

SPECIAL ISSUE ON THE 11TH INTERNATIONAL CONFERENCE ON RADIATION SHIELDING AND THE 15TH TOPICAL MEETING OF THE RADIATION PROTECTION AND SHIELDING DIVISION (PART 2)

- 253** Foreword: Special Issue on the 11th International Conference on Radiation Shielding and the 15th Topical Meeting of the Radiation Protection and Shielding Division / *Rebecca M. Howell, Nolan E. Hertel*

NEUTRON DATA

TECHNICAL PAPERS

- 257** Coupled Multigroup Proton/Neutron Cross Sections for Deterministic Transport / *Charles T. Kelsey IV, Anil K. Prinja*
- 264** Decommissioning and Safety Issues of Liquid-Mercury Waste Generated from High-Power Spallation Sources with Particle Accelerators / *S. Chiriki, J. Fachinger, R. Moormann, H.-K. Hinssen, A. Bukaemskiy, R. Odor*
- 270** Comparison of Photoneutron Yields in Tungsten Calculated by MCNPX Using Different Photonuclear Cross-Section Data for Typical Radiation Therapy Energies / *Bryan Bednarz, Bin Han, X. George Xu*
- 274** Validation of New Neutron Production Cross Sections for Tungsten Isotopes / *Do Heon Kim, Hyeong Ill Kim, Choong-Sup Gil, Young-Ouk Lee*
- 279** The EAF-2007 Neutron, Deuteron, and Proton Activation Libraries / *J-Ch. Sublet, R. A. Forrest, J. Kopecky*

NEUTRON MEASUREMENTS

TECHNICAL PAPERS

- 287** Photofission of ^{235}U and ^{237}Np with Bremsstrahlung Photons Below 20 MeV: Measurements of Delayed Neutron Yields and Time Spectra / *V. Macary, E. Berthoumieux, D. Doré, S. Panebianco, D. Ridikas, J-M. Laborie, X. Ledoux*
- 293** How Accurately Can We Calculate Fast Neutrons Slowing Down in Water? / *J-Ch. Sublet, D. E. Cullen, R. E. MacFarlane*
- 298** Benchmark Experiment of Neutron Penetration Through Iron and Concrete Shields for Hundreds-of-MeV Quasi-Monoenergetic Neutrons—I: Measurements of Neutron Spectrum by a Multimoderator Spectrometer / *H. Yashima, H. Iwase, M. Hagiwara, Y. Kirihara, S. Taniguchi, H. Yamakawa, K. Oishi, Y. Iwamoto, D. Satoh, Y. Nakane, H. Nakashima, T. Itoga, N. Nakao, T. Nakamura, A. Tamii, K. Hatanaka*

(Continued)

CONTENTS / NOVEMBER 2009—VOL. 168, NO. 2

(Continued)

- 304** Benchmark Experiment of Neutron Penetration Through Iron and Concrete Shields for Hundreds-of-MeV Quasi-Monoenergetic Neutrons—II: Measurements of Neutron Spectrum by an Organic Liquid Scintillator / *M. Hagiwara, H. Iwase, Y. Kirihara, H. Yashima, Y. Iwamoto, D. Satoh, Y. Nakane, H. Nakashima, T. Nakamura, A. Tamii, K. Hatanaka*
- 310** Computational and Experimental Validation of a WGPu Neutron Leakage Source Using a Shielded PuBe (α, n) Neutron Source / *Gabriel Ghita, Glenn Sjoden, James Baciak*
- 317** Design of a Collimator System of a Neutron Beam Line for Neutron-Nucleus Reaction Measurements / *Koichi Kino, Fujio Hiraga, Michihiro Furusaka, Yoshiaki Kiyanagi, Masayuki Igashira, Motoharu Mizumoto, Tatsuya Katabuchi*
- 322** Neutronics of the MEGAPIE Liquid PbBi Spallation Target: Inner Flux Measures and Simulations / *Franco Michel-Sendis, Sébastien Chabod, Alain Letourneau, Stefano Panebianco, Jean-Christian Toussaint*
- 328** How Accurately Can We Determine Spectra in High-Energy Neutron Fields with Bonner Spheres? / *Marcel Reginatto, Eike Hohmann, Burkhard Wiegel*
- 333** Measurement of High-Energy Neutron Spectra with a Bonner Sphere Extension System / *Rebecca M. Howell, Eric Burgett, Nolan E. Hertel, Stephen F. Kry, Zhonglu Wang, Mohammad Salehpour*
- 340** Measurement of Angular-Dependent Neutron Production with 140-MeV Protons / *Yosuke Iwamoto, Daiki Satoh, Masayuki Hagiwara, Hiroshi Iwase, Yoichi Kirihara, Hiroshi Yashima, Yoshihiro Nakane, Hiroshi Nakashima, Takashi Nakamura, Atsushi Tamii, Kichiji Hatanaka*
- 345** Monte Carlo Calculations of Neutron Dose Conversion Coefficients for Reference Korean Male / *Chan Hyeong Kim, Jong Hwi Jeong, Sungkoo Cho, Sang Hyoun Choi, Min Suk Chung*
- 349** Construction of Thermal Neutron Calibration Fields Using a Graphite Pile and Americium-Beryllium Neutron Sources at KAERI / *B. H. Kim, S. M. Jun, J. S. Kim, K. S. Lim, J. L. Kim*
- 354** BNCT Epithermal Neutron Beam Mapping by Using Indirect Neutron Radiography / *Yuan-Hao Liu, Chun-Kai Huang, Pi-En Tsai, Ang-Yu Chen, Hong-Ming Liu, Shih-Chung Lee, Shiang-Huei Jiang*
- 359** Response Matrix Calculation of a Bonner Sphere Spectrometer Based on a ${}^6\text{Li}(\text{Eu})$ Scintillator / *Héctor René Vega-Carrillo, Eduardo Gallego, Alfredo Lorente*

TECHNICAL NOTES

- 364** Anisotropy Factors for a ${}^{252}\text{Cf}$ Source / *K. G. Veinot, J. S. Bogard*
- 369** On Computing Neutron Transmission from the Responses of a Void Fraction Evaluation Scheme with Mixed Beams / *Marcos P. de Abreu*
- 373** A New Low-Energy Neutron Spectrometer Based on Position-Sensitive Proportional Counter for Accelerator-Based Neutron Source / *I. Murata, H. Miyamaru, I. Kato, S. Yoshida, Y. Mori*

(Continued)

CONTENTS / NOVEMBER 2009—VOL. 168, NO. 2

(Continued)

SHIELDING

TECHNICAL PAPERS

- 381** Shielding Analysis for X-Ray Sources Generated in Target Chamber of the National Ignition Facility / *Hesham Khater, Sandra Brereton, Mike Singh*
- 387** Radiation Shielding Aspects of the SCSS Prototype XFEL Facility / *Yoshihiro Asano, Toshiro Itoga, Xavier Marechal*
- 391** Monte Carlo Application in Shielding Design for an X-Ray Container/Vehicle Inspection System / *Junli Li, Shenjin Ming, Yanfeng Cao, Yanli Deng*
- 399** Testing of a High-Density Concrete as Neutron Shielding Material / *Eduardo Gallego, Alfredo Lorente, Héctor René Vega-Carrillo*
- 405** Status of NAÏADE 1 Shielding Benchmarks / *Jean-Claude Nimal*
- 411** Neutronic Modeling Challenges for the ITER ECRH Launcher Shielding Design / *A. Serikov, U. Fischer, R. Heidinger, K. Kleefeldt, L. Obholz, P. Spaeh, D. Strauss, H. Tsige-Tamirat*
- 417** Characteristics of Prompt Radiation Field and Shielding Design for Taiwan Photon Source / *R. J. Sheu, J. Liu, J. P. Wang, K. K. Lin, G. H. Luo*
- 424** Application of Quadruple Range Quadratures to Three-Dimensional Model Shielding Problems / *Joshua J. Jarrell, Marvin L. Adams, Joel M. Risner*
- 431** Impact of the Detailed Fission Source Distribution on Iris Shielding Analyses / *Fausto Franceschini, Bojan Petrovic*
- 438** Preliminary Evaluation of the Scale MAVRIC Code and FW-CADIS Method for Efficient Scoping of the Radiation Field Throughout the IRIS Containment / *Bojan Petrovic*
- 444** A (CERN) History of Accelerator Shielding / *Marco Silari*
- 456** Analytical Description of the $d(14)+Be$ Neutron Beam Source at the Essen Fast Neutron Therapy Facility / *Josselin Morand, Reinhard Hentschel, Andrea Wittig, Raymond Moss, Sabet Hachem, Yuan-Hao Liu, Wolfgang Sauerwein*
- 462** Radiation Shielding of a Beta-Beam Rapid Cycling Synchrotron / *Stefania Trovati, Matteo Magistris, Marco Silari*
- 467** Shielding Analysis for a 40-MeV Electron Linac Facility / *Kai Masuda, Toshiteru Kii, Hideaki Ohgaki, Heishun Zen, Tetsuo Yamazaki*
- 472** Beam Dump and Local Shielding Layout Around the ITEP Radiation Test Facility / *Yury Titarenko, Viacheslav Batyaev, Alexey Titarenko, Michael Butko, Kirill Pavlov, Sergey Florya, Roman Tikhonov, Pavel Boyko, Alexey Kovalenko, Nikolai Sobolevsky, Vasily Anashin, Stepan Mashnik, Waclaw Gudowski, Nikolai Mokhov, Igor Rakhno*
- 477** Shielding Studies for a Hadron Therapy Center / *F. Stichelbaut, T. Canon, Y. Jongen*

(Continued)

CONTENTS / NOVEMBER 2009—VOL. 168, NO. 2

(Continued)

- 482** Experimental Studies of Shielding and Irradiation Effects at High-Energy Accelerator Facilities / *H. Nakashima, Y. Sakamoto, Y. Iwamoto, N. Matsuda, Y. Kasugai, Y. Nakane, F. Masukawa, N. V. Mokhov, A. F. Leveling, D. J. Boehnlein, K. Vaziri, T. Sanami, H. Matsumura, M. Hagiwara, H. Iwase, N. Kinoshita, H. Hirayama, K. Oishi, T. Nakamura, H. Arakawa, N. Shigyo, K. Ishibashi, H. Yashima, N. Nakao, K. Niita*
- 487** Monte Carlo Simulations for the Shielding of the Collector Ring and the Recycled Experimental Storage Ring at FAIR / *Alexandra Knapp, Torsten Radon, Karsten Vogt, Georg Fehrenbacher*
- 492** Shielding of the Target Area of the Fragment Separator Super-FRS / *T. Radon, E. Kozlova, G. Fehrenbacher, H. Geissel, K. Sümmerer, H. Weick, M. Winkler*
- 497** Design of the Shielding of the Materials Test Station / *G. Muhrer, M. Wilson, Ch. Kelsey, E. Pitcher*
- 502** Shield Design of the Materials Test Station's Camera Room / *G. Muhrer, M. Wilson, Ch. Kelsey, E. Pitcher, F. Gallmeier, M. Wohlmuther*
- 508** Evaluation of Radionuclides in Concrete Shielding for Nuclear Power Plant Decommissioning / *Yen-Fu Chen, Yen-Kung Lin, Rong-Jiun Sheu, Shiang-Huei Jiang*
- 513** Preliminary Shielding Assessment of EURISOL Postaccelerator / *D. Ene, J.-C. David, D. Doré, B. Rapp, D. Ridikas*
- 519** Monte Carlo Calculations for the Shielding Design of Beam Injection and Extraction Areas at the 3-GeV Synchrotron in J-PARC / *Yoshihiro Nakane, Teruo Abe, Hiroshi Nakashima*

TECHNICAL NOTES

- 524** Considerations on Replacing Lead with Steel in Glove Box Configurations / *José Ramón Ramírez Sánchez, John Garcia, R. T. Perry*
- 528** Shielding Calculations for the New Experimental Storage Ring for the Facility for Antiproton and Ion Research / *K. Vogt, G. Fehrenbacher, A. Knapp, T. Radon*
- 533** Neutron Activation in the Metal Structures of an RBMK-1500 Reactor / *Ernestas Narkunas, Arturas Smaizys, Povilas Poskas*
- 537** XT-ADS: Neutronics, Shielding, and Radiation Damage Calculations / *Y. Romanets, H. Ait Abderrahim, D. De Bruyn, R. Dagan, I. Gonçalves, W. Maschek, G. Rimpault, D. Struwe, G. Van den Eynde, P. Vaz, C. Vicente*

SHIELDING MATERIALS

TECHNICAL PAPERS

- 545** Development of Novel Neutron Shielding Concrete / *Koichi Okuno, Masayoshi Kawai, Hitoshi Yamada*
- 553** High-Heat-Resistant Neutron Shielding Resin / *Atsuhiko M. Sukegawa, Koichi Okuno, Shinji Sakurai*
- 559** Transmission of Shielding Materials for Particle Therapy Facilities / *Nisy E. Ipe*

(Continued)

CONTENTS / NOVEMBER 2009—VOL. 168, NO. 2

(Continued)

- 564** Development of Low-Activation Reinforced Concrete Design Methodology—I: Manufacture of Low-Activation Concrete / *Masaharu Kinno, Ken-Ichi Kimura, Hirokazu Nishida, Yusuke Fujikura, Norichika Katayose, Takao Tanosaki, Koki Ichitsubo, Masaki Takimoto, Hiroichi Tomotake, Ryoetsu Yoshino, Taiichiro Mori, Katsumi Hayashi, Mikio Uematsu, Tomohiro Ogata, Mikihiro Nakata, Mitsuru Sato, Minoru Saito, Mamabu Sato, Akira Hasegawa*
- 571** Development of Low-Activation Reinforced Concrete Design Methodology—II: Concrete Activation Analyses of BWR/PWR / *Katsumi Hayashi, Shigeki Nemezawa, Motoi Tanaka, Mikio Uematsu, Tomohiro Ogata, Mikihiro Nakata, Katsuyoshi Yamaguchi, Masaharu Kinno, Ken-Ichi Kimura, Takao Tanosaki, Ryoetsu Yoshino, Mitsuru Sato, Minoru Saito, Akira Hasegawa*
- 576** Evaluation of Nuclear Activation of Tungsten Plates for Future Modeling of a Medical Accelerator / *Bin Han, Bryan Bednarz, Yaron Danon, Robert Block, X. George Xu*