

AUTHORS — DECEMBER 1994

PLASMA ENGINEERING

IMPLICATIONS OF FUSION PLASMA STUDIES TO OTHER COLLECTIVE NONEQUILIBRIUM SYSTEMS / *Francesco Pegoraro*

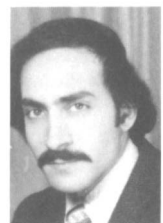
Francesco Pegoraro (Graduate, physics, University of Pisa, Italy, 1970; PhD, physics, Scuola Normale Superiore, Italy, 1974) entered theoretical plasma physics research in 1974. Currently, he is professor of theoretical physics at the University of Turin, Italy.



MATERIALS ENGINEERING

PHENOMENOLOGICAL INELASTIC CONSTITUTIVE EQUATIONS FOR SiC AND SiC FIBERS UNDER IRRADIATION / *A. El-Azab, N. M. Ghoniem*

A. El-Azab (top) [BS, 1986, and MS, 1989, nuclear engineering, University of Alexandria, Egypt; PhD, nuclear engineering, University of California, Los Angeles (UCLA), 1994] is currently a postdoctorate researcher at UCLA. His research emphasis is on the fundamental damage mechanisms and constitutive behavior of materials in high-temperature and irradiation environments, high-temperature fracture of ceramics and ceramic composites, and mathematical theory of dislocations. **N. M. Ghoniem** (BS, nuclear engineering, University of Alexandria, Egypt, 1971; M. Eng., engineering physics, McMaster University, Canada, 1974; MS and PhD, nuclear engineering, University of Wisconsin, 1977) has been an assistant professor at UCLA since 1977. His research interests are in the areas of radiation damage and effects in solids, pulsed irradiation, theoretical modelings of materials behavior in fission and fusion reactor, fusion technology, and computational methods.



TRANSPORT OF ENERGETIC ION AND ELECTRON ENERGY THROUGH THE VAPOR SHIELD DURING A TOKAMAK PLASMA DISRUPTION / *Eric C. Tucker, John G. Gilligan*

Eric C. Tucker (top) (BS, physics, East Carolina University; PhD expected in fall 1994, physics, North Carolina State University) works in the North Carolina State University Nuclear Engineering Department computer modeling the effects of tokamak fusion reactor disruptions on materials. **John G. Gilligan** (BSE, engineering science, Purdue University, 1971; PhD, nuclear engineering, University of Michigan, 1977) is a professor and director of graduate programs of nuclear engineering at North Carolina State University in Raleigh. Current research is focused on low-temperature plasmas, plasma/wall interactions, and high heat load components for fusion devices.



PROBLEMS AND METHODS OF ACTIVATION CALCULATIONS FOR EXPERIMENTAL AND NEXT-STEP FUSION DEVICES / *Massimo Zucchetti*

Massimo Zucchetti (degree, nuclear engineering, 1986, and PhD, energetics, 1990, Politecnico di Torino, Italy) is a researcher at Politecnico di Torino, where he works in the field of fusion reactor neutronics (breeding blankets), neutron-induced radioactivity in fusion reactor materials, and the environmental impact of fusion machines, in collaboration with the Joint Research Centre at Ispra.



COMPREHENSIVE SAFETY ANALYSIS CODE SYSTEM FOR NUCLEAR FUSION REACTORS II: THERMAL ANALYSES DURING PLASMA DISRUPTIONS FOR INTERNATIONAL THERMONUCLEAR EXPERIMENTAL REACTOR / *Takurou Honda, Koichi Maki, Takashi Okazaki, Tatsuhiko Uda, Yasushi Seki, Isao Aoki, Tomoaki Kunugi*

Takurou Honda (top right) (BS, 1987; MS, 1989; and Dr. Eng., 1992, nuclear engineering, University of Kyushu, Japan) is a researcher at the Energy Research Laboratory (ERL), Hitachi, Ltd. He has studied burn characteristics of inertial confinement fusion plasmas. His current research interest is safety for nuclear fusion reactors. **Koichi Maki** (top left) (BS, 1968, and Dr. Eng., 1985, nuclear engineering, University of Tokyo, Japan; MS, nuclear engineering, Kyoto University, Japan, 1971) is a senior researcher at ERL, Hitachi, Ltd. He has worked on nuclear force and fast breeder reactor (FBR) physics. His current interests are neutronics and plasma transport simulation in fusion reactors. **Takashi Okazaki** (bottom right) (Dr. Sci., physics, Waseda University, Japan, 1980) is a senior researcher at ERL, Hitachi, Ltd., where he is a fusion group leader. He worked in the fields of nonlinear oscillations and relativistic electron beam for plasma physics. His current interests include reactor design, plasma heating, current drive, neutronics, and safety for nuclear fusion. **Tatsuhiko Uda** (bottom left) (BS, pharmacology, 1970, and MS, agricultural engineering, 1972, University of Kyoto, Japan; Dr. Eng., nuclear engineering, Tokyo Institute of Technology, Japan, 1992) is a senior researcher at ERL, Hitachi, Ltd. Currently, he works in the department of the International Thermonuclear Experimental Reactor (ITER) project at the Japan Atomic Energy Research Institute (JAERI). His interests are safety evaluation, regulation, and tritium problems concerning a fusion experimental reactor.



Yasushi Seki (top) (BS, 1967, and Dr. Eng., 1977, nuclear engineering, University of Tokyo, Japan) is a principal scientist in the Department of Fusion Engineering Research at JAERI. He has worked in the areas of FBR nuclear design, fusion reactor nuclear design, and shielding analysis. He is currently in charge of fusion power reactor design and fusion reactor safety analysis and research and development coordination. **Isao Aoki** (center) (Ibaraki Polytechnic College, 1964) is an engineer in the Department of Fusion Engineering Research at JAERI. He has worked in the area of instrumentation technology of experimental nuclear data acquisition systems. He is currently in charge of fusion reactor design and fusion reactor safety analysis. **Tomoaki Kunugi** (bottom) (BS, 1977, and MS, 1979, chemical engineering, Keio University, Japan; Dr. Eng., system and quantum engineering, University of Tokyo, Japan, 1994) is a senior scientist in the Department of High Temperature Engineering at JAERI. He has worked in the areas of computational fluid dynamics, turbulence modeling, convective heat transfer, thermo-fluid visualization, and image processing. His current interests are micro- and meso-scale transport phenomena, nonequilibrium thermo-fluid modeling including neutral and charged particles under magnetic field, thermo-physical interface problems, fusion power reactor design, and fusion reactor safety.



ENERGY STORAGE,
SWITCHING, AND CONVERSION

BEAM DIRECT CONVERTER WITH VARYING MAGNETIC FIELD /
Mamoru Matsuoka, Masanori Araki, Makoto Mizuno

Mamoru Matsuoka (top) (Dr. Eng., electronic engineering, Nagoya University, Japan, 1993) was a senior research scientist in the Department of Fusion Facility (DFF) at the Japan Atomic Energy Research Institute (JAERI) but now works at Mie University as an associate professor. He was involved in developing a neutral beam injection (NBI) system and was also engaged in neutral beam current drive experiments. **Masanori Araki** (center) (Dr. Eng., nuclear engineering, Tohoku University, Japan, 1992) is a senior scientist at the Department of Fusion Engineering Research at JAERI. He has worked mainly on the design and the development of high heat flux components such as an ion beam dump including a beam direct energy conversion system for NBIs and plasma-facing components for a next-generation fusion machine. **Makoto Mizuno** (bottom) (M. Eng., electronic engineering, Nagoya University, Japan, 1981) was a research scientist in the DFF at JAERI. He worked on developing the motor generator system for the JT-60 heating systems and then was engaged in developing an NBI system. He currently works at STS Corporation as a group engineer.



ELECTROLYTIC DEVICES

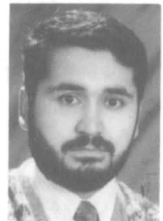
STUDY OF DEUTERIUM CHARGING IN PALLADIUM BY ELECTROLYSIS OF HEAVY WATER / *Antonella De Ninno, Vittorio Violante*

Antonella De Ninno (top) (Dr., physics, University of Rome, Italy, 1984) has worked in the ENEA INN-SVIL Department since 1987. Her research interests include low-temperature solid-state physics. Her principal interest is in the field of cold fusion concerning experimental and theoretical activities. **Vittorio Violante** (PhD, chemical engineering, Naples University, Italy) since the end of 1983 has been a researcher at ENEA (formerly CNEN), involved in the Euratom-ENEA Association for Fusion research program. Since 1992, he has been a professor of transport phenomena at Calabria University, Italy.



NEUTRONIC INVESTIGATION OF A POWER PLANT USING PEACEFUL NUCLEAR EXPLOSIVES / *Sümer Şahin, Ralph W. Moir, Sabahattin Ünalın*

Sümer Şahin (top) (MS, mechanical engineering, 1967, and PhD, nuclear engineering, 1970, University of Stuttgart, Germany; habilitation, physics, University of Ankara, Turkey, 1973) is a professor at Gazi University, Ankara, Turkey. His research field covers neutron transport theory, fusion-fission (hybrid) reactors, thermionic spacecraft reactors, and radiation shielding. **Ralph W. Moir** (center) (ScD, nuclear engineering, Massachusetts Institute of Technology, 1967) joined Lawrence Livermore National Laboratory (LLNL) in 1968. He has specialized in magnet design (yin-yang magnet concept), development of direct conversion of fusion plasma energy to electrical energy, and power plant design. He is currently project leader for the HYLIFE-II inertial fusion energy production project. **Sabahattin Ünalın** (bottom) (BS, 1986, and MS, 1988, mechanical engineering, and PhD, 1992, nuclear engineering, University of Erciyes, Turkey) is an assistant professor of the faculty of engineering at the University of Erciyes. His interests include fusion technology, computer science, and mathematical methods in engineering.



INHERENT CHARACTERISTICS OF FUSION POWER SYSTEMS: PHYSICS, ENGINEERING, AND ECONOMICS / *Robert W. Bussard, Nicholas A. Krall*

Robert W. Bussard (top) (BS, 1950, and MS, 1952, engineering, University of California, Los Angeles; AM, 1959, and PhD, 1961, physics, Princeton University) has conducted research and development in chemical rockets and nuclear rocket propulsion, as well as high-altitude plasma physics and electro-optics research. He created and directed research studies of high-density compact tokamaks, which subsequently formed the basis of the Compact Ignition Tokamak program at Princeton University. He is currently a technical director at Energy/Matter Conversion Corporation and directs research on a novel inertial-electrostatic confinement concept for nuclear fusion. **Nicholas A. Krall** (PhD, theoretical physics, Cornell University, 1959) was vice president and chief scientist at JAYCOR until 1987, when he left to form Krall Associates, a corporation that specializes in basic plasma science. He is also an adjunct professor at the University of California, San Diego.

