

# Curriculum Vitae

(as of March 21, 2019)

Kiyoshi YOSHIKAWA



**Kiyoshi Yoshikawa** (Professor Emeritus, Dr. Eng., nuclear engineering, Kyoto University, Japan, 1974) is a Research Specialist at Rajamangala University of Technology Thanyaburi since Feb. 18, 2019, after serving as a Research Advisor to the President of Rajamangala University of Technology Lanna, Chiangmai since June, 2015, Thailand. Before in Thailand, he served for 6 years as Executive Vice President for Research of Kyoto University, Japan. He held a visiting appointment at University of California, Lawrence Livermore Laboratory (now

LLNL) in 1978 and was at University of California, Lawrence Berkeley Laboratory (now LBNL) until March 1980. He served as the Chairperson of the Research Institute Directors' Committee of Ministry of Education, Culture, Sports, Science and Technology during 2003-2004, and also served as a director of Institute of Advanced Energy, Kyoto University during 2000-2007.

His main interests are now high voltage, plasma and micro/nano bubble application to agriculture, aquaculture and industries, in addition to fusion direct energy conversion, reactor-relevant advanced technologies, super-compact DD fusion inertial-electrostatic confinement fusion, fusion reactor design, free electron laser, and humanitarian landmine detection.

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Name: Kiyoshi Yoshikawa,

Age: 75

Birth date: April 4, 1943,

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## Qualifications

March, 1966: BS, Nuclear Engineering, Kyoto University, Japan.

March, 1968: MS, Nuclear Engineering, Graduate School of Engineering, Kyoto University, Japan.

May, 1974 : Dr. Eng., Nuclear Engineering, Graduate School of Engineering, Kyoto University, Japan., "Effects of non-uniformities in the non-equilibrium Magneto-hydrodynamic Electrical Power Generation"

November 2007; honorary degree of bachelor from RMUTT Faculty of Engineering.

## Current and previous appointment and position

January, 1971: Assistant Professor, Institute of Atomic Energy, Kyoto University

May, 1974: Associate Professor, Institute of Atomic Energy, Kyoto University

October, 1978- September, 1979: Visiting researcher at Lawrence Livermore Laboratory,

University of California, for Fusion Direct Energy Recovery Research in the group of Dr. Ralph Moir (paid by DOE)

October,1979- March,1980: Visiting scholar at Lawrence Berkeley Laboratory, University of California, for neutral beam injection system in the group of Dr. Robert Pyle

April,1992- March,1996: Professor, Institute of Atomic Energy, Kyoto University

April,1996- March,2000: Professor, Institute of Advanced Energy, Kyoto University (renamed)

April,2000-March, 2007: Director, Professor, Institute of Advanced Energy, Kyoto University

May 2003-April 2004: Chairperson of the Research Institute Directors' Committee of Ministry of Education, Culture, Sports, Science and Technology,

March 31, 2007 : mandatory retirement, Professor Emeritus of Kyoto University,

April 1, 2007- September 30, 2008: Head, Supporting Office of Planning for Research Promotion, Kyoto University,

October 1, 2008- September 30, 2014: Executive Vice President (Research), Kyoto University

February 2015 - February, 2019: Research advisor to the President of Rajamangala University of Technology Lanna, Chiangmai, Thailand.

February, 2019 - present; Research specialist, Rajamangala University of Technology Thanyaburi, Thanyaburi, Thailand

#### Academical research fields

- ◆ Non-equilibrium MHD electrical power generation,
- ◆ Fusion direct energy conversion, Inertial Electrostatic Confinement(IEC) Fusion,
- ◆ Free electron laser,
- ◆ Detection of landmines by an extremely compact IEC device with 5 years program "Research & Development of Humanitarian Landmine Detection System by a Compact Discharge-Type Fusion Neutron Source "(Oct. 2002-Oct.2007) supported by JSTA.
- ◆ High voltage, plasma and micro/nano bubble application to agriculture, aquaculture and industry

#### Most significant contributions to the fields(in 138 publications).

- 1) Achievement of a record high energy recovery efficiency in the beam direct energy conversion experiments as high as  $87\pm 6\%$  by using large perveance helium ion beams by the LLL-type beam direct convertor in 1989.

K. Yoshikawa, Y. Yamamoto, H. Toku, A. Kobayashi, T. Okazaki, "Direct Energy Recovery from Helium Ion Beams by a Beam Direct Converter with Secondary Electron Suppressors", Fusion Technology, Vol.15, 1541-1559, 1992 .

- 2) Innovative nuclear fusion reactor concepts were proposed as, "Moving –Ring Reactor KARIN-I, and also a D-T tokamak fusion reactor with advanced blanket using compact fusion advanced Rankine (CFAR) cycle

A. Mohri, Y. Fujii-E, K. Ikuta, H. Momota, H. Naitou, Y. Nomura, Y. Tomita, M. Ohnishi, K. Yoshikawa, S. Inoue, M. Nishikawa, S. Inoue Itoh, K. Kitamura, S. Nagao, H. Nakashima, "CONCEPTUAL DESIGN OF A MOVING-RING REACTOR: KARIN-I", Fusion Technology, Vol.9, No.3, pp.422-451, 1986.

K. Yoshikawa, D. Shimohiro, Y. Yamamoto, H. Toku, Y. Inui, M. Ishikawa, J. Umoto, N. Miki, A. Fukuyama, O. Mitarai, M. Okamoto, H. Sekimoto, Y. Fujii, H. Kim, K. Watanabe, T. Ishii, T. Takagi, T. Suzuki, I. Mutoh, K. Miyazaki, M. Saitoh, B.G. Logan, W.L. Barr, M.A. Hoffman, R.B. Campbell, "A D-T tokamak fusion reactor with advanced blanket using compact fusion advanced Rankine (CFAR) cycle", Fusion Engineering and Design, Vol.18, No.C, pp.239-248, 1991.

- 3) Success of the first observation of the double-well potential profile in the inertial-electrostatic confinement fusion (IECF) device by use of the laser-induced fluorescence method by making use of Stark effects. This first direct measurement of the localized electric field was reported in the IEEE symposium on fusion energy held in October 1999, and put an end to the controversy lasted in the past 30 years on the existence of the double-well potential profile.

Kiyoshi Yoshikawa, Ken Takiyama, Yasushi Yamamoto, Kai Masuda, Hisayuki Toku, Takahiro Koyama, Kenji Taruya, Hirofumi Hashimoto, Masami Ohnishi, Hiroshi Horiike, Nobuyuki Inoue, "Real Time Measurements of Strongly Localized Potential Profile through Stark Effects in the Central Core Region of an Inertial-Electrostatic Fusion Device", 18th Symposium on Fusion Engineering, Albuquerque, NM, Oct. 25-29, 27-30, 1999.

K. Yoshikawa, K. Takiyama, T. Koyama, K. Taruya, K. Masuda, Y. Yamamoto, T. Toku, T. Kii, H. Hashimoto, N. Inoue, M. Ohnishi, H. Horiike, "Measurements of strongly localized potential well profiles in an inertial electrostatic fusion neutron source", Nuclear Fusion, Vol.41, No.6, pp.717-720, 2001.

- 4) Development of landmine detection system by a compact fusion neutron source and advanced nuclear detection technique in Afghanistan.

K. Yoshikawa, K. Masuda, Y. Yamamoto, T. Takamatsu, H. Toku, K. Nagasaki, E. Hotta, K. Yamauchi, M. Ohnishi, H. Osawa, "Research and Development of a Compact Fusion Neutron Source for Humanitarian Landmine Detection", 20th IAEA Fusion Energy Conference, Vilamoura, Portugal, November 1-6, 2004, 132-133, IC/P6-54, 2004.

K. Yoshikawa, K. Masuda, T. Takamatsu, Y. Yamamoto, H. Toku, T. Fujimoto, E. Hotta, K. Yamauchi, M. Ohnishi, H. Osawa, S. Shiroya, T. Misawa, Y. Takahashi, Y. Kubo, T. Doi, "Research and development of the humanitarian landmine detection system by a compact fusion neutron source", IEEE Transactions on Nuclear Science, Vol.56, No.3, pp.1193-1202, 2009.

- 5) Innovative nuclear fusion reactor concepts were proposed as, "Moving –Ring Reactor KARIN-I, and also a D-T tokamak fusion reactor with advanced blanket using compact fusion advanced Rankine (CFAR) cycle

A. Mohri, Y. Fujii-E, K. Ikuta, H. Momota, H. Naitou, Y. Nomura, Y. Tomita, M. Ohnishi, K. Yoshikawa, S. Inoue, M. Nishikawa, S. Inoue Itoh, K. Kitamura, S. Nagao, H. Nakashima, "CONCEPTUAL DESIGN OF A MOVING-RING REACTOR: KARIN-I", Fusion Technology, Vol.9, No.3, pp.422-451, 1986.

K. Yoshikawa, D. Shimohiro, Y. Yamamoto, H. Toku, Y. Inui, M. Ishikawa, J. Umoto, N. Miki, A. Fukuyama, O. Mitarai, M. Okamoto, H. Sekimoto, Y. Fujii, H. Kim, K. Watanabe, T. Ishii, T. Takagi, T. Suzuki, I. Mutoh, K. Miyazaki, M. Saitoh, B.G. Logan, W.L. Barr, M.A. Hoffman, R.B. Campbell, "A D-T tokamak fusion reactor with advanced blanket using compact fusion advanced Rankine (CFAR) cycle", Fusion Engineering and Design, Vol.18, No.C, pp.239-248, 1991.

- 6) Free electron laser research was conducted, in particular, for visualization of spatial profiles of spectra and intensities in FEL simulation for the first time in the world, and also an advanced and innovative staggered-array undulator design was proposed.

K. Yoshikawa, T. Shinzato, Y. Yamamoto, M. Ohnishi, T. Yamazaki, "Visualization of spatial

profiles of spectra and intensities in FEL simulations", Nuclear Inst. and Methods in Physics Research, A, Vol.358, No.1-3, pp.295-299, 1995.

J. Kitagaki, K. Masuda, Z.-W. Dong, T. Kii, T. Yamazaki, K. Yoshikawa, "A design study on electron beam confinement in a staggered array undulator based on a 3D code", Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, Vol.475, No.1-3, pp.613-616, 2001.

### List of publications (143 publications)

1. YOSHIKAWA K, MICHIOYOSHI I, "ELECTRICAL CHARACTERISTICS OF MHD GENERATOR WITH RESISTIVE SEGMENTED ELECTRODES IN THERMAL EQUILIBRIUM", Journal of Nuclear Science and Technology, Vol.7, No.8, pp.394-400, 1970.
2. Tetsuo Ikegami, Kiyoshi Yoshikawa, Kenji Morimoto, Masahiro Numano, Itaru Michiyoshi, "EXPERIMENTAL STUDY OF THE RELAXATION PHENOMENA IN NON-EQUILIBRIUM MHD GENERATOR DUCT.", Journal of Nuclear Science and Technology, Vol.9, No.8, pp.439-444, 1972.
3. K. Yoshikawa, I. Michiyoshi, "The influence of spatial temperature distribution and measuring configuration on line-reversal temperature", Journal of Quantitative Spectroscopy and Radiative Transfer, Vol.12, No.12, pp.1673-1683, 1972.
4. K. Yoshikawa, I. Michiyoshi, "Ionization instability and stable region in potassium seeded argon gas plasma MHD generation", Plasma Physics, Vol.16, No.11, pp.1085-1099, 1974.
5. Kiyoshi Yoshikawa, Jiro Ogawa, Yoshio Hattori, "TRANSIENT CHARACTERISTICS OF CONSTANT VELOCITY FARADAY-TYPE MHD GENERATOR.", Journal of Nuclear Science and Technology, Vol.16, No.5, pp.316-328, 1979.
6. K. Yoshikawa, K. Okada, M. Ishikawa, "IMPURITY EFFECTS ON NON-EQUILIBRIUM AND GAS HEATED BY A FOSSIL FUEL-FIRED HEAT EXCHANGER.", Symposium - Engineering Aspects of Magnetohydrodynamics, pp.E. 1. 1-E. 1. 6, 1980.
7. Motoo Ishikawa, Seiji Higashi, Kiyoshi Yoshikawa, "APPLICATION OF INDUCTION MHD GENERATOR TO INERTIAL CONFINEMENT FUSION REACTOR.", Technical Reports of the Institute of Atomic Energy, Kyoto University, pp.1-11, 1981.
8. Kiyoshi Yoshikawa, Kiyoshi Okada, Motoo Ishikawa, "EFFECTS OF PRESENCE OF IMPURITIES ON NON-EQUILIBRIUM MHD POWER GENERATION INCORPORATING FOSSIL FUEL-FIRED HEAT EXCHANGER.", Journal of Nuclear Science and Technology, Vol.18, No.9, pp.673-683, 1981.
9. Hirotugu Murashima, Kiyoshi Yoshikawa, "DIRECT ENERGY RECOVERY OF MRCTR PLASMOID THROUGH EXPANSION.", Kyoto Daigaku Genshi Enerugi Kenkyusho Iho/Bulletin of the Institute of Atomic Energy, Kyoto Univ, Vol.61, pp.17-, 1982.
10. Kiyoshi Yoshida, Kiyoshi Yoshikawa, Yasushi Yamamoto, "EFFICIENCY DEGRADATION OF A BEAM DIRECT CONVERTER DUE TO ATOMIC PROCESSES.", Kyoto Daigaku Genshi Enerugi Kenkyusho Iho/Bulletin of the Institute of Atomic Energy, Kyoto Unive, Vol.62, pp.16-, 1982.
11. Kiyoshi Yoshikawa, "HIGH EFFICIENCY DIRECT ENERGY CONVERSION IN NUCLEAR FUSION.", Kyoto Daigaku Genshi Enerugi Kenkyusho Iho/Bulletin of the Institute of Atomic Energy, Kyoto Unive, Vol.62, pp.1-12, 1982.
12. Hironobu Koshimae, Kiyoshi Yoshikawa, Yasushi Yamamoto, "CHARACTERISTICS OF WAVE PROPAGATION IN MHD GENERATORS.", Kyoto Daigaku Genshi Enerugi Kenkyusho Iho/Bulletin of the Institute of Atomic Energy, Kyoto Unive, Vol.62, pp.20-, 1982.
13. Hiroshi Tamagaki, Kiyoshi Yoshikawa, "INFLUENCE OF BACKGROUND GASES TO A PLASMA DIRECT CONVERTER EFFICIENCY.", Kyoto Daigaku Genshi Enerugi Kenkyusho Iho/Bulletin of the Institute of Atomic Energy, Kyoto Unive, Vol.62, pp.17-, 1982.
14. Kouji Matsushita, Kiyoshi Yoshikawa, "COLD ELECTRON INFLOW IN THE TANDEM MIRROR REACTOR.", Kyoto Daigaku Genshi Enerugi Kenkyusho Iho/Bulletin of the Institute of Atomic Energy, Kyoto Unive, Vol.62, pp.18-, 1982.
15. Masami Ohnishi, Hiroki Matsuoka, Kiyoshi Yoshikawa, "SHELL STABILIZATION OF TILTING MODE INSTABILITY IN A MOVING RING REACTOR.", Nuclear technology/fusion, Vol.3, No.3,

pp.342-, 1983.

16. K. Yoshikawa, "I.3.4. Energy recovery", *Journal of Fusion Energy*, Vol.3, No.5-6, pp.389-390, 1983.
17. A. Mohri, Y. Fujii-e, K. Ikuta, H. Momota, H. Naito, Y. Nomura, Y. Tomita, M. Ohnishi, K. Yoshikawa, S. Inoue, M. Nishikawa, S.-Inoue Ito, K. Kitamura, H. Nakashima, S. Nagao, "CONCEPTUAL DESIGN OF A MOVING RING REACTOR, KARIN-I.", *Fusion Technology*, Vol.8, No.1 pt 2, pp.B, 1985.
18. K. Yoshikawa, H. Tamagaki, M. Ueda, H. Toku, Y. Yamamoto, K. Hirano, "PERFORMANCE CHARACTERISTICS OF A HALL ACCELERATOR WITH PREIONIZATION DISCHARGE (HAPID).", *Fusion Technology*, Vol.8, No.1 pt 2, pp.A, 1985.
19. A. Mohri, Y. Fujii-E, K. Ikuta, H. Momota, H. Naitou, Y. Nomura, Y. Tomita, M. Ohnishi, K. Yoshikawa, S. Inoue, M. Nishikawa, S. Inoue Itoh, K. Kitamura, S. Nagao, H. Nakashima, "CONCEPTUAL DESIGN OF A MOVING-RING REACTOR: KARIN-I", *Fusion Technology*, Vol.9, No.3, pp.422-451, 1986.
20. T. Kawabe, S. Hirayama, Y. Kozaki, K. Yoshikawa, N. Asami, Y. Fukai, K. Hattori, H. Hojo, T. Honda, H. Ida, T. Kitajima, S. Koda, K. Komatsu, R. Kumazawa, F. Matsuoka, "PHYSICAL AND ENGINEERING ASPECTS OF FUSION ENGINEERING TEST FACILITY BASED ON MIRROR CONFINEMENT (FEF).", *Fusion Technology*, Vol.10, No.3 pt 2B, pp.1102-1110, 1986.
21. Kiyoshi Yoshikawa, Hisayuki Toku, Keizo Matsuura, Kouichi Murashima, "PRESSURE DEPENDENCE OF PERFORMANCE CHARACTERISTICS OF A HALL ACCELERATOR WITH PREIONIZATION DISCHARGE.", pp.97-100, 1986.
22. Yasushi Yamamoto, Kiyoshi Yoshikawa, Yoshio Hattori, "DEVELOPMENT OF A TWO-DIMENSIONAL SIMULATION CODE (KUAD) INCLUDING ATOMIC PROCESSES FOR BEAM DIRECT ENERGY CONVERSION.", pp.1222-1226, 1987.
23. Kiyoshi Yoshikawa, Hisayuki Toku, Shinji Kohda, Akira Kobayashi, Toshiaki Wada, Yoshio Hattori, "APPLICATION OF ROGOWSKI-COIL SENSOR TO IN-SITU MEASUREMENT OF INCIDENT ION BEAM CURRENT TO BEAM DIRECT ENERGY CONVERTER.", pp.1218-1221, 1987.
24. Kiyoshi Yoshikawa, Shinji Kouda, Yasushi Yamamoto, Kouichi Maeda, "DEVELOPMENT OF A TWO-DIMENSIONAL PARTICLE TRAJECTORY CODE AND APPLICATION TO A DESIGN OF A PLASMA DIRECT ENERGY CONVERTER IN THE FUSION ENGINEERING FACILITY BASED ON MIRROR PLASMA CONFINEMENT.", *Fusion Technology*, Vol.14, No.2, pp.264-283, 1988.
25. K. Yoshikawa, M. Ohnishi, Y. Yamamoto, D. Shimohiro, Y. Inui, M. Ishikawa, J. Umoto, H. Kometani, A. Fukuyama, O. Mitarai, M. Okamoto, H. Sekimoto, Y. Fujii, K. Watanabe, T. Takagi, "Study of an advanced D-T tokamak fusion reactor with compact fusion advanced rankine (CFAR) cycle", *Proceedings - Symposium on Fusion Engineering*, Vol.2, pp.1348-1351, 1989.
26. Yasushi Yamamoto, Kiyoshi Yoshikawa, Hisayuki Toku, Tsuneyuki Haga, Takashi Noma, "Effects of beam perveance to the performance characteristics of the electrically electron-suppressed beam direct converter with secondary electron suppressor grids", *Proceedings - Symposium on Fusion Engineering*, Vol.2, pp.1096-1099, 1989.
27. Y. Kohzaki, T. Kawabe, K. Yoshikawa, R. Kumawzawa, S. Sato, N. Asami, F. Matsuoka, N. Morino, K. Okano, H. Shinohara, N. Tachikawa, Y. Uede, T. Watanabe, "Engineering aspects of the fusion engineering test facility based on mirror confinement (FEF)", *Fusion Engineering and Design*, Vol.10, No.C, pp.27-32, 1989.
28. K. Yoshikawa, A. Fukuyama, "Microwave heating of flowing slightly-ionized gases in a compact fusion advanced rankine (CFAR) cycle", *Fusion Engineering and Design*, Vol.9, No.C, pp.431-436, 1989.
29. S. Hirayama, T. Kawabe, Y. Kohzaki, H. Sagawa, K. Yoshikawa, N. Asami, Y. Fukai, T. Miyasugi, N. Morino, "Conceptual design of a fusion engineering test facility based on mirror confinement (FEF)", *Fusion Engineering and Design*, Vol.9, No.C, pp.387-393, 1989.
30. H. Sekimoto, K. Watanabe, E. Suetomi, K. Yoshikawa, M. Okamoto, T. Suzuki, B.G. Logan, C. Maninger, "Conceptual design of the blanket and superheater in compact fusion advanced rankine cycle", *Fusion Engineering and Design*, Vol.9, No.C, pp.437-444, 1989.
31. Kiyoshi Yoshikawa, "Facilities and activities for fusion nuclear technology. Kyoto Univ", *Fusion Technology*, Vol.17, No.2, pp.273-277, 1990.
32. Yasushi Yamamoto, Kiyoshi Yoshikawa, Hisayuki Toku, Tsuneyuki Haga, "Dependence of beam direct energy conversion on beam energy and current in neutral beam injection systems", *Fusion Technology*, Vol.17, No.4, pp.540-554, 1990.
33. Kiyoshi Yoshikawa, Yoshihiko Nimura, Yasushi Yamamoto, Hiroshi Watanabe, "Direct energy

recovery from unneutralized ion beams in a negative-ion-beam-based neutral beam injection system", *Fusion Technology*, Vol.17, No.4, pp.527-539, 1990.

34. Y. Inui, N. Miki, M. Ishikawa, J. Umoto, K. Yoshikawa, "Study of high-performance non-equilibrium MHD generator for compact fusion advanced Rankine cycle", *Fusion Engineering and Design*, Vol.18, No.C, pp.233-238, 1991.
35. K. Yoshikawa, D. Shimohiro, Y. Yamamoto, H. Toku, Y. Inui, M. Ishikawa, J. Umoto, N. Miki, A. Fukuyama, O. Mitarai, M. Okamoto, H. Sekimoto, Y. Fujii, H. Kim, K. Watanabe, T. Ishii, T. Takagi, T. Suzuki, I. Mutoh, K. Miyazaki, M. Saitoh, B.G. Logan, W.L. Barr, M.A. Hoffman, R.B. Campbell, "A D-T tokamak fusion reactor with advanced blanket using compact fusion advanced Rankine (CFAR) cycle", *Fusion Engineering and Design*, Vol.18, No.C, pp.239-248, 1991.
36. Morihiro Okada, Hisayuki Toku, Yasushi Yamamoto, Kiyoshi Yoshikawa, "Application of a Hall accelerator to diamondlike carbon film coatings", *Japanese Journal of Applied Physics, Part 1: Regular Papers and Short Notes and Review Papers*, Vol.31, No.6 A, pp.1845-1854, 1992.
37. Kunioki Mima, Kiyoshi Yoshikawa, Osami Morimiya, Haruhiko Takase, Hideaki Takabe, Yoneyoshi Kitagawa, Toshiki Tajima, Yasuji Kosaki, Sadao Nakai, "Preliminary studies of direct energy conversion in a D-<sup>3</sup>He inertial confinement fusion reactor", *Fusion Technology*, Vol.22, No.1, pp.56-65, 1992.
38. Kiyoshi Yoshikawa, Yasushi Yamamoto, Hisayuki Toku, Akira Kobayashi, Toru Okazaki, "Direct energy recovery from helium ion beams by a beam direct converter with secondary electron suppressors", *Fusion Technology*, Vol.15, No.n, pp.1541-1559, 1992.
39. K. Yoshikawa, Y. Inanaga, Y. Yamamoto, M. Ohnishi, T. Yamazaki, K. Yamada, "Radiation from the ETL optical klystron in TERAS and effects of dispersive section on spectral fine structure", *Nuclear Inst. and Methods in Physics Research, A*, Vol.331, No.1-3, pp.416-420, 1993.
40. Morihiro Okada, Hisayuki Toku, Yasushi Yamamoto, Kiyoshi Yoshikawa, "Characteristics of Hall accelerator for helium-ion beam extraction", *Japanese Journal of Applied Physics, Part 1: Regular Papers and Short Notes and Review Papers*, Vol.32, No.10, pp.4826-4837, 1993.
41. K. Yoshikawa, S. Hashimoto, M. Ohnishi, Y. Yamamoto, T. Yamazaki, K. Yamada, N. Sei, "Evaluation of the gain in ETL FEL oscillation with an optical klystron", *Nuclear Inst. and Methods in Physics Research, A*, Vol.341, No.1-3, pp.ABS5-ABS6, 1994.
42. Morihiro Okada, Hisayuki Toku, Yasushi Yamamoto, Kiyoshi Yoshikawa, "Characteristics of Hall accelerator with He, H<sub>2</sub>, CH<sub>4</sub>, O<sub>2</sub> and Argases", *Japanese Journal of Applied Physics, Part 1: Regular Papers and Short Notes and Review Papers*, Vol.33, No.8, pp.4782-4786, 1994.
43. Masami Ohnishi, Yasushi Yamamoto, Kiyoshi Yoshikawa, Jiro Kitagaki, Akio Ishida, "Steady state field-reversed configuration with rotating magnetic field", *Proceedings - Symposium on Fusion Engineering*, Vol.2, pp.1413-1418, 1995.
44. Masami Ohnishi, Yasushi Yamamoto, Kiyoshi Yoshikawa, Kunihiro Sato, "Multi-potential well formation and neutron production in inertial-electrostatic confinement fusion by numerical simulations", *Proceedings - Symposium on Fusion Engineering*, Vol.2, pp.1468-1471, 1995.
45. K. Yoshikawa, M. Ohnishi, Y. Yamamoto, H. Toku, I. Kataoka, Y. Inui, M. Ishikawa, J. Umoto, A. Fukuyama, O. Mitarai, M. Okamoto, H. Sekimoto, M. Nagatsu, "A preliminary study of a D-T tokamak fusion reactor with advanced blanket using the compact fusion advanced Brayton (CFAB) cycle", *Fusion Engineering and Design*, Vol.29, No.C, pp.78-88, 1995.
46. M. Ishikawa, Y. Inui, J. Umoto, K. Yoshikawa, "Preliminary analysis of MHD-Brayton cycle applied to fusion reactors (CFAR)", *Fusion Engineering and Design*, Vol.29, No.C, pp.57-63, 1995.
47. K. Yoshikawa, T. Shinzato, Y. Yamamoto, M. Ohnishi, T. Yamazaki, "Visualization of spatial profiles of spectra and intensities in FEL simulations", *Nuclear Inst. and Methods in Physics Research, A*, Vol.358, No.1-3, pp.295-299, 1995.
48. Yasushi Yamamoto, Masami Ohnishi, Kiyoshi Yoshikawa, Hisayuki Toku, Mitsunori Hasegawa, Takashi Matsuo, "Preliminary studies of inertial-electrostatic confinement fusion experiments", *Fusion Technology*, Vol.30, No.3, pp.1332-1336, 1996.
49. Kai Masuda, Kiyoshi Yoshikawa, Masami Ohnishi, Yasushi Yamamoto, Masaaki Sobajima, "Direct energy conversion from spent electron beam in high-power CW klystrons", *Fusion Technology*, Vol.30, No.3, pp.805-809, 1996.
50. M. Ohnishi, K.H. Sato, Y. Yamamoto, K. Yoshikawa, "Correlation between potential well structure and neutron production in inertial electrostatic confinement fusion", *Nuclear Fusion*, Vol.37, No.5, pp.611-619, 1997.
51. M. Sobajima, K. Yoshikawa, M. Ohnishi, Y. Yamamoto, K. Masuda, H. Toku, T. Nakamura,

- "Quantitative study of optical guiding by three-dimensional simulation", Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, Vol.393, No.1-3, pp.280-283, 1997.
52. Y. Yamamoto, T. Inamasu, K. Masuda, M. Sobajima, M. Ohnishi, K. Yoshikawa, H. Toku, E. Tanabe, "Simulations of electron backstreaming in a microwave thermionic gun", Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, Vol.393, No.1-3, pp.443-446, 1997.
  53. M. Ohnishi, J. Kitagaki, Y. Yamamoto, K. Yoshikawa, "Evolution of field-reversed configuration by flux enhancement with rotating magnetic field", Proceedings - Symposium on Fusion Engineering, Vol.2, pp.741-744, 1998.
  54. Y. Yamamoto, M. Hasegawa, M. Ohnishi, K. Yoshikawa, N. Inoue, "Preliminary studies of potential well measurement in inertial-electrostatic confinement fusion experiments", Proceedings - Symposium on Fusion Engineering, Vol.2, pp.745-748, 1998.
  55. M. Ohnishi, S. Shimada, J. Kitagaki, K. Okada, M. Sobajima, K. Masuda, Y. Yamamoto, H. Toku, K. Yoshikawa, "Improvements of a staggered-array undulator by tapered iron disks", Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, Vol.407, No.1-3, pp.434-438, 1998.
  56. Masami Ohnishi, Kiyoshi Yoshikawa, Yasushi Yamamoto, Kai Masuda, Hisayuki Toku, Mitsunori Hasegawa, Chikara Hoshino, Takahiro Koyama, Kenji Taruya, "Studies of inertial electrostatic confinement fusion neutron source", Fusion Technology, Vol.34, No.3 pt 2, pp.1071-1075, 1998.
  57. M. Ohnishi, Y. Yamamoto, M. Hasegawa, K. Yoshikawa, G.H. Miley, "Study on an inertial electrostatic confinement fusion as a portable neutron source", Fusion Engineering and Design, Vol.42, No.1-4, pp.207-211, 1998.
  58. K. Yoshikawa, D. Tsukahara, T. Inamasu, K. Masuda, M. Sobajima, J. Kitagaki, Y. Yamamoto, H. Toku, M. Ohnishi, "Study of the performance characteristics of a travelling-wave RF-gun", Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, Vol.407, No.1-3, pp.364-369, 1998.
  59. M. Sobajima, Y. Li, J. Xie, K. Yoshikawa, M. Ohnishi, Y. Yamamoto, H. Toku, K. Masuda, J. Kitagaki, T. Nakamura, "Numerical study on improvements of Beijing FEL lasing performances through modifications of the beam-duct geometry", Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, Vol.407, No.1-3, pp.121-125, 1998.
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