



Contents

Nuclear I&C

- The development of gyrotron data management system for ECRH system based on InfluxDB
Haoming Chang, Zege Wu, Huaichuan Hu, Xiaojie Wang, and Fukun Liu.....103489
- Naturally-switching velocity and admittance control (NSVAC) for bilateral teleoperation in CFETR remote handling
Jun Zhang, Ke Wu, Xuanchen Zhang, Hao Han, Tao Zhang, Wei Zhang, Yong Cheng, and Kun Lu103495
- Design and simulation of the primary frequency regulation for a small pressurized water reactor under load change
Yuhong Zhang, Xiao Shi, Xiaoyu Li, Linna Wang, and Wenjie Zeng.....103496
- An approach to develop real-time in-situ underwater monitoring system based on integrated beta and gamma detection
Woo Nyun Choi, Min Ji Kim, Hyeonmin Lee, Seunghin Yoon, and Hee Reyoung Kim.....103508
- Sampling requirements of discrete wavelet transform (DWT) method for n - γ discrimination by liquid scintillators
Harleen Singh, Rohit Mehra, Akhil Jhingan, and Kundan Singh.....103511
- Dual on-premises storage framework for memory optimization and secure data transmission in nuclear power plants
Niaayesh Gharaei.....103526
- Decision tree based parameter identification and state estimation: Application to Reactor Operation Digital Twin
Rong Zhao, Lizhan Hong, Hongjun Ji, Qinyi Zhang, Shiquan Zhang, Qing Li, and Helin Gong103527
- A case study on the failure of the electrical panel of nuclear power plants by shaking table tests
Bub-Gyu Jeon, Dong-Uk Park, Sung-Wan Kim, Sung-Jin Chang, Seunghyun Eem, and Junhee Park.....103533

Nuclear Fuel Cycle and Radioactive Waste Management

- The effect of irradiation on the thermal stability of the levextrel dibenzo-21-crown-7 applying to the high-level waste fractionation processes
A.M. Koscheeva, K.V. Shelamov, A.S. Obedkov, A.M. Koshcheev, A.V. Rodin, A.V. Ponizov, E.V. Belova, and A.V. Ananiev103504
- A feasibility study on clearance levels for real U(VI)-contaminated soil and the mechanisms involving metal ions after neutralization of effluents generated from the soil-washing process
Byung-Moon Jun, Maengkyo Oh, Jun-Young Jung, Hee-Chul Eun, and Yeomin Yoon.....103518
- Synthetic data for radioactive waste management: A comparative study for disused sealed radioactive sources in Indonesia
Pendi Rusadi, Zico Pratama Putra, Ajrieh Setyawan, Moch Romli, Muhammad Yusuf, Hendra Adhi Pratama, and Raden Sumarbagiono103524
- Utilization of reverse osmosis and nanofiltration for the separation of SiO_2 from boric acid solutions at nuclear power plants
Šárka Lásková, Thi Minh Do, Anna Sears, and Pavel Kus.....103528

Nuclear Fuel and Reactor Materials

- Comparison of two kinetic approaches for modeling of radial hydride fraction in zirconium-based fuel rod cladding
Mikhail Kolesnik.....103479





Contents

Comparative analysis of thermal-hydraulic coupling characteristics of cruciform and trefoil helical fuel assemblies <i>Chuanfu Wei, Wenqiang Li, Qi Zhang, Yong Xin, Chenxi Li, Jun Zhu, and Diwang Teng</i>	103497
A practical cesium axial migration model for fast reactor fuel pins <i>Fabien Bernachy-Barbe, Tommaso Barani, Jean-Christophe Dumas, and Alexandre Kallen</i>	103521
Cyclic behaviors of diffusion welded alloy 800H <i>Jong-Bae Hwang and Eung-Seon Kim</i>	103536
Effects of high misfit on isothermal $\beta \rightarrow \omega$ phase transformation in Ti-19V alloy: A three-dimensional phase-field simulation <i>Shisen Gao, Xuxi Liu, Penghui Lei, and Wenbo Liu</i>	103537

Nuclear Policy, Economics, and Human Resource Development

Patents for power: Intellectual property and the geopolitics of nuclear energy technologies <i>Teva Meyer</i>	103470
--	--------

Nuclear Physics, Fusion, Laser, and Accelerator Technology

Investigation of the ICRF waves heating using the high field side B-dot probe in EAST tokamak <i>Lin Ai, Lunan Liu, Wei Zhang, Xinjun Zhang, and Chengming Qin</i>	103478
Numerical studies on electron cyclotron resonance heating and optimization in the CN-H1 stellarator <i>Chun Yan Li, Ping Wei Zheng, Xue Yu Gong, Zheng Kun Gao, and Xin Chen Jiang</i>	103487
Research on the high heat flux removal technique of a lithium target for the AB-BNCT application <i>Xiaolong Wang, Jiangang Li, Ji-Chao Wang, Xiancai Meng, Wei Xu, Peng Lu, Bing Hong, Yuzhong Qian, Kaiyu Ou, Yongqiang Pang, Qiang Li, Lizhen Liang, and Chundong Hu</i>	103498
Simulation study of high-quality electron beam injector for external injection of laser plasma wakefield acceleration <i>Lanxin Liu, Jianhua Zhong, Jiabao Guan, Zeyi Dai, Guoxing Xia, Jike Wang, and Yuancun Nie</i>	103531

Structural Integrity Analysis and Plant Management & Maintenance

Intelligent metallic loose part monitoring in three-dimensional structures using convolutional neural networks and the position-invariant loss function <i>Jungsik Choi, Jeongmin Oh, Taeyoung Ko, Byunyoung Chung, Young-Chul Choi, Sooyoung Lee, and Hyunseok Oh</i>	103474
Effect of nonlinear structural response on seismic fragility and risk of emergency power supply and distribution system in a nuclear power plant <i>Yuchuan Tang, Emrullah Tombaş, and Chengzhen Li</i>	103486
Development of a force identification method using system-level measurements with component-level reduced-order modeling <i>Hyeongyeong Jin and Seunghun Baek</i>	103503





Contents

Data processing method for evaluating pipe wall thinning in nuclear secondary systems using SVM regression algorithm <i>Seongbin Mun, Young-jin Oh, and Sanghoon Lee</i>	103517
Dynamic behavior of duplex stainless steel with improved chloride-induced stress corrosion cracking resistance in drop scenarios for dry storage containers <i>Hyungyu Roh, Ki-Wan Seo, Chaewon Jeong, Ji-Hye Kim, No-Cheol Park, Yun-Jae Kim, and Changheui Jang</i>	103522
Microstructure characteristic and corrosion resistance of pressure resistance seal welded joint of clad tubes <i>Jian Lin, Ziang Zhou, Shuncheng Ji, Zhandong Wan, and Li Lu</i>	103534

Nuclear Safety

Development and training operation analysis results of virtual reality/augmented reality training simulator for radiation emergency medicine <i>Hyung Woo Nam, Se Jong Lee, Jung Jin Kim, Ju Yeon Lee, and Minsu Cho</i>	103477
An improved CREAM model based on Deng entropy and evidence distance <i>Xiaoyan Su, Ziyang Hong, Zhihui Xu, and Hong Qian</i>	103485
Leveraging machine learning for accurate DNBR prediction using python <i>Mohamed Y.M. Mohsen, Meshari Al Meshari, Yasser Alzamil, Abdulrahman Alhammad, Khaled Alenazi, Atef El-Taher, Tarek F. Nagla, and Mohamed A.E. Abdel-Rahman</i>	103532

Radiation Application

A drill hole in-situ lithium content measurement method based on pulsed neutron technology <i>Chi Liu, Yan Zhang, Haoran Zhang, Zihong Yu, Zhenrong Li, Chonggui Zhong, Dexiong He, Wenxing Hu, Ziyang Yu, Yuanyang Fang, Renbo Wang, and Bin Tang</i>	103473
Anterior view of the thyroid scintigraphy imaging with collimator-less gamma camera system using XCAT phantom and Monte-Carlo method <i>Ajin Jo, Jaehwan Lee, and Wonho Lee</i>	103481
A system design method for signal-to-noise ratio enhancement in single-grating-based X-ray phase-contrast imaging <i>Hunwoo Lee, Minjae Lee, Hyunwoo Lim, Jonghyeok Lee, and Hyosung Cho</i>	103482
In-situ estimation of gamma-ray source location at a specific depth based on a coded-aperture gamma camera <i>Dukwoo Kim and Manhee Jeong</i>	103483
Dosimetric and energy deposition evaluation of the dual-microcavity capsule structure for glioma ¹²⁵ I brachytherapy using Monte Carlo simulation <i>Dongjie Li, Yu Liang, Gang Yao, Zhongbao Guan, and Weida Gao</i>	103484
Coded-aperture based stereo gamma-ray imager for near field 3-D localization <i>Seungho Lee, Minseo Song, Dukwoo Kim, Joonhyuk Lee, Changyu Ko, and Manhee Jeong</i>	103488
Design of a PG-SPECT for boron concentration monitoring in BNCT at XJTU <i>Jingjing Fan, Quanxu Jiang, Yaocheng Hu, Zheng Han, Yuqi Dai, Yongze Liu, Kai Liu, Taketani Atsushi, Mingfei Yan, and Sheng Wang</i>	103499
Compton suppression system with asymmetric NaI/BGO guard detectors <i>Minkyu Kim, Seonkwang Yoon, Cheol-ha Baek, and Chaehun Lee</i>	103505





Contents

Comparison of LaBr ₃ :Ce and CeBr ₃ scintillators for ⁵⁵ Fe detection <i>Jae Hyung Park, Siwon Song, Seunghyeon Kim, Sangjun Lee, Jinhong Kim, Cheol Ho Pyeon, Sin Kim, and Bongsoo Lee</i>	103506
Design of a magnetic-modulated target-selective X-ray tube to improve the energy distribution for intraoperative radiotherapy <i>Limin Jin, Xi Zhang, Li Chen, Xiuli Hu, and Yanze Sun</i>	103507
The consequences of proton irradiation of KLuP ₂ O ₇ doped with Pr ³⁺ ions <i>S.A. Kiselev, V.A. Pustovarov, M.N. Sarychev, and M.O. Kalinkin</i>	103523
Assessing radiological properties of novel tissue equivalent materials for heterogeneous pediatric head phantom: Experimental insights and Monte Carlo simulations <i>Hamza Sekkat, Abdellah Khallouqi, Omar El rhazouani, Youssef Madkouri, and Abdellah Halimi</i>	103525
Radiation protection	
Monte Carlo simulations in the optimisation of linac bunker shielding <i>Gavin Pikes, Pejman Rowshanfarzad, Joshua Dass, Mark Reynolds, Martin Ebert, and David Pfefferlé</i>	103469
Optimized ant colony system algorithm for path planning in radiation environments <i>Xiaochang Zheng, Jinjia Cao, Yulong Zhang, Wei Chen, Yanjun Wang, and Yadong Zhang</i>	103471
Assessment of the radiological impact of a melting furnace explosion in a radioactive waste treatment facility on the multi-unit nuclear power plant site <i>Hyeonyeong Lee and Chang-Lak Kim</i>	103472
Study the impact of MgO, Al ₂ O ₃ , MoO ₃ , BaO, ZnO and PbO on the radiation shielding performance of borate glasses <i>M. Elsafi, A.M. Hedaya, and M.I. Sayyed</i>	103475
Simulation study on iodine thyroid blocking in Koreans with high dietary iodine consumption <i>Tae-Eun Kwon, Yoonsun Chung, and Choonsik Lee</i>	103480
Environmental radioactivity and geochemical characterization of granite: Implications for sustainable construction <i>Hassan A.A. Shahin, Masoud S. Masoud, Ahmed E. Abdel Gawad, Turki Kh Faraj, Mayeen Uddin Khandaker, and Mohamed Y. Hanfi</i>	103502
Alternative gamma-ray shielding material: Ternary composite including polyester resin/barite/molybdenum <i>H.Gurel Ozdemir, M.R. Kacal, F. Akman, and H. Polat</i>	103512
Advancing pediatric organ dose assessment in radioiodine therapy with ICRP pediatric mesh-type reference computational phantoms <i>Chansoo Choi, Bangho Shin, Soo Min Lee, and Yeon Soo Yeom</i>	103513
Study on radiation protection for isotope production facility with 100 MeV proton beam <i>Chen Li, Ya-Ling Zhang, Zheng Wei, Wei Wang, Xue-Zhi Zhang, Ji-Zheng Duan, and Lei Yang</i>	103519
Monte Carlo simulation of neutron interaction in Mn bath used for primary standard neutron dosimetry <i>Khaled Mostafa, Mohamed A. Elsaied, A. Abdelsalam, W. Osman, Reham Hamdy Bakr, and A.R. El-Sersy</i>	103535



Contents

Reactor Physics

- Loading pattern optimization of the multi-batch boron-free core by the coati optimization algorithm
M. Hosseinlu, O. Safarzadeh, M. Abbasi, and F. Dehghani.....103476
- High-resolution rapid calculation method of neutron spectrum based on energy response
Dongyuan Li, Qingquan Pan, and Xiaojing Liu103490
- Searching for an optimum burnable absorber for managing the reactivity of the supercritical water reactor (SCWR) from the neutronic point of view
Ali A. Mohamed, Ahmed Elgarayhi, A. Abdelghafar Galahom, and Mohammed Sallah.....103516
- Burnup dynamics and reactivity change in proton induced Tc-99 transmutation fuel assembly
Chang M. Kang and Youngin Kim.....103520

Thermal Hydraulics

- Heat transfer analysis of radiated thin-film flow of couple-stress nanofluid embedded in a Darcy-Forchheimer medium with Newtonian heating effects
Noura Khemiri, Sohail Rehman, Taoufik Saidani, and Vineet Tirth103510
- Experimental research on fluid elastic instability in rod bundles subjected to lead-bismuth eutectic (LBE) cross-flow
Yibo Yin, Puzhen Gao, Xinyang Yu, Junshuai Sun, Jiming Wen, and Ruifeng Tian103514
- An improved two-temperature method for computing the temperature distributions within a TRISO-coated particle pebble fuel
Dali Yu, Fangnian Wang, Huaping Mei, Xiongwei Cheng, and Chengjun Duan.....103515