

TO: Executive Secretaries of the US-Japan Fusion Research Collaboration
FROM: JIFT Steering Committee
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SUBJECT: JIFT Annual Report of Activities for 2000-2001

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Annual Report of JIFT Activities

Prof. Richard D. Hazeltine
Co-Chairman, JIFT Steering Committee
Director, Institute for Fusion Studies
The University of Texas at Austin
Austin, Texas 78712, USA

Prof. Tetsuya Sato
Co-Chairman, JIFT Steering Committee
Director, Theory & Computer Simulation Center
The 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, 2000–March 31, 2001

JIFT Steering Committee

Co-Chairmen: Richard D. Hazeltine and Tetsuya Sato

Co-Executive Secretaries: Masao Okamoto and James W. Van Dam

March 23, 2000

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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 various 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 20 years of successful operation, JIFT has sponsored 114 long-term visits by exchange scientists, 71 topical workshops, and 111 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 a month or two 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. Status of Current Activities (2000-2001 Program)

Most of the activities in all three categories—workshops, personal exchanges, and joint computational projects—that had been scheduled for the 2000-2001 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 seven Visiting Scientists made exchange visits. One visit was postponed, another was cancelled, and a third deferred from last year was carried out. The JIFT joint computational projects were also active.

The JIFT activities for the past year (April 1, 2000-March 31, 2001) are listed below, with brief annotations concerning attendance, location, and dates.

A. 2000-2001 Workshops

US to Japan:

JF1-01 *Physics of Plasma Flow and Its Application to High Beta Plasmas*
Organizers: Y. Ogawa, Z. Yoshida (Tokyo); S. Mahajan (IFS-Texas)
Held: University of Tokyo; November 29-December 1, 2000
Participants: approximately 10 Japanese, 2 US, and 4 others

JF1-02 *Numerical Simulation for Self-Organization*
Organizers: R. Horiuchi (NIFS); W. Horton (IFS-Texas)
Held: NIFS; December 9, 2000
Participants: 8 Japanese, 1 US, and 3 others

Japan to US:

JF1-05 *Effects of High Energy Particles on MHD Modes*
Organizers: N. Nakajima & Y. Todo (NIFS); J. Van Dam (IFS-Texas); R. Nazikian (PPPL)
Held: Burlington, VT; April 25-29, 2000
Participants: 6 Japanese, 8 US

JF1-06 *High Field Science*
Organizers: K. Mima (ILE-Osaka); T. Ditmire & T. Tajima (IFS-Texas)
Held: University of Texas at Austin; October 30-31, 2000
Participants: 10 Japanese, 15 US

JF1-07 *JIFT Steering Committee Meeting*
Organizers: T. Sato (NIFS); R. Hazeltine (IFS-Texas)
Held: University of Texas at Austin; December 13, 2000
Participants: 3 Japanese, 3 US

B. 2000-2001 Exchange Visits

Japan to US:

JF1-09 *Nonlinear Evolution of Alfvén Eigenmodes*
Yasushi Todo (NIFS), Visiting Professor (paid by US)

Visited IFS, September 4-November 30, 2000

- JF1-10 *Study on Turbulent Transport in Tokamak Plasmas*
Satoshi Hamaguchi (Kyoto U.), Visiting Scientist
Visited IFS and PPPL, November 26, 2000-January 10, 2001
- JF1-11 *Magnetohydrodynamic Dynamo Effect*
Akira Kageyama (NIFS), Visiting Scientist
Visited PPPL, August 5-November 1, 2000
- JF1-12 *Development of Laser Plasma Analysis Codes*
Hitoshi Sakagami (Himeji Technical Univ.), Visiting Scientist
Visited GA, August 7-November 5, 2000
- JF1-08 *Study on the Transport of Toroidal Plasma*
Masao Okamoto (NIFS), Visiting Scientist
Visited GA, March 10-16, 2001

US to Japan:

- JF1-13 *Theoretical Study for Equilibrium, Stability, and Transport in Helical Systems*
Paul Garabedian (NYU), Visiting Professor (paid by Japan)
Visited NIFS, March 1-24, 2001
- JF1-14 *Physics Consideration on the New Helical System*
Prashant Valanju (FRC Texas), Visiting Scientist
Visit cancelled
- JF1-04 *Microinstability Studies for Toroidal Plasmas-I*
G. Rewoldt (PPPL), Visiting Scientist
Visited NIFS and JAERI, July 2-7, 2000 (deferred from last year, FP2-5)
- JF1-16 *Microinstability Studies for Toroidal Plasmas-II*
G. Rewoldt (PPPL), Visiting Scientist
Visited NIFS and JAERI, January 29-February 3, 2001
- JF1-03 *Study of Structure Formation in Magnetized Plasmas*
P. Diamond (UCSD), Visiting Scientist
Visited Kyoto and NIFS, December 9-13, 2000
- JF1-15 *LHD High Beta Data Analysis*
D. Mikkelsen (PPPL), Visiting Scientist
Visit postponed

C. 2000-2001 Joint Computational Projects

- JF2-01 *MHD Stability in Advanced Tokamaks*
S. Tokuda, Y. Ishii, M. Ozeki (JAERI); J. Manickam (PPPL); A. Aydemir (IFS);
modified from 1999-2000.
- JF2-02 *3-D Codes and Island Formation*
D. Monticello (PPPL); A. Boozer (Columbia); C. Hegna (Wisc.); T. Hayashi, R. Kanno
(NIFS); Y. Nakamura (Kyoto U.); continued from 1999-2000.
- JF2-03 *New Simulation Algorithms for Massively Parallel Processing*
J. Dawson and V. Decyk (UCLA); W. Tang (PPPL); T. Sato, K. Watanabe (NIFS); S.
Ishiguro (NIFS); continued from 1999-2000.
- JF2-04 *Toroidal Simulation and Plasma Transport Modeling*
T. Tajima and W. Horton (IFS); Y. Kishimoto and M. Azumi (JAERI); continued from
1999-2000.
- JF2-05 *Numerical Study of High Energy Particle Effect on MHD Stability*
C. Z. Cheng (PPPL); J. Van Dam (IFS); M. Azumi and T. Ozeki (JAERI); continued
from 1999-2000.
- JF2-06 *Turbulent Transport Applications to Tokamaks and Helical Systems*
B. Carreras (ORNL); W. Horton (IFS); M. Wakatani, Y. Nakamura (Kyoto); H. Sugama
(NIFS); continued from 1999-2000.
- JF2-07 *Tokamak Simulation on Massively Parallel Computers*
B. Carreras, D. Spong, J.N. Leboeuf (ORNL); J. Dawson, V. Decyk (UCLA); S. Tokuda,
G. Kurita, Y. Ishii (JAERI); continued from 1999-2000
- JF2-08 *MHD and Transport Phenomena in Toroidal Systems*
W. Tang, G. Rewoldt, C.Z. Cheng (PPPL); M. Okamoto, H. Sugama, N. Nakajima
(NIFS); continued from 1999-2000
- JF2-09 *Kinetic Effects on MHD Phenomena*
H. Berk, J. Van Dam, B. Breizman (IFS); M. Okamoto, N. Nakajima, K. Ichiguchi
(NIFS); continued from 1999-2000
- JF2-10 *Two-Fluid Model for Plasma Simulation*
B. Coppi, T. Takaya, L. Sugiyama (MIT); T. Sato, H. Miura, M. Tanaka (NIFS);
continued from 1999-2000
- JF2-11 *Gyrokinetic Transport Simulation*

J. Dawson, V. Decyk, and R. Sydora (UCLA); W. Lee (PPPL); T. Sato and T. Takayama (NIFS); H. Naitou (Yamaguchi); continued from 1999-2000.

JF2-12 *Plasma Rotation, Vortices, and Anomalous Transport*

W. Horton, A. Aydemir (IFS); B. Carreras (ORNL); M. Okamoto, N. Nakajima (NIFS); M. Wakatani (Kyoto); continued from 1999-2000.

3. Technical Progress Highlights

The four 2000-2001 JIFT workshops were on topics of timely interest and had stimulating participation by both theoretical and computational scientists, as well as some experimentalists.

- The workshop on *Physics of Plasma Flow and Its Application to High Beta Plasmas* attracted significant participation by scientists from allied fields. There were two statistical mechanics talks, one about the statistical framework for fluid dynamics and another about relaxed states. Also, the effect of strongly sheared flows in cosmology and astrophysics was described. Two presentations emphasized solar physics: one on the “asymptotic persistence” of linear perturbations that feed off energy in the shear flow (to explain tornadoes in the solar atmosphere), and another on bifurcation leading to catastrophes and energy release (to explain eruptions in the solar corona). Spectacular movies of sheared-flow fluid dynamics were shown. Simulations of the nonlinear stability of tokamak plasmas with sheared flow were also discussed. A successor workshop on the same topic is being proposed for the coming year, to be held in the US.
- The workshop on *High Field Science* continued what has become an extremely fruitful line of research in the JIFT program over the last several years. Theoretical, computational, and experimental talks were presented. Topics included fast ignitor physics; the generation and astrophysical applications of electron-positron plasmas with ultra-intense lasers; relativistic electron filaments in laser plasmas; a new approach to laser pulse compression; laser-driven fusion neutron source using cluster targets; short microwave pulse generation; Coulomb explosions in a foam; strongly coupled dusty plasmas; and neutrino generation. A follow-up workshop is planned for the coming year, to be held in conjunction with the biennial Conference on Inertial Fusion Science and Applications in Japan.
- The one-day workshop on *Numerical Simulation for Self-Organization* was held as a satellite workshop of the 2000 International Toki Conference. A wide variety of interesting topics was covered at this workshop, including MHD dynamo physics and virtual reality visualization, nonlinear plasma transport simulations, self-organization of relativistic electrons in high-intensity laser plasmas, photon condensation and soliton formation, intermittent reconnection, and transport barrier dynamics.
- The workshop on *Effects of High Energy Particles on MHD Modes* was held in conjunction with the annual meeting of the Transport Task Force and co-sponsored by its Fast Particle Working Group. Two half-day sessions of talks were organized, which included theoretical,

simulation, and experimental presentations of latest results, with applications to tokamak, stellarator, spherical torus, and dipole confinement configurations. In addition, an informal brain-storming session—which was quite successful—was held to discuss what are the current and future problems of interest, forthcoming experimental campaigns, and specific future needs and opportunities (computational, diagnostic, theoretical, experimental, etc.) for fast particle research.

The JIFT exchange visits during 2000-2001 have also been productive, in terms of collaborations established, research accomplished, and papers written. Here we mention just a few highlights.

- *Dr. Yasushi Todo* (NIFS) collaborated with Dr. H. Berk and Dr. B. Breizman at IFS to develop numerical simulations of intermittent fast particle loss due to Alfvén eigenmode bursts. New and interesting results on nonlinear saturation and global relaxation were obtained, in excellent agreement with experimental observations. Subsequently this joint work was selected for an invited talk at the 2001 International Sherwood Fusion Theory Conference, to be given by Dr. Todo. He also gave an invited paper on this subject at the 18th IAEA Fusion Energy Conference (Sorrento, Italy, October 4-10, 2000).
- *Dr. Akira Kageyama* (NIFS) collaborated with Dr. Hantao Ji (PPPL) and Dr. J. Goodman (Princeton University, Astronomy Department) to study the so-called magneto-rotational instability (MRI) as a powerful mechanism to transport angular momentum. Local and global linear stability analysis showed that MRI can be triggered at modest rotation speeds. A small-scale gallium disk with rotating inner and outer walls was proposed to study MRI in laboratory experiments. These results are very relevant to the fast angular momentum transport in accretion disks, which has been an outstanding problem in astrophysics for more three decades. A poster paper, "Study of Magnetorotational Instability in a Rotating Liquid Metal Disk," on this joint work was presented at 197th American Astronomy Society meeting in San Diego, January 8-11, 2001. Enthusiastic responses were received from the astronomy community.
- *Dr. Greg Rewoldt* (PPPL) continued his successful series of visits for collaborations with Japanese theorists and experimentalists on microinstability studies in toroidal plasmas. Two papers have been written based on this work, one describing drift mode calculations for the Large Helical Device and another analyzing radial patterns of instability and transport in JT-60U internal transport barrier discharges.
- *Dr. Patrick Diamond* (UCSD) collaborated with scientists at Kyoto University and NIFS. He participated in a JIFT workshop, presenting a talk on drag reduction in turbulent pipe flow by polymer additives. He also presented an invited talk at the 2000 International Toki Conference.

Twelve JIFT joint computational projects on various topics were also active during the past year. Some of these projects involved limited travel.

4. Program Administration

JIFT has a Steering Committee of eight members, four from each country, with two co-chairmen. The co-chairman on the Japanese side is the director of the Theory and Computer Simulation Center at the National Institute for Fusion Science. The co-chairman on the US side is the director of the Institute for Fusion Studies (IFS) of The University of Texas at Austin. Two other members of the Steering Committee, who are called co-executive secretaries, are responsible for the ongoing daily oversight of the progress of JIFT activities. 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

R. Hazeltine (IFS)—Co-Chairman
J. Van Dam (IFS)—Co-Exec. Secretary
W. Sadowski (DOE)
J. Dawson (UCLA)

Japanese Members

T. Sato (NIFS)—Co-Chairman
M. Okamoto (NIFS)—Co-Exec. Secretary
M. Wakatani (Kyoto)
K. Mima (Osaka)

JIFT Advisors

Japanese Advisor: Y. Kishimoto (JAERI)

US Advisory Committee: A. Aydemir (IFS), P. Catto (MIT), B. Carreras (ORNL), V. Chan (GA), B. Cohen (LLNL), J. Johnson (PPPL), W. Horton (IFS), J. Leboeuf (ORNL), T. Tajima (IFS), W. Tang (PPPL), and P. Terry (UWM)

The Steering Committee attempts to schedule workshops in such a way as to dovetail with other meetings, to involve participation at workshops by interested experimentalists, and to invite 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.

A talk describing the JIFT program and its administration was presented by the US co-executive secretary at a meeting of the Theory Review Sub-panel of the US Fusion Energy Sciences

Advisory Committee (January 31, 2001, Los Angeles).

5. Twentieth Anniversary of US-Japan Fusion Collaborations

The 20th anniversary of US-Japan research cooperation in fusion was commemorated at a meeting of the U.S.-Japan Coordinating Committee on Fusion Energy held June 21, 2000, in Tokyo. The US co-executive secretary of JIFT attended as an invited delegate and presented a talk about the past two decades of JIFT activities.

The Japanese and US co-executive secretaries wrote a 4-page description of JIFT activities that will be published as Chapter 1 of *Twenty Year Report for Activities regarding U.S.-Japan Fusion Research Collaboration [Expert Summary for 1980 (Nov. 1979)—2000]*, to be published by the U.S.-Japan Coordinating Committee on Fusion Energy.

The same write-up will be included, in edited form, in a brochure about US-Japan fusion collaboration activities that is being prepared by General Atomics.

6. Recent JIFT-Related Publications

Below are listed a number of papers that either have been or will be published in connection with JIFT activities.

1. V. I. Berezhiani, S. M. Mahajan, Z. Yoshida, and M. Ohhashi, "Self-trapping of strong electromagnetic beams in relativistic plasmas," IFS Report No.925 (March 2001), to be published.
2. B. A. Carreras, V. E. Lynch, H. Zushi, K. Ichiguchi, and M. Wakatani, "Internal disruptions in stellarators," in *Fusion Energy 1998: Proceedings of the 17th Conference, Yokohama, 18-24 October 1998* (IAEA, Vienna, 1999), vol. 4, pp. 1473-1476.
3. J. Q. Dong, W. Horton, and Y. Kishimoto, "Gyrokinetic study of ion temperature gradient instability in vicinity of flux surfaces with reversed magnetic shear," *Phys. Plasmas* 8 (1), 167-173 (2001).
4. Hantao Ji, Jeremy Goodman, and Akira Kageyama, "Magnetorotational instability in a rotating liquid metal annulus," Princeton Plasma Physics Laboratory Report No. PPPL-3548 (2001), submitted for publication.
5. N.N. Gorelenkov, S. Bernabei, C. Z. Cheng, K. Hill, R. Nazikian, S. Kaye, Y. Kusama, G. J. Kramer, K. Shinohara, T. Ozeki, and M. V. Gorelenkova, "Stability properties of toroidal Alfvén modes driven by fast particles," Princeton Plasma Physics Laboratory Report No. PPPL-3391 (2000), submitted for publication.
6. N. N. Gorelenkov, S. Bernabei, C. Z. Cheng, G. Y. Fu, K. Hill, S. Kaye, G. J. Kramer, Y. Kusama, K. Shinohara, R. Nazikian, T. Ozeki, and W. Park, "Fast Particle Effects on the Internal Kink, Fishbone and Alfvén Modes," Princeton Plasma Physics Laboratory Report

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- No. PPPL-3512 (2001), submitted for publication.
7. S. M. Mahajan, R. Miklaszewski, K. I. Nikol'skaya, and N. L. Shatashvili, "Formation and primary heating of the solar corona: Theory and simulation," *Phys. Plasmas* **8** (4), 1340-1357 (2001).
 8. S. M. Mahajan and Z. Yoshida, "A collisionless self-organizing model for the high-confinement (H-mode) boundary layer," *Phys. Plasmas* **7** (2), 635-649 (2000).
 9. D. R. Mikkelsen, H. Shirai, N. Asakura, T. Fujita, T. Fukuda, T. Hatae, S. Ide, A. Isayama, Y. Kamada, Y. Kawano, Y. Koide, O. Naito, Y. Sakamoto, T. Takizuka, and H. Urano, "Correlation between core and pedestal temperatures in JT-60U: Experiment and modeling," Princeton Plasma Physics Laboratory Report No. PPPL-3512 (2001), submitted for publication.
 10. N. Mizuguchi, T. Hayashi, and T. Sato, "Convective loss of heat energy excited in the edge region of spherical tokamak," *Contributions to Plasma Physics*, in press.
 11. S. Murakami and Vincent Chan, "3-D electric field effects in a Fokker-Planck Monte Carlo simulation," NIFS Report No. 582 (1999), in preparation for publication.
 12. Shuichi Ohsaki, Zensho Yoshida, Nana Shatashvili, and Swadesh M. Mahajan, "Eruptive events in the solar atmosphere," Institute for Fusion Studies Report (March 2001).
 13. G. Rewoldt, L.-P. Ku, W.M. Tang, H. Sugama, N. Nakajima, K. Y. Watanabe, S. Murakami, H. Yamada, and W. A. Cooper, "Drift mode calculations for the Large Helical Device," Princeton Plasma Physics Laboratory Report No. PPPL-3451 (2000), submitted for publication.
 14. G. Rewoldt, K.W. Hill, R. Nazikian, W. M. Tang, H. Shirai, Y. Sakamoto, Y. Kishimoto, S. Ide, and T. Fujita, "Radial patterns of instability and transport in JT-60U internal transport barrier discharges," Princeton Plasma Physics Laboratory Report No. PPPL-3547 (2001), submitted for publication.
 15. T. Tatsuno, V. Berezhiani, and S. M. Mahajan, "Vortex solitons: Mass, energy, and angular momentum bunching in relativistic electron-positron plasmas," Institute for Fusion Studies Report (2001).
 16. Y. Todo and T. Sato, "Kinetic-magnetohydrodynamic simulation study of fast ions and toroidal Alfvén eigenmode," in *Fusion Energy 1998: Proceedings of the 17th Conference, Yokohama, 18-24 October 1998* (IAEA, Vienna, 1999), vol. 4, pp. 1577-1580.
 17. Y. Todo, T.-H. Watanabe, H.-B. Park, and T. Sato, "Fokker-Planck Simulation Study of Alfvén Eigenmode Burst," National Institute for Fusion Science Report No. NIFS-645 (Sept. 2000), invited paper at 18th IAEA Fusion Energy Conference (Sorrento, Italy, October 4-10, 2000).
 18. F. Volponi, Z. Yoshida, and S. Mahajan, "Asymptotic analysis and renormalized perturbation theory of non-Hermitian dynamics," accepted in *Phys. Plasmas*

18. Zensho Yoshida and Swadesh M. Mahajan, "Simultaneous Beltrami conditions in coupled vortex dynamics," J. Math. Phys. **40** (10), 5080-5091 (1999).

7. Plans for Future Activities (Proposed 2001-2002 Program)

The topics and themes of the exchange activities that have been proposed for next year (April 1, 2001–March 31, 2002) 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 (2001-2002) is listed below.

A. 2001-2002 Proposed Workshops

US to Japan:

High Field Science

Organizers: K. Mima (Osaka ILE); T. Tajima and T. Ditmire (Texas IFS)

Proposed Place/Time: Kyoto, September 9-14, 2001 (concurrent with Conference on Inertial Fusion Science and Applications)

Physics of Magnetic Islands in Toroidal Systems

Organizers: M. Okamoto (NIFS), M. Wakatani (Kyoto); D. Monticello and A. Reiman (PPPL)

Proposed Place/Time: NIFS, December 3-7, 2001 (concurrent with Toki Conference)

JIFT Steering Committee Meeting

Organizers: T. Sato (NIFS); R. Hazeltine (IFS)

Proposed Place/Time: to be determined

Japan to US:

Scope of Complexity Science

Organizers: T. Sato and R. Horiuchi (NIFS); W. Horton (Texas IFS)

Proposed Place/Time: IFS, January, 2002

Equilibrium, Stability, and Transport in Tori

Organizers: Z. Yoshida (Tokyo), N. Nakajima (NIFS); S. Mahajan (Texas IFS)

Proposed Place/Time: IFS, November 19-24, 2001

B. 2001-2002 Proposed Exchange Visits

Japan to US:

Simulation Study of Complexity Science

Hiroaki Nakamura (NIFS), Visiting Professor

IFS; October 1-December 28, 2001 (three months); paid by IFS

Study of Turbulence in Tori

Masatoshi Yagi (Kyushu U.), Visiting Scientist

IFS & PPPL; September 15-December 13, 2001 (three months); paid by Japan

Worldwide Virtual System for Simulations

Tetsuya Sato (NIFS), Visiting Scientist

PPPL & IFS; one month; paid by Japan

Influence of Magnetic Field on Magnetic Curvature and Shear

N. Nakajima (NIFS), Visiting Scientist

IFS & PPPL; September 10-30, 2001; paid by Japan

Analysis of the Stability of Plasmas with Shear Flow

Tomoya Tatsuno (Tokyo U.), Visiting Scientist

IFS; July 8-September 9, 2001; paid by Japan

Possible extra Visiting Scientists to the US:

Modeling of Relaxation Phenomena in Spherical Tokamak

Naoki Mizuguchi (NIFS), Visiting Scientist

PPPL; June 4-August 22, 2001; paid by Japan

Investigation of Nonlinear Relaxation Phenomena of an MHD Plasma in Helical Fusion Devices by Nonlinear Simulation Approach

Hideaki Miura (NIFS), Visiting Scientist

PPPL; September 6-December 2, 2001; paid by Japan

Basic Study for the Development of 3-D Divertor Plasma Transport Code

Arimichi Takayama (NIFS), Visiting Scientist

MIT & NYU; October 1-December 21, 2001; paid by Japan

Gyro-Landau-Fluid Model and Microinstabilities

Hideo Sugama (NIFS), Visiting Scientist

PPPL; August 1-September 30, 2001; paid by Japan

Effect of Bootstrap Current on Magnetic Islands

Ryutaro Kanno (NIFS), Visiting Scientist
PPPL; October 1-November 30, 2001; paid by Japan

US to Japan:

Development of Particle Simulation code for Open System

C. K. Birdsall (UC Berkeley), Visiting Professor
NIFS; January 10-April 10, 2002; three months; paid by Japan

Physics Consideration on New Helical System

M. S. Chu (General Atomics), Visiting Scientist
NIFS, Kyoto, & JAERI; date to be determined; paid by US

Microinstability Analysis of Magnetically Confined Plasmas

G. Rewoldt (PPPL), Visiting Scientist
NIFS and JAERI; two weeks in February-March 2002 time frame; paid by US

Comparison of experimental and theoretical stellarator transport.

D. R. Mikkelsen (PPPL), Visiting Scientist
NIFS; one week in late May 2001 (deferred JF1-15 from 2000); paid by US

LHD high beta data analysis

G. Y. Fu (PPPL), Visiting Scientist
NIFS; two weeks; time frame to be determined; paid by US

MHD Equilibrium in Stellarators

D. Monticello (PPPL), Visiting Scientist
NIFS; three weeks in February-March 2002 time frame; paid by US

C. 2001-2002 Proposed Joint Computational Projects

MHD Stability in Advanced Tokamaks

S. Tokuda, Y. Ishii, M. Ozeki, and M. Azumi (JAERI)
J. Manickam (PPPL); A. Aydemir (IFS)
1 week; 1 person to US; continued from 2000-2001

3-D Codes and Island Formation

A. Boozer (Columbia); D. Monticello (PPPL); C. Hegna (Wisc.)
T. Hayashi and R. Kanno (NIFS); Y. Nakamura (Kyoto U.)
2 weeks; 1 person to US; continued from 2000-2001

New Simulation Algorithms for Massively Parallel Processing

J. Dawson and V. Decyk (UCLA); W. Tang (PPPL)

K. Watanabe, R. Horiuchi, S. Ishiguro (NIFS)

2 weeks; 1 person to US; continued from 2000-2001

Toroidal Simulation and Plasma Transport Modeling

T. Tajima (LLNL); W. Horton (IFS)

Y. Kishimoto and A. Azumi (JAERI); M. Takamaru (NIFS)

1 week; 1 person to US; continued from 2000-2001

Numerical Study of High Energy Particle Effect on MHD Stability

C.Z. Cheng (PPPL); J. Van Dam (IFS)

M. Azumi and T. Ozeki (JAERI); Y. Todo (NIFS)

1 week; 1 person to US; continued from 2000-2001

Turbulent Transport Applications to Tokamaks and Helical Systems

B. Carreras (ORNL); W. Horton (IFS)

M. Wakatani and Y. Nakamura (Kyoto); M. Yokoyama (NIFS)

1 week; 1 person to US; continued from 2000-2001

Tokamak Simulation on Massively Parallel Computers

B. Carreras, D. Spong (ORNL); J.N. Leboeuf (UCLA)

J. Dawson and V. Decyk (UCLA)

S. Tokuda and G. Kurita (JAERI); T. Watanabe (NIFS)

1 week; 1 person to US; continued from 2000-2001

MHD and Transport Phenomena in Toroidal Systems

W. Tang, G. Rewoldt, and C.Z. Cheng (PPPL)

S. Kida, H. Sugama, and R. Ishizaki (NIFS)

1 week; 1 person to US; continued from 2000-2001

Kinetic Effects on MHD Phenomena

J. Van Dam and H. Berk (IFS)

M. Okamoto, N. Nakajima, and K. Ichiguchi (NIFS)

1 week; 1 person to US; continued from 2000-2001

Two-Fluid Model for Plasma Simulation

B. Coppi, T. Takaya, and L. Sugiyama (MIT)

T. Sato, H. Miura, and M. Tanaka (NIFS)

1 week; 1 person to US; continued from 2000-2001

Gyrokinetic Transport Simulation

J. Dawson, V. Decyk, and R. Sydora (UCLA); W. Lee (PPPL)

T. Sato and T. Takayama (NIFS); H. Naitou (Yamaguchi)

2 weeks; 1 person to Japan; continued from 2000-2001

Plasma Rotation, Vortices, and Anomalous Transport

W. Horton, A. Aydemir, and K. Shaing (IFS); B. Carreras (ORNL)

T. Sato, M. Okamoto and S. Murakami (NIFS); M. Wakatani (Kyoto)

3 weeks; 1 person to Japan; continued from 2000-2001