



Contents

Nuclear I&C

- Reducing digital risks and improving reliability in nuclear power integrated energy systems
Shannon Eggers, Robert Youngblood, Ruixuan Li, and Katya Le Blanc103466

Nuclear Fuel Cycle and Radioactive Waste Management

- Evaluation of saturation and erosion of compacted bentonite using electrical resistivity measurement:
A numerical study
Chang-Ho Hong, Tae-Young Kim, Jin-Seop Kim, and Song-Hun Chong103412
- Modeling temperature distribution in an electrolytic reducer considering decay and salt resistive heat
effects
Jin-Mok Hur and Jae Soo Ryu103413
- Cesium retention in powdered granite under saline and alkaline conditions: Role of biotite in deep
geological repositories
Ja-Young Goo, Jin-Seok Kim, Sang-Ho Lee, Jang-Soon Kwon, and Ho Young Jo103417
- Comprehensive evaluation of residual water based on vacuum drying methods
Ji Hwan Lim, Kyoung-Sik Bang, Kyung-Wook Shin, Nam-Hee Lee, and Seung-Hwan Yu103430
- Lattice Boltzmann simulation for the evolution of porous media induced by mineral dissolution and
precipitation during acid leaching of sandstone uranium ore
Haiying Fu, Meng Lian, Zhiman Yang, Dexin Ding, and Guicheng He103435
- Applicability of anion exchange resin used at nuclear power plants for separating iodides from solutions
containing boric acid
Šárka Lásková, Thi Minh Do, Semen Gogulin, and Pavel Kůs103461
- A comparative review on groundwater hydrogeochemistry in countries preferring crystalline rock for
deep geological disposal
Eunhye Kwon, Jang-Soon Kwon, Kyung-Woo Park, and YeoJin Ju103463

Nuclear Fuel and Reactor Materials

- Experimental investigation and model development for grain growth behavior of reactor-grade Zr-Nb-Sn
alloy at the temperatures 500–700 °C
Donghyeon Son and Youho Lee103389
- Comparative evaluation of hydrogen production with various chlorine thermochemical cycles integrated
in a PACER fusion driver thorium based molten salt reactor
Medine Özkaya and Adem Acir103391
- Production and characterization of the $\text{Cu}_5\text{Cr}_{35}\text{Fe}_{35}\text{V}_{20}\text{Mo}_5$ high entropy alloy as a coupling interlayer for
plasma facing components
B. Savoini, M.A. Monge, and A. Rodriguez-Lopez103399
- Structural characterization and thermal expansion behaviour in $\text{Dy}_2\text{Ti}_{2-x}\text{Zr}_x\text{O}_7$ ($0 \leq x \leq 2$) system
Chiranjit Nandi, Rohan Phatak, Swayam Kesari, Rekha Rao, and Amrit Prakash103421
- Multi-physics simulation of CRUD deposition and lithium meta-borates precipitation in pressurized
water reactors
Seungjin Seo, Nakkyu Chae, Richard I. Foster, and Sungyeol Choi103433





Contents

Nuclear Policy, Economics, and Human Resource Development

- Does nuclear energy consumption contribute to load capacity factor? Modeling the effects of public debt and financial development in France
Mumtaz Ali, Suhaib Ahmed Soomro, Haroon Bakari, Ahmed Samour, and Turgut Tursoy103414
- Review of the cost estimation in nuclear power plant decommissioning and proposal of the cost estimation methodology for kori unit 1
Chan-Geun Park and Hyung-Woo Seo103458

Nuclear Physics, Fusion, Laser, and Accelerator Technology

- Conceptual design of a low-energy ion beam storage ring and a recoil separator to study radiative neutron capture by radioactive ions
Kihong Pak, Barry Davids, and Yong Kyun Kim103392
- Optical plasma boundary detection using improved YOLOv8 segmentation network on EAST tokamak
Qirui Zhang, Ming Chen, Biao Shen, Bihao Guo, Dalong Chen, Yao Huang, Jianhua Yang, Jiangong Fu, and Bingjia Xiao103411
- Medium-energy crossbar H-mode drift tube linear accelerator design and the variable energy adjustment research
Ying Xia, Zhi Wang, Yuanrong Lu, Shuli Gao, Jie Zhao, Meiyun Han, Tianhao Wei, and Austin Morris103432
- Self-synchronized ultrafast electron beam diagnostics using a split-ring resonator driven by multicycle THz pulses
Hong Qi, Yifang Song, Cheng-Ying Tsai, Yang Xu, Zhengzheng Liu, Jinfeng Yang, and Kuanjun Fan103434

Structural Integrity Analysis and Plant Management & Maintenance

- Multi-objective optimization study of nuclear reactor building assembled with BIS-TMDI system
Zhihua Yue and Guangcai Han103394
- Development of the environmental assisted fatigue assessment method for nuclear plants in digital twin
Mingya Chen, Han Liu, Wanxiang Zhao, Yanzhao Zhang, Weiwei Yu, Quanjia Peng, Shuiyong Wang, and Lei Lin103402
- Numerical modelling of an air operated valve assembly for virtual diagnosis based on experimental diagnosis in nuclear power plants
Jaehyung Kim, Sang Hyuk Lee, and Kibeom Park103403
- An optimal procedure for fragility analysis of nuclear containment structures under internal pressure
Hoang D. Nguyen, Chanyoung Kim, and Myoungsu Shin103408
- The fluid-structure interaction seismic analysis of the BWR nuclear power plant spent fuel pool
Yu-Yu Shen103423
- Time series prediction of key parameters of pump-type machinery in nuclear power plants based on empirical wavelet transform-gate recurrent unit (EWT-GRU)
Yihu Zhu, Hong Xia, Zhichao Wang, and Jiyu Zhang103431





Contents

Numerical simulation based on creep damage model for creep crack growth analysis of TMSR defective structures

Xiao-Yan Wang, Wei Gong, Chao-Chao Huang, Yan-Li Yang, Shi-Feng Zhu, and Zhi-Jun Li.....103465

Nuclear Safety

Impact of equipment reliability on safety classification of research reactors

Jacek Kałowski, Karol Kowal, Rafał Laskowski, and Grzegorz Mrugała.....103388

Shaking table test on shield building considering soil-structure interaction

Chenning Song, Changle Zhou, Zhi Zhang, and Chao Wei103422

Research on key technology and application progress of rescue robot in nuclear accident emergency situation

Duo Dong, Ziqi Wang, Jingyu Guan, Yi Xiao, and Yuqi Wang.....103457

Machine-learning methods for blind characterisation of nuclear fuel assemblies

J. Paz-Peñuelas-Oliván and J. Ruz103462

Radiation Application

Investigation of radiological properties and water equivalence of polymer gel dosimeters in the energy range 0.1–10 keV

Aytaç Levet, Sonika Thakur, Parminder Kaur, Mustafa Mohammad Rafiei, Sara Parsaei, and Mehmet Büyükyıldız103387

Transformable geometry for rapid in-situ gamma monitoring: Transformable in-situ gamma monitoring (TRIGAM) system

Min Sun Lee, Younghak Kim, Mee Jang, and Jong-Myoung Lim.....103395

Monte Carlo simulation of an accounting system for small amounts of special nuclear material using fast neutron multiplicity counting

Changyu Ko and Manhee Jeong103397

Synthesis and application of bioadsorbent for Y(III) ions from Poly(vinyl amine) grafted onto rayon by radiation-induced grafting

Niken Hayudanti Anggarini, Meri Suhartini, Rahmawati Rahmawati, Marissa Arlinka ega Putri, Muhamad Yasin Yunus, Deswita Deswita, and Untung Sugiharto103398

A method for determining the effective order of NASVD denoising for the airborne gamma-ray spectrometry data

Sheng Zhang, Yongjun Wang, and Ruijun Wang103400

Applications of machine learning in nuclear arms control verification

Xiao-Suo He, Yao-Dong Dai, and Qing-Hua He.....103401

Current trends in cyclotrons and Radionuclide production: A comprehensive analysis in the Republic of Korea

Min Jun Kim, Hee In Kim, Jae Kwon, and Kwang Pyo Kim.....103405

Pedagogical radiation detector simulator with radioactive sources embedded in an ARM Cortex-M7 MCU

Ángel García-Durán, Antonio Baltazar-Raigosa, Carina Oliva Torres-Cortes, and José Juan Ortega-Sígala.....103406

Preliminary study on scintillation pixel position determination through deep learning of a two-layer DOI detector

Byungdu Jo and Seung-Jae Lee103409





Contents

Preliminary results of a spent nuclear fuel internal tomography (SFIT) system Yoon Soo Chung, Hyung-Joo Choi, Chul Hee Min, and Yong Hyun Chung	103415
Characterization of real-time dose measurement using monitor ionization chamber in electron beam FLASH radiotherapy Xinle Lang, Faming Luo, Min Li, Kai Zhou, Juan Li, Zhenguo Hu, Ruishi Mao, Zhiguo Xu, and Guoqing Xiao	103551

Radiation protection

Optimization of emission strategies for airborne radioactive material from nuclear facilities under normal operating conditions Renjie Chen, Qian Guo, Zhenping Chen, Zeyu Lu, Qiaoxu Liu, Zhiyuan Zhao, and Zhitao Zhang	103396
POKER: A new point kernel 3D radiation field characterization code with stratified and deep shielding capabilities Junyi Chen, Ruihan Li, Yujia Chen, Chenghao Cao, and Jingang Liang	103410
Gamma-spectroscopic assessment of radionuclides and radiological hazards in undisturbed and cultivated soils of Rupnagar, Punjab, India Sanjeet S. Kaintura, Soni Devi, Katyayni Tiwari, Swati Thakur, Resmi Sebastian, and Pushpendra P. Singh	103418
Electron paramagnetic resonance characterization of gamma and electron irradiated high-density polyethylene: Possible use as a high-dose dosimeter Ghada A. Khouqeer, Khaled Farah, Safa Toumi, and Faouzi Hosni	103419
Optimized LiZnBO ₃ phosphor as a promising candidate for low dose radiation dosimetry Md Raghieb Rahat, Homaira Afia Mimi, Shah Azharul Islam, Md Kamruzzaman, Md Abul Hasnat, Md Nazmul Hassan, Shahadat Hossain, Hamid Osman, Mustafa Mahmoud, Mayeen Uddin Khandaker, Md Al-Mamun, and A.K.M. Mizanur Rahman	103427
Enhancing the spinel minerals γ -rays shield effectiveness via crystal void volume optimization and ion composition Z.Y. Khattari	103428
Development of real-time path-based 3D dose rate mapping system Dahui Kwack, Pyeongwon Park, Yongkwon Kim, and Bohyun Ryu	103464
Design optimization of PET-CT facilities: Technical support provided to license holders and the regulatory bodies to reduce unjustified radiation doses Mostafa M. Elashmawy, Hoda H. Said, and Nadia M. Sirag	103467

Reactor Physics

Development and verification of transport and tally capabilities based on unstructured mesh in Reactor Monte Carlo code RMC Jie Li, Pengfei Shen, Zhaoyuan Liu, Qing Li, and Kan Wang	103404
A multi-scale finite element method for neutron diffusion eigenvalue problem Xindi Hu, Helin Gong, and Shengfeng Zhu	103420
TH-NK neutron noise analysis in KWU-PWR NPP N. Olmo-Juan, R. Miró, T. Barrachina, and G. Verdú	103424





Contents

Predicting neutron flux density distribution in HTR-10 using U-Net based on DEM-MC coupled simulations <i>Qianye Yang, Nan Gui, Xingtuan Yang, Jiyuan Tu, and Shengyao Jiang</i>	103425
Spectrum importance model for heavy nuclei synthesis in reactors: Taking ^{252}Cf as an example <i>Qingquan Pan, Xiaojing Liu, Yi Xia, and Guohua Wang</i>	103426
An improved submesh method to treat the environmental effect in PWR-core two-step analysis <i>Junwei Qin, Yunzhao Li, Shuhao Pan, and Weiguo Wang</i>	103429

Thermal Hydraulics

Development and validation of one-dimensional and three-dimensional coupling methods based on ComspaFOAM <i>Gonglin Li, Hui Wang, Zehua Guo, Haozhi Bian, and Ming Ding</i>	103390
A recurrent neural network for modeling natural circulation density wave instabilities <i>Paul Hurley and Juliana Pacheco Duarte</i>	103407
Numerical study on the thermal stratification characteristics of the primary system for Lead-based cooled Fast Reactor <i>Zhenyu Feng, Dalin Zhang, Wenqiang Wu, Haodong Guo, Xilin Zhang, Xiaoyu Wang, Jian Deng, Wenxi Tian, Suizheng Qiu, and Guanghui Su</i>	103456
Development and application of sub-channel thermal-hydraulic analysis code for liquid metal cooled reactors <i>Jinshun Wang, Ronghua Chen, Yu Liang, Minyang Gui, Xinyang Zhu, Wenxi Tian, and Suizheng Qiu</i>	103459
Experimental and numerical investigation on the flow and heat transfer behavior of double-side heating once-through steam generator with helical tubes <i>Jiahang Jiang, Xinwen Zhao, Shengwei Fu, and Meng Jiao</i>	103460

