ENS fusion technology

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PLASMA ENGINEERING

TRANSPORT CODE ANALYSIS OF SOME ASPECTS OF IMPURITY CONTROL IN REACTOR GRADE TOKAMAK PLASMAS

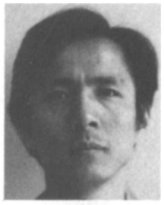
W. K. Terry
Jeffrey N. Brooks
Charles D. Boley

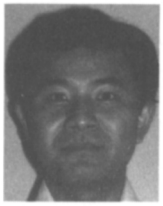
W. K. Terry (top) (PhD, nuclear engineering, University of Washington, 1980) is an assistant professor in the School of Nuclear Engineering at Purdue University. He has collaborated with the Fusion Power Program of Argonne National Laboratory (ANL) since 1982. His current research interests are plasma engineering and fusion reactor design, especially in tokamaks and field-reversed configurations. **Jeffrey N. Brooks** (center) (PhD, electrical engineering, New York University, 1972) is a staff member in the Fusion Power Program at ANL. His current interests are in fusion plasma engineering and fusion reactor design studies. **Charles D. Boley** (bottom) (PhD, physics, Massachusetts Institute of Technology, 1971) is a physicist in the Fusion Power Program at ANL. His research interests include transport studies of tokamak plasmas, neutral gas transport, and limiter/divertor design issues.

PLASMA HEATING SYSTEMS

EXTRACTION ELECTRODE FOR A 100-kV, 40-A, 10-s ION SOURCE

Hiroshi Horiike
Masato Akiba
Masanori Araki
Masaaki Kuriyama
Shinzaburo Matsuda
Mamoru Matsuoka
Yoshihiro Ohara
Yoshikazu Okumura
Kiyoshi Shibanuma
Shigeru Tanaka





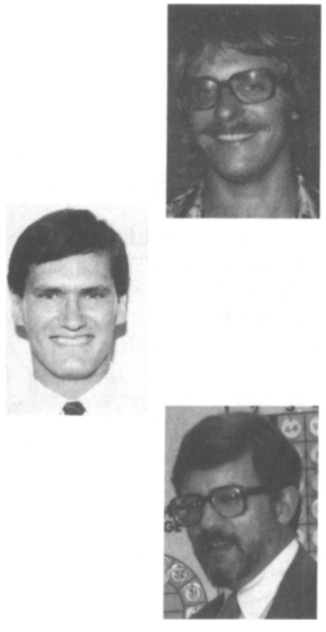
Hiroshi Horiike (top) (PhD, nuclear engineering, Osaka University) is a research scientist in the Division of Thermonuclear Fusion Research at Japan Atomic Energy Research Institute (JAERI). He has worked mainly in the development of ion source and neutral beam injector (NBI) for magnetically confined plasmas (JT-60 tokamak). **Masato Akiba** (center) (PhD, nuclear engineering, Kyusyu University) is a research scientist in the Division of Thermonuclear Fusion Research at JAERI. He works mainly in the development of the control system and the ion source of the NBI for the JT-60 tokamak. **Masanori Araki** (bottom) (BS, nuclear engineering, Kobe University of Mercantile Marine) is a research scientist in the Division of Thermonuclear

Fusion Research at JAERI. He works mainly in the design and development of the NBI system for the JT-60. **Masaaki Kuriyama** (top right) (PhD, mechanical engineering, Tokyo Institute of Technology) is a research scientist in the Division of Thermonuclear Fusion Research at JAERI. He has worked in the development and construction of the NBI systems for JT-60 tokamak. **Shinzaburo Matsuda** (top left) (PhD, electrical engineering, Kyoto University) is a senior scientist in the Division of Thermonuclear Fusion Research at JAERI. He is engaged in the development of the ion source and neutral beam system for JFT-2 and JT-60 tokamaks as the leader of the neutral beam group. He is presently chief of the plasma heating laboratory 1. **Mamoru Matsuoka** (second from top right) (MS, electrical engineering, Nagoya University) works in developing the power supply system and the NBI for JT-60. He is a research scientist in the Division of Thermonuclear Fusion Research at JAERI. **Yoshihiro Ohara** (center left) (PhD, nuclear engineering, The University of Tokyo) is engaged in development of the ion source and the NBI for JT-60, as a research scientist in the Division of Thermonuclear Fusion Research at JAERI. **Yoshikazu Okumura** (third from top right) (MS, nuclear engineering, Osaka University) is a research scientist in the Division of Thermonuclear Fusion Research at JAERI. He works mainly in the development of the ion source and the beam diagnostic system for the JT-60 NBI. **Kiyoshi Shibanuma** (bottom left) (MS, mechanical engineering, Waseda University) is a research scientist in the Division of Thermonuclear Fusion Research at JAERI. He works mainly in the development of the cryopump system for the NBI for JT-60. **Shigeru Tanaka** (bottom right) (PhD, instrumentation engineering, Keio Gijuku University) is a research scientist in the Division of Thermonuclear Fusion Research at JAERI. He works in the development of the ion source and the NBI for JT-60 tokamak.

EXPERIMENTAL DEVICES

CHARGE NEUTRALIZATION BY FOILS TO STUDY ALPHA EDGE FLUX PRODUCED IN MAGNETIC FUSION REACTORS

Glenn Gerdin
Donald Mueller
Bernard W. Wehring



Glenn Gerdin (top) (PhD, physics, Dartmouth College, 1971) worked in experimental plasma physics in graduate school at Dartmouth College. At Florida Atlantic he performed Langmuir probe and microwave diagnostics on a Penning discharge and was able to apply some of these techniques to his subsequent research at NASA-Lewis on their Bumpy Torus Experiment. For the past six years he has been principal investigator on a dense plasma focus experiment, where the energy spectra and total fluence of the particle beam and fusion products generated by that device have been analyzed. **Donald Mueller** (center) (BS, 1983, and MS, 1984, nuclear engineering, University of Illinois) is currently employed at Westinghouse Electric Corporation in the Nuclear Fuels Division. **Bernard W. Wehring** (bottom) (BSE, engineering physics, 1959, and engineering math, 1959, University of Michigan; MS, physics, 1961, and PhD, nuclear engineering, 1966, University of Illinois) is professor of nuclear engineering and director of the Nuclear Reactor Program at North Carolina (NC) State University. Before joining NC State, he was assistant (1966 to 1970), associate (1970 to 1977), and professor (1977 to 1984) of nuclear engineering at the University

of Illinois. His research interests are in providing new instruments, new experimental techniques, and new data needed to further the development of fission and fusion power.

PLASMA ENGINEERING

CALCULATIONS TO EVALUATE THE USE OF THE ATTENUATION OF D-D NEUTRONS IN LIQUID OXYGEN AS A MEANS OF MEASURING PLASMA ION TEMPERATURE

R. G. Alsmiller, Jr.
R. T. Santoro
J. F. Manneschmidt
J. M. Barnes

R. G. Alsmiller, Jr. (top right) (PhD, University of Kansas, 1957) is leader of the Applied Physics and Fusion-Reactor Analysis Group of the Engineering Physics Division at Oak Ridge National Laboratory (ORNL). For several years he has directed the theoretical research in this division in the areas of high energy nuclear reactions, high energy nuclear transport, and fusion reactor neutronics. **R. T. Santoro** (top left) (MS, University of Tennessee, 1967) is a member of the Engineering Physics Division at ORNL. His current interests are in neutron transport and neutron interactions with matter related to fusion reactor design. He is currently involved in the neutronic investigations of reactor blanket and shield design, neutron beam injectors (NBIs), radiation streaming from penetrations, radiation effects in materials, and the analysis of integral experiments for fusion reactor shields. **J. F. Manneschmidt** (bottom right) (MS, University of Tennessee, 1980) is a member of the Computing and Telecommunications Division at ORNL. He is currently involved with data base management for the U.S. Nuclear Regulatory Commission, although past work includes neutronic analysis of fusion reactors and duct calculations with Monte Carlo and discrete ordinates transport codes. **J. M. Barnes** (bottom left) (BS, University of Arkansas, 1965) is a member of the Computer Sciences Division at ORNL. He is involved in the neutronic analysis of fusion reactor blankets and shields, NBIs, radiation effects in materials, and the analysis of integral experiments for fusion reactor shields.

FIRST-WALL TECHNOLOGY

PARTICLE BOMBARDMENT OF THE FIRST WALL IN A TANDEM MIRROR REACTOR

William L. Barr
B. G. Logan

William L. Barr (right) (PhD, physics, University of California at Berkeley, 1957) is a member of the Advanced Mirror Systems (Fusion) Group at Lawrence Livermore National Laboratory (LLNL), and is presently analyzing the end plasma and direct energy recovery for the Mirror Advanced Reactor Study. He has developed and tested plasma direct energy converters (for mirror end-loss plasma) and beam direct converters (for the ions from neutral beam injectors). Photograph and biography for **B. G. Logan** were not available in time for publication.