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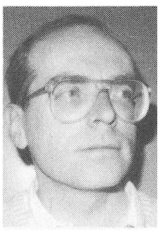
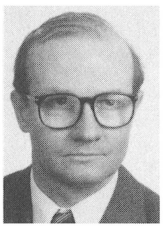
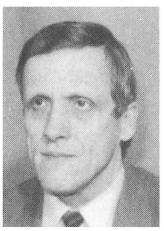
AUTHORS — SEPTEMBER 1990

FUSION REACTORS

TWO-DIMENSIONAL THERMAL-HYDRAULIC CALCULATIONS FOR THE MOL 7C EXPERIMENTS WITH THE COMPUTER CODE BACCHUS

Christoph Homann
Maurizio Bottoni
Burkhardt Dorr
Dankward Struwe

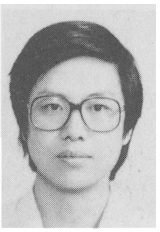
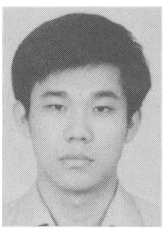
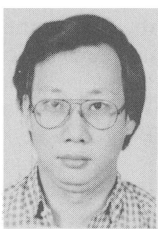


Christoph Homann (top right) [Dr. rer. nat., Hannover University, Federal Republic of Germany (FRG), 1977] has previously worked in the field of plasma physics. Since 1978 he has been involved in the numerical simulation of the thermohydraulic behavior of partially blocked liquid-metal fast breeder reactor (LMFBR) subassemblies at Kernforschungszentrum Karlsruhe (KfK). **Maurizio Bottoni** (top left) (Dr. Eng., Bologna University, Italy, 1965) has been working at KfK since 1974. He is responsible for the development and verification of computer programs applied for safety analysis of LMFBRs. **Burkhardt Dorr** (bottom right) (Dipl.-Phys.-Eng., Physical-Technological Institute, Wedel, FRG, 1966) has been involved with the design and interpretation of sodium boiling experiments in partially blocked bundles of LMFBRs. **Dankward Struwe** (bottom left) (Dr.-Ing., Karlsruhe University, FRG, 1977) joined KfK in 1967. He is head of the Reactor Dynamics Section of the Institute of Reactor Development.

NUCLEAR SAFETY

A STUDY ON HYDROGEN GENERATION, BURNING, AND THEIR IMPACT ON FISSION PRODUCT RELEASE UNDER A POSTULATED LARGE-BREAK LOCA

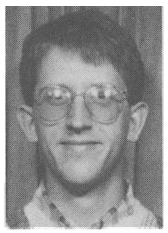
Tien-Ko Wang
Jun Hsin
Min Lee

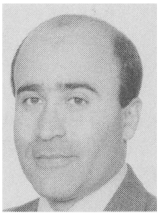
Tien-Ko Wang (top) (PhD, nuclear engineering, Purdue University, 1984) is a professor in the Department of Nuclear Engineering at National Tsing-Hua University (NTHU), Taiwan. His research interests include radiation application, radiation shielding and dosimetry, reactor analysis, nuclear power plant severe-accident analysis, and safety. **Jun Hsin** (center) (MS, nuclear engineering, NTHU, Taiwan, 1989) is an engineer at Taiwan Power Company. His expertise is in the field of nuclear power plant safety and nuclear waste disposal. **Min Lee** (bottom) (PhD, nuclear engineering, Massachusetts Institute of Technology, 1985) worked at Brookhaven National Laboratory for 3 years before he became an associate professor in the Department of Nuclear Engineering, NTHU, Taiwan. His research interests are in the fields of nuclear power plant safety and thermohydraulics.

A BEST-ESTIMATE PARADIGM FOR DIAGNOSIS OF MULTIPLE FAILURE TRANSIENTS IN NUCLEAR POWER PLANTS USING ARTIFICIAL INTELLIGENCE

Robert P. Martin
Bahram Nassersharif



Robert P. Martin (top) (MS, nuclear engineering, Texas A&M University, 1989) is currently employed at EG&G Idaho as an engineer for the system engineering and simulation group within the Nuclear Reactor Research and Technology Division. His research has involved the general application of artificial intelligence to nuclear engineering, including diagnostics, intelligent design, and intelligent interfaces for thermal-hydraulic codes. He is interested in the application of a modified assumption-based truth maintenance system to the diagnosis of multiple failure transient in nuclear power plants. **Bahram Nassersharif** (BS, mathematics, Oregon State University, 1980; PhD, nuclear engineering, Oregon State University, 1982) is currently director of Texas A&M University's Supercomputer Center, director of the Numeric/Symbolic Computations Laboratory of Texas Engineering Experiment Station, and assistant professor of computer science and nuclear engineering at Texas A&M University. His primary areas of research interest are algorithms for novel architectures, numerical analysis, computational methods, and artificial intelligence.



FUEL CYCLES

EVALUATION OF DEPLETION AND PRODUCTION OF URANIUM, PLUTONIUM, TRANSPLUTONIUM NUCLIDES, AND FISSION PRODUCTS IN JPDR-1 FUEL

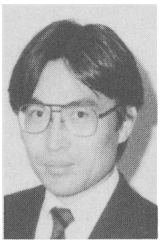
Hideo Ezure

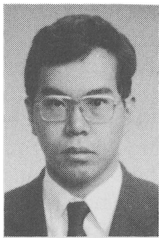
Hideo Ezure (electrical engineering, National Ibaraki University, Japan, 1958) worked at the Japan Atomic Energy Research Institute from 1958 to 1988, where he was involved in measurement and analysis of core performance. He is now director of research and development at the Research Association of Nuclear Facility Decommissioning.

NUCLEAR FUELS

ÉTOILE: A THREE-DIMENSIONAL FINITE ELEMENT CODE FOR LMFBR FUEL BUNDLE ANALYSIS

Masatoshi Nakagawa
Yasusi Tsuboi



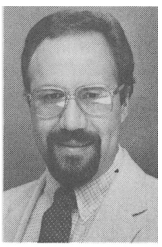


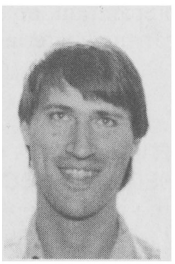
Masatoshi Nakagawa (top) (BS, 1973, and MS, 1975, nuclear engineering, Osaka University, Japan) is a senior researcher in the reactor core department of the Research Laboratory at Nippon Atomic Industry Group Company. His recent research includes the development of computational mechanics in the area of core mechanics such as core bowing and fuel bundle mechanical performance under irradiation in liquid-metal fast breeder reactors. **Yasusi Tsuboi** (BS, 1980, and MS, 1982, engineering science, Kyoto University, Japan) is an engineer in the Nuclear Engineering Division at Toshiba Corporation, where he is engaged in fast breeder reactor fuel development. His current research interests are long-life fuel design and metal fuel analysis.

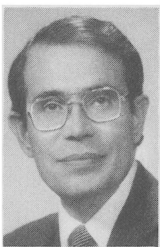
MATERIAL CHARACTERIZATION AND FLAW DETECTION, SIZING, AND LOCATION BY THE DIFFERENTIAL GAMMA SCATTERING SPECTROSCOPY TECHNIQUE. PART I: DEVELOPMENT OF THEORETICAL BASIS

MATERIAL CHARACTERIZATION AND FLAW DETECTION, SIZING, AND LOCATION BY THE DIFFERENTIAL GAMMA SCATTERING SPECTROSCOPY TECHNIQUE. PART II: EXPERIMENT

Samim Anghaie
Larry L. Humphries
Nils J. Diaz



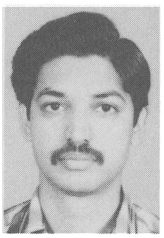


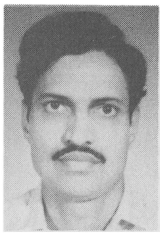


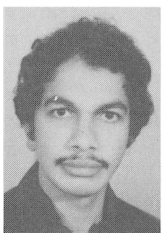
Samim Anghaie (top) (PhD, nuclear engineering, Pennsylvania State University, 1982) is currently an associate professor of nuclear engineering sciences and associate director of the Innovative Nuclear Space Power Institute (INSPI) at the University of Florida (UF). Before joining UF, he was on the faculty of Oregon State University. His research interests include transport phenomena, development of radiation-based probes, and thermofluid engineering of advanced reactor systems. **Larry L. Humphries** (center) (BS, engineering, Idaho State University; MS, nuclear engineering, Oregon State University; PhD, UF, 1989) received his doctorate for developmental research on the differential gamma scattering spectroscopy technique for nondestructive evaluation of materials. His research interests included development of advanced nondestructive examination (NDE) techniques for materials characterization and applied radiation transport methods. Currently, he is employed with Science Applications International Corporation. **Nils J. Diaz** (bottom) (PhD, nuclear engineering sciences, UF, 1969) is currently professor of nuclear engineering sciences at UF and director of the INSPI for the Strategic Defense Initiative Organization. The INSPI is a national consortium of universities, industry, and national laboratories conducting research on innovative and advanced nuclear space power sources, energy conversion, and thermal management. The current focus at INSPI is on gaseous core reactors for space power and propulsion. He has been conducting theoretical and experimental studies on NDE techniques using photons since 1984.

OXIDATION BEHAVIOR OF CARBIDE FUELS

V. S. Iyer
S. K. Mukerjee
R. V. Kamat
K. T. Pillai
N. Kumar
V. N. Vaidya
D. D. Sood

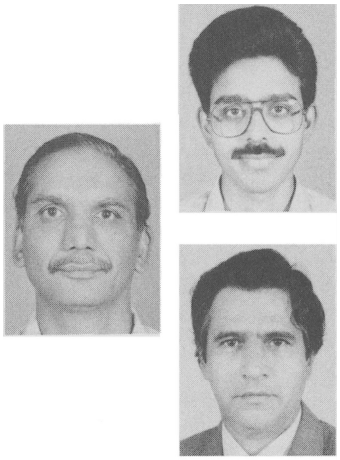






V. S. Iyer (top right) (BSc, chemistry, Kerala University, India, 1969) joined the Bhabha Atomic Research Centre (BARC) in 1971. He has worked on the solution chemistry of plutonium and the development of the sol-gel process for the fabrication of nuclear fuels. He is currently working on high-temperature thermodynamic investigation of nuclear fuel materials. **S. K. Mukerjee** (top left) (MSc, chemistry, Nagpur University, India, 1979) joined the Fuel Chemistry Division of BARC in 1981 after completing the multidisciplinary training course of BARC. He is currently working on the development of the sol-gel process for fuel fabrication. His field of research includes kinetics of the synthesis and oxidation of carbides and nitrides of uranium and plutonium. **R. V. Kamat** (bottom right) (MSc, physical chemistry, Karnatak University, India, 1973) joined BARC in 1974. He has worked on the solution chemistry of plutonium and on the recycling of the (U,Pu)C fabrication waste of the fast breeder test reactor. His current interest is the development of the sol-gel process for the fabrication of advanced ceramics for nuclear as well as nonnuclear applications. **K. T. Pillai** (bottom left) (BSc, chemistry, Kerala University, India, 1974) joined the Fuel Chemistry

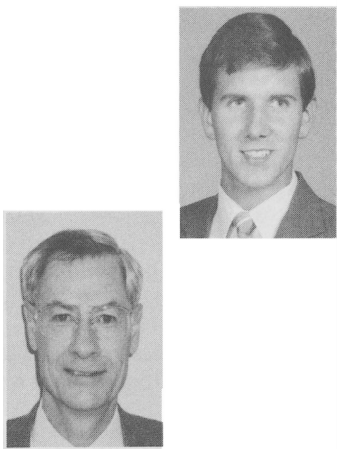
Division of BARC in 1977. He has been working on the development of the sol-gel process for the preparation of advanced ceramics for nuclear and nonnuclear applications. **N. Kumar** (top) (BSc, chemistry, Poona University, India, 1980) joined BARC in 1981 and has been working on the preparation of fuel materials, particularly by the sol-gel process. **V. N. Vaidya** (center) (PhD, Bombay University, India, 1987) joined BARC in 1969 and has been working on the high-temperature aspects of actinides. He is a group leader for the development of the sol-gel process for ceramic nuclear fuels. **D. D. Sood** (bottom) (PhD, chemistry, Bombay University, India, 1984) joined BARC in 1960 and is currently the head of the Fuel Chemistry Division. He trained in nuclear metallurgy at the Royal School of Mines, London, and participated in the molten salt breeder reactor program at Oak Ridge National Laboratory, for 2 years. His current interests include preparation, quality control, and thermodynamic studies of nuclear fuel materials.



EFFECT OF ANTIOXIDANTS ON RADIATION STABILITY OF POLYMERS USED FOR ELECTRIC CABLE INSULATION

Jeffrey W. Ray
Albert B. Reynolds

Jeffrey W. Ray (top) (BS, physics, Presbyterian College, 1987; MS, nuclear engineering, University of Virginia, 1989) is an engineer in the reactor engineering department at Westinghouse Savannah River Company. His current interests include participation in the design and analysis of the Savannah River Site's leak detection instrumentation and the reactor confinement system. **Albert B. Reynolds** (ScD, chemical engineering, Massachusetts Institute of Technology, 1959) is a professor of nuclear engineering at the University of Virginia. He conducted research on liquid-metal reactor safety for many years at General Electric and the University of Virginia. Since 1986, he has been involved in research on radiation and thermal aging of polymers used for electric cable insulation.

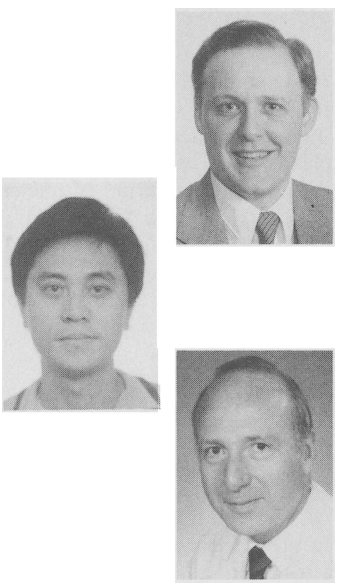


RADIOISOTOPES AND ISOTOPE SEPARATION

A NEUTRONIC STUDY OF AN ACCELERATOR-BASED NEUTRON IRRADIATION FACILITY FOR THE TREATMENT OF SUPERFICIAL MELANOMA BY BORON NEUTRON CAPTURE THERAPY

T. X. Bruce Qu
Thomas E. Blue
C. K. Chris Wang
Reinhard A. Gahbauer

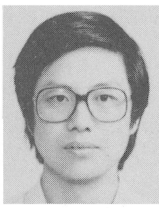
T. X. Bruce Qu (photograph not available) [BS, nuclear physics, Beijing University, People's Republic of China, 1984; MS, nuclear engineering, the Ohio State University (OSU), 1989] is a PhD student in the nuclear engineering program at OSU. His research interests include radiation dosimetry in neutron capture therapy (NCT) and Monte Carlo calculation based NCT treatment planning. **Thomas E. Blue** (top) (PhD, nuclear engineering, University of Michigan, 1978) is an assistant professor of nuclear and mechanical engineering at OSU. His research interests include radiation interaction, transport, and measurement in biology and medicine and, especially, in boron neutron capture therapy (BNCT). **C. K. Chris Wang** (center) (PhD, nuclear engineering, OSU, 1989) is an assistant professor of nuclear engineering at Kansas State University. His research interests are in the area of medical use of radiation. **Reinhard A. Gahbauer** (bottom) [Ludwig Maximilian University, Federal Republic of

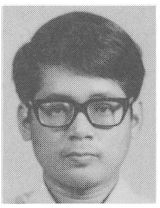


Germany (FRG), 1969; MD, Technische Hochschule, FRG, 1970] was clinical director of the CCF National Aeronautics and Space Administration neutron treatment program after postgraduate training in Augsburg and Vancouver. Since 1985, he has been director of the Division of Radiation Oncology at OSU. Brain tumors are an area of particular interest. He is actively participating in the OSU–Brookhaven National Laboratory BNCT research program.

FUEL BURNUP DETERMINATION BASED ON THE MEASUREMENT OF A SHORT-LIVED FISSION PRODUCT

Tien-Ko Wang
Liang-Chen Shiao
Chia-Lian Tseng





Tien-Ko Wang (top) (PhD, nuclear engineering, Purdue University, 1984) is a professor in the Department of Nuclear Engineering at National Tsing-Hua University (NTHU), Taiwan. His research interests include radiation application, radiation shielding and dosimetry, reactor analysis, nuclear power plant severe accident analysis, and safety. **Liang-Chen Shiao** (center) (MS, nuclear science, NTHU, Taiwan, 1989) has worked in the Nuclear Reactor Division at NTHU for 14 years. His expertise is in the fields of radiation measurement and health physics. **Chia-Lian Tseng** (bottom) has worked as a chemical technician for 27 years in the Health Physics Division at NTHU. He has been involved in radiation measurement, radiation safety, radiochemistry, and nuclear waste disposal.