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

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

DATE: May 16, 2007

SUBJECT: JIFT Annual Report of Activities for 2006-2007

CONTENTS:

Annual Report of JIFT Activities

James W. Van Dam
US Chairman, JIFT Steering Committee
Director, Institute for Fusion Studies
The University of Texas at Austin
Austin, Texas 78712, USA

Shigeru Sudo
JA Chairman, JIFT Steering Committee
Director, Department of Simulation Science
National Institute for Fusion Science
Oroshi 322-6, Toki, Gifu 509-5292, Japan

Annual Report of Activities

US-Japan Joint Institute for Fusion Theory

April 1, 2006–March 31, 2007

JIFT Steering Committee

Co-Chairmen: S. Sudo and J. W. Van Dam

Co-Executive Secretaries: R. Horiuchi and F. L. Waelbroeck

May 16, 2007

TABLE OF CONTENTS

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. Both objectives are pursued through collaborations between U.S. and Japanese scientists by means of three types of exchange program activities—namely, workshops, exchange visitors, and joint computational projects.

Each year the JIFT program usually consists of four topical workshops (two in each country), six exchange scientists (three from each country), and a fluctuating number of joint computational projects (on the order of a dozen). So far, during its 25 years of successful operation, JIFT has sponsored 145 long-term visits by exchange scientists, 91 topical workshops, and 182 joint computational projects.

- 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 three months.
- The third category of JIFT exchange activities consists of *joint computational projects*. In general these are continuing collaborations on various problems of current interest, which initially develop out of interactions at workshops and through individual exchange visits.

The topics and also the participating scientists for the JIFT exchange visits, workshops, and joint computational projects 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 (2006-2007 PROGRAM)*

Almost all of the activities in the three categories—workshops, personal exchanges, and joint computational projects—that had been scheduled for the 2006-2007 JIFT program were carried out during the past year. All four workshops were successfully held, in addition to the JIFT Steering Committee meeting. In the category of personal exchanges, two Visiting Professors and four Visiting Scientists made exchange visits. The JIFT joint computational projects were also active.

Summary reports about JIFT activities for 2006-2007 are given below.

A. 2006-2007 Workshops

US to Japan:

JF1-1 *Progress of Extended MHD Models*
Organizers: Noriyoshi Nakajima (NIFS) and Donald A. Spong (ORNL)
Location: National Institute for Fusion Science, Japan
Dates: March 26–27, 2007
Summary:

This US-Japan workshop was held at the National Institute for Fusion Science (NIFS). The sessions on March 27 were video sessions connecting NIFS and the Institute for Fusion Studies (IFS), University of Texas at Austin.

For the video sessions, the organizers appreciated technical assistance received from Yasushi Todo (NIFS) and Linjin Zheng (IFS). The workshop had 14 oral talks and 17 participants. The presentations and discussions covered a broad variety of extended and standard MHD models in stellarators/helical devices, tokamaks, and spherical tokamaks. The participants discussed (1) closure relations for extended MHD, (2) gyrokinetics to recover ideal MHD, (3) multi-scale interactions among MHD, micro-turbulence, and zonal flows, (4) energetic-particle-driven instabilities, (5) edge and scrape-off layer flows driven by Pfirsch-Schluter flux, (6) motion of plasmoids in tooidal plasmas, (7) Hall-MHD equilibria with flow and pressure anisotropy, (8) MHD stability analysis using a wave propagation analysis code, (9) nonlinear evolution of MHD instabilities, and (10) simulations of external MHD modes, resistive wall modes, and ELM crashes.

Related publications:

Detailed information about this US-Japan workshop is available at the workshop web site: http://www.dss.nifs.ac.jp/todo/US-Japan2007/.

JF1-02 ***Theory and Simulation on Ultra-Intense Laser Plasmas***

Organizers: Kunioki Mima (Osaka) and C .S. Liu (Maryland)

Location: Osaka University, Japan

Dates: March 22–24, 2007

Summary:

The workshop shed light on the physics of relativistic laser plasmas in relation to fast ignition and other applications of ultra-intense lasers. The workshop reviewed the present status of relativistic laser plasma physics and several special topics, in particular, the simulation methodology for comprehensive simulation of large-scale relativistic laser plasmas. A fast ignition integrated interconnected code (FI3) has been developed at ILE, Osaka University, which integrates four simulation codes—PIC, PIC-fluid hybrid, Fokker Planck, and radiation hydro. The highlights of the discussions included electromagnetic turbulence generated by relativistic electron beams, radiation recoil effects on the extremely high-intensity laser plasma interactions, and the generation of high-energy ions. The dynamics of the Weibel instability and its accompanying electromagnetic turbulence are found to play an important role in cone-shell-target fast ignition.

Related publications:

T. Nakamura, K. Mima, et al., “Electron surface interaction on a solid capillary inner surface irradiated with ultra-intense laser pulses,” to be published in Physics of Plasmas (2007)

Japan to US:

JF1-07 ***Gyrokinetic Simulation of Ion and Electron Temperature Gradient-Driven Transport ‐ Physics Mechanisms Behind the Transport Coefficient***

Organizers: Taik-Soo Hahm (PPPL) and Hideo Sugama (NIFS)

Location: University of California at San Diego, USA

Dates: January 10–12, 2007

Summary:

The JIFT Workshop on "Gyrokinetic Simulation of Ion and Electron Temperature Gradient-Driven Transport" was held during January 10-12, 2007 in the University of California at San Diego (UCSD). Dr. Patrick Diamond (UCSD) assisted the organizers with local arrangements. This workshop consisted of six sessions: (1) recent progress in gyrokinetic simulations; (2) validation and momentum transport; (3) ETG, electromagnetic turbulence, and zonal flows; (4) astrophysics and edge physics; (5) new approaches; and (6) continuum simulations. Also there was a special lecture on "Magnetic fields in star formation". There were 24 presentations, including 5 from Japan and 2 from EU. Recent results from gyrokinetic theory and simulation studies on turbulent plasma transport and zonal flows were presented. ITG and ETG turbulent transport and zonal flow evolution were simulated with several different codes, and benchmark test results were reported. The noise problem in delta-f simulations was discussed as a possible reason why ETG turbulent thermal diffusivity is smaller than in continuum simulations, and some new numerical schemes for reducing the noise level were described.

Related publications:

J. Plasma Fusion Res. Vol. 83, No. 3 (2007) 309 [JIFT workshop report in Japanese].

JF1-06 ***Integrated Modeling of Multi-Physics in Fusion Plasmas II***

Organizers: Donald B. Batchelor (ORNL) and Atsushi Fukuyama (Kyoto)

Location: Oak Ridge National Laboratory, Oak Ridge, TN
Dates: January 29–31, 2007
Summary:

In order to predict the behavior of burning plasmas and optimize its operational scenarios, it is necessary to establish integrated modeling approach describing various multi-physics phenomena with disparate time and spatial scales. This workshop was the fourth of a series of JIFT workshops on integrated simulation of fusion plasmas. The participants were composed of 17 from the US, 7 from Japan, and 2 from EU. The 24 presentations at the workshop covered the subjects of plans and needs of integrated simulation, computer science and mathematics, developments in integrated codes, edge plasma simulation, simulation of RF interactions, global stability, and transport modeling. Fruitful collaborations with computer science on integrated simulations, development of unified data interfaces for the components of integrated codes, improvements of numerical algorithms for various stiff problems, and the integrated simulation of ELM cycles including the core-edge-divertor transport and the MHD stability were among the impressive and successful results presented at this workshop.

Related publications:

All of the presentations (which were broadcast over the internet) have been posted on the workshop web site http://www.cswim.org/meetings/us-japan-2007/.

JF1-05 ***JIFT Steering Committee Meeting***
Organizers: James W. Van Dam (IFS) and Ritoku Horiuchi (NIFS)
Location: Marriott Hotel, Philadelphia, USA
Dates: October 30– November 3, 2006
Summary:

Participants at the steering committee meeting reviewed the status of JIFT activities for 2006-07 and discussed recommendations for exchange activities during 2007-08.

B. 2006-2007 Exchange Visits

Japan to US:

JF1-13 ***Neoclassical Transport around Magnetic Islands***
Visiting Professor: Ryutaro Kanno (NIFS)
Location: IFS Texas, USA
Dates: November 1–December 21, 2006 (7 weeks); paid by US
Summary:

Dr. Kanno spent about two months at the IFS in order to study neoclassical transport in and around magnetic islands, by means of both theoretical analysis and numerical simulations. Physics and modeling of the transport were considered. Magnetic islands play important roles in fusion plasmas. In recent Large Helical Device experiments, it is observed that an m/n=1/1 magnetic island, which is formed at the edge, is healed. The experimental results suggest that current depending on the pressure is expected to explain the healing. There are two conventional candidates for such a current: the Pfirsch-Schluter current and the bootstrap current. In a previous simulation study, it was found that the healing is not explained by the Pfirsch-Schluter current only. Thus, the bootstrap current is a possible mechanism. However, this argument has the difficulty that once the island shrinks, the m/n=1/1 mode of the bootstrap current density disappears because the pressure gradient becomes low. Kotschenreuther has shown that there is a possibility that the healing is explained by another current, which is related to the ergodic behavior of field lines around the X-point of the island, so that even if the island shrinks, the current may maintain the healing because the ergodic region always exists around the island in a stellarator. This concept implies that when the island is formed at the edge, neoclassical effects can play important roles even in edge transport phenomena. To study the edge transport phenomena, a new transport simulation code was constructed by expanding a Monte-Carlo particle simulation scheme based on the delta-f method. The details of the results will be reported in a forthcoming publication.

Related publications:

Paper to be submitted to the 11th International Workshop on Plasma Edge Theory in Fusion Devices (23-25 May 2007, Takayama, Japan).

JF1-12 ***Theoretical Research of Energy Release in Magnetic Reconnection with Chaos Diffusion***
Exchange Scientist: Hiroaki Ohtani (NIFS)
Location: Institute for Fusion Studies, University of Texas at Austin, USA
Dates: January 31–March 31, 2007 (two months); paid by Japan
Status:

Magnetic reconnection plays an important role in high-temperature plasmas; examples are the solar corona, high-temperature tokamak discharges, and geomagnetic substorms. However, the mechanism of fast energy release is not fully understood. This research theoretically investigated the behavior of complex particle orbits in the magnetic dissipation region, from the viewpoint of chaotic scattering. A model potential was introduced to show the magnetic field where the magnetic reconnection occurs, and a method was developed to calculate the particle orbits analytically.

JF1-11 ***Modeling and Analysis of Plasma Flow Effect on Resistive Wall Mode***
Exchange Scientist: Masaru Furukawa (Tokyo)
Location: University of Texas, Austin, TX, USA
Dates: September 4–November 11, 2006 (69 days); paid by Japan
Research Summary:

Stabilization of resistive wall modes by plasma rotation in tokamaks has been one of the important issues in fusion plasma research. Recently it was found experimentally that the critical rotation velocity required for the stabilization of these modes is much slower than the value that had been predicted theoretically and numerically. Thus improved modeling is required to resolve this problem, . Therefore we have adopted an initial-value approach to formulate evolution equations for the resistive wall mode. This formalism allows us to analyze non-exponential time dependence, as well as inhomogeneous terms such as the error field. In the conventional normal-mode analysis, the time dependence of the perturbation is assumed to be exponential and is retained only at the thin layer around the mode-rational surface and at the resistive wall. By using jump conditions across the thin layer and the resistive wall, solutions for the region except for the thin layer and the resistive wall are connected to give the dispersion relation for the mode. In this formulation, an exponential time dependence is not assumed; instead, an initial-value approach is used to express the jump conditions and obtain the evolution equation for the perturbation, rather than a dispersion relation.

Related publications:

“Initial-value analysis of resistive wall modes including plasma rotation”, M. Furukawa and L. -J. Zheng, Meeting Abstracts of the Physical Society of Japan, Kagoshima Univ., March 2007, Vol. 62, 20pQA-1 [in Japanese].

JF1-10 ***Energy Transport along Target Surface Irradiated by Ultra-Short Laser Pulses***
Visiting Scientist: Tatsufumi Nakamura (Osaka University)
Location: University of Nevada, Reno, NV, USA
Dates: January 28–February 10, 2007 (two weeks); paid by Japan
Summary:

In fast ignition, cone targets are used to guide ignition laser pulses towards core plasma and generate high energy electrons, which ignite the core plasma. Since the burning efficiency strongly depends on the electron energy characteristics, understanding the interaction between cone target and ignition laser pulse is crucial. In numerical simulations of those phenomena, the Particle-In-Cell (PIC) approach which can treat kinetic effects, is widely used. In PIC simulations, collisional effects are usually not taken into account since it is difficult to achieve momentum and energy conservation with high accuracy when weighted particles are used. In this research, we developed a new calculation subroutine that is appropriate for use in large-scale PIC simulations. In the subroutine, a new algorithm is introduced that perfectly conserves the energy and statistically well conserves the momentum. Then a Langevin approach is introduced, which drastically reduces the calculation time. This new scheme is able to realistically simulate the laser-cone interaction for the actual time duration (pico second range), for which collisional effects are not negligible.

US to Japan:

JF1-04 ***Theoretical and computational study of extended MHD models***

Visiting Professor: Donald A. Spong (ORNL)
Location: National Institute for Fusion Studies, Japan
Dates: February 19– May 18, 2007 (three months); paid by Japan
Summary:

During his visit, Dr. Spong worked on three main topics: (1) Alfvén eigenmode spectra and mode structure calculations for stellarators, (2) application of neoclassical moments method to the LHD SDC regime, and (3) MHD closure relations for extended MHD models of tearing instabilities. In addition, he provided calculations of Alfvén continua for the ECH electron tail regime in the CHS experiment for M. Isobe and assisted M. Osakabe with use of the DELTA5D code for LHD energetic particle confinement. Under topic (1), he developed a code that he applied to several LHD equilibria and will compare with the nonlinear MHD calculations of Y. Todo. On topic (2), he presented two seminars on his results to the LHD experimental group (April 2) and the theory and data analysis group (April 19) . Also, he had detailed discussions with M. Yokoyama and O. Yamagishi, who are developing a similar code. Also, he had discussions with N. Ohyabu concerning application of ORNL's STELLOPT code to designing new configurations that could enhance the physics of the SDC regime. On topic (3), he continued on-going calculations and gave talks both to the simulation group (March 23) and at a U.S.-Japan JIFT Workshop on Progress of Extended MHD Models (March 26).

Related publications:

It is anticipated that work started during this visit will lead to future publications in the areas of Alfvén instabilities, closure relations, and flow calculations in stellarators. One paper that he had submitted prior to his arrival at NIFS was modified and accepted for publication in Nuclear Fusion during the time he was here: "Shear Flow Generation in Stellarators–Configurational Variations," by D. A. Spong, J. H. Harris, A. S. Ware, S. P. Hirshman and L. A. Berry.

JF1-03 ***Gyrokinetic simulation of guide field magnetic reconnection***
Visiting Scientist: Tomoya Tatsuno (University of Maryland)
Location: National Institute for Fusion Studies, Japan
Dates: June 12 – July 7, 2006 (four weeks); paid by USA
Summary:

The purpose of this research was to consider the use of the gyrokinetic simulation model for studying collisionless magnetic reconnection with a guide magnetic field (vertical to the reconnection plane). The GS2 code is a continuum gyrokinetic simulation code for a toroidal flux tube geometry. Developed at the University of Maryland, it has been widely used for the study of anomalous transport in magnetically confined fusion plasmas. In the present study, the GS2 code was optimized and tuned up for use on the vector computer SX-8, in order to increase the code portability. Then, some test runs were successfully carried out in cooperation with NIFS scientists. Through this activity, it was learned that the GS2 code needs to be upgraded for more efficient vector operations of the implicit finite differencing for the advection term along field lines. Dr. Tatsuno also had many fruitful discussions on simulations of steady magnetic reconnection in an open system during his stay at NIFS.

Related publications:

B. N. Rogers, S. Kobayashi, P. Ricci, W. Dorland, J. Drake, and T. Tatsuno, "Gyrokinetic Simulations of Collisionless Magnetic Reconnection" (in preparation).

C. 2006-2007 Joint Computational Projects

The following 15 JIFT joint computational projects on various topics were also active during the past year.

JF2-01 *Gyrokinetic Simulation of Guide-Field Magnetic Reconnection*
Z. Yoshida (Tokyo); R. Horiuchi, T. Watanabe (NIFS);
T. Tatsuno, W. Dorland (Maryland)

JF2-02 *Particle Simulation in Open Systems*
S. Ishiguro, R. Horiuchi, H. Ohtani (NIFS);
J. N. Leboeuf, V. K. Decyk (UCLA)
Continued from 2005-2006

JF2-03 *Development of a Numerical Analysis Method of the Drift Kinetic Equation by Monte Carlo Method*
S. Murakami (Kyoto U.);
V. S. Chan, M. Choi, L. Lao (GA)
Continued from 2005-2006

JF2-04 *MHD Nonlinear Effects on Alfvén Eigenmode Evolution*
Y. Todo (NIFS);
H. L. Berk, B. N. Breizman, J. W. Van Dam (IFS)

JF2-05 *Drift Mode Analysis for the Large Helical Device*
N. Nakajima (NIFS);
G. Rewoldt (PPPL)
Continued from 2005-2006

JF2-06 *Gyrokinetic Transport Simulation*
V. Decyk, R. Sydora (UCLA); W. Lee (PPPL);
T. Takayama (NIFS); H. Naitou (Yamaguchi)
Continued from 2005-2006

JF2-07 *Plasma Rotation, Vortices, and Anomalous Transport*
W. Horton, A. Aydemir (IFS); B. Carreras (ORNL);
M. Okamoto, H. Sugama (NIFS); S. Murakami (Kyoto)
Continued from 2005-2006

JF2-08 *Nonlinear MHD Simulation of Heliotron Plasmas*
K. Ichiguchi, T. Hayashi, N. Nakajima (NIFS);
B. Carreras, D. Spong, V. Lynch (ORNL); L. Sugiyama (MIT); S. Hudson (PPPL)

JF2-09 *MHD Stability in Advanced Tokamaks*
M. Ozeki, Y. Ishii (JAERI), Y. Tomita (NIFS);
J. Manickam (PPPL); A. Aydemir (IFS)
Continued from 2005-2006

JF2-10 *New Simulation Algorithms for Massively Parallel Processing*
V. Decyk (UCLA); W. Tang (PPPL);
K. Watanabe, R. Horiuchi, S. Ishiguro (NIFS)
Continued from 2005-2006

JF2-11 *Toroidal Simulation and Plasma Transport Modeling*
W. Horton (IFS);
Y. Kishimoto (Kyoto); A. Azumi (JAERI); H. Takamaru (NIFS)
Continued from 2005-2006

JF2-12 *Numerical Study of High Energy Particle Effect on MHD Stability*
C.Z. Cheng (PPPL); J. Van Dam (IFS);
M. Azumi, T. Ozeki (JAERI); Y. Todo (NIFS)
Continued from 2005-2006

JF2-13 *Turbulent Transport Applications to Tokamaks and Helical Systems*
B. Carreras (ORNL); W. Horton (IFS);
Y. Nakamura (Kyoto); M. Yokoyama (NIFS)
Continued from 2005-2006

JF2-14 *MHD and Transport Phenomena in Toroidal Systems*
W. Tang, G. Rewoldt, C.Z. Cheng (PPPL);

H. Sugama, R. Ishizaki (NIFS)
Continued from 2005-2006

JF2-15 *Kinetic Effects on MHD Phenomena*
J. Van Dam, H. Berk (IFS);
M. Okamoto, N. Nakajima, K. Ichiguchi (NIFS)
Continued from 2005-2006

3. *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 director of the Theory and Computer Simulation Center at the National Institute for Fusion Science, and the Japanese co-executive secretary is currently director of the Computer and Information Network Center. 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	S. Sudo (NIFS)—Co-Chairman
F. Waelbroeck (IFS)—Co-Exec. Secretary	R. Horiuchi (NIFS)—Co-Exec. Secretary
J. Leboeuf (UCLA)	Z. Yoshida (Tokyo)
M. Crisp (DOE)	K. Mima (Osaka)

JIFT Advisors

Japanese Advisory Committee: N. Nakajima (NIFS), S. Ishiguro (NIFS), A. Fukuyama (Kyoto), 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 JIFT web site at http://peaches.ph.utexas.edu/jift/.

In April 2007, the Theory and Computer Simulation Center at the National Institute for Fusion Science, which serves as the Japanese host for the activities of JIFT, was combined with the Computer and Information Network Center and re-organized as the Department of Simulation Science. Prof. S. Sudo is now the Executive Director of the Department of Simulation Science. In connection with the establishment of this new department, a special celebratory symposium on simulation science will be held at NIFS in September 2007.

4. *PLANS FOR FUTURE ACTIVITIES (PROPOSED 2007-2008 PROGRAM)*

The topics and themes of the exchange activities that have been proposed for the next year (April 1, 2007–March 31, 2008) 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 (2007-2008) is listed below.

A. 2007-2008 Proposed Workshops

US to Japan:

Gyrokinetic simulation of plasma transport
Organizers: Higeo Sugama (NIFS) and T.S. Hahm (PPPL)
Proposed Place/Time: Nagoya; January 2008

New development of simulation science
Organizers: Noriyoshi Nakajima (NIFS) and J. W. Van Dam (IFS)
Proposed Place/Time: NIFS; September 2007

On critical issues of hydrodynamic stability for high gain and fast ignition
Organizers: K. Nishihara (Osaka) and V. Goncharov (Rochester)
Proposed Place/Time: Osaka U; December 2007

JIFT Steering Committee Meeting
Organizers: Sigeru Sudo (NIFS) and James Van Dam (IFS)
Proposed Place/Time: NIFS; September 2007

Japan to US:

Multi-scale turbulent dynamics in laboratory and astrophysical plasmas
Organizers: Patrick Diamond (UCSD) and Yasuaki Kishimoto (Kyoto)
Proposed Place/Time: UCSD; December 2007

Numerical simulation of complex plasmas
Organizers: J. W. Van Dam (IFS) and Ritoku Horiuchi (NIFS)
Proposed Place/Time: IFS Texas; October 2007

B. 2007-2008 Proposed Exchange Visits

Japan to US:

Study of the effect on the transport due to zonal flows in high temperature plasmas
S. Toda (NIFS), Visiting Scientist
UCSD; June 2007 (five weeks); paid by Japan

Relativistic Fast Electron Transport in Fast Ignition Targets
T. Johzaki (Osaka U), Visiting Scientist
Nevada U; October 2007 (two weeks); paid by Japan

Nonlinear MHD analysis of pressure driven mode in heliotron plasma
Katsuji Ichiguchi (NIFS), Visiting Scientist
BACV Solutions; June 2007 (two weeks); paid by Japan

Analysis of Fast Ignition Experiments with Integrated Simulations
Hitoshi Sakagami (NIFS), Visiting Scientist
Rochester U; September-November 2007 (seven weeks); paid by Japan

US to Japan:

Domain Substructuring and Scalability for Peta-scale Simulation of Extended MHD Plasmas
A. H. Glasser (LANL), Visiting Professor
NIFS; April–June 2007 (three months); paid by Japan

Radial transport studies for improving plasma confinement due to potential/ E(r) shear control

Wendell Horton (IFS), Visiting Scientist
Tsukuba U; May 2007 (two weeks); paid by US

Analysis of plasma rotation and error field effects on resistive wall modes in tokamaks
L. -J. Zheng (IFS) , Visiting Scientist
Tokyo U; September 2007 (two weeks); paid by US

2007-2008 Proposed Joint Computational Projects

JF2-01 *Analysis of Plasma Rotation and Error Field Effects on Resistive Wall Modes in tokamaks*
M. Furukawa and Yoshida (Tokyo);
L.J. Zheng and J. Van Dam (IFS)

JF2-02 *Particle Simulation in Open Systems*
S. Ishiguro, R. Horiuchi, H. Ohtani (NIFS);
V. K. Decyk (UCLA)
Continued from 2006-2007

JF2-03 *Development of a Numerical Analysis Method of the Drift Kinetic Equation by Monte Carlo Method*
S. Murakami (Kyoto U.);
V. S. Chan, M. Choi, L. Lao (GA)
Continued from 2006-2007

JF2-04 *Simulation Study of Zonal Magnetic Field in Alfvén Eigenmode Nonlinear Evolution*
Y. Todo (NIFS);
H. L. Berk, B. N. Breizman, J. W. Van Dam (IFS)

JF2-05 *Drift Mode Analysis for the Large Helical Device*
N. Nakajima (NIFS);
G. Rewoldt (PPPL)
Continued from 2006-2007

JF2-06 *Gyrokinetic Transport Simulation*
V. Decyk (UCLA); W. Lee (PPPL);
T. Takayama (NIFS); H. Naitou (Yamaguchi)
Continued from 2006-2007

JF2-07 *Plasma Rotation, Vortices, and Anomalous Transport*
W. Horton, A. Aydemir (IFS);
H. Sugama (NIFS); S. Murakami (Kyoto)
Continued from 2006-2007

JF2-08 *Nonlinear MHD Simulation of Heliotron Plasmas*
K. Ichiguchi, N. Nakajima, N. Mizuguchi (NIFS);
D. Spong, V. Lynch (ORNL); B.A. Carreras (BACV Solutions)

JF2-09 *MHD Stability in Advanced Tokamaks*
S.Tokuda, T. Ozeki (JAEA), Y. Tomita (NIFS);
J. Manickam (PPPL); A. Aydemir (IFS)
Continued from 2006-2007

JF2-10 *New Simulation Algorithms for Massively Parallel Processing*
V. Decyk (UCLA); W. Tang (PPPL);
R. Horiuchi, S. Ishiguro (NIFS); K. Watanabe(ES)
Continued from 2006-2007

JF2-11 *Toroidal Simulation and Plasma Transport Modeling*

W. Horton (IFS);
Y. Kishimoto (Kyoto); Y. Idomura (JAEA); H. Takamaru (Chubu)
Continued from 2006-2007

JF2-12 *Numerical Study of High Energy Particle Effect on MHD Stability*
J. Van Dam, H. L. Berk, B. N. Breizman (IFS); G. Y. Fu (PPPL); D. A. Spong (ORNL)
Y.Ishii, T. Ozeki (JAEA); Y. Todo (NIFS)
Continued from 2006-2007

JF2-13 *Turbulent Transport Applications to Tokamaks and Helical Systems*
B. Carreras (BACV Solutions); W. Horton (IFS);
Y. Nakamura (Kyoto); M. Yokoyama (NIFS)
Continued from 2006-2007

JF2-14 *Numerical simulation of micro-turbulence in magnetized plasmas using GKV code*
T.H. Watanabe, H. Sugama (NIFS);
W. Horton and J.H. Kim (IFS)