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

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

DATE: August 4, 2006

SUBJECT: JIFT Annual Report of Activities for 2005-2006

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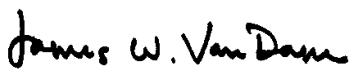

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Annual Report of Activities

US-Japan Joint Institute for Fusion Theory

April 1, 2005–March 31, 2006

JIFT Steering Committee

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

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

August 4, 2006

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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. 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 24 years of successful operation, JIFT has sponsored 139 long-term visits by exchange scientists, 87 topical workshops, and 167 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 (2005-2006 PROGRAM)*

Almost all of the activities in the three categories—workshops, personal exchanges, and joint computational projects—that had been scheduled for the 2005-2006 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 three Visiting Scientists made exchange visits, while one other exchange visit was cancelled. The JIFT joint computational projects were also active.

Summary reports about JIFT activities for 2005-2006 are given below.

A. 2005-2006 Workshops

US to Japan:

JF1-03 ***New Development of Simulation Science***
Organizers: Ritoku Horiuchi (NIFS) and Oleg Batishchev (MIT)
Location: Nara, Japan
Dates: July12-15, 2005
Summary:

This US-Japan workshop was held in conjunction with the 19th International Conference on Numerical Simulation of Plasmas (ICNSP). The workshop shed light on simulation science as a new methodology of

science and discussed recent development of simulation science. The conference had 175 oral and poster presentations, with 194 participants. The strong US delegation consisted of sixteen participants, seven of whom gave invited and oral talks. The presentations and discussions covered numerical simulations in the areas of space and astrophysical plasmas; magnetic and inertial fusion plasmas; intense laser interactions with plasmas; beam and accelerator physics; low-temperature plasmas, dusty plasmas, and nano-plasmas; various plasma-based devices; material science; and bio-science. The participants discussed numerical methods for various types of simulations, such as MHD methods, other fluid methods for plasma, kinetic plasma methods (PIC and Vlasov), hybrid methods, gyro-kinetic and gyro-fluid methods, grid-free methods and molecular dynamics, high-order, adaptive and multi-scale methods, and scientific visualization for numerical simulation. This workshop also served as an important forum for the communication of new ideas in algorithm development, massively parallel processing, and programming techniques.

Related publications:

- Detailed information about the US-Japan Workshop is available at http://www.tcsc.nifs.ac.jp/icnsp/US-JapanSimulationWorkshop.html. Information about the International Conference can be found at http://www.tcsc.nifs.ac.jp/icnsp/index.html.
- The proceedings of the Workshop and the Conference will be published as a special issue of *Journal of Plasma Physics* (UK), which will include about 120 refereed articles.

JF1-02 ***Integrated Modeling of Multi-Scale Physics in Fusion Plasmas***

Organizers: Atsushi Fukuyama (Kyoto) and Steven Jardin (PPPL)
Location: Kyushu University, Japan
Dates: September 13-15, 2005
Summary: This US-Japan workshop was a follow-up to two previous JIFT workshops on the topic of integrated modeling in fusion plasmas. The topics included extended MHD modeling, turbulence modeling, transport modeling, wave-plasma interaction modeling, edge plasma modeling, and integrated simulation. There were five participants from the U.S., three from the E.U., one from Korea, and 20 from Japan. The meeting provided a convenient venue to discuss the status of integrated modeling for burning plasmas. Each of the ITER partners reported on their capabilities and plans. This was the third workshop in a series, and a fourth is planned to be held in ORNL in January of 2007.
Related publications:

- Copies of the presentations given at the JIFT workshop are available at http://pbsi.nucleng.kyoto-u.ac.jp/bpsi/usjws3/index.html.

JF1-01 ***JIFT Steering Committee Meeting***

Organizers: James Van Dam (IFS) and Masao Okamoto (NIFS)
Location: Takayama, Japan
Dates: November 9, 2005
Summary:

Participants at the steering committee meeting reviewed the status of JIFT activities for 2005-06 and discussed recommendations for exchange activities during 2006-07.

Japan to US:

JF1-06 ***Issues in Theoretical Analyses for Three Dimensional Configurations***

Organizers: Donald Monticello (PPPL) and Noriyoshi Nakajima (NIFS)
Location: Princeton Plasma Physics Laboratory, USA
Dates: March 14-16, 2006
Summary:

Five Japanese scientists and 11 US scientists participated in this JIFT workshop, with another ten US scientists also in attendance. Here are a few highlights from the workshop: G. Rewoldt reported that, for all of the stellarator configurations he has studied (including NCSX, LHD, W7X, and several others), the ITG-TEM mode is strongly unstable linearly if the temperature gradient is large. A. Ishizawa reported that the nonlinear interaction between micro-instabilities and macro-instabilities leads to a change in the macro-equilibrium and this caused the micro-instabilities to spread over the entire plasma. R. Ishizaki presented results from a new

pellet ablation code that shows the cloud expanding along the field lines and drifting to the weak-field side. N. Nakajima reported on his development of a new simple method to evaluate the thermal diffusion caused by co-existing stochastic electrostatic and magnetic fluctuations. S. Murakami developed an ICRF heating simulation code in toroidal plasmas and applied it to LHD plasmas, with good results. D. Spong presented results that show a stellarator could lower the power threshold for H-mode operation by optimizing around ExB shearing rates.

Related publications:

- All of the presentations (which were broadcast over the internet) have been posted on the workshop web site http://w3.pppl.gov/~shudson/JIFT/2006/JIFT2006.html.

JF1-07 ***Theory and Simulation on Ultra-Intense Laser Plasmas***

Organizers: Gennady Shvets (IFS Texas) and Kunioki Mima (Osaka)
Location: University of Texas, Austin, TX
Dates: October 31–November 1, 2005
Summary:

Six participants from Japan and twelve from the US attended this workshop, which was a follow-up to the workshop held at Osaka in April 2004. Topics discussed at the workshop included fast ignition laser fusion, laser particle acceleration, cluster fusion, laser plasma optical devices, relativistic astrophysics, plasma wake-field acceleration, and self-generated magnetic fields. A particular highlight of the workshop was the description of electromagnetic effects on the transport of high-energy electrons. Scientists from Osaka University and NIFS proposed that the relativistic electrons are guided by self-generated magnetic fields onto solid target surfaces, and that strong relativistic electron flows in dense plasmas break down into filaments and are self-organized to confine electron beam energy. Another result was that magnetic field generation causes softening of the electron energy spectrum. US groups at UCLA, University of Nevada-Reno, and University of Texas at Austin reported that the heated surface area is observed to expand very rapidly outward from a small laser spot and that collisional particle-in-cell simulations shows the electromagnetic dynamics of hot electrons are influenced strongly by Coulomb collisions. Collaborative studies of those phenomena by Japanese and US groups will be continued. Other interesting topics reported at the workshop were particle acceleration by laser and electron beam wake fields, and X-ray and THz radiation emission processes in relativistic laser plasmas. During the workshop, the participants were given a guided tour of the Texas Petawatt Laser facility.

B. 2005-2006 Exchange Visits

Japan to US:

JF1-10 ***Direct Numerical Simulation of MHD in LHD***

Visiting Professor: Hideaki Miura (NIFS)
Location: IFS Texas, USA
Dates: January 25–March 9, 2006 (six weeks); paid by US
Summary:

During this visit, Dr. Miura carried out research on nonlinear simulations of the Large Helical Device (LHD). Various topics, such as numerical techniques, boundary conditions, and linear eigenfunctions, were discussed with IFS scientists. Recent numerical results were presented in the IFS seminar series. Also, a new research project on two-fluid Hall-MHD was initiated with S. Mahajan and S. Ohsaki. A new numerical code for three-dimensional Hall-MHD was developed for triple-periodic boundary conditions. The first results from this code have recently been obtained. This collaboration will be continued.

Related publications:

- H. Miura, paper to be published in Fusion Science and Technology (2006).

JF1-08 ***Simulation Study of RF Heating and Energetic Particle Transport***

Exchange Scientist: Sadayoshi Murakami (Kyoto University)
Location: General Atomics
Dates: August 31–September 12, 2005 (two weeks); paid by Japan
Status:

During ion-cyclotron radio frequency heating of plasma, energetic tail ions are generated. An important research issue is the effect of the finite orbits of those ions on radial transport. In order to solve this problem, Dr. Murakami developed the GNET and ORBIT-RF codes. These simulation codes, based on the Monte Carlo method, can study the finite orbit effect during ion-cyclotron RF heating. The two simulation codes were benchmarked against second-harmonic ion cyclotron RF heating in the C-Mod device. Note that this exchange visit had been deferred from the preceding year.

Related publications:

- S. Murakami et al., "A global simulation study of ICRF heating in the LHD," Nucl. Fusion **46** (2006) S425-S432.

JF1-09 ***Simulation Study of Kinetic MHD Modes by Using a New Gyrokinetic Particle Code***

Exchange Scientist: Hiroshi Naitou (Yamaguchi)
Location: Princeton Plasma Physics Laboratory, USA
Dates: August 8-27, 2005 (three weeks); paid by Japan
Research Summary:

To understand MHD-like phenomena in present-day and future tokamaks, it is important to develop simulation codes that can treat extended-MHD or kinetic-MHD phenomena. The gyrokinetic particle code with the delta-f method is one of the candidates to treat such phenomena, including electron inertia, diamagnetic effects, and ion Landau damping. A new method to treat kinetic-MHD modes in the high-beta regime was developed. The basic idea is to incorporate the split-weight scheme in the electromagnetic gyrokinetic particle code gyr3d, with which the kinetic internal kink mode had previously been simulated in the low beta regime [H. Naitou et al., *Phys. Plasmas* (1995), vol. 2, pp. 4257-4268]. The basic formulation was completed, and the importance of mesh accumulation or adaptive mesh refinement techniques was examined. This study is continuing; at present it awaits benchmarking of the simulation results by various codes, including two-fluid MHD codes.

JF1-10 ***Nonlinear MHD Analysis of LHD Plasmas***

Visiting Scientist: Katsuji Ichiguchi (NIFS)
Location: Oak Ridge National Laboratory, USA
Dates: June 8-29, 2005 (three weeks); paid by Japan
Summary:

This exchange visit focused on three research topics: [1] A multi-scale nonlinear MHD evolution scheme was developed for numerical analysis of the behavior of a heliotron plasma as the beta value increases. In this scheme, a nonlinear MHD code based on the reduced MHD equations is used to solve for the fast-time-scale dynamics, and a 3D static equilibrium code is used for the slow dynamics. The time evolution is calculated iteratively, with a linear interpolation technique for the equilibrium quantities. This scheme was applied to analyze the Large Helical Device. Self-organization of the pressure profile, induced by the interchange instability, has been found. [2] Magnetic island formation during nonlinear saturation of the resistive interchange mode was investigated. The interchange mode induces vortices around the resonant surface. The radial flow of the vortex can cause reconnection of the magnetic field line due to resistivity. As a result, magnetic islands can be generated in the nonlinear saturation phase of the resistive interchange mode. In this case, the number of islands in the poloidal cross section is twice the poloidal mode number of the dominant component. An analytic expression for the island formation was developed. This work is being continued. [3] Flow generation during nonlinear saturation of the interchange mode was studied. Uniform poloidal flow is generated by the nonlinear coupling of the interchange mode. The relationship between the angular momentum, boundary condition and the Reynolds stress was explored in cylindrical geometry. This work is also being continued.

Related publications:

- M. S. Chu and K. Ichiguchi, "Effect of the resistive wall on the growth rate of weakly unstable external kink mode in general 3D configurations," NIFS Report No. NIFS-812 (May 2005).
- K. Ichiguchi, Joint Meeting of 19th International Conference on Numerical Simulation of Plasmas and 7th Asia Pacific Plasma Theory Conference, July 12-15, 2005, Nara, Japan.
- K. Ichiguchi and B. A. Carreras, "Multi-Scale Approach to the Solution of Nonlinear MHD Evolution of Heliotron Plasma," accepted for publication in Journal of Plasma Physics.

US to Japan:

JF1-05 ***Fluid Closure Models and Application in Low Collisionality Plasma Regimes***
Visiting Professor: Jesus Ramos (MIT)
Location: National Institute for Fusion Studies
Dates: June 10–September 9, 2005 (three months); paid by Japan
Summary:

Reduced two-fluid systems including anisotropic temperature gradient effects were derived, and Hall-MHD equilibria with flows and strong electron pressure anisotropy were analyzed. The work on reduced two-fluid systems, in partnership with Dr. Ishizawa, was motivated by an existing numerical code based on a "four-field plus temperature" set of dynamical variables in a large-aspect-ratio geometry with weak parallel gradients. The newly derived extension generalizes the three-dimensional geometry and includes a complete account of diamagnetic effects from temperature gradients and ion gyroviscosity. The anisotropic ion and electron temperatures are evolved dynamically, and the analysis covers both the MHD and drift orderings. The main new contributions of the work on Hall-MHD equilibria with flows, carried out in collaboration with Dr. Ito, are the generalization to strong electron pressure anisotropy and the adoption of closure conditions based on the collisionless parallel heart flux equations in the limit of negligible electron mass. This provides a more physically satisfying model than the adiabatic or double-adiabatic closures and yields the correct mirror and firehose instability thresholds. An axisymmetric equilibrium system was derived that consists of generalized Grad-Shafranov equations for the magnetic and ion flow stream functions and a Bernoulli equation for the density. This work was presented at the 2005 APS Division of Plasma Physics Meeting, and the theory is being implemented in a numerical code. Future plans are to continue this work with an investigation of the relationship between the characteristics of the waves supported by this system and the elliptic or hyperbolic signature of the equilibrium partial differential equations.

Related publications:

- J. Ramos et al., Bull. Am. Phys. Soc. (2005), vol. 50, no. 8, paper UP1-5.

JF1-04 *MHD Stability Calculations for LHD*
Exchange Scientist: Benjamin Carreras (ORNL)
Location: NIFS
Dates: December 2-15, 2005 (two weeks); paid by US
Status: Cancelled

C. 2005-2006 Joint Computational Projects

The following 14 JIFT joint computational projects on various topics were also active during the past year.

JF2-01 *Large Scale Simulation on Helical Plasma Physics*
K. Ichiguchi, T. Hayashi, N. Nakajima (NIFS);
B. Carreras (ORNL); L. Sugiyama (MIT); S. Hudson (PPPL)

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

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)

JF2-04 *Computer Simulation of Alfvén Eigenmode Bursts*
Y. Todo (NIFS);
H. L. Berk, B. N. Breizman, J. W. Van Dam (IFS)

JF2-05 *Drift Mode Analyses for the Large Helical Device*
N. Nakajima, H. Yamada (NIFS);
G. Rewoldt, G. Y. Fu (PPPL)

Continued from 2004-2005

JF2-06 *Gyrokinetic Transport Simulation*
V. Decyk, R. Sydora (UCLA); W. Lee (PPPL);
T. Takayama (NIFS); H. Naitou (Yamaguchi)
Continued from 2004-2005

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 2004-2005

JF2-08 *MHD Stability in Advanced Tokamaks*
M. Ozeki, Y. Ishii (JAERI), Y. Tomita (NIFS);
J. Manickam (PPPL); A. Aydemir (IFS)
Continued from 2004-2005

JF2-09 *New Simulation Algorithms for Massively Parallel Processing*
V. Decyk (UCLA); W. Tang (PPPL);
K. Watanabe, R. Horiuchi, S. Ishiguro (NIFS)
Continued from 2004-2005

JF2-10 *Toroidal Simulation and Plasma Transport Modeling*
W. Horton (IFS);
Y. Kishimoto, A. Azumi (JAERI); H. Takamaru (NIFS)
Continued from 2004-2005

JF2-11 *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 2004-2005

JF2-12 *Turbulent Transport Applications to Tokamaks and Helical Systems*
B. Carreras (ORNL); W. Horton (IFS);
Y. Nakamura (Kyoto); M. Yokoyama (NIFS)

Continued from 2004-2005

JF2-13 *MHD and Transport Phenomena in Toroidal Systems*
W. Tang, G. Rewoldt, C.Z. Cheng (PPPL);
H. Sugama, R. Ishizaki (NIFS)
Continued from 2004-2005

JF2-14 *Kinetic Effects on MHD Phenomena*
J. Van Dam, H. Berk (IFS);
M. Okamoto, N. Nakajima, K. Ichiguchi (NIFS)
Continued from 2004-2005

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 Studies, and the Japanese co-executive secretary is currently director of the Computer and Information Network Center. Furthermore, on the Japanese side there is one official Advisor, who is from the Japan Atomic Energy Research Institute; 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	M. Okamoto (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 Advisor: T. Ozeki (JAERI)

*US Advisory Committee***:** A. Aydemir (IFS), P. Catto (MIT), B. Carreras (ORNL), 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.

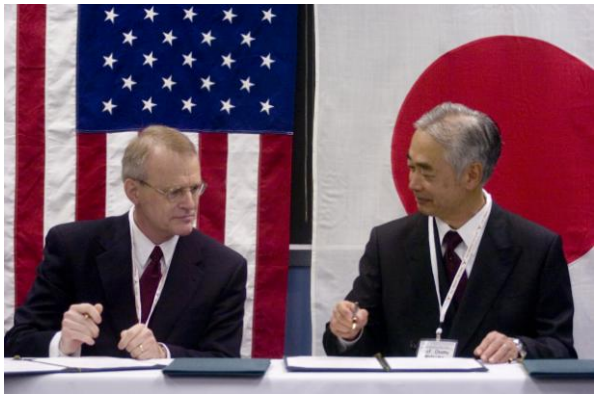
As the principal program for fundamental theoretical exchanges in the US-Japan Fusion Research Collaboration, JIFT operates alongside the Fusion Physics Planning Committee (FPPC) and the Fusion Technology Planning Committee (FTPC). In particular, the JIFT activities are coordinated with the four FPPC 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 2006, Prof. Masao Okamoto, director of the Theory and Computer Simulation Center at NIFS, retired. He had served for 12 years as the Japanese executive secretary for the JIFT program and then four years as the Japanese chairman for JIFT. He was the organizer of numerous JIFT workshops and participated in many others. His valuable services have been highly appreciated. (Prof. Shigeru Sudo is now the director of the Theory and Computer Simulation Center.)

4. *OTHER INFORMATION*

In September 2005 the agreement between Japan and the U.S. for all fusion exchange activities (including JIFT) expired before its renewal could be approved. This development was related to the fact that the Japanese national university system (in 2004) and also the Japan Atomic Energy Research Institute (which in 2005 became the Japan Atomic Energy Agency) had their status changed to that of independent administrative agencies. In order to prevent any disruption of funding on the Japanese side, the Institute for Fusion Studies (University of Texas) and the National Institute for Fusion Science signed a Memorandum of Agreement, which will allow the continuation of JIFT exchange activities for the sake of all US and Japan fusion theory scientists. The signing ceremony was held March 6, 2006, at the Institute for Fusion Studies; Prof. Osamu Motojima, director-general of the National Institute for Fusion Science, led the Japanese delegation.



Signing ceremony: J. Van Dam and O. Motojima

5. *PLANS FOR FUTURE ACTIVITIES (PROPOSED 2006-2007 PROGRAM)*

The topics and themes of the exchange activities that have been proposed for the next year (April 1, 2006–March 31, 2007) 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 (2006-2007) is listed below.

A. 2006-2007 Proposed Workshops

US to Japan:

Progress of Extended Models
Organizers: Noriyoshi Nakajima (NIFS) and Donald Spong (ORNL)
Proposed Place/Time: NIFS; March 2007

Theory and Simulation on Ultra-Intense Laser Plasmas
Organizers: Kunioki Mima (Osaka) and Gennady Shvets (Texas)
Proposed Place/Time: Osaka University

Japan to US:

Integrated Modeling of Multi-Physics in Fusion Plasmas II
Organizers: Steven Jardin (PPPL) and Atsushi Fukuyama (Kyoto)
Proposed Place/Time: ORNL; September 2006

Gyrokinetic Simulation of Ion and Electron Temperature Gradient-Driven Transport
Organizers: T. S. Hahm (PPPL) and Hideo Sugama (NIFS)
Proposed Place/Time: PPPL; January 2007

Bifurcations and Criticality in Turbulent Plasmas and Fluids
Organizers: Patrick Diamond (UCSD) and Masatoshi Yagi (Kyushu)
Proposed Place/Time: UCSD; January 2007 — Japan pending

JIFT Steering Committee Meeting
Organizers: Ritoku Horiuchi (NIFS) and James Van Dam (IFS)
Proposed Place/Time: Philadelphia (in conjunction with APS/DPP Meeting); October 2006

B. 2006-2007 Proposed Exchange Visits

Japan to US:

Neoclassical Transport around Magnetic Islands
R. Kanno (NIFS), Visiting Professor
IFS Texas; October–November 2006 (seven weeks); paid by US

Modeling and Analysis of Plasma Flow Effect on Resistive Wall Mode
M. Furukawa (Tokyo), Visiting Scientist
IFS Texas; September–November 2006 (twelve weeks); paid by Japan

Theoretical Research of Energy Release in Magnetic Reconnection with Chaos Diffusion
H. Ohtani (NIFS), Visiting Scientist
IFS Texas; May–June 2006 (nine weeks); paid by Japan

Nonlinear MHD Analysis of Pressure Driven Mode in LHD Plasmas
Katsuji Ichiguchi (NIFS), Visiting Scientist
ORNL; July 2006 (two weeks); paid by Japan — Japan pending

Energy Transport along Target Surface Irradiated by Ultra-Short Laser Pulses
T. Nakamura (NIFS), Visiting Scientist
University of Texas; January 2007 (two weeks); paid by Japan

US to Japan:

Theoretical and Computational Study of Extended MHD Modes
Donald Spong (ORNL), Visiting Professor
NIFS; February–May 2007 (three months); paid by Japan

Gyrokinetic Simulation of Guide-Field Magnetic Reconnection
Tomoya Tatsuno (Maryland), Visiting Scientist
NIFS; August 2006 (four weeks); paid by US

C. 2006-2007 Proposed Joint Computational Projects

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*
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V. S. Chan, M. Choi, L. Lao (GA)
Continued from 2005-2006

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JF2-09 *MHD Stability in Advanced Tokamaks*
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JF2-11 *Toroidal Simulation and Plasma Transport Modeling*
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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