



# Contents

## Nuclear I&C

- Control strategy for the core power in an accelerator drive sub-critical system  
Xinxin Li, Yuan He, Wenjing Ma, Wenjuan Cui, Zhiyong He, Detai Zhou, Hai Zheng, Feng Yang, Yuhui Guo,  
Haihua Niu, Kai Yin, and Shiwu Dang ..... 103197
- Safeguards-related event detection in surveillance video using semi-supervised learning approach  
Se-Hwan Park, Byung-Hee Won, and Seong-Kyu Ahn ..... 103206

## Nuclear Fuel Cycle and Radioactive Waste Management

- Effects of specimen size and loading rate on the mechanical property of Bentonil-WRK bentonite for  
engineered barrier system  
Ivan Jeff Navea, Jebie Balagosa, Se Hee Han, Seok Yoon, and Yun Wook Choo ..... 103172
- Development of simplified treatment methods for removal of Ra-226 and Ra-228 from sludge waste  
produced in natural gas processing plants  
Ayman M. Sharaf, M.A. El-Nahal, Islam M. Nabil, I.H. Saleh, and Mohamed Elsafi ..... 103175
- Thermodynamic study on the separation of strontium and barium from LWR spent fuel  
Jin-Mok Hur, Jungho Hur, Yung-Zun Cho, and Chang Hwa Lee ..... 103181
- Laser cutting study of zirconium alloys for nuclear decommissioning  
Jae Sung Shin, Joonsoo Ock, and Sungyeol Choi ..... 103184
- Searching for an optimal fuel for a supercritical water reactor (SCWR) to dispose of minor actinides  
resulting from the nuclear waste  
Nassar Alnassar, Maha Algarawi, Sitah Alanazi, Muneerah Al-Aqeel, Ahmed Salah Khalil, and  
A. Abdelghafar Galahom ..... 103194
- A model for operational risk of industrial facilities including ageing/test degradation effects and  
maintenance effectiveness  
S.F. Quintão Ribeiro and J.J. Rivero ..... 103196
- Quantitative determination of the leaching range of in-situ leaching mining area by stagnation point  
Chong Zhang, Yongmei Li, Yuqing Niu, Kaixuan Tan, Tingting Xie, Yixuan Yao, Chunguang Li, and  
Zhenzhong Liu ..... 103204
- Kinetic simulation of uranium migration in granite fissure media of beishan, gansu, China: A case study  
based on the Laplace transform and inverse transform methods  
Xianzhe Duan, Cong Du, Nan Li, Jiaxin Duan, and Zhenping Tang ..... 103205
- Electrokinetic in situ leaching of U from low-permeability uranium ore  
Chunguang Li, Wenji Wang, Zhenzhong Liu, Yongmei Li, Qi Liu, and Longcheng Liu ..... 103212
- Quantum mechanical study of the influence of noble metals on the process of reduction of uranium oxides  
A.S. Vorob'ev, A.Y. Galashev, and Yu P. Zaikov ..... 103217
- Criticality safety analysis for eccentric loading of fuel assemblies in spent nuclear fuel cask  
Seok Geun Cho, Keon Il Cha, and Kyoong Ho Cha ..... 103221
- Enhanced formula-based method to estimate burnup, initial enrichment, and cooling time using limited  
gamma-ray source data of reference PWR spent nuclear fuel assemblies  
Sang Hyeok Lee and Jae Hak Cheong ..... 103222

## Nuclear Fuel and Reactor Materials

- High temperature mechanical properties of diffusion welded alloy 800H  
Jong-Bae Hwang, Injin Sa, Eung-Seon Kim, and Dong-Hyun Lee ..... 103177



# Contents

---

- Coupled heat and mass transfer simulation of CRUD migration and deposition in PWR systems  
Xuesong Li, Meng Zhang, Yang Gao, Hongguo Hou, Caishan Jiao, and Nan Chao ..... 103213

- Development of axisymmetric shell model for creep deformation analysis of reactor pressure vessel lower head  
Jang Min Park and Kukhee Lim ..... 103220

## Nuclear Policy, Economics, and Human Resource Development

- Multi-step multivariate forecasting of transmission power in NPPs using operational and meteorological data  
Jaeseok Yoo, Young-jin Oh, Nam-hyun Kim, Soo-ill Lee, and Jaepil Ko ..... 103169

- The small modular molten salt reactor potential and opportunity in Saudi Arabia  
Dana Hejazi, Anas M. Alwafi, Salman M. Alzahrani, Meshari M. Alqahtani, and Salman M. Alshehri ..... 103203

- Evaluation of tritium production capability of the 5 MWe gas-cooled graphite-moderated reactor at Yongbyon using tritium-producing burnable absorber rods  
Dokyun Kim, Seong Jeong Jeong, and Hyung Jin Shim ..... 103207

- Differentiated influences of perceived benefit types of nuclear power on its acceptance: Evidence from South Korea  
Jin Won Lee, Hailin Zhang, and Seungkook Roh ..... 103214

## Nuclear Physics, Fusion, Laser, and Accelerator Technology

- Optimization of a large-area grid electrode for negative ion source in fusion neutral beam injector  
Jinhong Wang, Yan Wang, Yuwen Yang, Yuming Gu, Yahong Xie, Lizhen Liang, and Jianglong Wei ..... 103182

- Estimation of neutral beam injector power transferred to KSTAR plasmas  
Jong-Gu Kwak, J.H. Jeong, and S.C. Hong ..... 103188

- Evaluations and calculations of neutron reactions on  $^{238}\text{U}$  up to 20 MeV  
Yue Zhang, Ruirui Xu, Yuan Tian, Haicheng Wu, Xichao Ruan, Yinlu Han, Huanyu Zhang, Ping Liu, Xi Tao, Zhi Zhang, Changlin Lan, Xiaodong Sun, Yongli Jin, Nengchuan Shu, Jimin Wang, Xiaolong Huang, and Zhigang Ge ..... 103190

- Accurate pulse time distribution determination using MLEM algorithm in integral experiments  
S.Y. Zhang, Y.B. Nie, Y.Y. Ding, Q. Zhao, K.Z. Xu, X.Y. Pan, H.T. Chen, Q. Sun, and Z. Wei ..... 103191

## Structural Integrity Analysis and Plant Management & Maintenance

- The design and implementation of automated maintenance system for the first-wall based on dual-arm manipulator  
Ke Wu, Jun Zhang, Yong Cheng, Qingxi Yang, Hongtao Pan, Tao Wang, Aiming Liu, and Hao Han ..... 103170

- Experimental and numerical study on seismic behaviors of SRC column-RC slab joints in NPP  
Dayang Wang, Qiang Liu, Yuanqi Song, Yong Zhu, and Yongshan Zhang ..... 103176

- Comparative study on tensile and high cycle fatigue behaviour of 316L(N) SS hardfaced with Ni-Cr-B-Si alloy by GTA and laser cladding processes  
Amruta Pasarkar and S. Balaguru ..... 103185

# Contents

- Numerical investigation of welding deformation diminution for double shell structure using the layered inherent strain  
Cheng Li, Hua Zhai, Lianwei Zhu, Zhihong Liu, Jianguo Ma, Xiaofeng Zhu, and Qiong Liu..... 103208
- Algorithm for estimating Cr coating thickness for accident tolerant fuel cladding using a pancake ECT sensor  
Jeong Won Park, Daegyun Ko, Hun Jang, Hoyoung Kim, Jaebeom Lee, and Wonjae Choi..... 103216

## Nuclear Safety

- Identifying a probe to visualize the variability of operating teams for supporting the human reliability analysis of nuclear power plants: An explanatory study  
Jinkyun Park, Wasin Vechgama, and Seung Ki Shin ..... 103193
- Research on transient hydraulic characteristics of the whole process of reactor coolant pump under shaft stuck accident  
Qichao Xia, Xiuli Wang, Yuanyuan Zhao, Rongsheng Zhu, Zhichen Wang, Shenpeng Yang, and Wei Xu ..... 103218

## Radiation Application

- Evaluating the Kerma coefficients relevant to various water-equivalent materials at different photon energies  
Zahra Abdi, Hamid Reza Baghani, and Reza Shamsabadi ..... 103174
- Patient's head position-dependent safety analysis of birdcage coil, loop array, and dipole array for applications at 300 MHz in magnetic resonance imaging based on hydrogen nuclei: Simulation study  
Eunwoo Lee, Taewoo Nam, Daniel Hernandez, Donghyuk Kim, Yeunchul Ryu, Yeji Han, and Kyoung-Nam Kim ..... 103179
- Analysis of Naturally Occurring Radioactive Material (NORM) in shifting earth layers in Piyungan, Bantul  
Iqbal Nurrahim, Andang Widi Harto, Yohannes Sardjono, Isman Mulyadi Triatmoko, Zuhdi Ismail, and Gede Sutresna Wijaya ..... 103186
- Validation of the FLUKA code to simulate response functions of organic liquid scintillator for high-energy neutrons  
Ahad Ghavami and Mojtaba Tajik ..... 103198
- Study on the nuclear shield behaviors of basalt/carbon fibers reinforced PbO blended epoxy matrix composite – A novel material for thermal insulation applications  
Raja Thandavamoorthy and Yuvarajan Devarajan ..... 103200

## Radiation protection

- Localizing multiple radiation sources actively with a particle filter  
Tomas Lazna and Ludek Zalud ..... 103171
- Performances of halide scintillators for the dosimetry based on gamma-ray spectrometry for environmental monitoring systems  
Wanook Ji, Eunjoong Lee, and Young-Yong Ji ..... 103173
- Fluence-to-dose conversion coefficients in a voxel rat model for external neutron irradiation  
Xiaomin Zhang, Xu Xu, Yong Yuan, Jing Ning, Dawei Li, and Yunlong Ji ..... 103187
- IVR-UNED: Interactive virtual environments to understand radiation fields  
Mario Belotti and Rafael Juárez ..... 103199

# Contents

---

Radon an indoor risk: In the Urban Devarakonda, Telangana state, India

- M. Srinivas Reddy, G. Suman, K. Vinay Kumar Reddy, M. Sreenath Reddy, Ch Gopal Reddy, and P. Yadagiri Reddy.....103202

## Reactor Physics

Assemblies design and modeling analysis of a new fine mesh neutronics/thermal-hydraulics coupling benchmark for plate-type PWR core

- Zhigang Li, Wei Lu, Shanfang Huang, Xiafeng Zhou, Yingwei Wu, Bangyang Xia, Junji Chen, Tao He, Guodong Liu, Yangyu Zhong, and Zhiying Yue .....103189

TRACE assessment of density wave instability onset with void reactivity feedback under natural circulation

- Paul Hurley, Yang Liu, Tomasz Kozlowski, and Juliana P. Duarte .....103195

An innovative and efficient implementation of matrix-free Newton krylov method for neutronics/thermal-hydraulics coupling simulation

- Peijun Li, Chen Hao, Ning Xu, Yanling Zhu, Yizhen Wang, and Zhigang Zhang .....103209

## Thermal Hydraulics

Analysis and optimization of LN2 two-phase flow in CRAFT NNBI cryopump

- Qianxu Wang, Yuanlai Xie, Huihui Hong, Yang Zhu, Fang Wang, Kun Tian, and Bin Li .....103178

Experimental investigation of threshold velocities for air-water two-phase flow in a vertical tube and annular channels

- Almog Biton, Evgeny Rabinovich, and Erez Gilad .....103183

Verification and Validation of CFD analysis for 1/7th scale model of APR1400 for CVAP

- Giwon La, Kunwoo Yi, Doyoung Ko, and Kyuhyoung Kim .....103192

MRCNN: Multi-input residual convolution neural network for three-dimensional reconstruction of bubble flows from light field images

- Heng Zhang, Jiayi Li, Niujia Sun, Hua Li, and Qin Hang .....103210

Development of CFD porous model parameters of Korean PWR spent nuclear fuel assemblies for thermal analysis

- Do Yun Kim, Han-Seop Song, Jae-Ho Jeong, and Seung-Hwan Yu .....103211

## Corrigendum

Corrigendum to "Radiometric examination of fertilizers and assessment of their health hazards, commonly used in Pakistan" [Nucl. Eng. Tech. 55 (2023) 2447–2453]

- Hannan Younis, Sumbilah Shafique, Zahida Ehsan, Aleena Ishfaq, Khurram Mehboob, Muhammad Ajaz, Abdullah Hidayat, and Wazir Muhammad .....103241

Corrigendum to "Fission accelerated steady-state post irradiation examinations - Part II" Nucl. Eng. Technol. 56 (2024) 4158-4168

- Sobhan Patnaik, Geoffrey L. Beausoleil II, and Luca Capriotti .....103500

Corrigendum to "High-fidelity numerical investigation on structural integrity of SFR fuel cladding during design basis events" [NET56 (2024) p.359-374]

- Seo-Yoon Choi, Hyung-Kyu Kim, Min-Seop Song, and Jae-Ho Jeong .....103501

---

This journal was supported by the Korean Federation of Science and Technology Societies Grant funded by the Korean Government (Ministry of Education).