

# **13th International Conference on Emerging Nuclear Energy Systems 2007**

**(ICENES 2007)**

**Istanbul, Turkey  
3-8 June 2007**

**Volume 1 of 2**

**Editor: Prof. Dr. Sümer ŞAHİM**

**ISBN: 978-1-61782-476-0**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2007) by Bakhus Tourism Industry and Trading Inc.  
All rights reserved.

Printed by Curran Associates, Inc. (2011)

For permission requests, please contact Bakhus Tourism Industry and Trading Inc.  
at the address below.

Bakhus Tourism Industry and Trading Inc.  
Goreme Sok. 8/5  
Kavaklidere, Cankaya  
Ankara 06680 Turkey

Phone: 90 312 4661500  
Fax: 90 312 4661295

nagihant@bakhus.com

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: curran@proceedings.com  
Web: www.proceedings.com

# TABLE OF CONTENTS

## VOLUME 1

### **OPENING SESSION**

<b>WELCOME</b> .....	1
<i>Jose M. Martinez-Val</i>	

### **SESSION 1 - PLENARY SESSION**

*Chairman: Guillermo Velarde*

<b>KEYNOTE SPEECH: OVERVIEW OF PRINCIPLES AND CHALLENGES OF FUSION NUCLEAR TECHNOLOGY</b> .....	3
<i>Mohamed Abdou</i>	
<b>A ROAD MAP FOR THE REALIZATION OF GLOBAL-SCALE THORIUM BREEDING FUEL CYCLE BY SINGLE MOLTEN-FLUORIDE FLOW</b> .....	5
<i>Kazuo Furukawa</i>	
<b>NIF: A PATH TO FUSION ENERGY</b> .....	33
<i>Edward Moses</i>	

### **SESSION 2 - PLENARY SESSION**

*Chairman: Ralph W. Moir*

<b>SPACE NUCLEAR REACTOR CONCEPTS FOR AVOIDANCE OF A SINGLE POINT FAILURE</b> .....	45
<i>M. S. El-Genk</i>	
<b>SUSTAINABLE ENERGY SYSTEMS AND THE EURATOM RESEARCH PROGRAMME</b> .....	56
<i>S. Webster, G. Van Goethem</i>	

### **SESSION 3A - THE FUTURE OF NUCLEAR FISSION**

*Chairman: Borut Smodis*

<b>INNOVATIVE FISSION REACTORS FOR THIS CENTURY</b> .....	67
<i>Emilio Minguez</i>	
<b>NUCLEAR POWER IN SPACE</b> .....	73
<i>Samim Anghaie</i>	
<b>THE FIXED BED NUCLEAR REACTOR CONCEPT</b> .....	74
<i>Sümer Sahin, Farhang Sefidvash</i>	
<b>CHALLENGES OF NUCLEAR POWER FOR THE SUSTAINABLE ROLE IN KOREAN ENERGY POLICY</b> .....	101
<i>Young Eal Lee</i>	

### **SESSION 3B - ACCELERATOR DRIVEN SYSTEMS I**

*Chairman: Werner Maschek*

<b>DEVELOPMENT OF THE HEAT SINK STRUCTURE OF A BEAM DUMP FOR THE PROTON ACCELERATOR</b> .....	109
<i>Wan Young Maeng</i>	
<b>STUDY OF FISSION CROSS SECTIONS INDUCED BY NUCLEONS AND PIONS USING THE CASCADE-EXCITON MODEL CEM95</b> .....	114
<i>Zafar Yasin, M. Ikram Shahzad</i>	
<b>MONTE CARLO STUDIES IN ACCELERATOR-DRIVEN SYSTEMS FOR TRANSMUTATION OF HIGH-LEVEL NUCLEAR WASTE</b> .....	129
<i>B. Sarer, M. E. Korkmaz, M. Gunay, A. Aydin</i>	
<b>CALCULATIONS OF THE MAIN FREE PATH ON NEUTRON EMISSION CROSS-SECTION FOR SPALLATION REACTION OF TARGET AND FUEL NUCLEI</b> .....	142
<i>E. Tel, H. F. Kisoglu, A. Kayis Topaksu, A. Aydin, A. Kaplan</i>	

### **SESSION 3C - ALTERNATIVE ENERGY**

*Chairman: Kazuhiko K. Kudo*

<b>ARE THE LESSONS OF THE TECHNO-ECONOMIC STUDIES ON THE SULPHUR-IODINE CYCLE APPLICABLE TO THE OTHER CYCLES?</b> .....	162
<i>F. Werkoff, France C. Mansilla</i>	

### **SESSION 4A - FUSION I**

*Chairman: Dong-Su Kim*

<b>NUCLEAR CHALLENGES AND PROGRESS IN DESIGNING STELLARATOR POWER PLANTS</b> .....	171
<i>Laila El-Guebaly</i>	
<b>SELF-ORGANIZED IGNITION OF A TOKAMAK PLASMA</b> .....	192
<i>Klaus Schoepf</i>	
<b>THE STUDY OF INERTIAL FUSION ENERGY PROBLEM VIA THE EQUATION OF STATE</b> .....	205
<i>Shalom Eliezer, J.M. Martinez-Val, M. Murakami</i>	
<b>TRIANGULARITY EFFECTS ON THE COLLISIONAL DIFFUSION FOR ELLIPTIC TOKAMAK PLASMA</b> .....	216
<i>P. Martin, E. Castro</i>	
<b>INNOVATIVE THREE-DIMENSIONAL NEUTRONICS ANALYSES DIRECTLY COUPLED WITH CAD MODELS OF GEOMETRICALLY COMPLEX FUSION SYSTEMS</b> .....	221
<i>Mohamed Sawan, P. Wilson, T. Tautges, L. El-Guebaly, D. Henderson, G. Sviatoslavsky, T. Bohm, B. Kiedrowski, A. Ibrahim, B. Smith, R. Slaybaugh</i>	

### **SESSION 4B - FISSION REACTORS I**

*Chairman: Emilio Minguez*

<b>ENHANCING VVER ANNULAR PROLIFERATION RESISTANCE FUEL WITH MINOR ACTINIDES</b> .....	226
<i>G. S. Chang</i>	
<b>SOLITARY BURN-UP WAVE SOLUTION IN MULTI-GROUP DIFFUSION-BURNUP COUPLED SYSTEM</b> .....	236
<i>X.-N. Chen, W. Maschek</i>	
<b>WHOLE CORE TRANSPORT CALCULATION FOR THE VHTR HEXAGONAL CORE</b> .....	246
<i>Jin-Young Cho, Kang-Seog Kim, Chung-Chan Lee, Han-Gyu Joo</i>	

### **SESSION 4C - SOLAR ENERGY**

*Chairman: Mohammadreza Nematollahi*

<b>A NOVEL GUI MODELED FUZZY LOGIC CONTROLLER FOR A SOLAR POWERED ENERGY UTILIZATION SCHEME</b> .....	256
<i>I. H. Altas, A.M. Sharaf</i>	
<b>SOLAR CONTROL ON IRRADIATED TA2O5 THIN FILM</b> .....	261
<i>Nilgün Dogan Baydogan, Esra Ozkan Zayim</i>	
<b>CONCEPTUAL DESIGN OF GAN BETA-VOLTAIC BATTERY USING IN CARDIAC PACEMAKER</b> .....	282
<i>M. Mohamadian, S.A.H. Feghhi, H. Afarideh</i>	

### **SESSION 5A - ACCELERATOR DRIVEN SYSTEMS II**

*Chairman: Edward Moses*

<b>R&amp;D ACTIVITIES AROUND THE EUROTRANS ACCELERATOR FOR ADS APPLICATIONS</b> .....	289
<i>Jean-Luc Biarrotte, France Alex C. Mueller</i>	
<b>NEUTRONICS AND SHIELDING ISSUES OF ADS</b> .....	297
<i>Hamid A. Abderrahim, T. Aoust, E. Gonzalez, W. Haeck, E. Malambu, J.M. Martinez-Val, Y. Romanets, G. Van den Eynde, P. Vaz, C. Vicente</i>	
<b>THERMAL FEATURES OF SPALLATION WINDOW TARGETS</b> .....	308
<i>J.M. Martinez-Val, F. Sordo, P. T. Leon</i>	
<b>CERMET FUEL BEHAVIOUR AND PROPERTIES IN ADS REACTORS</b> .....	309
<i>D. Haas, A. Fernandez, D. Staicu, J. Somers, W. Maschek, X. Chen</i>	

<b>ASSESSMENT OF THE TRANSMUTATION CAPABILITY OF AN ACCELERATOR DRIVEN SYSTEM COOLED BY LEAD BISMUTH EUTECTIC ALLOY .....</b>	<b>335</b>
<i>F. Bianchi, V. Peluso, R. Calabrese, X. Chen, W. Maschek</i>	

### **SESSION 5B - FISSION REACTORS II**

*Chairman: Masaki Ozawa*

<b>REACTOR PHYSICS SIMULATIONS WITH COUPLED MONTE CARLO CALCULATION AND COMPUTATIONAL FLUID DYNAMICS .....</b>	<b>345</b>
<i>Volkan Seker, Justin W. Thomas, Thomas J. Downar</i>	
<b>LINEAR PULSE MOTOR TYPE CONTROL ELEMENT DRIVE MECHANISM FOR THE INTEGRAL REACTOR .....</b>	<b>350</b>
<i>Je-Yong Yu, Suhm Choi, Ji-Ho Kim, Doo-Jeong Lee</i>	
<b>SENSORY SYSTEMS FOR A CONTROL ROD POSITION USING REED SWITCHES FOR THE INTEGRAL REACTOR .....</b>	<b>351</b>
<i>Je-Yong Yu, Suhm Choi, Ji-Ho Kim, Doo-Jeong Lee</i>	

### **SESSION 5C - ENERGY TECHNOLOGIES**

*Chairman: Pedro Vaz*

<b>A NOVEL CO<sub>2</sub> SEQUESTRATION SYSTEM FOR ENVIRONMENTALLY PRODUCING HYDROGEN FROM FOSSIL-FUELS .....</b>	<b>357</b>
<i>William Eucker IV</i>	

### **SESSION 6 - PLENARY SESSION**

*Chairman: Shalom Eliezer*

<b>RECOMMENDATIONS FOR A RESTART OF MOLTEN SALT REACTOR DEVELOPMENT .....</b>	<b>358</b>
<i>Ralph W. Moir</i>	
<b>MHR DESIGN, TECHNOLOGY AND APPLICATIONS .....</b>	<b>377</b>
<i>D. Baldwin, M. Campbell, C. Ellis, M. Richards, A. Shenoy</i>	
<b>NUCLEAR REACTOR DEVELOPMENT IN KOREA: IT'S HISTORY AND STATUS .....</b>	<b>383</b>
<i>Jongsik Cheong, Insik Kim, Dong-Su Kim</i>	

### **SESSION 7A - FISSION REACTORS III**

*Chairman: Samim Anghaie*

<b>TRANSMUTATION OF MINOR ACTINIDES IN A CANDU THORIUM BURNER .....</b>	<b>384</b>
<i>Simen Sahin, Senay Yalcin, Haci Mehmet Sahin, Adem Acir, Kadir Yildiz, Necmettin Sahin, Taner Altinok, Mahmut Alkan</i>	
<b>SCENARIO ANALYSIS FOR TRANSURANIC TRANSMUTATION BY USING FAST REACTORS .....</b>	<b>386</b>
<i>Chang Joon Jeong</i>	
<b>FEASIBILITY STUDY OF SELF SUSTAINING CAPABILITY ON WATER COOLED THORIUM REACTORS FOR DIFFERENT POWER REACTORS .....</b>	<b>392</b>
<i>Sidik Permana, Naoyuki Takaki, Hiroshi Sekimoto</i>	
<b>NEUTRONICS OF A LIQUID SALT COOLED - VERY HIGH TEMPERATURE REACTOR .....</b>	<b>423</b>
<i>J. Zakova</i>	
<b>TYPICAL STEAM GENERATOR TUBES RUPTURE (SGTR) EFFECT ON THERMO HYDRAULIC PARAMETERS OF VVER-1000 PRIMARY LOOP .....</b>	<b>431</b>
<i>Abbas Zare, Mohammadreza Nematollahi, Kamal Hadad, Masood Aminmozaffari</i>	

### **SESSION 7B - HYDROGEN ENERGY**

*Chairman: James C. Kuijper*

<b>SOLAR PUMPED LASER AND ITS APPLICATION TO HYDROGEN PRODUCTION .....</b>	<b>438</b>
<i>K. Imasaki, T. Saiki, D. Li, S. Motokosi, M. Nakatsuka</i>	
<b>TECHNOLOGIES FOR HYDROGEN PRODUCTION BASED ON DIRECT CONTACT OF GASEOUS HYDROCARBONS AND EVAPORATED WATER WITH MOLTEN PB OR PB- .....</b>	<b>446</b>
<i>A. V. Gulevich, P. N. Martynov, V. A. Gulevsky, V. V. Ulyanov</i>	

## **SESSION 7C - FUSION & PHYSICS**

*Chairman: Yasuyuki Nakao*

<b>3kJ PLASMA FOCUS SYSTEM: DESIGN, CONSTRUCTION AND EXPERIMENTS</b> .....	456
<i>A. Alaçakir, Y. Akgun, A. S. Bolukdemir, A. Elmali, H. Karadeniz, T. Oncu, E. Recepoglu, I. T. Cakir, O. Yesiltas, S. Zararsiz</i>	
<b>NEW DISCOVERY: QUANTIZATION OF ATOMIC AND NUCLEAR REST MASS DIFFERENCES AND SELF-ORGANIZATION OF ATOMS AND NUCLEI</b> .....	461
<i>F.A. Gareev, I.E. Zhidkova</i>	

## **SESSION 8A - FISSION REACTORS IV**

*Chairman: Tawfik Al-Kusayer*

<b>NOBLE GAS, BINARY MIXTURES FOR COMMERCIAL GAS-COOLED REACTOR SYSTEMS</b> .....	465
<i>Mohamed S. El-Genk, Jean-Michel Tournier</i>	
<b>ACR-1000: OPERATOR-BASED DEVELOPMENT</b> .....	477
<i>B. Shalaby, A. Alizadeh</i>	
<b>PLUTONIUM AND MINOR ACTINIDES MANAGEMENT IN THERMAL HIGH-TEMPERATURE REACTORS - THE EU FP6 PROJECT PUMA</b> .....	478
<i>J. C. Kuijper</i>	
<b>DESIGN STUDY ON SMALL CANDLE REACTOR</b> .....	489
<i>Hiroshi Sekimoto, Mingyu Yan</i>	
<b>MONTE CARLO BENCHMARK CALCULATIONS FOR 400MW<sub>TH</sub> PBMR CORE</b> .....	498
<i>Hong-Chul Kim, Soon Young Kim, Jong Kyung Kim, Jae Man Noh</i>	

## **SESSION 8B - LASERS & NUCLEAR REACTORS**

*Chairman: Klaus Schoepf*

<b>APPLICATIONS OF SUPER-HIGH INTENSITY LASERS IN NUCLEAR ENGINEERING</b> .....	517
<i>Rainer Salomaa, Antti Hakola, Marko Santala</i>	
<b>A STUDY ON PHYSICAL CHARACTERISTICS OF SUPERCRITICAL LIGHT-WATER REACTOR LOADED WITH (<sup>233</sup>U-TH-<sup>238</sup>U) OXIDE FUEL</b> .....	545
<i>E.G. Kulikov, N. Shmelev, G.G. Kulikov, V.A. Apse</i>	

## **SESSION 8C - NUCLEAR REACTION EFFECTS**

*Chairman: David E. Baldwin*

<b>NEUTRONIC AND THERMAL HYDRAULIC ASSESSMENT OF FAST REACTOR COOLING BY WATER OF SUPER CRITICAL PARAMETERS</b> .....	554
<i>Y.D. Baranaev, A.P. Glebov, V.F. Ukraintsev, V.V. Kolesov</i>	
<b>NEUTRONIC LIMITS IN VARIOUS TARGET MEDIUMS DRIVEN BY A PROTON BEAM OF 1 GeV ENERGY</b> .....	563
<i>Gamze Genc, Nesrin Demir, Huseyin Yapici</i>	
<b>TRANSMUTATION OF HIGH LEVEL WASTES IN A FUSION-DRIVEN TRANSMUTER (FDT)</b> .....	571
<i>Nesrin Demir, Gamze Genc, Huseyin Yapici</i>	
<b>PURPOSEFUL SYNTHESIS OF CHEMICAL ELEMENTS AND ECOLOGICALLY PURE MOBILE SOURCES OF ENERGY</b> .....	579
<i>Vladimir A. Krivitsky, Fangil A. Gareev</i>	

## **VOLUME 2**

## **SESSION 9 - PLENARY SESSION**

*Chairman: Ala Alizadeh*

<b>GAMMA RAY BEAM TRANSMUTATION</b> .....	590
<i>K. Imasaki, D. Li, S. Miyamoto, S. Amano, T. Motizuki</i>	
<b>RESULTS OF THE IAEA CRP ON 'STUDIES OF ADVANCED REACTOR TECHNOLOGY OPTIONS FOR EFFECTIVE INCINERATION OF RADIOACTIVE WASTE'</b> .....	598
<i>W. Maschek</i>	

<b>THE PROMISES AND CHALLENGES OF FUTURE REACTOR SYSTEM DEVELOPMENTS .....</b>	<b>611</b>
<i>Si-Hwan Kim, Moon Hee Chang, Hyun-Jun Kim</i>	

**SESSION 10A - FISSION REACTORS V**

*Chairman: Rainer Salomaa*

<b>STATUS AND PROSPECTIVE OF THE INTERNATIONAL PROJECT ON INNOVATIVE NUCLEAR REACTORS AND FUEL CYCLES (INPRO) .....</b>	<b>617</b>
<i>Masanao Moriwaki</i>	
<b>ADVANCED ORIENT CYCLE, FOR STRATEGIC SEPARATION, TRANSMUTATION AND UTILIZATION OF NUCLIDES IN THE NUCLEAR FUEL CYCLE.....</b>	<b>629</b>
<i>Masaki Ozawa, Reiko Fujita, Shinichi Koyama, Tatsuya Suzuki, Yasuhiko Fujii</i>	
<b>TECHNO-ECONOMIC STUDY OF HYDROGEN PRODUCTION BY HIGH TEMPERATURE ELECTROLYSIS COUPLED WITH AN EPR – WATER STEAM PRODUCTION AND COUPLING POSSIBILITIES .....</b>	<b>635</b>
<i>R. Rivera-Tinoco, C. Mansilla, F. Werkoff, C. Bouallou</i>	
<b>HYBRID NUCLEAR CYCLES FOR NUCLEAR FISSION SUSTAINABILITY .....</b>	<b>649</b>
<i>Mireia Piera, Jose M. Martinez-Val</i>	

**SESSION 10B - NEW PERSPECTIVES**

*Chairman: Didier Haas*

<b>THE GDT-BASED FUSION NEUTRON SOURCE AS DRIVER OF A MINOR ACTINIDES BURNER .....</b>	<b>676</b>
<i>K. Noack, A. Rogov, A. A. Ivanov, E. P. Kruglyakov, Y.A. Tsidulko</i>	
<b>PRELIMINARY NEUTRONIC DESIGN OF SPOCK REACTOR: A NUCLEAR SYSTEM FOR SPACE POWER GENERATION .....</b>	<b>696</b>
<i>N. Burgio, M. Cumo, A. Fasano, M. Frullini, A. Santagata</i>	

**SESSION 10C - REACTOR PHYSICS**

*Chairman: Romney B. Duffey*

<b>MONTE CARLO CALCULATION FOR DIFFERENT ENRICHMENT LITHIUM MODERATOR IN A HYBRID REACTOR .....</b>	<b>715</b>
<i>Haci Mehmet Sahin, Senay Yalcin, Taner Altinok, Adem Acir</i>	
<b>AN ADVANCED ENERGY SYSTEM WITH NUCLEAR REACTORS AS AN ENERGY SOURCE.....</b>	<b>736</b>
<i>Yasuyoshi Kato, Takao Ishizuka, K. Nikitin</i>	
<b>PREMISES FOR USE OF FUSION SYSTEMS FOR ACTINIDE WASTE INCINERATION.....</b>	<b>746</b>
<i>Stefan Taczanowski</i>	

**SESSION 11 - PLENARY SESSION**

*Chairman: Mohamed S. El-Genk*

<b>EURATOM STRATEGY TOWARDS FUSION ENERGY .....</b>	<b>756</b>
<i>Carlos Varandas</i>	
<b>FAST IGNITION STUDIES AT OSAKA UNIVERSITY.....</b>	<b>771</b>
<i>Kazuo A. Tanaka and FI Project Team</i>	
<b>EXERGY ANALYSIS OF A SYSTEM USING A CHEMICAL HEAT PUMP TO LINK A SUPERCRITICAL WATER-COOLED NUCLEAR REACTOR AND A THERMO CHEMICAL WATER SPLITTING CYCLE.....</b>	<b>772</b>
<i>Mikhail Granovskii, Ibrahim Dincer, Marc A. Rosen, Igor Pioro</i>	
<b>LASER ENHANCED RADIOACTIVE DECAY AND SELECTIVE TRANSMUTATION OF NUCLEAR WASTE .....</b>	<b>788</b>
<i>Rainer Salomaa, Pertti Aarnio, Jarmo Ala-Heikkila, Antti Hakola, Mrko Santala</i>	

**SESSION 12A - NUCLEAR FUTURE**

*Chairman: Hiroshi Sekimoto*

<b>STOCHASTIC TRANSITION MATRIX APPROACH TO STOCHASTIC TRANSPORT .....</b>	<b>803</b>
<i>A. Ziya Akcasu</i>	

<b>INNOVATIONS ON NUCLEAR ENERGY – WHAT CAN A SMALL COUNTRY CONTRIBUTE?</b> .....	815
<i>Borut Smodis, Milan Cercek</i>	
<b>TECHNICAL CONSIDERATIONS ON NUCLEAR TERRORISM</b> .....	820
<i>Guillermo Velarde</i>	
<b>TOWARDS A NEW WORLD: THE CONTRIBUTIONS OF NUCLEAR ENERGY TO A SUSTAINABLE FUTURE</b> .....	821
<i>R. B. Duffey, A. I. Miller, P. J. Fehrenbach, S. Kuran, D. Tregunno, S. Suppiah</i>	

### **SESSION 12B - RADIATION EFFECTS**

*Chairman: Jasmina Vujic*

<b>ENCAPSULATING OF HIGH-LEVEL RADIOACTIVE WASTE WITH USE OF PYROCARBON AND SILICON CARBIDE COATINGS</b> .....	846
<i>A. Chernikov</i>	
<b>DETERMINATION OF SHIELDING PARAMETERS FOR DIFFERENT TYPES OF CONCRETES BY MONTE CARLO METHODS</b> .....	852
<i>A. Aminian, M. R. Nematollahi</i>	

### **SESSION 12C - ALTERNATIVE ENERGY**

*Chairman: Ibrahim Dincer*

<b>THERMAL DESIGN, TECHNICAL ECONOMICAL AND ENVIRONMENTAL ANALYSES OF A HYDROGEN FIRED MULTI-OBJECTIVE COGENERATION SYSTEM</b> .....	859
<i>Ali Durmaz, M. Zeki Yilmazoglu, Aysegul Pasaoglu</i>	
<b>NEW ENERGY OPINION LEADERS' LIFESTYLES AND MEDIA USAGE -- APPLYING DATA MINING DECISION TREE ANALYSIS FOR UNIDO-ICHET WEBSITE USERS</b> .....	884
<i>Mavis Tsai, Ayfer Veziroglu, Scott Warren, Yunze Que</i>	

### **SESSION 13A - FUSION II**

*Chairman: Carlos Varandas*

<b>D-<sup>3</sup>He FUELED FUSION DEVICES AS A STEP TOWARDS TOTAL FUSION SAFETY</b> .....	923
<i>Laila El-Guebaly, Massimo Zucchetti</i>	
<b>RECONSTRUCTION AND ANALYSIS OF TEMPERATURE AND DENSITY SPATIAL PROFILES FROM INERTIAL CONFINEMENT FUSION IMPLOSION CORES</b> .....	925
<i>R. C. Mancini</i>	
<b>ON THE POSSIBILITY OF D-<sup>3</sup>He FUSION BASED ON FAST-IGNITION INERTIAL CONFINEMENT SCHEME</b> .....	931
<i>Yasuyuki Nakao, K. Hegi, T. Ohmura, M. Katsube, T. Johzaki, K. Kudo, M. Ohta</i>	

### **SESSION 13B - FISSION REACTORS VI**

*Chairman: Si-Hwan Kim*

<b>INVESTIGATION OF THE PROPERTIES OF THE NUCLEI USING ON THE NEW GENERATION REACTOR TECHNOLOGY SYSTEMS</b> .....	933
<i>E. Tel, H. M. Sahin, Senay Yalçin, Taner Altinok, A. Kaplan, A. Aydin</i>	

### **SESSION 13C - SOCIETAL ISSUES**

*Chairman: Masanao Moriwaki*

<b>SOCIETY RESPONSE TO NUCLEAR ENERGY</b> .....	956
<i>Natividad Carpintero Santamaria, Jose Gutierrez Abascal</i>	
<b>USEFULNESS OF UNDER CONTROLLED POWERS</b> .....	957
<i>O. Alniak</i>	
<b>INVESTIGATION OF TRITIUM AND <sup>233</sup>U BREEDING IN A FISSION-FUSION HYBRID REACTOR FUELLING WITH ThO<sub>2</sub></b> .....	962
<i>Kadir Yildiz, Necmettin Sahin, H. Mehmet Sahin, Senay Yalçin, Taner Altinok, Adem Acir, Mustafa Bayrak, Mahmut Alkan, Okhan Durukan</i>	



### **SESSION 14A - FUSION III**

*Chairman: Kazuo Furukawa*

<b>FRACTAL REACTOR: AN ALTERNATIVE NUCLEAR FUSION SYSTEM BASED ON NATURE'S GEOMETRY</b> .....	969
<i>Todd Lael Siler</i>	
<b>THERMONUCLEAR FUSION BY MECHANICAL ADIABATIC COMPRESSION OF A DENSE PLASMA</b> .....	992
<i>David W. Kraft</i>	
<b>BENCHMARKING THE CAD-BASED ATILA DISCRETE ORDINATES CODE WITH EXPERIMENTAL DATA OF FUSION EXPERIMENTS AND TO THE RESULTS OF MCNP CODE IN SIMULATING ITER</b> .....	1000
<i>Mahmoud Z. Youssef</i>	

### **SESSION 14B - NUCLEAR TECHNIQUES**

*Chairman: Stefan Taczanowski*

<b>UTILIZING THE SLOWING-DOWN-TIME TECHNIQUE FOR BENCHMARKING NEUTRON THERMALIZATION IN GRAPHITE</b> .....	1030
<i>T. Zhou, A. I. Hawari, B. W. Wehring</i>	
<b>ANALYSIS AND IMPROVEMENT OF CYCLOTRON THALLIUM TARGET ROOM SHIELD</b> .....	1039
<i>N. Hajiloo, G. Raisali</i>	
<b>ENHANCEMENT OF NUCLEAR HEAT TRANSFER IN A TYPICAL PRESSURIZED WATER REACTOR BY NEW SPACER GRIDS</b> .....	1053
<i>Mohammad Nazifi, Mohammadreza Nematollahi</i>	

### **SESSION 14C - NUCLEAR PHYSICS**

*Chairman: Kazuo A. Tanaka*

<b>CALIBRATION EXPERIMENTS OF NEUTRON SOURCE IDENTIFICATION AND DETECTION IN SOIL</b> .....	1069
<i>N. V. Gorin, E. N. Lipilina, G. V. Rukavishnikov, D. V. Shmakov, A. I. Ulyanov</i>	
<b>FUSION BY QED CONFINEMENT?</b> .....	1074
<i>T. V. Prevenslik</i>	

### **SESSION 15A - NUCLEAR FISSION POWER**

*Chairman: Laila El-Guebaly*

<b>OBSERVATIONS ON THE CANDLE BURN-UP IN VARIOUS GEOMETRIES</b> .....	1086
<i>Walter Seifritz</i>	
<b>EXPERIMENTAL RESULTS FROM A REACTOR MONITORING EXPERIMENT WITH A CUBIC METER SCALE ANTINEUTRINO DETECTOR</b> .....	1087
<i>Adam Bernstein</i>	
<b>FEASIBILITY STUDY OF SMALL LONG-LIFE WATER COOLED THORIUM REACTORS (WTRS) FOR PROVIDING SMALL QUANTITY OF ENERGY DEMANDS</b> .....	1089
<i>I. Ismail, Peng Hong Liem, Sidik Permana, Hiroshi Sekimoto</i>	

### **SESSION 15B – MISCELLANEOUS**

*Chairman: Andrey V. Gulevich*

<b>METAPHYSICS METHODS DEVELOPMENT FOR HIGH TEMPERATURE GAS COOLED REACTOR ANALYSIS</b> .....	1090
<i>Volkan Seker, Thomas J. Downar</i>	
<b>CRITICAL HEAT FLUX NEAR THE CRITICAL PRESSURE IN HEATER ROD BUNDLE COOLED BY R-134a FLUID: EFFECTS OF UNHEATED RODS AND SPACER GRID</b> .....	1096
<i>Se-Young Chun, Chan-Whan Shin, Sung-Deok Hong, Sang-Ki Moon</i>	

**SESSION 15C - LOW ENERGY REACTION AND NUCLEAR PHYSICS**

*Chairman: Stefan Taczanowski*

**INVESTIGATION OF EXCITATION FUNCTIONS USING NEW EVALUATED EMPIRICAL  
AND SEMI-EMPIRICAL SYSTEMATIC FOR 14-15 MEV (N, T) REACTION CROSS SECTIONS..... 1107**

*E. Tel, A. Aydin, E. G. Aydin, A. Kaplan*

**LOW ENERGY NUCLEAR REACTIONS: 2007 UPDATE..... 1126**

*Steven B. Krivit*

**TUNNELING EFFECT ENHANCED BY LATTICE SCREENING AS MAIN COLD FUSION  
MECHANISM: A BRIEF THEORETICAL OVERVIEW ..... 1141**

*Fulvio Frisone*

**PLENARY SESSION**

**CLOSING SESSION ..... 1160**

*Jose M. Martinez-Val*

**Author Index**