (MIT)
Location: Kyoto University, Kyoto
Dates: March 9-11, 2011
Summary:

The purpose of this workshop was to promote the activities on integrated modeling of toroidal plasmas required for predicting the performance of burning plasmas, optimizing the operation scenario of experiments, and designing DEMO reactors. This was the sixth in the series of JIFT workshops on integrated modeling. The workshop was attended by 43 participants. There were 30 oral presentations (5 from the US, 25 from Japan), which covered a wide range of subjects related to integrated modeling, such as integrated code development; transport, turbulence, rotation, heating and current drive; MHD activities; plasma edge; and scrape-off layer and divertor plasmas.

Related publications:

The agenda, abstracts, presentations, and photographs can be obtained from the workshop web site (http://bpsi.nucleng.kyoto-u.ac.jp/bpsi/usjws6/).

JF-9 ***Hierarchical Self-Organization of Turbulence and Flows in Plasmas Oceans, and Atmospheres***
Organizers: Yasuaki Kishimoto (Kyoto) and Patrick H. Diamond (UC San Diego)
Location: Kyoto University, Kyoto
Dates: Deferred
Summary:

This workshop had been scheduled in March 2011. Due to the earthquake disaster in Japan, however, it was agreed that this workshop would be deferred to next year's JIFT program.

B. 2010-2011 Exchange Visits

Japan to US:

JF-3 ***Three-Dimensional Effects on Transport in Toroidal Magnetic Configurations***
*Exchange Scientist***:** Tomohiko Watanabe (NIFS)
Location: PPPL
Dates: November 14-21, 2010 (8 days); paid by Japan
Summary:

During the JIFT visit by T.-H. Watanabe (NIFS) to PPPL, he had intensive discussions with PPPL scientists working on transport theory and simulations of toroidal plasmas. Progress of collaborative benchmark activities on gyrokinetic simulations for non-axisymmetric systems was confirmed through discussions with Dr. D. Mikkelsen. Detailed discussions with Drs. W.-X. Wang, G. Hammett, and W. W. Lee on time-integration schemes in various gyrokinetic codes contributed to significant improvements of the numerical schemes employed in the gyrokinetic code GKV. During the visit, Watanabe and Wang also planned a future JIFT workshop on "Neoclassical and turbulent flow generations and associated transport," which will further enhance the collaboration activities.

JF-4 ***Nonlinear MHD Analysis of Pressure-Driven Modes in Heliotron Plasmas***
*Visiting Scientist***:** Katsuji Ichiguchi (NIFS)
Location: BACV Solutions, Oak Ridge, Tennessee
Dates: Cancelled
Summary:

This exchange visit was cancelled for health reasons.

JF-5 ***Theoretical and Computational Study of Reversed-Shear Alfven Eigenmode***

Visiting Scientist: Yasushi Todo (NIFS)
Location: IFS, University of Texas at Austin, Austin, Texas
Dates: August 1-15, 2010 (15 days); paid by Japan
Summary:

This exchange activity was Japan pending as a US-Japan fusion program, but was carried during August 1-15, 2010, by means of other budget support. Dr. Todo has been collaborating for a number of years with Dr. H. L. Berk and Dr. B. N. Breizman at Texas on the nonlinear evolution of Alfvén eigenmodes destabilized by energetic particles. They recently compared the nonlinear MHD simulation results of a toroidal Alfvén eigenmode (TAE mode) evolution to the linear MHD simulation results. In both the simulations, nonlinear energetic particle dynamics is retained and coupled with the MHD fluid. They found that the saturation amplitude of the TAE mode in the nonlinear MHD simulation is reduced by a factor of two, due to the generation of zonal and higher-*n* modes. This reduction is attributed to the increased dissipation arising from the non-linearly generated modes. The fully nonlinear simulations also show that geodesic acoustic mode is excited by the MHD nonlinearity after the TAE mode saturation. Furthermore, energetic-particle source, loss, and collisions were implemented in the simulation code. The energetic particles are simulated using the delta-f particle-in-cell method with a time-dependent equilibrium distribution function. During Dr. Todo's visit in 2010, the time-dependent equilibrium distribution was analytically formulated in collaboration with Dr. Berk and Dr. Breizman. This enabled the first numerical demonstration of Alfvén eigenmode bursts with parameters similar to the TFTR experiment and with the nonlinear MHD effects.

Related publications:

[1] Y. Todo, H. L. Berk, and B. N. Breizman, "Nonlinear magnetohydrodynamic effects on Alfvén eigenmode evolution and zonal flow generation", Nuclear Fusion **50**, 084016 (1-9) (2010).
[2] Y. Todo, H. L. Berk, and B. N. Breizman, "Simulation Study of Nonlinear Magnetohydrodynamic Effects on Alfvén Eigenmode Evolution and Zonal Flow Generation", in *Proceedings of the 23rd IAEA Fusion Energy Conference* (Daejeon, Korea, Oct. 11-16, 2010), paper THW/2-3Ra.

JF-6 ***Simulation Study of Toroidal Flow Generation by ICRF Heating***

Visiting Professor: Sadayoshi Murakami (Kyoto)
Location: IFS, University of Texas at Austin
Dates: July 11-25, 2010 (15 days); paid by US
Summary:

Since 2008, Dr. S. Murakami has been collaborating with Dr. L.J. Zheng and Dr. J. Van Dam on the analysis of the generation of intrinsic toroidal flow with ICRF heating. Dr L.J. Zheng visited Kyoto University in December 2010 for a week and, and he and Dr. Murakami began theoretical analysis of the effect of ICRF heating on the toroidal flow in order to explain the results obtained from the GNET code, where an averaged minority ion toroidal velocity up to 0.3 of the thermal ion velocity is obtained. They found that two kinds of toroidal flows exist. One is the sheared flow near the RF power absorption region, which depends on the sign of the parallel wave number $k_{\|}$, and the other is the toroidal flow, which is larger than the preceding one and is independent of the sign of $k_{\|}$. During this visit, they found that the $k_{\|}$ sign-dependent flow would be related to the mechanism proposed by Ohkawa et al. [Phys. Plasmas **12** (2005) 094506.]. Also, they studied the net toroidal drift motion of trapped tail ions to clarify the other toroidal flow-generating mechanism. They found that the $k_{\|}$ sign-independent toroidal flow, which is dominant in the results obtained numerically, is generated by the net toroidal motion of energetic tail ions. This result was presented in an invited presentation at the IAEA FEC 2010 meeting.

Related publications:

[1] S. Murakami, K. Itoh, L. Zheng, J.W. Van Dam, and A. Fukuyama, "Study of Toroidal Flow Generation by the ICRF Minority Heating", in *Proceedings of the 23rd IAEA Fusion Energy Conference* (Daejeon, Korea, Oct. 11-16, 2010), paper THW/P4-03.

JF-12 ***Development and Application of Hamiltonian Method for the Stability of Extended Magnetohydrodynamic Model***

Visiting Scientist: M. Hirota (JAEA)
Location: The University of Texas at Austin, USA
Dates: August 11-August 31, 2010 (three weeks); paid by Japan (JAEA)

Summary:

Dr. M. Hirota (JAEA) initiated a collaboration research with Prof. P. J. Morrison (IFS) with the aid of this JIFT exchange visit. During the visit, they addressed the stability analysis of the extended magnetohydrodynamic (MHD) model by utilizing its non-canonical Hamiltonian structure. For the development of a Hamiltonian method, they focused on the effect of the electron inertia on the tearing instability. Since the electron inertia plays the role of a singular perturbation in MHD, the tearing mode can occur within the Hamiltonian framework (without resistivity). By introducing the displacement field for ideal plasma motion, they formulated a new energy principle for the extended MHD model and derived the growth rate analytically. They also had many discussions about how to take into account the presence of equilibrium flow.

US to Japan:

JF-7 ***Study of Energetic Particle Effects by Extended MHD Simulation***

Visiting Professor: Charlson Kim (University of Washington)
Location: National Institute for Fusion Science, Toki
Dates: January 11-April 15, 2011 (three months); paid by Japan
Summary:

Dr. Kim worked with Professor Yasushi Todo on hybrid kinetic MHD simulations of the Toroidal Alfven Eigenmode (TAE) in tokamak geometry. In particular, he worked with Professor Todo to reproduce the ITPA TAE benchmark case defined in the paper "Global particle-in-cell simulations of fast-particle effects on shear Alfven waves" by A. Mishchenko, A. Konies, and R. Hatzky [Physics of Plasma **16**, 082105 (2009)]. These simulations will be performed with the hybrid kinetic-MHD module implemented in the NIMROD code [C. C. Kim and the NIMROD Team, "Impact of velocity space distribution on hybrid kinetic-magnetohydrodynamic simulation of the (1,1) mode," Physics of Plasmas **15**, 072507 (2008)] with the use of both the drift kinetic and the full Lorentz orbit formulations. Previous simulations have shown that resolution of the finite Larmor radius significantly reduces the growth rates of the energetic particle-driven TAE modes. These simulations will be performed on the NIFS Plasma Simulator, a Hitachi SR 16000 model L2, with 128 nodes, 32 cores per node, and 16 TB of memory with a peak performance of 77 Tflops. During the second week of the visit, Dr. Kim presented a seminar entitled "Overview of Hybrid Kinetic-MHD simulations in NIMROD" that gave an overview of the NIMROD code features and the kinetic-MHD hybrid implementation. Dr. Kim presented further seminars, summarizing his research. Also, he presented preliminary results at the US-Japan JIFT Workshop on Integrated Modeling and Simulation in Toroidal Plasmas, held March 9-11, 2011, at Kyoto University.

JF-10 ***Flow-Field Coupling in Magnetospheric High-Beta Plasmas***

Visiting Scientist: Swadesh M. Mahajan (IFS, U. Texas at Austin)
Location: University of Tokyo, Kashiwa
Dates: Postponed
Summary:

This project is aimed at constructing a general basis for the nonlinear theory of "vortexes" in plasmas. Through the continuing collaborations of S.M. Mahajan and Z. Yoshida in recent years, significant progress was made in 2010 (with the main results being published in the following references). Because of rather busy schedules on both sides, the visit of S.M. Mahajan to Japan was postponed until April of 2011.

Related publications:

[1] Z. Yoshida, S. M. Mahajan, T. Mizushima, Y. Yano, H. Saitoh, and J. Morikawa, Generalized two-fluid equilibria ---Understanding RT-1 experiments and beyond, Phys. Plasmas **17** (2010), 112507.

[2] S. M. Mahajan and Z. Yoshida, Relativistic generation of vortex and magnetic field, Phys. Plasmas (to be published).

JF-11 ***Theoretical and Computational Study of Reversed-Shear Alfven Eigenmode***

Visiting Scientist: Boris Breizman (IFS)
Location: National Institute for Fusion Science, Toki
Dates: Deferred to 2011-2012
Summary:

Due to schedule conflicts, this exchange visit will be deferred to next year's JIFT program.

3. *OTHER JIFT-RELATED PUBLICATIONS*

A number of papers on work that was done in connection with JIFT exchange activities were recently published. For the sake of reference, we list them below:

- T. S. Hahm, Lu Wang, and J. Madsen, "Fully electromagnetic nonlinear gyrokinetic equations for tokamak edge turbulence," Phys. Plasmas **16**, 022305 (2009).

- T. Johzaki, Y. Sentoku, H. Nagatomo, H. Sakagami, Y. Nakao, and K. Mima, "Core heating properties in FIREX-I - influence of cone tip," Plasma Phys. Control. Fusion **51**, 014002 (2009).

- Y. Nagashima, S.-I. Itoh, K. Itoh, A. Fujisawa, S. Inagaki, Y. Kawai, S. Shinohara, M. Fukao, T. Yamada, K. Terasaka, T. Maruta, K. Kamatak, H. Arakawa, M. Yagi,N. Kasuya, G. Tynan, P. H. Diamond, and Y. Takase, "Reynolds Stress Measurements for Investigation of Nonlinear Processes of Turbulence in the Large Mirror Device and in the Large Mirror Device-Upgrade," J. Plasma Fusion Res. SERIES, vol. 8, pp. 50-54 (2009).

- K. Toi, M. Isobe, M. Osakabe, F. Watanabe, K. Ogawa, S. Yamamoto, N. Nakajima, D.A. Spong, K. Ida, T. Ido, T. Ito, S. Morita, K. Nagaoka, K. Narihara, M. Nishiura, S. Ohdachi, S. Sakakibara, A. Shimizu, K. Tanaka, Y. Todo, T. Tokuzawa, A. Weller and LHD Experiment Group, "MHD Modes Destabilized by Energetic Ions on LHD," Fusion Science and Technology **58**, 186-193 (2010).

- M. Yoshida, Y. Kamada, H. Takenaga, et al., "Characteristics of momentum transport in JT-60U H-mode plasmas," Nucl. Fusion **49**, 115028 (2009).

- A. Arefiev, B. Breizman, V. Khudik, X. Gao, and M. Downer, "Generation of fast ions in microclusters", Plasma Fusion Research **5**, S2071 (2010).

- M. Furukawa, S. Tokuda, and L. J. Zheng, "A numerical matching technique for resistive magnetohydrodynamics modes," Phys. Plasmas **17**, 052502 (2010).

- S. R. Hudson and N. Nakajima, "Pressure, chaotic magnetic fields and magnetohydrodynamic equilibria"," Phys. Plasmas **17**, 052511 (2010).

- D. A. Spong, E. D'Azevedo, and Y. Todo, "Clustered frequency analysis of shear Alfvén modes in stellarators," Physics of Plasmas **17**, 022106 (2010).

- D. A. Spong, B. N. Breizman, D.L. Brower, E. D'Azevedo, C. B. Deng, A. Konies, Y. Todo, and K. Toi, "Energetic particle-driven instabilities in general toroidal configurations," Contributions to Plasma Physics **50** (8), 708-712 (2010).

- K. Toi, F. Watanabe, T. Tokuzawa, K. Ida, et al., "Observation of Reversed Shear Alfvén Eigenmodes Excited by Energetic Ions in a Helical Plasma," Phys. Rev. Lett. **105**, 145003 (2010).

- K. Toi, M. Isobe, M. Osakabe, K. Ogawa, D. Spong, Y. Todo, and LHD Experiment Group, "Overview of Studies on Energetic Ion Driven MHD Instabilities in Stellarator/Helical Plasmas and Comparison with Tokamaks," Contributions to Plasma Physics **50** (6-7), 493-500 (2010).

- L. Zheng and M. Furukawa, "Current-interchange tearing modes: Conversion from interchange-type modes to tearing modes," Phys. Plasmas **17**, 052508 (2010).

4. PROGRAM ADMINISTRATION

JIFT has a Steering Committee consisting of eight members, four from each country. Two of these members are the Japanese and US co-chairmen. Two other members of the Steering Committee, the US and Japanese co-executive secretaries, are responsible for the ongoing daily oversight of the progress of JIFT activities. The co-chairman and co-executive secretary on the US side are, respectively, the director and associate director of the Institute for Fusion Studies (IFS) of The University of Texas at Austin. The Japanese co-chairman is the Leader of the Numerical Simulation Research Project at the National Institute for Fusion Science, and the Japanese co-executive secretary is the director of the Fusion Theory and Simulation Research Division in the Department of Helical Plasma Research at the National Institute for Fusion Science. Furthermore, on the Japanese side there is an Advisory Committee comprised of several members representing a spectrum of Japanese universities and the Japan Atomic Energy Agency; and on the US side there is an Advisory Committee comprised of several members representing a spectrum of US universities and national laboratories. The names of the persons on the Steering Committee and the names of the Advisors are listed below.

JIFT Steering Committee

US Members	*Japanese Members*
J. Van Dam (IFS)—Co-Chairman	R. Horiuchi (NIFS)—Co-Chairman
F. Waelbroeck (IFS)—Co-Exec. Secretary	H. Sugama (NIFS)—Co-Exec. Secretary
J. Leboeuf (UCLA)	Z. Yoshida (Tokyo)
M. Crisp (DOE)	A. Fukuyama (Kyoto)

JIFT Advisors

Japanese Advisory Committee: N. Nakajima (NIFS), S. Ishiguro (NIFS), Y. Kishimoto (Kyoto), H. Naito (Yamaguchi), M. Yagi (Kyusyu), T. Ozeki (JAEA)

*US Advisory Committee***:** A. Aydemir (IFS), P. Catto (MIT), B. Carreras (BACV Solutions), V. Chan (GA), B. Cohen (LLNL), W. Horton (IFS), W. Tang (PPPL), and P. Terry (UWM)

The JIFT Steering Committee attempts to schedule workshops in such a way as to dovetail with other meetings. It also encourages participation at workshops by interested experimentalists and invites relevant available scientists from other countries to attend workshops.

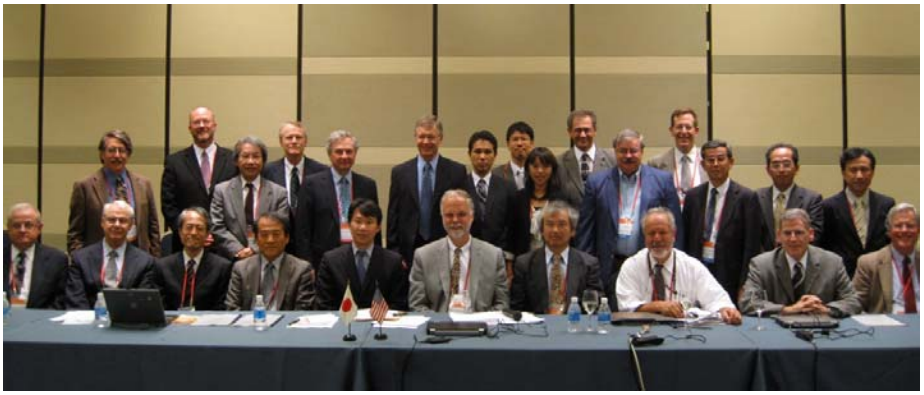
As the principal program for fundamental theoretical exchanges in the US-Japan Fusion Research Collaboration, JIFT operates alongside the Fusion Physics Planning Committee (FPPC) and the Fusion Technology Planning Committee (FTPC). In particular, the JIFT activities are coordinated with the four FPPC areas of activity, viz., core plasma phenomena, edge behavior and control, heating and current drive, and new approaches and diagnostics.

Note that information about the JIFT program, including annual schedules of exchange activities, can be found on the US JIFT web site at http://w3fusion.ph.utexas.edu/ifs/jift/index.html on the US side. A corresponding Japanese JIFT web site at http://www.dss.nifs.ac.jp/JIFT/ was set up in 2008, with information such as previous JIFT annual reports and JIFT meetings in Japan.

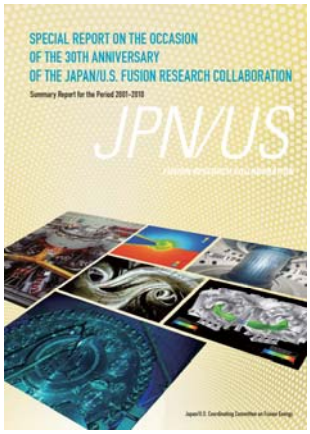
The 30th anniversary of the Japan-US Cooperation Activity was celebrated during the October 13, 2010, meeting of the US-Japan Coordinating Committee on Fusion Energy (CCFE), held during the IAEA Fusion Energy Conference in Daejeon, Korea. To mark this auspicious anniversary, a report is being published by the CCFE about the collaboration activities during the past decade (since in 2000 a report had been published about the first two decades of joint activities). The US and Japanese JIFT Co-Chairmen worked together to write the chapter describing JIFT collaborations for this new report and to compile a complete bibliography of published papers and invited talks at conferences, which have resulted from the joint research activities. The report, 238 pages long, was published in March, as follows:

R. Horiuchi and J. W. Van Dam, Chapter 5 “Joint Institute for Fusion Theory (JIFT)” of *Special Report on the Occasion of the 30th Anniversary of the Japan/U.S. Fusion Research Collaboration: Summary Report for the*

Period 2011-2010, pages 55-74, Japan/U.S. Coordinating Committee on Fusion Energy (Ministry of Education, Science, and Technology of Japan and U.S. Department of Energy), March 2011.



Participants at the 2010 CCFE Meeting at which the 30th anniversary of US-Japan Cooperation Activity was celebrated.



Cover of the 30th anniversary report

5. *PLANS FOR FUTURE ACTIVITIES (PROPOSED 2011-2012 PROGRAM)*

The topics and themes of the exchange activities that have been proposed for JFY 2011 (April 1, 2011–March 31, 2012) are consistent with the traditional emphasis of JIFT on fundamental theoretical plasma physics issues. At the same time the proposed activities have direct relevance to the fusion science programmatic interests of both countries. The schedule of proposed activities for the coming year (2011-2012) is listed below.

A. 2011-2012 Proposed Workshops

US to Japan:

Theory and Simulation on Fast Ignition Target Design
Organizers: H. Nagatomo (Osaka) and P. Patel (LLNL)
Proposed Place/Time: Wakayama; February 8-10, 2012

The Next Stage in the Progress of Simulation Science in Plasma Physics
Organizers: H. Ohtani (NIFS) and A. Arefiev (IFS)
Proposed Place/Time: NIFS; December 12-13, 2011

JIFT Steering Committee Meeting
Organizers: R. Horiuchi (NIFS) and James Van Dam (IFS)
Proposed Place/Time: Toki; December 2011

Japan to US:

Integrated Modeling and Simulation of Fusion Plasmas
Organizers: V. Chan (GA) and A. Fukuyama (Kyoto)
Proposed Place/Time: General Atomics; March 12-14, 2012

Neoclassical and Turbulent Flow Generations and Associated Transport
Organizers: W. Wang (PPPL) and T.H. Watanabe (NIFS)
Proposed Place/Time: Long Branch, New Jersey; September 9-10, 2011

B. 2011-2012 Proposed Exchange Visits

Japan to US:

Interaction between magnetic Islands and Turbulence
A. Ishizawa (NIFS), Visiting Professor
IFS Texas; April 20-May 20, 2011 (4 weeks); paid by US

Examination of Multi-Hierarchy Model based on Particle-MHD Interlocking Algorithm
S. Usami (NIFS), Visiting Scientist
IFS; November 6-19 (2 weeks); paid by Japan

Quantum Chemical Molecular Dynamic Simulations of Li-C-H-O Systems
S. Irie (Nagoya)), Visiting Scientist
ORNL; October 2-15, 2011 (2 weeks), paid by Japan

Stability Analuysis based on Extended MHD Models
A. Ito (NIFS), Visiting Scientist
MIT; August 1-15, 2011 (2 weeks); paid by Japan

Radiation Transport Effects on Relativistic Laser-Plasma Interactions
T. Johzaki (Osaka), Visiting Scientist
University of Nevada Reno; November 15-30, 2011 (2 weeks); paid by Japan

Benchmark of RWM codes of MINERVA/RWMac and MARS-F
J. Shiraishi (JAEA), Visiting Scientist
General Atomics, January, 2012 (3 weeks); paid by Japan

US to Japan:

Particle-in-Cell Algorithms on Advanced Computer Architectures
V. Decyk (UCLA), Visiting Professor
NIFS; September 22-December 21, 2011 (3 months); paid by Japan

Theoretical and computational study of reversed-shear Alfven eigenmode
Boris Breizman (IFS), Visiting Scientist
NIFS; November 28-December 2, 2011 (1 week); paid by US – deferred from 2010-2011 program

Thermal Transport due to Electromagnetic Turbulence
Wendell Horton (IFS), Visiting Scientist
NIFS; September 1-30, 2011 (four weeks); paid by US