

## **II. PUBLICATION LIST**

### **(APRIL 2022 – MARCH 2023)**

## 1. Slow Neutron Physics and Neutron Scattering

### Papers

Local structure analysis of disordered materials via contrast variation in scanning transmission electron microscopy  
Kimoto Koji, Shiga Motoki, Kohara Shinji, Kikkawa Jun, Cretu Ovidiu, Onodera Yohei, Ishizuka Kazuo  
**AIP Advances** 12(9) (2022) 095219 (doi) 10.1063/5.0104798

A novel nuclear emulsion detector for measurement of quantum states of ultracold neutrons in the Earth's gravitational field

Muto N., Abele H., Ariga T., Bosina J., Hino M., Hirota K., Ichikawa G., Jenke T., Kawahara H., Kawasaki S., Kitaguchi M., Micko J., Mishima K., Naganawa N., Nakamura M., Roccia S., Sato O., Sedmik R.I.P., Seki Y., Shimizu H.M., Tada S., Umemoto A.

**Journal of Instrumentation** 17(7) (2022) P07014 (doi) 10.1088/1748-0221/17/07/P07014

Microscopic observation of the effects of elongation on the polymer chain dynamics of crosslinked polybutadiene using quasi-elastic  $\gamma$ -ray scattering

Mashita Ryo, Saito Makina, Yoda Yoshitaka, Kishimoto Hiroyuki, Seto Makoto, Kanaya Toshiji

**Journal of Synchrotron Radiation** 29(5) (2022) 1180- 1186 (doi) 10.1107/S1600577522007998

Time-resolved resonant soft X-ray scattering combined with MHz synchrotron X-ray and laser pulses at the Photon Factory

Fukaya Ryo, Adachi Jun-ichi, Nakao Hironori, Yamasaki Yuichi, Tabata Chihiro, Nozawa Shunsuke, Ichiyanagi Kouhei, Ishii Yuta, Kimura Hiroyuki, Adachi Shin-ichi

**Journal of Synchrotron Radiation** 29(6) (2022) 1414-1419 (doi) 10.1107/S1600577522008724

Rayleigh Scattering of Synchrotron Mössbauer Radiation Using a Variable Bandwidth Nuclear Bragg Monochromator  
Mitsui Takaya, Masuda Ryo, Kitao Shinji, Kobayashi Yasuhiro, Seto Makoto

**Journal of the Physical Society of Japan** 91(6) (2022) 64001 (doi) 10.7566/JPSJ.91.064001

Characterization of Precipitated Phase in Cu–Ni–Si Alloy by Small-Angle X-ray Scattering, Small Angle Neutron Scattering and Atom Probe Tomography

Sasaki Hirokazu, Akiya Shunta, Oba Yojiro, Onuma Masato, Giddings A.D., Ohkubo Tadakatsu

**MATERIALS TRANSACTIONS** 63(10) (2022) 1384-1389 (doi) 10.2320/matertrans.MT-D2022003

Study on the reusability of fluorescent nuclear track detectors using optical bleaching

Muneem Abdul, Yoshida Junya, Ekawa Hiroyuki, Hino Masahiro, Hirota Katsuya, Ichikawa Go, Kasagi Ayumi, Kitaguchi Masaaki, Kodaira Satoshi, Mishima Kenji, Nabi Jameel-Un, Nakagawa Manami, Sakashita Michio, Saito Norihito, Saito Takehiko R., Wada Satoshi, Yasuda Nakahiro

**Radiation Measurements** 158 (2023) 106863 (doi) 10.1016/j.radmeas.2022.106863

Extracting time series matching a small-angle X-ray scattering profile from trajectories of molecular dynamics simulations  
Shimizu Masahiro, Okuda Aya, Morishima Ken, Inoue Rintaro, Sato Nobuhiro, Yunoki Yasuhiro, Urade Reiko, Sugiyama Masaaki

**Scientific Reports** 12(1) (2022) 9970 (doi) 10.1038/s41598-022-13982-9

### Proceedings

Development of a program for MRI by means of beta-NMR method

T. Sugisaki, Y. Kimura, G. Takayama, M. Tanaka, Y. Mizoi, M. Mihara, M. Fukuda, Y. Otani, M. Fukutome, R. Taguchi, T. Izumikawa, N. Noguchi, K. Takatsu, T. Ohtsubo, K. Matsuda, A. Kitagawa, S. Sato

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VIII" Online (Jan. 28, 2022) 45-49 (in Japanese)**

Laser spectroscopy at KISS

Y. Hirayama, M. Mukai, Y.X. Watanabe, P. Schury, H. Choi, J.Y. Moon, T. Hashimoto, S. Iimura, M. Oyaizu, S.C. Jeong, T. Niwase, M. Tajima, A. Taniguchi, M. Wada, H. Miyatake

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VIII" Online (Jan. 28, 2022) 40-44 (in Japanese)**

Structural Analysis of Additive in Lubricants by Means of Small Angle X-ray Scattering  
Tomoko Hirayama, Sohei Nambo, Naoki Yamashita, Yoriyuki Takashima, Nobuhiro Sato, Masaaki Sugiyama  
**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 17 (in Japanese)**

## 2. Nuclear Physics and Nuclear Data

### Papers

Reprint of The improvement of the energy resolution in epi-thermal neutron region of Bonner sphere using boric acid water solution moderator

Ueda H., Tanaka H., Sakurai Y.

**Applied Radiation and Isotopes 106 (2022) 107-110 (doi) 10.1016/j.apradiso.2015.10.010**

Multibeam Laser Plasma Interaction at Gekko XII laser facility in conditions relevant for Direct-Drive Inertial Confinement Fusion

Cristoforetti G., Koester P., Atzeni S., Batani D., Fujioka S., Hironaka Y., Hüller S., Idesaka T., Katagiri K., Kawasaki K., Kodama R., Mancelli D., Nicolai Ph., Ozaki N., Schiavi A., Shigemori K., Takizawa R., Tamagawa T., Tanaka D., Tentori A., Umeda Y., Yogo A., Gizzi L.A.

**High Power Laser Science and Engineering 11 (2023) e24 (doi) 10.1017/hpl.2023.13**

Development of a water Cherenkov neutron detector for the active rotation method and demonstration of nuclear material detection

Tanabe Kosuke, Komeda Masao, Toh Yosuke, Kitamura Yasunori, Misawa Tsuyoshi, Tsuchiya Ken'ichi, Akiba Norimitsu, Kakuda Hidetoshi, Shibasaki Kazunari, Sagara Hiroshi

**Journal of Nuclear Science and Technology 61(7) (2022) 1-13 (doi) 10.1080/00223131.2022.2143449**

Spectroscopic and electric properties of the TaO<sup>+</sup> molecule ion for the search of new physics: A platform for identification and state control

Sunaga Ayaki, Fleig Timo

**Journal of Quantitative Spectroscopy and Radiative Transfer 288 (2022) 108229 (doi) 10.1016/j.jqsrt.2022.108229**

Measurement of neutron flux parameters for implementation of k0-INAA at Kyoto University Research Reactor

Soliman Mohamed, Abdou Fatma S., Ho Van-Doanh, Sekimoto Shun, Takamiya Koichi, Mohamed Nader M. A., Ohtsuki Tsutomu

**Journal of Radioanalytical and Nuclear Chemistry 331(9) (2022) 3949-3956 (doi) 10.1007/s10967-022-08391-1**

In-gas-cell laser resonance ionization spectroscopy of Pt200, 201

Hirayama Y., Mukai M., Watanabe Y. X., Schury P., Nakada H., Moon J. Y., Hashimoto T., Iimura S., Jeong S. C., Rosenbusch M., Oyaizu M., Niwase T., Tajima M., Taniguchi A., Wada M., Miyatake H.

**Physical Review C 106(3) (2022) 34326 (doi) 10.1103/PhysRevC.106.034326**

Spin-charge coupling and decoupling in perovskite-type iron oxides (Sr<sub>1-x</sub>Bax)<sub>2/3</sub> La<sub>1/3</sub>FeO<sub>3</sub>

Onose M., Takahashi H., Saito T., Kamiyama T., Takahashi R., Wadati H., Kitao S., Seto M., Sagayama H., Yamasaki Y., Sato T., Kagawa F., Ishiwata S.

**Physical Review Materials 6(9) (2022) 94401 (doi) 10.1103/PhysRevMaterials.6.094401**

### Proceedings

<sup>61</sup>Mössbauer Spectroscopy for Supramolecular Bridging Cyanide Complexes

T. Kitazawa, K. Kitase, D. Ueda, D. Fujimoto, S. Arai, Y. Kobayashi, S. Kitao, T. Kubota, M. Seto

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VIII" Online (Jan. 28, 2022) 1-5 (in Japanese)**

Discussion of spin bistability on Fe-Ag-type cyanobridged complex type using Mössbauer effect

K. Kitase, T. Kitazawa

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VIII" Online (Jan. 28, 2022) 22-26 (in Japanese)**

Gamma Ray Spectrum Measurement from Capture Reactions of Uranium-238 for Thermal and Resonance Energy Neutrons  
Y. Nauchi, J. Hori, K. Terada, T. Sano

**International conference on nuclear data (ND2022) Online (Jul. 21-29, 2022)**

Local Structure of Cadmium Doped SrTiO<sub>3</sub>  
S. Komatsuda, W. Sato, A. Taniguchi, M. Tanigaki, Y. Ohkubo

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VIII" Online (Jan. 28, 2022) 10-14 (in Japanese)**

Present Status and Approach for Industrial Application of Various-Element Mossbauer Spectroscopy using KUR, LINAC and Synchrotron Radiation

Shinji Kitao, Yasuhiro Kobayashi, Masayuki Kurokuzu, Makoto Seto, Hiroyuki Tajima, Hiroyuki Yamashita, Hidetoshi Ota, Takumi Kubota, Ryo Masuda

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 22 (in Japanese)**

Present Status and Future Projects for Mössbauer Spectroscopy at Institute for Integrated Radiation and Nuclear Kyoto University

S. Kitao, Y. Kobayashi, M. Kurokozu, T. Kubota, H. Tajima, T. Fujiwara, R. Masuda, M. Seto

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VIII" Online (Jan. 28, 2022) 6-9 (in Japanese)**

Research on the chemical state of nitrogen in H<sub>2</sub>O by  $\mu$ -SR and  $\beta$ -NMR spectroscopy

Y. Kimura, M. Mihara, K. Matsuta, M. Fukuda, R. Wakabayashi, Y. Otani, M. Fukutome, G. Takayama, T. Minamisono, D. Nishimura, H. Takahashi, T. Izumikawa, T. Ohtsubo, N. Noguchi, M. Ogose, M. Sato, K. Takatsu, S. Momota, A. Ozawa, T. Nagamoto, A. Kitagawa, S. Sato, M.K. Kubo, K. Shimomura, A. Koda, S. Takeshita

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VIII" Online (Jan. 28, 2022) 50-55 (in Japanese)**

$\beta$ -decay spectroscopy of rare fission products with 4 $\pi$ clover detector using an Isotope Separator On-Line KUR-ISOL-Search for  $\gamma$ -rays in the decay of <sup>155</sup>Pr

Y. Irie, S. Sakakibara, M. Shibata, A. Taniguchi

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VIII" Online (Jan. 28, 2022) 35-39 (in Japanese)**

## Reviews

Development and application of the neutron standards

Matsumoto Tetsuro, Masuda Akihiko, Harano Hideki

**Journal of the Atomic Energy Society of Japan 63(6) (2022) 480-484 (in Japanese) (doi)10.3327/jaesjb.63.6\_480**

## Others

Yield measurements for <sup>86</sup>Kr + <sup>198</sup>Pt at KISS

Y.X. Watanabe, Y. Hirayama, M. Mukai, T. Niwase, P. Schury, M. Rosenbusch, M. Wada, H. Miyatake, S.C. Jeong, S. Iimura, M. Oyaizu, A. Taniguchi

**RIKEN Accelerator Progress Report 2021 55 (2022) 25**

In-gas-cell laser ionization spectroscopy of <sup>200</sup>gPt using MRTOF-MS at KISS

Y. Hirayama, M. Mukai, Y.X. Watanabe, P. Schury, J.Y. Moon, T. Hashimoto, S. Iimura, S.C. Jeong, M. Rosenbusch, M. Oyaizu, T. Niwase, M. Tajima, A. Taniguchi, M. Wada, H. Miyatake

**RIKEN Accelerator Progress Report 2021 55 (2022) 26**

$\beta$ -decay spectroscopy of rare fission products with a 4 $\pi$  clover detector using an Isotope Separator On-Line KUR-ISOL

S. Sakakibara, Y. Irie, T. Yamaguchi, T. Miyazawa, M. Shibata, A. Taniguchi

**KURNS Progress report 2021 (2022) 94**

### 3. Reactor Physics and Reactor Engineering

#### Papers

Hybrid Organic–Inorganic Perovskite Semiconductor-Based High-Flux Neutron Detector with BN Converter  
Okuno Yasuki, Matsui Taisuke, Kobayashi Tomohiro, Imaizumi Mitsuru, Jimba Yuki, Hao Yu, Kondo Sosuke, Kaneko Yukihiro, Kasada Ryuta

**ACS Applied Electronic Materials** 4(7) (2022) 3411–3420 (doi) 10.1021/acsaelm.2c00258

Dynamic mode decomposition application to dominance ratio assessment in Monte Carlo k-eigenvalue calculation  
Yamamoto Toshihiro, Shen Xiuzhong, Sakamoto Hiroki

**Annals of Nuclear Energy** 175 (2022) 109205 (doi) 10.1016/j.anucene.2022.109205

Dynamic mode decomposition for subcriticality measurement using measured data at single location  
Yamamoto Toshihiro, Sakamoto Hiroki

**Annals of Nuclear Energy** 180 (2023) 109480 (doi) 10.1016/j.anucene.2022.109480

Higher harmonic analyses of the Rossi- $\alpha$  method and application of dynamic mode decomposition for time decay constant determination in a 1D subcritical system

Yamamoto Toshihiro, Sakamoto Hiroki

**Annals of Nuclear Energy** 168 (2022) 108886 (doi) 10.1016/j.anucene.2021.108886

Monte Carlo sensitivity analyses of isothermal temperature coefficient in solid-moderated and solid-reflected cores at Kyoto University critical assembly

Song Kyoseong, Ho Pyeon Cheol, Jin Shim Hyung

**Annals of Nuclear Energy** 180 (2023) 109491 (doi) 10.1016/j.anucene.2022.109491

Fast-neutron capture cross section data measurement of minor actinides for development of nuclear transmutation systems  
Katabuchi Tatsuya, Iwamoto Osamu, Hori Jun-ich, Kimura Atsushi, Iwamoto Nobuyuki, Nakamura Shoji, Rovira Gerard, Endo Shunsuke, Shibahara Yuji, Terada Kazushi, Kodama Yu, Nakano Hideto, Sato Yaoki, Matsuura Shota

**EPJ Web of Conferences** 281 (2023) 00014 (doi) 10.1051/epjconf/202328100014

Interfacial area concentration in gas-liquid metal two-phase flow

Shen Xiuzhong, Yamamoto Toshihiro, Han Xu, Hibiki Takashi

**Experimental and Computational Multiphase Flow** 5(1) (2023) 84–98 (doi) 10.1007/s42757-021-0110-x

Two-phase interfacial structure development in vertical narrow rectangular channels

Shen Xiuzhong, Hibiki Takashi

**International Journal of Heat and Mass Transfer** 191 (2022) 122832 (doi) 10.1016/j.ijheatmasstransfer.2022.122832

Visualization of Gas-Liquid Interfacial Behavior in a Narrow Channel Using High-Speed Neutron Imaging

Daisuke ITO, Naoya ODAIRA, Kei ITO, Yasushi SAITO, Keisuke KURITA, Hiroshi IIKURA

**JAPANESE JOURNAL OF MULTIPHASE FLOW** 37(1) (2023) 73–78 (in Japanese) (doi) 10.3811/jjmf.2023.007

X線イメージングを用いた球充填層内のボイド率分布計測

YAMAMOTO Seishiro, ODAIRA Naoya, ITO Daisuke, ITO Kei, SAITO Yasushi, IMAIZUMI Yuya, MATSUBA Kenichi, KAMIYAMA KenjiKenichi, KAMIYAMA Kenji

**JAPANESE JOURNAL OF MULTIPHASE FLOW** 37(1) (2023) 79–85 (in Japanese) (doi) 10.3811/jjmf.2023.008

Monte Carlo sensitivity calculation in fixed source problems with the derivative source method

Yamamoto Toshihiro, Sakamoto Hiroki

**Journal of Computational Physics** 460 (2022) 111155 (doi) 10.1016/j.jcp.2022.111155

Spatial distribution and preferred orientation of crystalline microstructure of lead-bismuth eutectic

Ito Daisuke, Sato Hirotaka, Odaira Naoya, Saito Yasushi, Parker Joseph Don, Shinohara Takenao, Kai Tetsuya, Oikawa Kenichi

**Journal of Nuclear Materials** 569 (2022) 153921 (doi) 10.1016/j.jnucmat.2022.153921

Application of dynamic mode decomposition to Rossi- $\alpha$  method in a critical state using file-by-file moving block bootstrap method

Endo Tomohiro, Nishioka Fuga, Yamamoto Akio, Watanabe Kenichi, Pyeon Cheol Ho

**Journal of Nuclear Science and Technology** 59(9) (2022) 1117–1126 (doi) 10.1080/00223131.2022.2030260

Development of a critical heat flux correlation based on a mechanistic model under subcooled flow boiling conditions  
Yodo Tadakatsu, Odaira Naoya, Ito Kei, Ito Daisuke, Saito Yasushi  
**Journal of Nuclear Science and Technology** 60(3) (2022) 197-214 (doi) 10.1080/00223131.2022.2091054

Uncertainty Quantification of Light-Water-Moderated and Light-Water-Reflected Cores with Highly-Enriched Uranium Fuel at Kyoto University Critical Assembly  
C. H. Pyeon and K. Morioka  
**Journal of Nuclear Science and Technology** 59 (2022) 898-906 (doi) 10.1080/00223131.2021.2017371

Pressure drop evaluation based on two-phase flow observation in packed bed system  
YASUGI Noriaki, ODAIRA Naoya, ITO Daisuke, ITO Kei, SAITO Yasushi  
**Mechanical Engineering Journal** 9(4) (2022) 21-00437 (doi) 10.1299/mej.21-00437

Conceptual design of a target station using a 30-MeV cyclotron accelerator for the basic study of boron neutron capture therapy at KURNS  
Nakamura R., Hino M., Tanaka H., Kuriyama Y., Iwashita Y.  
**Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment** 1042 (2022) 167425 (doi) 10.1016/j.nima.2022.167425

Nuclear Data-Induced Uncertainty of Criticality in Solid-Moderated and Solid-Reflected Cores with Highly-Enriched Uranium Fuel at Kyoto University Critical Assembly  
C. H. Pyeon and K. Morioka  
**Nuclear Science and Engineering** 196 (2022) 1147-1160 (doi) 10.1080/00295639.2022.2070385

Theoretical Derivation of a Unique Combination Number Hidden in the Higher-Order Neutron Correlation Factors Using the Pál-Bell Equation  
Endo Tomohiro, Nishioka Fuga, Yamamoto Akio, Watanabe Kenichi, Pyeon Cheol Ho  
**Nuclear Science and Engineering** 197Z(2) (2022) 176-188 (doi) 10.1080/00295639.2022.2049992

## Proceedings

Double Heterogeneity Effect on Reactivity of U-Mo Research Reactor Fuel  
H. Unesaki  
**European Research Reactor Conference-RRFM2022 Budapest, Hungary (Jun. 6-10 2022)** 334-341

High-Radiation-Tolerant CIGS Solar Cell based Self-Power Driven Radiation Dosimeter for IF  
奥野泰希, 今泉充, 上川由紀子, 岡本保, 小林知洋, 牧野喬紘, 笠田竜太  
**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023)** 1-3 (in Japanese)

Measurement of U-233 Sample Reactivity Worth in KUCA for Integral Validation of Nuclear Data  
T. Sano, J. Hori, Y. Takahashi, K. Terada, T. Kanda, H. Unesaki  
**International Conference on Physics of Reactors (PHYSOR 2022) Pittsburgh, U.S.A. (May 15-20, 2022)** 2822-2830

Preliminary Experiment in a Graphite-Moderated Core to Avoid Full Mock-up Experiment for the Future First Commercial HTGR  
S. Okita, Y. Fukaya, A. Sakon, T. Sano, Y. Takahashi, H. Unesaki  
**International Conference on Physics of Reactors (PHYSOR 2022) Pittsburgh, U.S.A. (May 15-20, 2022)** 2338-2346

Subcritical Experiment using U-7Mo LEU at KUCA facility  
Y. Takahashi, K. Wakabayashi, Y. Kitamura, H. Unesaki, T. Misawa  
**RERT 2022 - 42nd International Meeting on Reduced Enrichment for Research and Test Reactors Vienna, Austria (Oct. 3-5, 2022)**

Void fraction prediction for gas-liquid two-phase flow in plate-type fuel assembly  
Xiuzhong Shen, Toshihiro Yamamoto, Ken Nakajima, Takashi Hibiki  
**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023)** 21 (in Japanese)

## Reviews

Channel size effect on drift-flux parameters for adiabatic and boiling two-phase flows  
Hibiki Takashi, Ju Peng, Rassame Somboon, Miwa Shuichiro, Shen Xiuzhong, Ozaki Tetsuhiro  
**International Journal of Heat and Mass Transfer** 185 (2022) 122410  
(doi)10.1016/j.ijheatmasstransfer.2021.122410

Development of a reactor-based slow-positron beamline  
Atsushi Kinomura, Atsushi Yabuuchi  
**Positron sciences** 19 (2022) 3-12 (in Japanese)

## Books

Introduction to Nuclear Reactor Experiments  
Wakabayashi Genichiro, Yamada Takahiro, Endo Tomohiro, Pyeon Cheol Ho  
**Springer Nature Singapore** 2022 (ISBN) 9789811965883 (doi) 10.1007/978-981-19-6589-0

## Others

Development of accident tolerant control rod (3) Compatibility between novel neutron absorbing and core structural materials at high temperature  
Kinya NAKAMURA, Hirokazu, OHTA  
**Atomic Energy Society of Japan 2021 Annual Meeting (2021) 2K02 (in Japanese)**

Development of accident tolerant control rod (3) Reactivity measurement of candidate neutron absorbing materials  
Hirokazu Ohta, Yasushi Nauchi, Kinya Nakamura and Tadafumi Sano  
**Atomic Energy Society of Japan 2018 Annual Meeting (2018) 2F16 (in Japanese)**

## 4. Material Science and Radiation Effects

### Papers

Improvement of laccase biosensor characteristics using sulfur-doped TiO<sub>2</sub> nanoparticles  
Kavetskyy Taras, Smutok Oleh, Demkiv Olha, Kukhazh Yuliia, Stasyuk Nataliya, Leonenko Evhen, Kiv Arnold, Kobayashi Yoshinori, Kinomura Atsushi, Šauša Ondrej, Gonchar Mykhailo, Katz  
**Evgeny Bioelectrochemistry** 147 (2022) 108215 (doi) 10.1016/j.bioelechem.2022.108215

Preparation of Li<sub>2</sub>TiO<sub>3</sub>-Li<sub>4</sub>SiO<sub>4</sub>-Pb tritium breeding ceramic and its mechanical properties  
Wang Qiao, Zhou Qilai, Xiong Qingbi, Zhou Jianglin, Li Sicheng, Hirata Shiori, Oya Yasuhisa  
**Ceramics International** 40(18) (2022) 26742-26749 (doi) 10.1016/j.ceramint.2022.05.369

High thermal conductivity of stishovite promotes rapid warming of a sinking slab in Earth's mantle  
Hsieh Wen-Pin, Marzotto Enrico, Tsao Yi-Chi, Okuchi Takuo, Lin Jung-Fu  
**Earth and Planetary Science Letters** 584 (2022) 117477 (doi) 10.1016/j.epsl.2022.117477

Acoustic Wave Velocities of Ferrous-Bearing MgSiO<sub>3</sub> Glass up to 158 GPa With Implications for Dense Silicate Melts at the Base of the Earth's Mantle  
Mashino Izumi, Murakami Motohiko, Kitao Shinji, Mitsui Takaya, Masuda Ryo, Seto Makoto  
**Geophysical Research Letters** 49(19) (2022) e2022GL098279 (doi) 10.1029/2022GL098279

Evaluation of Radiation Damage to LAN-Cable Sheaths in a Vacuum Vessel for Neutron Scattering  
Taiki Tominaga, Misaki Ueda, Kawakita Yukinobu, Toshiyuki Chatake, Tsuyoshi Saito, Nobuhiro Sato  
**Hamon** 32(2) (2022) 91-95 (in Japanese)

<sup>161</sup>Dy synchrotron-radiation-based Mössbauer absorption spectroscopy  
Masuda Ryo, Kitao Shinji, Tajima Hiroyuki, Taniguchi Hiroki, Mitsui Takaya, Fujiwara Kosuke, Yoda Yoshitaka, Nagasawa Nobumoto, Ishikawa Daisuke, Baron Alfred. Q. R., Yoshida Takefumi, Sato Tetsu, Katoh Keiichi, Kobayashi Hisao, Seto Makoto  
**Hyperfine Interactions** 243(1) (2022) 17-1- 17-8 (doi) 10.1007/s10751-022-01802-5

Energy domain synchrotron-radiation-based Mössbauer spectroscopy of EuH<sub>2</sub> under a few GPa pressure  
Masuda Ryo, Hirao Naohisa, Fujiwara Kosuke, Mitsui Takaya, Fujihara Taku, Yamashita Hiroyuki, Tajima Hiroyuki, Kurokuzu Masayuki, Kitao Shinji, Seto Makoto  
**Hyperfine Interactions** 244(1) (2023) 5 (doi) 10.1007/s10751-022-01815-0

Mössbauer study of the material of the electric power transformers  
Kobayashi Yasuhiro, Kitao Shinji, Yuasa Kosuke, Seto Makoto  
**Hyperfine Interactions** 243 (2022) 26 (doi) 10.1007/s10751-022-01810-5

Hugoniot and released state of calcite above 200 GPa with implications for hypervelocity planetary impacts  
Umeda Yuhei, Fukui Keiya, Sekine Toshimori, Guarguaglini Marco, Benuzzi-Mounaix Alessandra, Kamimura Nobuki, Katagiri Kento, Kodama Ryosuke, Matsuoka Takeshi, Miyanishi Kohei, Ravasio Alessandra, Sano Takayoshi, Ozaki Norimasa  
**Icarus** 377 (2022) 114901 (doi) 10.1016/j.icarus.2022.114901

Repetitive Irradiation Tests at Cryogenic Temperature by Neutrons and Protons on Stabilizer Materials of Superconductor  
Yoshida M., Nakamoto T., Ogitsu T., Xu Q., Yoshiie T., Meigo S., Iwamoto Y.  
**IEEE Transactions on Applied Superconductivity** 32 (2022) 7100405 (doi) 10.1109/TASC.2022.3178944

Effect of neutron dose on the tritium release behavior of Li<sub>2</sub>TiO<sub>3</sub>–0.5Li<sub>4</sub>SiO<sub>4</sub> biphasic ceramic  
Zhou Qilai, Sun Fei, Hirata Shiori, Li Sicheng, Li Yuanyuan, Oya Yasuhisa  
**International Journal of Hydrogen Energy** 48(11) (2023) 4363–4370 (doi) 10.1016/j.ijhydene.2022.11.009

Investigation of defect states in light-irradiated single-crystal ZnO by low-temperature positron annihilation lifetime spectroscopy  
Nakajima Makoto, Kinomura Atsushi, Yabuuchi Atsushi, Kuriyama Kazuo  
**Japanese Journal of Applied Physics** 10 (2022) 100905 (doi) 10.35848/1347-4065/ac9103

Rare-earth silicides: the promising candidates for thermoelectric applications at near room temperature  
Tanusilp Sora-at, Kurosaki Ken  
**Japanese Journal of Applied Physics** 62(SD) (2022) SD0802 (doi) 10.35848/1347-4065/aca0fc

Response of piezoelectric lead zirconate titanate to 20 MeV electron beam irradiation  
Takechi Seiji, Morita Yudai, Niiya Shingo, Miyachi Takashi, Kobayashi Masanori, Okudaira Osamu, Okada Nagaya, Takahashi Toshiharu, Abe Naoya  
**Japanese Journal of Applied Physics** 61(12) (2022) 128001 (doi) 10.35848/1347-4065/ac9e30

Comparative study of vacancy cluster formation in pure Ni, CoCrNi, and CoCrFeNi with a CoCrFeMnNi multicomponent system  
Xu Q., Guan H.Q., Huang S.S., Zhong Z.H.  
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Large thermopower in novel thermoelectric Yb(Si<sub>1-x</sub>Ge<sub>x</sub>)<sub>2</sub> induced by valence fluctuation  
Nishide Akinori, Tanusilp Sora-at, Kowa Wataru, Yashima Mitsuharu, Nambu Akira, Hayakawa Jun, Ohishi Yuji, Muta Hiroaki, Mukuda Hidekazu, Kurosaki Ken  
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Elasticity of Hydrated Al-Bearing Stishovite and Post-Stishovite: Implications for Understanding Regional Seismic V<sub>s</sub> Anomalies Along Subducting Slabs in the Lower Mantle  
Zhang Yanyao, Fu Suyu, Karato Shun-ichiro, Okuchi Takuo, Chariton Stella, Prakapenka Vitali B., Lin Jung-Fu  
**Journal of Geophysical Research: Solid Earth** 127(4) (2022) e2021JB023170 (doi) 10.1029/2021JB023170

Sorption of Cs<sup>+</sup> and Eu<sup>3+</sup> ions onto sedimentary rock in the presence of gamma-irradiated humic acid  
Zhao Qi, Saito Takeshi, Miyakawa Kazuya, Sasamoto Hiroshi, Kobayashi Taishi, Sasaki Takayuki  
**Journal of Hazardous Materials** 428 (2022) 128211 (doi) 10.1016/j.jhazmat.2021.128211

Influence of interatomic potential and simulation procedures on the structures and properties of sodium aluminosilicate glasses from molecular dynamics simulations  
Kalahe Jayani, Onodera Yohei, Takimoto Yasuyuki, Hijiya Hiroyuki, Ono Madoka, Miyatani Katsuaki, Kohara Shinji, Urata Shingo, Du Jincheng

**Journal of Non-Crystalline Solids** 588 (2022) 121639 (doi) 10.1016/j.jnoncrysol.2022.121639

Tritium recovery behavior for tritium breeder  $\text{Li}_4\text{SiO}_4\text{-Li}_2\text{TiO}_3$  biphasic material  
Hirata Shiori, Ashizawa Kyosuke, Sun Fei, Feng Yongjin, Wang Xiaoyu, Wang Hailiang, Kobayashi Makoto, Taguchi Akira, Oya Yasuhisa

**Journal of Nuclear Materials** 567 (2022) 153838 (doi) 10.1016/j.jnucmat.2022.153838

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**Journal of Nuclear Science and Technology** 60(4) (2022) 425-434 (doi) 10.1080/00223131.2022.2112782

Thermophysical and mechanical properties of  $\text{LaB}_6$  and  $\text{CeB}_6$  synthesized through spark plasma sintering  
Sun Yifan, Ohishi Yuji, Higaki Junya, Muta Hiroaki, Kurosaki Ken

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Kitao Shinji, Masuda Ryo, Fujihara Taku, Tajima Hiroyuki, Nagasawa Nobumoto, Yoda Yoshitaka, Masuda Takahiro, Yoshimura Koji and Seto Makoto

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Investigation of the Structure of Atomically Dispersed  $\text{NiN}_x$  Sites in Ni and N-Doped Carbon Electrocatalysts by  $^{61}\text{Ni}$  Mössbauer Spectroscopy and Simulations

Koshy David M., Hossain Md Delowar, Masuda Ryo, Yoda Yoshitaka, Gee Leland B., Abiose Kabir, Gong Huaxin, Davis Ryan, Seto Makoto, Gallo Alessandro, Hahn Christopher, Bajdich Michal, Bao Zhenan, Jaramillo Thomas F.

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Aoyagi Takuya, Onodera Yohei, Kohara Shinji, Naito Takashi, Ina Toshiaki, Takamatsu Daiko, Onodera Taigo, Miyake Tatsuya, Tachizono Shinichi, Yoshimura Kei

**Journal of the Ceramic Society of Japan** 130(7) (2022) 504-508 (doi) 10.2109/jcersj.2.22024

Topological analyses of structure of glassy materials toward extraction of order hidden in disordered structure Yohei Onodera

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Nucleation mechanisms in a  $\text{SiO}_2\text{-Li}_2\text{O-P}_2\text{O}_5\text{-ZrO}_2$  biomedical glass-ceramic: Insights on crystallisation, residual glasses and  $\text{Zr}^{4+}$  structural environment

Cicconi M.R., Belli R., Brehl M., Lubauer J., Hayakawa T., Kimura K., Hirota T., Usui K., Kohara S., Onodera Y., Lohbauer U., Hayashi K., de Ligny D.

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Zhu Te, Jin Shuoxue, Yan Qingzhi, Wang Baoyi, Song Ligang, Hong Zhiyuan, Zhang Peng, Zhang Qiaoli, Fan Ping, Yuan Daqing, Cao Xingzhong, Ngan Alfonso H.W., Xu Qiu

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Toshimasa Yoshiie

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Atomic level control of association-dissociation behavior of In impurities in polycrystalline ZnO

Sato W., Takata M., Shimizu H., Komatsuda S., Yoshida Y., Moriyama A., Shimamura K., Ohkubo Y.

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**Science 379(6635) (2023) 908-912 (doi) 10.1126/science.abc4787**

Effects of hydrogen charging and deformation on tensile properties of a multi-component alloy for nuclear applications  
Zhu Te, Zhong Zhi-Hong, Sato Koichi, Song Ya-Min, Ye Feng-Jiao, Wang Qian-Qian, Dong Ye, Zhang Peng, Yu Run-Sheng, Wang Bao-Yi, Ngan Alfonso H. W., Cao Xing-Zhong, Xu Qiu

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Effects of Zr/Mo addition on He bubble formation in Y<sub>2</sub>O<sub>3</sub>-added W alloys

Xu Qiu, Miyamoto M., Luo Lai-Ma

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Atomic Level Control of Association-Dissociation Behavior of In Donors in ZnO

W. Sato, M. Takata, H. Shimizu, S. Komatsuda, Y. Ohkubo

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Development of High-Dose Rate Real-Time Monitors with an Optical Fiber

Shunsuke Kurosawa, Hiroki Tanaka, Takushi Takada, Daisuke Matsukura, Chihaya Fujiwara, Satoshi Ishizawa, Akihiro Yamaji, Shohei Kodama

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 28 (in Japanese)**

Development of very small d-spacing multilayers and neutron focusing supermirror

Masahiro Hino, Tatsuro Oda, Riichiro Nakamura, Hisao Yoshinaga, Takuya Hosobata, Masahiro Takeda, Yutaka Yamagata, Hitoshi Endo

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 19 (in Japanese)**

Evaluation of nanovoids in Si irradiated with hydrogen ions and annealed at high temperature by positron beams

Masatoshi Hiroe, Atsushi Kinomura, Kinji Uda, Kohtaku Suzuki, Toshihiko Hori, Koji Michishio, Seiya Manabe, Tetsuro Matsumoto

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 36 (in Japanese)**

Evaluation of Oxide Ion Conduction Properties on solid Oxide Fuel Cell Material YSZ Using Short-Lived Nucleus <sup>19</sup>O  
Y. Otani, M. Mihara, K. Matsuta, M. Fukuda, R. Wakabayashi, N. Okimoto, M. Fukutome, Y. Kimura, G. Takayama, T. Izumikawa, N. Noguchi, M. Ogose, M. Sato, K. Takatsu, T. Ohtsubo, D. Nishimura, H. Takahashi, S. Sugawara, A. Gladkov, H. Ishiyama, A. Kitagawa, S. Sato, S. Momota, H. Okumura, T. Moriguchi, A. Ozawa, K. Tomita, N. Nakase, A. Yano

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Gamma dose evaluation method with BeO OSLD in BNCT

Nishiki Matsubayashi, Takushi Takata, Naonori Ko, Akihiro Sasaki, Tetsuya Mukawa, Keita Suga, Yoshinori Sakurai, Hiroki Tanaka

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 20 (in Japanese)**

Interaction between radiation induced defects and hydrogen in bulk metals by using Gamma beam induced Positron Spectroscopy

S. Araki, X. Qiu, Y. Taira and F. Hori

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 17 (in Japanese)**

Mössbauer spectra of YIG substituted with Bi

M. Yishida, Y. Watanabe, Y. Kobayashi

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VIII" Online (Jan. 28, 2022) 18-21 (in Japanese)**

Solid State Physics Research via  $\beta$ -NMR

K. Matsuta

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VIII" Online (Jan. 28, 2022) 61-66 (in Japanese)**

Stability of novel neutron absorbing materials in coolant water and under low fluence irradiation

H. Ohta, K. Nakamura, T. Sano, Y. Takahashi

**The Nuclear Materials Conference (NuMAT2022) Ghent, Belgium (Oct. 24-28, 2022) O1-O5**

Study on Oxide Doped with Nb Mössbauer Spectroscopy

H. Rahman, S. Nakajima

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DX application to the field of nuclear materials and its issues (1)

Ken Kurosaki

**Journal of the Atomic Energy Society of Japan 10 (2022) 569-571 (in Japanese) (doi)10.3327/jaesjb.64.10\_569**

Topological analyses of structure of glassy materials toward extraction of order hidden in disordered structure

Yohei Onodera

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元素擬人化と動画コンテンツによる科学教育の可能性

Agedoridori, Masaya Kumagai, Ken Kurosaki

**Journal of the Thermoelectrics Society of Japan 19(2) (2022) 75-77 (in Japanese)**

量子ビーム回折によるガラス構造の研究—乱れた原子配列の理解から新規材料開発を目指す—

Yohei Onodera

**Ceramics Japan 57(8) (2022) 517-520 (in Japanese)**

## Books

Development and Market of Renewable Energy

豊島安健、西脇文男、菊地隆司、黒崎健、郷右近展之、飯野光政、海江田秀志、飯尾昭一郎、田丸浩、澤田陽樹、シーエムシー出版 編集部

**CMC Publishing (2023) (ISBN) 978-4-7813-1723-6**

## Others

Development of accident tolerant control rod (5) Leaching test of novel neutron absorbing materials in PWR coolant water

Hirokazu OHTA, Kinya NAKAMURA

**Atomic Energy Society of Japan 2022 Annual Meeting (2022) 3J10 (in Japanese)**

Development of Accident Tolerant Control Rod for Light Water Reactors- Stability of novel neutron absorbing materials in coolant water and under low fluence irradiation -

Hirokazu Ohta, Kinya Nakamura, Tadafumi Sano and Yoshiyuki Takahashi

**NuMat2022: The Nuclear Materials Conference (2022) O1.5**

High-temperature behavior of accident-tolerant control rods clad with Zr alloy during BDBA and SA leading to reaction with molten fuel

Kinya Nakamura, Hirokazu Ohta and Masahide Takano

**27th International QUENCH Workshop (2022)**

CRIEPI Accident Tolerant Control Rod update

Kinya Nakamura and Hirokazu Ohta

**12th Annual EPRI/DOE/INL Joint Combined Workshop on ATF and HBU (2023)**

化合物合金における空孔型欠陥と注入水素原子挙動に関する研究  
Fuminobu Hori  
**九州大学応用力学研究所共同利用研究成果報告書 25 (2022) 143 (in Japanese)**

TDPAC Measurement of  $^{111}\text{Cd}(\leftarrow^{111}\text{In})$  in Ultrafine Bubble Water  
M. Tanigaki, D. Hayashi, Y. Ohkubo, A. taniguchi, Y. Ueda, Y. Tokuda  
**KURNS Progress report 2021 (2022) 124**

TDPAC Spectra of the  $^{111}\text{Cd}(\leftarrow^{111}\text{mCd})$  and  $^{117}\text{In}(\leftarrow^{117}\text{Cd})$  Probes in  $\text{CdIn}_2\text{O}_4$   
W. Sato, S. Komatsuda, A. Taniguchi, M. Tanigaki, Y. Ohkubo  
**KURNS Progress report 2021 (2022) 112**

Concentration Dependence of Local Structures at Cd Sites in  $\text{Cd}_x\text{Sr}_{1-x}\text{TiO}_3$  studied by TDPAC Method  
S. Komatsuda, W. Sato, A. Taniguchi, M. tanigaki, Y. Ohkubo  
**KURNS Progress report 2021 (2022) 116**

## 5. Geochemistry and Environmental Science

### Papers

Development of Nondestructive Elemental Analysis System for Hayabusa2 Samples Using Muonic X-rays  
Osawa Takahito, Nagasawa Shunsaku, Ninomiya Kazuhiko, Takahashi Tadayuki, Nakamura Tomoki, Wada Taiga, Taniguchi Akihiro, Umegaki Izumi, Kubo Kenya M., Terada Kentaro, Chiu I-Huan, Takeda Shinichiro, Katsuragawa Miho, Minami Takahiro, Watanabe Shin, Azuma Toshiyuki, Mizumoto Kazumi, Yoshida Go, Takeshita Soshi, Tampo Motonobu, Shimomura Koichiro, Miyake Yasuhiro  
**ACS Earth and Space Chemistry 7(4) (2023) 699-711 (doi) 10.1021/acsearthspacechem.2c00303**

Vertical distribution of airborne microorganisms over forest environments: A potential source of ice-nucleating bioaerosols  
Maki Teruya, Hosaka Kentaro, Lee Kevin C., Kawabata Yasuhiro, Kajino Mizuo, Uto Maoto, Kita Kazuyuki, Igarashi Yasuhito  
**Atmospheric Environment 302 (2023) 119726 (doi) 10.1016/j.atmosenv.2023.119726**

Middle Miocene forearc alkaline magmatism in Amami-Oshima Island, central Ryukyu Arc: implications for paleoreconstruction of Shikoku Basin  
Motohashi Ginta, Ishizuka Osamu, Oda Hirokuni, Sano Takashi, Sekimoto Shun, Ujiie Kohtarō  
**Earth Planets and Space 75(1) (2023) 9 (doi) 10.1186/s40623-022-01760-w**

Origin and Age of Magmatism in the Northern Philippine Sea Basins  
Ishizuka Osamu, Tani Kenichiro, Taylor Rex N., Umino Susumu, Sakamoto Izumi, Yokoyama Yuka, Shimoda Gen, Harigane Yumiko, Ohara Yasuhiko, Conway Chris E., Perez Americus, Sekimoto Shun  
**Geochemistry, Geophysics, Geosystems 23(4) (2022) e2021GC010242 (doi) 10.1029/2021GC010242**

Stratigraphic reconstruction of the lower–middle Miocene Goto Group, Nagasaki Prefecture, Japan  
Kiyokawa Shoichi, Yasunaga Masaru, Hasegawa Takanori, Yamamoto Ayako, Kaneko Daisaku, Ikebata Yuta, Hasebe Noriko, Tsutsumi Yukiyasu, Takehara Mami, Horie Kenji  
**Island Arc 31(1) (2022) e12456 (doi) 10.1111/iar.12456**

History of Research and Developments, and Latest Trends in Decomposition Techniques for PFOS and PFOA in Water  
FUJIKAWA Yoko, HASHIGUCHI Ayumi  
**Journal of Environmental Conservation Engineering 51(6) (2022) 316-326 (in Japanese) (doi) 10.5956/jriet.51.6\_316**

ADSORPTION OF HEAVY METALS AND DISSOLUTION OF STRUCTURAL ELEMENTS FROM CLAY MINERALS EFFECTED BY HEAT TREATMENT  
Maiko IKEGAMI, Satoshi FUKUTANI  
**Journal of Japan Society of Civil Engineers, Ser. G (Environmental Research) 78(7) (2022) III\_449- III\_458 (in Japanese) (doi) 10.2208/jscej.78.7\_III\_449**

$^{87}\text{Sr}/^{86}\text{Sr}$  Isotopic Ratio of Ferromanganese Crusts as a Record of Detrital Influx to the Western North Pacific Ocean  
Azami Keishiro, Hirano Naoto, Kimura Jun-Ichi, Chang Qing, Sumino Hirochika, Machida Shiki, Yasukawa Kazutaka, Kato Yasuhiro  
**Minerals 12(8) (2022) 943 (doi) 10.3390/min12080943**

A pristine record of outer Solar System materials from asteroid Ryugu's returned sample

Ito Motoo *et al.*

**Nature Astronomy 6(10) (2022) 1163-171 (doi) 10.1038/s41550-022-01745-5**

Oxygen isotope evidence from Ryugu samples for early water delivery to Earth by CI chondrites

Greenwood Richard C. *et al.*

**Nature Astronomy 7 (2022) 29-38 (doi) 10.1038/s41550-022-01824-7**

Phase transition and melting in zircon by nanosecond shock loading

Takagi Sota, Ichiyanagi Kouhei, Kyono Atsushi, Kawai Nobuaki, Nozawa Shunsuke, Ozaki Norimasa, Seto Yusuke, Okuchi Takuo, Nitta Souma, Okada Satoru, Miyanishi Kohei, Sueda Keiichi, Togashi Tadashi, Yabuuchi Toshinori

**Physics and Chemistry of Minerals 49(5) (2022) 8 (doi) 10.1007/s00269-022-01184-8**

Impacts on air dose rates after the Fukushima accident over the North Pacific from 19 March 2011 to 2 September 2015

Wang Kuo-Ying, Nedelec Philippe, Clark Hannah, Harris Neil, Kajino Mizuo, Igarashi Yasuhito

**PLOS ONE 17(8) (2022) e0272937 (doi) 10.1371/journal.pone.0272937**

ACTIVITY CONCENTRATIONS OF RADIOCAESIUM, 90SR AND 129I IN AGRICULTURAL CROPS COLLECTED FROM FUKUSHIMA AND REFERENCE AREAS IN JAPAN, AND INTERNAL RADIATION DOSES

Tsukada H, Takahashi T, Fukutani S

**Radiation Protection Dosimetry 198 (13-15) (2022) 1104-1108 (doi) 10.1093/rpd/ncac066**

Formation and evolution of carbonaceous asteroid Ryugu: Direct evidence from returned samples

T. Nakamura *et al.*

**Science 379 (6634) (2023) 787 (doi) 10.1126/science.abn8671**

Noble gases and nitrogen in samples of asteroid Ryugu record its volatile sources and recent surface evolution

R. Okazaki *et al.*

**Science 379 (6634) (2022) eabo0431 (doi) 10.1126/science.abo0431**

First asteroid gas sample delivered by the Hayabusa2 mission: A treasure box from Ryugu

R. Okazaki *et al.*

**Science Advances 8(46) (2022) eabo7239 (doi) 10.1126/sciadv.abo7239**

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Comparison of the Mass Balance Trends of Organobromine in Sediments from Osaka Bay, Beppu Bay, and Lake Biwa  
Ito. K, Fujimori. T, Fukutani S, Anh. H. Q, Kuwae. M, Takaoka. M, Takahashi. S.

**Dioxin 2022 New Orleans, USA (Oct. 10-14, 2022)**

Comparison of the Temporal Trends of Extractable Organochlorine and Organobromine in Archive Samples  
Ito. K, Fujimori. T, Fukutani S, Mizukawa. H, Kunisue. T, Takaoka. M, Takahashi. S.

**Chemical Hazard Symposium Hokkaido, Japan (Jan. 12-13, 2023)**

Effect of Redox Condition on the Precipitation of Fe Oxide/Hydroxide in the Presence of Silicic Acid

H. HIRANO, K. YONEZU, T. YOKOYAMA

**International Symposium on Earth Science and Technology 2022 Fukuoka, Japan (Dec. 1-2, 2022) 232-237**

Generation of radiocesium-bearing microparticles originating from the Fukushima nuclear accident by laser heating  
Makoto Inagaki, Shun Sekimoto, Koichi Takamiya, Yuichi Oki, Tsutomu Ohtsuki

**Proceedings of the 23rd Workshop on Environmental Radioactivity Tsukuba, Japan (Mar. 8-10, 2022) 159-164 (in Japanese)**

Size distribution of metal elements of the atmospheric aerosol

Norio Ito, Akira Mizohata

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 37 (in Japanese)**

The Formation Factors of Silica Scale from Geothermal Water with Low Silica Concentration and Near Neutral pH

K. ARISATO, S. JUHRI, K. YONEZU, S. MIYABE, E. WATANABE, T. YOKOYAMA

**International Symposium on Earth Science and Technology 2022 Fukuoka, Japan (Dec. 1-2, 2022) 63-66**

大阪湾底質コアを用いた有機塩素マスバランスの時系列変化

Ito. K, Fujimori. T, Fukutani S, Kuwae. M, Takaoka. M, Takahashi. S.

**第 30 回環境化学討論会 Toyama, Japan (Jun. 13-16 2022) 227-278 (in Japanese)**

中性子放射化分析における揮発性液体試料中塩素・臭素の測定方法の検討

Ito. K, Fujimori. T, Shiota. S, Fukutani S, Oshita. K, Takaoka. M, Takahashi. S.

**第 30 回環境化学討論会 Toyama, Japan (Jun. 13-16 2022) 430-431 (in Japanese)**

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Progress of radiocesium studies and contributions from soil and plant sciences

3. Current status and problems of agricultural land after decontamination

Takashi Saito, Minoru Tanigaki

**Japanese Journal of Soil Science and Plant Nutrition 94(1) (2023) 38-43 (in Japanese)**

Ultrafast structure transformation of olivine to ringwoodite during laser-driven shock compression

Takuo Okuchi

**SPring-8/SACLA Research Frontiers 2021 21 (2022) 94-95**

特集のねらい〈有機フッ素化合物の分析と分解処理〉

Yoko Fujikawa

**環境技術 51(5) (2022) 239 (in Japanese)**

## Others

石の年齢をはかる

Osamu Ishizuka

**毎日小学生新聞 2022.8.16 号 (2022) (in Japanese)**

## 6. Life Science and Medical Science

### Papers

Rapid and Highly Stable Membrane Reconstitution by LAiR Enables the Study of Physiological Integral Membrane Protein Functions

Godoy-Hernandez Albert, Asseri Amer H., Purugganan Aiden J., Jiko Chimari, de Ram Carol, Lill Holger, Pabst Martin, Mitsuoka Kaoru, Gerle Christoph, Bald Dirk, McMillan Duncan G. G.

**ACS Central Science 9(3) (2023) 494- 507 (doi) 10.1021/acscentsci.2c01170**

Protonation states of hen egg-white lysozyme observed using D/H contrast neutron crystallography

Chatake Toshiyuki, Tanaka Ichiro, Kusaka Katsuhiro, Fujiwara Satoru

**Acta Crystallographica Section D Structural Biology 78(6) (2022) 770-778**

**(doi) 10.1107/S2059798322004521**

Efficient Multiple Domain Ligation for Proteins Using Asparaginyl Endopeptidase by Selection of Appropriate Ligation Sites Based on Steric Hindrance

Okuda Aya, Shimizu Masahiro, Inoue Rintaro, Urade Reiko, Sugiyama Masaaki

**Angewandte Chemie International Edition 62(1) (2022) e202214412 (doi) 10.1002/anie.202214412**

Induction of Paraptosis by Cyclometalated Iridium Complex-Peptide Hybrids and CGP37157 via a Mitochondrial Ca<sup>2+</sup> Overload Triggered by Membrane Fusion between Mitochondria and the Endoplasmic Reticulum

Yokoi Kenta, Yamaguchi Kohei, Umezawa Masakazu, Tsuchiya Koji, Aoki Shin

**Biochemistry 61(8) (2022) 639-655 (doi) 10.1021/acs.biochem.2c00061**

Design, Synthesis, and Anticancer Activity of Triptycene-Peptide Hybrids that Induce Paraptotic Cell Death in Cancer Cells

Yamaguchi Kohei, Yokoi Kenta, Umezawa Masakazu, Tsuchiya Koji, Yamada Yasuyuki, Aoki Shin **Bioconjugate**

**Chemistry 33(4) (2022) 691-717 (doi) 10.1021/acs.bioconjchem.2c00076**

Design, synthesis and biological evaluation of 2-pyrrolone derivatives as radioprotectors  
Sato Hidetoshi, Ochi Shintaro, Mizuno Kosuke, Saga Yutaka, Ujita Shohei, Toyoda Miyu, Nishiyama Yuichi, Tada Kasumi, Matsushita Yosuke, Deguchi Yuichi, Suzuki Keiji, Tanaka Yoshimasa, Ueda Hiroshi, Inaba Toshiya, Hosoi Yoshio, Morita Akinori, Aoki Shin

**Bioorganic & Medicinal Chemistry** 67 (2022) 116764 (doi) 10.1016/j.bmc.2022.116764

Identification of D-amino Acid Residues in Proteins Using Mass Spectrometry

Takumi Takata

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Multi-Targeted Neutron Capture Therapy Combined with an 18 kDa Translocator Protein-Targeted Boron Compound Is an Effective Strategy in a Rat Brain Tumor Model

Kashiwagi Hideki, Hattori Yoshihide, Kawabata Shinji, Kayama Ryo, Yoshimura Kohei, Fukuo Yusuke, Kanemitsu Takuya, Shiba Hiroyuki, Hiramatsu Ryo, Takami Toshihiro, Takata Takushi, Tanaka Hiroki, Watanabe Tsubasa, Suzuki Minoru, Hu Naonori, Miyatake Shin-Ichi, Kirihata Mitsunori, Wanibuchi Masahiko

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A Novel Amphotericin B Hydrogel Composed of Poly(Vinyl Alcohol)/Borate Complex for Ophthalmic Formulation  
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ZBTB<sub>2</sub> links p53 deficiency to HIF-1-mediated hypoxia signaling to promote cancer aggressiveness

Koyasu Sho, Horita Shoichiro, Saito Keisuke, Kobayashi Minoru, Ishikita Hiroshi, Chow Christalle CT, Kambe Gouki, Nishikawa Shigeto, Menju Toshi, Morinibu Akiyo, Okochi Yasushi, Tabuchi Yoshiaki, Onodera Yasuhito, Takeda Norihiko, Date Hiroshi, Semenza Gregg L, Hammond Ester M, Harada Hiroshi

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Effect of N-benzyl group in indole scaffold of thiosemicarbazones on the biological activity of their Pd(II) complexes: DFT, biomolecular interactions, in silico docking, ADME and cytotoxicity studies

Balakrishnan Nithya, Haribabu Jebiti, Eshaghi Malekshah Rahime, Swaminathan Srividya, Balachandran Chandrasekar, Bhuvanesh Nattamai, Aoki Shin, Karvembu Ramasamy

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Kita Akiko, Morimoto Yukio

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Altered gene expression levels of evolved radioresistant E. coli relative to wild-type E. coli  
Takeshi Saito  
**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023)** 31 (in Japanese)

Gallium isotope ratio of samples of GSJ standard rocks  
Rikuya Aso, Chizu Kato, Satoshi Fukutani, Ryoichi Nakada, Kazuya Nagaishi, Shigeyuki Wakaki, Toshiyuki Fujii  
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Yuta Kagasawa, Ingu Kim, Takumi Takata  
**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023)** 38 (in Japanese)

Neutron crystallographic approach to reveal hydration structure of protein  
Toshiyuki Chatake, Ichiro Tanaka, Katsuhiko Kusaka, Tomoko Sunami, Satoru Fujiwara  
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Production experiments for  $^{225}\text{Ac}$  using an electron linear accelerator and radiolabeling tests using the produced alpha emitter  
M. Maeda, T. Tadokoro, Y. Ueno, K. Nishida, Y. Kani, T. Sasaki, T. Watanabe, H. Kikunaga, S. Kashiwagi, K. Shirasaki, S. Sekimoto, T. Ohtsuki, M. Inagaki, S. Fukutani, Y. Shibahara, H. Fujii, M. Yoshimoto, K. Ohnuki  
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Haruna Sugawa, Takumi Takata  
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Cataract: Lens Protein Misfolding Disease  
Takumi Takata  
**日本白内障学会誌** 34(1) (2022) 23-28 (in Japanese)

Identification of D-amino Acid Residues in Proteins Using Mass Spectrometry  
Takumi Takata  
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Multistep growth of amyloid intermediates and its inhibition toward exploring therapeutic way: A case study using insulin B chain and fibrinogen  
Yamamoto Naoki, Chatani Eri  
**Biophysics and Physicobiology** 19 (2023) 3190017 (doi)10.2142/biophysico.bppb-v19.0017

Post-complexation Functionalization of Cyclometalated Iridium(III) Complexes and Applications to Biomedical and Material Sciences  
Aoki Shin, Yokoi Kenta, Hisamatsu Yosuke, Balachandran Chandrasekar, Tamura Yuichi, Tanaka Tomohiro  
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## 7. Neutron Capture Therapy

### Papers

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Tsujino Kohei, Kashiwagi Hideki, Nishimura Kai, Kayama Ryo, Yoshimura Kohei, Fukuo Yusuke, Shiba Hiroyuki, Hiramatsu Ryo, Nonoguchi Naosuke, Furuse Motomasa, Takami Toshihiro, Miyatake Shin-Ichi, Hu Naonori, Takata Takushi, Tanaka Hiroki, Suzuki Minoru, Kawabata Shinji, Nakamura Hiroyuki, Wanibuchi Masahiko

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DNA damage and biological responses induced by Boron Neutron Capture Therapy (BNCT)

Natsuko Kondo

**Enzymes 51 (2022) 65-78 (doi) 10.1016/bs.enz.2022.08.005**

Measurements of  $\gamma$ -rays and neutrons in BNCT irradiation field using thermoluminescent phosphor

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**Japanese Journal of Applied Physics 62(1) (2022) 010502 (doi) 10.35848/1347-4065/ac971e**

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**Japanese Journal of Clinical Oncology 52(5) (2022) 433-440 (doi) 10.1093/jjco/hyac004**

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Tanaka Masaya, Oh Ryoken, Sugioka Natsumi, Tanaka Hiroki, Takata Takushi, Wakabayashi Genichiro, Sugawara Satoru, Watanabe Kenichi, Uritani Akira, Yoshihashi Sachiko, Nagasaka Kosei, Okada Go, Negishi Toru, Shinsho Kiyomitsu

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Hu Naonori, Tanaka Hiroki, Akita Kazuhiko, Kakino Ryo, Aihara Teruhito, Nihei Keiji, Ono Koji

**Journal of Neutron Research 24(3-4) (2023) 359-366 (doi) 10.3233/JNR-220037**

Analysis of boron neutron capture reaction sensitivity using Monte Carlo simulation and proposal of a new dosimetry index in boron neutron capture therapy

Takeno Satoshi, Tanaka Hiroki, Ono Koji, Mizowaki Takashi, Suzuki Minoru

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**Journal of Radiation Research 64(1) (2023) 91-98 (doi) 10.1093/jrr/rrac077**

Determining a methodology of dosimetric quality assurance for commercially available accelerator-based boron neutron capture therapy system

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**Journal of Radiation Research 63(4) (2022) 620-635 (doi) 10.1093/jrr/rrac030**

Intensity-modulated irradiation for superficial tumors by overlapping irradiation fields using intensity modulators in accelerator-based BNCT

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The impact of TP53 status of tumor cells including the type and the concentration of administered  $^{10}\text{B}$  delivery agents on compound biological effectiveness in boron neutron capture therapy  
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**Medical Physics** 49(8) (2022) 4944-4954 (doi) 10.1002/mp.15823

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Hu Naonori, Tanaka Hiroki, Ono Koji

**Medical Physics** 49(10) (2022) 6609-6621 (doi) 10.1002/mp.15864

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Matsubayashi Nishiki, Hu Naonori, Takata Takushi, Sasaki Akinori, Nojiri Mai, Mukawa Tetsuya, Sakurai Yoshinori, Tanaka Hiroki

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Characteristics of optically stimulated luminescent dosimeter of beryllium oxide in BNCT irradiation field  
Matsubayashi Nishiki, Hu Naonori, Takata Takushi, Sasaki Akinori, Mukawa Tetsuya, Suga Keita, Sakurai Yoshinori, Tanaka Hiroki

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**Scientific Reports** 12(1) (2022) 13778 (doi) 10.1038/s41598-022-17974-7

Persistent elevation of lysophosphatidylcholine promotes radiation brain necrosis with microglial recruitment by P2RX4 activation

Kondo Natsuko, Sakurai Yoshinori, Takata Takushi, Kano Kuniyuki, Kume Kyo, Maeda Munetoshi, Takai Nobuhiko, Suzuki Shugo, Eto Fumihiko, Kikushima Kenji, Wanibuchi Hideki, Miyatake Shin-Ichi, Kajihara Takayuki, Oda Shoji, Setou Mitsutoshi, Aoki Junken, Suzuki Minoru

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Polyglycerol Functionalized  $^{10}\text{B}$  Enriched Boron Carbide Nanoparticle as an Effective Bimodal Anticancer Nanosensitizer for Boron Neutron Capture and Photothermal Therapies

Wang Yuquan, Reina Giacomo, Kang Heon Gyu, Chen Xiaoxiao, Zou Yajuan, Ishikawa Yoshie, Suzuki Minoru, Komatsu Naoki

**Small** 18(37) (2022) 2204044 (doi) 10.1002/sml.202204044

# 類上皮肉腫に対するホウ素中性子捕捉療法(BNCT)を用いた新たな治療方法の開発

Takuya Fujimoto, Tooru Andoh, Toshiko Sakuma, Ikuo Fujita, Masayuki Morishita, Masahide Fujita, Teruya Kawamoto, Ryosuke Kuroda, Akisue Toshihiro, Takanori Hirose, Minoru Suzuki

**The Journal of the Japanese Orthopaedic Association 96(6) (2022) S1300 (in Japanese)**

## Proceedings

### Advancement of integrated system for dose estimation in BNCT

Yoshinori Sakurai, Kenichi Watanabe, Sachiko Yoshihashi, Akihiko Masuda, Masayori Ishikawa, Akihiro Nohtomi, Isao Murata, Satoru Endo, Kenichi Tanaka, Shoji Uno, Kiyomitsu Shinsho, Masataka Oita, Shinichiro Hayashi, Hiroki Tanaka, Shunsuke Kurosawa, Toru Tanimori, Atsushi Takada, Satoshi Nakamura, Tak:ushi Takata, Tak:eshi Kamomae, Hiroyuki Michiue, Hiroshi Yasuda, Shinichiro Kuroki, Kazuyo Igawa

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 46-50 (in Japanese)**

### Attempts to enhance the anti-tumor effects of BNCT by targeting the tumor microenvironment

Yu Sanada, Takushi Takata, Hiroki Tanaka, Yoshinori Sakurai, Tsubasa Watanabe

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### Biology study for BNCT

Yuko Kinashi

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 12-14 (in Japanese)**

### Commissioning of the world's first clinical BNCT treatment planning system and validation against an independent Monte Carlo dose calculation system

Naonori Hu

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 6 (in Japanese)**

### Development of carborane-containing amino acid derivatives for boron neutron capture therapy (BNCT)

H. Nagasawa

**2023 Taiwan-Japan Neutron Capture Therapy Academic Conference of Elite Hsinchu, Taiwan (Mar. 18, 2023) 34-35**

### Evaluation of thermal neutron flux using Imaging Plate for BNCT

Mai Nojiri, Takushi Takata, Yoshinori Sakurai, Minoru Suzuki, Hiroki Tanaka

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 27 (in Japanese)**

### Investigation of the effects on the ambient environment by activation of animals' bodies for the adaptation of BNCT to companion animals

Yusuke Wada, Takushi Takata, Minoru Suzuki

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 10-11 (in Japanese)**

### Structural Analysis of Solid-Liquid Interface by Neutron Reflectometry for Tribology Study

Naoki Yamashita, Tomoko Hirayama, Masahiro Hino

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15 2023) 40 (in Japanese)**

### Study of dose distribution formation by neutron intensity-modulated irradiation method for accelerator-based BNCT

Akinori Sasaki, Naonori Hu, Takushi Takata, Nishiki Matsubayashi, Yoshinori Sakurai, Minoru Suzuki, Hiroki Tanaka

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### ホウ素中性子捕捉療法 (BNCT) がマウス正常骨に与える生物学的影響

Ryota Iwasaki, Ryutaro Yoshikawa, Takashi Mori, Takehisa Matsukawa, Satoshi Takeno, Minoru Suzuki, Koji Ono

**日本放射線腫瘍学会第 59 回生物部会学術大会, Sapporo, Japan (Jun. 24-25 2022) 27 (in Japanese)**

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BNCT/Neutrons in Clinical Practice: BNCT  
Hiroki Tanaka

**Japanese Journal of Medical Physics (Igakubutsuri) 42(3) (2022) 143-148 (in Japanese)**

Measurements of  $\gamma$ -rays and neutrons in BNCT irradiation field using thermoluminescent phosphor  
Shinsho Kiyomitsu, Oh Ryoken, Tanaka Masaya, Sugioka Natsumi, Tanaka Hiroki, Wakabayashi Genichiro, Takata Takushi, Chang Weishan, Matsumoto Shinnosuke, Okada Go, Sugawara Satoru, Sasaki Ema, Watanabe Kenichi, Koba Yusuke, Nagasaka Kosei, Yoshihashi Sachiko, Uritani Akira, Negishi Toru

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Kazuyo Igawa, Hiroyuki Michiue, Atsushi Fujimura

**Medical Science Digest (2023) (in Japanese)**

## Others

Computational investigation of polymer gel composition doped with  $^{33}\text{S}$  for epithermal neutron measurement for BNCT  
K. Tanaka, T. Kajimoto, Y. Sakurai, S. Hayashi, H. Tanaka, T. Takata, G. Bengua, S. Endo

**Bulletin of Kyoto Pharmaceutical University 3(2) (2023) 224-236**

## 8. Neutron Radiography and Radiation Application

### Papers

Evaluation of subcooled void fraction in downward flow under low mass flux condition by using neutron radiography  
Ami Takeyuki, Umekawa Hisashi, Ito Daisuke, Saito Yasushi

**Experimental Thermal and Fluid Science 141 (2023) 110799 (doi) 10.1016/j.expthermflusci.2022.110799**

Investigation of neutron imaging applications using fine-grained nuclear emulsion

Muneem Abdul, Yoshida Junya, Ekawa Hiroyuki, Hino Masahiro, Hirota Katsuya, Ichikawa Go, Kasagi Ayumi, Kitaguchi Masaaki, Muto Naoto, Mishima Kenji, Nabi Jameel-Un, Nakagawa Manami, Naganawa Naotaka, Saito Takehiko R.

**Journal of Applied Physics 133(5) (2023) 054902 (doi) 10.1063/5.0131098**

Effects of the mixer shape in a flow-type supercritical hydrothermal reactor as evaluated by neutron radiography and  $\text{CeO}_2$  nanoparticle synthesis

Sato Kosei, Sasaki Ryosuke, Xie Bo, Takami Seiichi, Kubo Masaki, Tsukada Takao, Sugimoto Katsumi, Odaira Naoya, Ito Daisuke, Saito Yasushi

**Reaction Chemistry & Engineering (2023) (doi) 10.1039/D3RE00018D**

### Proceedings

Frost Formation on Automobile Heat Exchange

Rikuto Kuroda, Ryosuke Matsumoto, Yutaka Oda, Ao Fukai, Kenta Kida, Hiroshi Iikura, Keisuke Kurita

**2022 JSRAE Annual Conference Okayama, Japan (Sep. 7-9, 2022) B124 (in Japanese)**

Neutron imaging of thermal-hydraulic phenomena under severe conditions

Daisuke Ito, Naoya Odaira, Kei Ito, Yasushi Saito

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 41-42 (in Japanese)**

Neutron phase imaging of INCONEL rods fabricated by additive manufacturing

Yoshichika Seki, Masahiro Hino, Riichiro Nakamura, Takenao Shinohara, Tomoko Hirayama

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 25 (in Japanese)**

Project for Neutron Imaging

Yasushi Saito, Daisuke Ito, Naoya Odaira

**Proceedings of the 57th KURNS Scientific Meeting Online/Kumatori, Japan (Feb. 14-15, 2023) 43-45 (in Japanese)**

## Review

Frosting Phenomena on Heat Exchanger and Frost Micro Structure

—Novel Development on the Frost Research by Using Radiography Technique—

Ryosuke Matsumoto

**Eurozoru Kenkyu 37(4) (2022) 268-274 (in Japanese)**

## 9. TRU and Nuclear Chemistry

### Papers

Improvement of spatial resolution of elemental imaging using laser ablation-ICP-mass spectrometry

Tanaka Eisei, Matsukawa Takehisa, Kuroki Yasuo, Suzuki Minoru, Yokoyama Kazuhito, Hirata Takafumi

**Analytical Sciences 38(4) (2022) 695-702 (doi) 10.1007/s44211-022-00085-8**

Non-Destructive Composition Identification for Mixtures of Iron Compounds Using a Chemical Environmental Effect on a Muon Capture Process

Ninomiya Kazuhiko, Kajino Meito, Nambu Akihiro, Inagaki Makoto, Kudo Takuto, Sato Akira, Terada Kentaro, Shinohara Atsushi, Tomono Dai, Kawashima Yoshitaka, Sakai Yoichi, Takayama Tsutomu

**Bulletin of the Chemical Society of Japan 95(12) (2022) 1769-1774 (doi) 10.1246/bcsj.20220289**

Influence of additives on low-temperature hydrothermal synthesis of  $\text{UO}_{2+x}$  and  $\text{ThO}_2$

Tabata Chihiro, Shirasaki Kenji, Sakai Hironori, Sunaga Ayaki, Li Dexin, Konaka Mariko, Yamamura Tomoo

**CrystEngComm 22(22) (2022) (doi) 10.1039/D2CE00278G**

Diffuse Basis Functions for Relativistic s and d Block Gaussian Basis Sets Dyll

Kenneth G., Tecmer Paweł, Sunaga Ayaki

**Journal of Chemical Theory and Computation 19(1) (2023) 198-210 (doi) 10.1021/acs.jctc.2c01050**

Homogeneity of (U, M) $\text{O}_2$  (M = Th, Np) prepared by supercritical hydrothermal synthesis

Shirasaki Kenji, Tabata Chihiro, Sunaga Ayaki, Sakai Hironori, Li Dexin, Konaka Mariko, Yamamura Tomoo

**Journal of Nuclear Materials 563 (2022) 153608 (doi) 10.1016/j.jnucmat.2022.153608**

Thermal-Neutron capture cross-section measurements of Neptunium-237 with graphite thermal column in KUR  
Nakamura Shoji, Shibahara Yuji, Endo Shunsuke, Kimura Atsushi

**Journal of Nuclear Science and Technology 59(11) (2022) 1388-1398 (doi) 10.1080/00223131.2022.2058639**

Structural Approach to Understanding the Formation of Amorphous Metal Hydroxides

Kobayashi Taishi, Fushimi Tomokazu, Mizukoshi Hirofumi, Motokawa Ryuhei, Sasaki Takayuki

**Langmuir 38(48) (2022) 14656-14665 (doi) 10.1021/acs.langmuir.2c02081**

Phase analysis of simulated nuclear fuel debris synthesized using  $\text{UO}_2$ , Zr, and stainless steel and leaching behavior of the fission products and matrix elements

Tonna Ryutaro, Sasaki Takayuki, Kodama Yuji, Kobayashi Taishi, Akiyama Daisuke, Kirishima Akira, Sato Nobuaki, Kumagai Yuta, Kusaka Ryoji, Watanabe Masayuki

**Nuclear Engineering and Technology 4 (2022) 1300-1309 (doi) 10.1016/j.net.2022.12.017**

Discovery of New Isotope  $\text{U}^{241}$  and Systematic High-Precision Atomic Mass Measurements of Neutron-Rich Pa-Pu Nuclei Produced via Multinucleon Transfer Reactions

Niwase T., Watanabe Y. X., Hirayama Y., Mukai M., Schury P., Andreyev A. N., Hashimoto T., Iimura S., Ishiyama H., Ito Y., Jeong S. C., Kaji D., Kimura S., Miyatake H., Morimoto K., Moon J.-Y., Oyaizu M., Rosenbusch M., Taniguchi A., Wada M.

**Physical Review Letters 130 (2023) 132502 (doi) 10.1103/PhysRevLett.130.132502**

A summary of environmental radioactivity research studies by members of the Japan Society of Nuclear and Radiochemical Sciences

Y. Igarashi, K. Tagami, K. Takamiya, A. Shinohara

**Radiochimica Acta 110(6-9) (2022) 785-797 (doi) 10.1515/ract-2022-0019**

Sr(ii) extraction by crown ether in HFC: entropy driven mechanism through H<sub>2</sub> PFTOUD

Shirasaki Kenji, Nagai Mitsuie, Nakase Masahiko, Tabata Chihiro, Sunaga Ayaki, Yaita Tsuyoshi, Yamamura Tomoo

**RSC Advances 12(41) (2022) 26922-26933 (doi) 10.1039/d2ra04411k**

Linearity and Chemical Bond of UO<sub>2</sub><sup>2+</sup> Revisited: A Comparison Study with UN<sub>2</sub> and UE<sub>2</sub><sup>2+</sup> (E = S, Se, and Te) Based on Relativistic Calculations

Sunaga Ayaki, Tabata Chihiro, Yamamura Tomoo

**The Journal of Physical Chemistry A 126(46) (2022) 8606-8617 (doi) 10.1021/acs.jpca.2c05216**

## Proceedings

Characteristics of solvent extraction of antimony from nitric acid solutions using a new extractant

Chuya Saiga, Chizu Kato, Satoshi Fukutani, Tatsuro Matsumura, Toshiyuki Fujii

**Proceedings of the 57th KURNS Scientific Meeting, Online/Kumatori, Japan (Feb. 14-15, 2023) 24 (in Japanese)**

Experiments on the formation of radionuclide endohedral fullerenes by laser

Makoto Inagaki

**Proceedings of the 57th KURNS Scientific Meeting, Online/Kumatori, Japan (Feb. 14-15, 2023) 4-5 (in Japanese)**

Gallium concentrations in GSJ standard materials

Chizu Kato, Satoshi Fukutani, Toshiyuki Fujii

**Proceedings of the 57th KURNS Scientific Meeting, Online/Kumatori, Japan (Feb. 14-15, 2023) 16 (in Japanese)**

Redox behavior of vanadium ions in sodium orthovanadate solutions

Yuki Yokoyama, Akihiro Uehara, Naoya Wada, Renki Sugiyama, Takuma Mototani, Chizu Kato, Toshiyuki Fujii

**Proceedings of the 57th KURNS Scientific Meeting, Online/Kumatori, Japan (Feb. 14-15, 2023) 23 (in Japanese)**

Redox reaction of vanadium ions in the malonic acid system

Renki Sugiyama, Akihiro Uehara, Naoya Wada, Yuki Yokoyama, Takuma Mototani, Chizu Kato, Toshiyuki Fujii

**Proceedings of the 57th KURNS Scientific Meeting, Online/Kumatori, Japan (Feb. 14-15, 2023) 33 (in Japanese)**

Solvent extraction characteristics of europium and erbium from nitric acid solutions using a novel extractant

Masaya Ikeno, Chizu Kato, Satoshi Fukutani, Tatsuro Matsumura, Toshiyuki Fujii

**Proceedings of the 57th KURNS Scientific Meeting, Online/Kumatori, Japan (Feb. 14-15, 2023) 15 (in Japanese)**

Study of Isotope Separation via Chemical Exchange Reaction

Ryuta Hazama, Takaaki Yoshimoto, Kumsut Pantawa, Anawat Rattirong, Yoichi Sakuma, Toshiyuki Fujii, Satoshi Fukutani, Yuji Shibahara

**Proceedings of the 57th KURNS Scientific Meeting, Online/Kumatori, Japan (Feb. 14-15, 2023) 34 (in Japanese)**

Study on the solid phase and solubility of Zr, Ce oxide solid solutions

Yutaro Sato, Taishi Kobayashi, Takayuki Sasaki, Atsushi Ikeda-Ohno, Daiju Matsumura, Ryuhei Motokawa

**Proceedings of the 57th KURNS Scientific Meeting, Online/Kumatori, Japan (Feb. 14-15, 2023) 35 (in Japanese)**

## Review

Discussion on Translational Research of Drug Product for Targeted Alpha Therapy-Part 8-Discussion on Targeted Alpha Therapy for Viral Infection

Yano Tsuneo, Takeshi Fuchigami, Yutaka Takahashi, Yuichiro Kadonaga, Koki Hasegawa, Hiroki Kato, Tadashi Watabe, Tomoo Yamamura, Tatsuhiko Sato, Hirabayashi Yoko, Hirofumi Fujii, Yoshiharu Yonekura, Koichi Fukase

**Pharmaceutical and medical device regulatory science 38(13) (2022) 2187-2200 (in Japanese)**

## 10. Health Physics and Waste Management

### Papers

Development of stabilization treatment technology for radioactive aluminum waste  
SEKI Misaki, FUJITA Yoshitaka, FUJIHARA Yasuyuki, J. Zhang, YOSHINAGA Hisao, SANO Tadafumi, HORI Junichi, NAGATA Hiroshi, OTSUKA Kaoru, OMORI Takazumi, TAKEUCHI Tomoaki, IDE Hiroshi, TSUCHIYA Kunihiro  
**Journal of Nuclear Fuel Cycle and Environment** 29(1) (2022) 2-9 (in Japanese) (doi) 10.3327/jnuce.29.1\_2

Potential alpha particle detection with thin poly (ether sulfone) substrates  
Nakamura Hidehito, Mori Kazuhiro, Shirakawa Yoshiyuki  
**Physica Scripta** 97(8) (2022) 085303 (doi) 10.1088/1402-4896/ac807e

DEVELOPMENT OF A ROBOT FOR THE MEASUREMENT OF RADIOACTIVE CONTAMINATION AND FERTILITY OF THE SOIL IN FARMLAND  
Tanigaki Minoru, Inoue Yoshio, Momota Sadao, Saito Takashi, Nemoto Tomoaki, Ono Tsukasa, Wada Akira, Ohashi Masaharu, Tsuno Koichi, Kano Masahiro, Matsuura Takahiro, Yasuoka Tadaaki, Hanai Hiroyuki, Arakawa Koichi  
**Radiation Protection Dosimetry** 198(13-15) (2022) 964-970 (doi) 10.1093/rpd/ncac020

### Reviews

Development of stabilization treatment technology for radioactive aluminum waste  
SEKI Misaki, FUJITA Yoshitaka, FUJIHARA Yasuyuki, J. Zhang, YOSHINAGA Hisao, SANO Tadafumi, HORI Junichi, NAGATA Hiroshi, OTSUKA Kaoru, OMORI Takazumi, TAKEUCHI Tomoaki, IDE Hiroshi, TSUCHIYA Kunihiro  
**Journal of Nuclear Fuel Cycle and Environment** 29(1) (2022) 2-9 (in Japanese) (doi) 10.3327/jnuce.29.1\_2

Study on a relation between effective dose equivalents and risk weighted dose equivalents depending on age and sex.  
Urabe Isumasa  
**Japanese Journal of Health Physics** 21(4) (2022) 251-256 (in Japanese) (doi) 10.5453/jhps.21.251

## 11. Accelerator Physics

### Papers

Development of Combined-Function Multipole Permanent Magnet for High-Intensity Beam Transportation  
Fuwa Y., Takayanagi T., Iwashita Y.  
**IEEE Transactions on Applied Superconductivity** 32(6) (2022) 4006705 (doi) 10.1109/TASC.2022.3176251

Magnetic Field Shielding With Superconductors  
Iwashita Y., Kuriyama Y., Tongu H., Fuwa Y.  
**IEEE Transactions on Applied Superconductivity** 32(6) (2022) 3500404 (doi) 10.1109/tasc.2022.3167623

Performance of Bipolar Correction Magnet with Permanent Magnets  
Kuriyama Yasutoshi, Iwashita Yoshihisa, Fuwa Yasuhiro, Terunuma Nobuhiro  
**IEEE Transactions on Applied Superconductivity** 32(6) (2022) 1-4 (doi) 10.1109/TASC.2022.3180300

Properties of Praseodymium Permanent Magnet for Cryogenic Hybrid Magnet  
Fuwa Yasuhiro, Iwashita Yoshihisa, Kondo Akihiro  
**IEEE Transactions on Applied Superconductivity** 32(6) (2022) 4007304 (doi) 10.1109/TASC.2022.3179996

Measurement of 107-MeV proton-induced double-differential thick target neutron yields for Fe, Pb, and Bi using a fixed-field alternating gradient accelerator at Kyoto University  
Iwamoto Hiroki, Nakano Keita, Meigo Shin-Ichiro, Satoh Daiki, Iwamoto Yosuke, Sugihara Kenta, Nishio Katsuhisa, Ishi Yoshihiro, Uesugi Tomonori, Kuriyama Yasutoshi, Yashima Hiroshi, Okabe Kota, Makii Hiroyuki, Hirose Kentaro, Orlandi Riccardo, Suzaki Fumi, Oizumi Akito, Tsukada Kazuaki, Maekawa Fujio, Mori Yoshiharu  
**Journal of Nuclear Science and Technology** 60(4) (2022) 435-449 (doi) 10.1080/00223131.2022.2115423

Study on construction of an additional beamline for a compact neutron source using a 30 MeV proton cyclotron  
Kuriyama Y., Hino M., Iwashita Y., Nakamura R., Tanaka H.  
**Journal of Physics: Conference Series** 2420 (2022) 012110 (doi) 10.1088/1742-6596/2420/1/012110

Ionoacoustic application of an optical hydrophone to detect proton beam range in water  
Sueyasu Shota, Takayanagi Taisuke, Miyazaki Koichi, Kuriyama Yasutoshi, Ishi Yoshihiro, Uesugi Tomonori, Unlu Mehmet Burcin, Kudo Nobuki, Chen Ye, Kasamatsu Koki, Fujii Masayuki, Kobayashi Masanori, Rohringer Wolfgang, Matsuura Taeko  
**Medical Physics** 50(4) (2023) 2438- 2449 (doi) 10.1002/mp.16189

## Proceedings

FABRICATION AND LOW-POWER TEST OF DISK-AND-WASHER CAVITY FOR MUON ACCELERATION  
Y. Takeuchi, J. Tojo, Y. Nakazawa, Y. Kondo, R. Kitamura, T. Morishita, E. Cicek, H. Ego, K. Futatsukawa, N. Kawamura, M. Otani, T. Yamazaki, M. Yoshida, T. Mibe, N. Saito, Y. Iwashita, U. Sue, K. Sumi, M. Yotsuzuka, H. Yasuda  
**13th International Particle Accelerator Conference (IPAC22) Bangkok, Thailand (Jun. 12-17, 2022) 1534-1537**

MAGNETIC FIELD SHIELD FOR SC-CAVITY WITH THIN Nb SHEET  
Y. Iwashita, Y. Kuriyama, H. Tongu, Y. Fuwa  
**13th International Particle Accelerator Conference (IPAC22) Bangkok, Thailand (Jun. 12-17, 2022) 3090-3092**

Spin-Polarized Beam Production by Low-Energy Nuclear Reaction Using Inverse kinematics  
M. Mihara, Y. Otani, Y. Kimura, T. Sugisaki, T. Moriguchi, A. Yano, K. Tomita, N. Kaname, A. Ozawa, H. Ishiyama, M. Fukutome, G. Takayama, R. Uda, H. Yuta, M. Fukuda  
**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VIII" Online (Jan. 28, 2022) 30-34 (in Japanese)**

STUDY ON CONSTRUCTION OF AN ADDITIONAL BEAMLINE FOR A COMPACT NEUTRON SOURCE USING A 30 MeV PROTON CYCLOTRON  
Y. Kuriyama, M. Hino, Y. Iwashita, R. Nakamura, H. Tanaka  
**13th International Particle Accelerator Conference (IPAC22) Bangkok, Thailand (Jun. 12-17, 2022) 3087- 3089**

## 12. Other

### Papers

Ultralow Thermal Conductivity of Highly Dense ZrW<sub>2</sub>O<sub>8</sub> Ceramics with Negative Thermal Expansion  
Tanusilp Sora-at, Kumagai Masaya, Ohishi Yuji, Furusawa Hideki, Suwabe Motoomi, Kurosaki Ken  
**Advanced Engineering Materials** 24(9) (2022) 2101720 (doi) 10.1002/adem.202101720

Phase velocity of the Love wave estimated from the microtremor array records in the Wakayama plain, Japan, by using array-derived rotation  
Kunikazu Yoshida, Hiroto Uebayashi, Michihiro Ohori  
**BUTSURI-TANSA(Geophysical Exploration)** 75 (2022) 70-78 (in Japanese) (doi) 10.3124/segj.75.70

High-Pressure Diffusion Control: Na Extraction from NaAlB<sub>14</sub>  
Fujioka Masaya, Hoshino Mihiro, Iwasaki Suguru, Morito Haruhiko, Kumagai Masaya, Katsura Yukari, Zagarzusem Khurelbaatar, Ono Madoka, Nishii Junji  
**Chemistry of Materials** 35(7) (2023) 3008-3014 (doi) 10.1021/acs.chemmater.3c00318

Compositional dependence of intensity and electric field gradient tensors for Fe<sup>2+</sup> at the M1 site in Ca-rich pyroxene by single crystal Mössbauer spectroscopy  
FUKUYAMA Daiki, SHINODA Keiji, TAKAGI Daigo, KOBAYASHI Yasuhiro  
**Journal of Mineralogical and Petrological Sciences** 117(1) (2022) 220506 (doi) 10.2465/jmps.220506

Structured Approach for the Negotiation of the FM(C)T  
Kumekawa Hirokazu, Tsuboi Hiroshi, Unesaki Hironobu  
**Journal of Nuclear Materials Management** 50(3) (2022) 22-33

Deformation of an electron bunch caused by free-electron lasers  
Sei Norihiro, Zen Heishun, Ohgaki Hideaki  
**Physica Scripta** 98(2) (2023) 025510 (doi) 10.1088/1402-4896/acb253

X-ray diffraction study of phase transformation dynamics of Fe and Fe-Si alloys along the shock Hugoniot using an x-ray free electron laser

Krygier A., Harmand M., Albertazzi B., McBride E. E., Miyanishi K., Antonangeli D., Inubushi Y., Kodama R., Koenig M., Matsuoka T., Moggi G., Pietrucci F., Saitta A. M., Togashi T., Umeda Y., Vinci T., Yabashi M., Yabuuchi T., Fiquet G., Ozaki N.

**Physical Review B 105(22) (2022) L220102 (doi) 10.1103/PhysRevB.105.L220102**

Effects of data bias on machine-learning-based material discovery using experimental property data

Kumagai Masaya, Ando Yuki, Tanaka Atsumi, Tsuda Koji, Katsura Yukari, Kurosaki Ken

**Science and Technology of Advanced Materials: Methods 2(1) (2022) 302-309 (doi) 10.1080/27660400.2022.2109447**

Density Functional Study on the Photopolymerization of Styrene Using Dinuclear Ru-Pd and Ir-Pd Complexes with Naphthyl-Substituted Ligands

Salmahaminati, Inagaki Akiko, Hada Masahiko, Abe Minoru

**The Journal of Physical Chemistry A 127(12) (2023) 2810-2818 (doi) 10.1021/acs.jpca.3c01299**

Studies on Networks for Monitoring Posts Based on Mesh-Type LPWA

TANIGAKI Minoru, TANAKA Atsunori, OKUMURA Ryo, YOSHINAGA Hisao, IINUMA Yuto, IKUTA Misao

**Transactions of the Atomic Energy Society of Japan 22(1) (2023) 38-49 (in Japanese) (doi) 10.3327/taesj.J21.025**

## Proceedings

Development of a method for controlling the physical properties of stored materials and a direct conversion process for the separation and temporary storage of MA

Tomoo Yamamura, Masahiko Nakase, Kenji Takeshita, Takashi Shimada, Koichi Kakinoki, Taisuke Tsukamoto, Hitomi Ishida, Ryo Takahashi

**International Symposium on Zero Carbon Energy System Tokyo, Japan (Jan. 10-12, 2023) A23-3**

Dissolution of Thorium Dioxide in Aqueous Solution by using Thermochemical Conversion

Feng Yin, ZuoRan Ma, Chihiro Tabata, Satoshi Fukutani, Tomoo Yamamura, Tatsuya Suzuki

**International Symposium on Zero Carbon Energy System Tokyo, Japan (Jan. 10-12, 2023) A31-A33**

Extraction behavior of the lightest Actinide, Actinium, for targeted alpha therapy

Masahiko Nakase, Kenji Shirasaki, Miki Harigai, Shingo Sugawara, Shinta Watanabe, Chihiro Tabata, Tomoo Yamamura

**International Symposium on Zero Carbon Energy System Tokyo, Japan (Jan. 10-12, 2023) A23-1**

Measurement of the Neutron Capture Cross Section of Am-243 with the ANNRI beam line, MLF/J-PARC

Yu Kodama, T. Katabuchi, G. Rovira, A. Kimura, S. Nakamura, S. Endo, N. Iwamoto, H. Nakano, Y. Sato, J. Hori, Y. Shibahara, K. Terada

**15th International Conference on Nuclear Data for Science and Technology (ND2022) California, USA (Jul. 24-29, 2022)**

Neutron beam filter system for neutron capture cross-section measurement at the ANNRI beamline of MLF/J-PARC

G. Rovira, A. Kimura, S. Nakamura, S. Endo, O. Iwamoto, N. Iwamoto, T. Katabuchi, Y. Kodama, H. Nakano, J. Hori, Y. Shibahara, K. Terada

**15th International Conference on Nuclear Data for Science and Technology (ND2022) California, USA (Jul. 24-29, 2022)**

Neutron capture cross-section measurement of lead-204 by mass spectrometry

Shoji NAKAMURA, Atsushi KIMURA, Syunsuke ENDO, Yuji SHIBAHARA, Toshiyuki SHIZUMA

**2022 Fall Meeting of the Atomic Energy Society of Japan, Ibaraki, Japan (Sep. 7-9, 2022) 3N04 (in Japanese)**

Scale up production of Ac-225 using an electron linear accelerator and drug labeling experiment

Mizuho Maeda, Takahiro Tadokoro, Yuichiro Ueno, Takahiro Watanabe, Hidetoshi Kikunaga, Kenji Shirasaki, Mitsuyoshi Yoshimoto, Hirofumi Fujii, Shun Sekimoto, Tsutomu Ohtsuki, Yuko Kani, Kento Nishida, Takahiro Sasaki, Shigeru Kashiwagi, Kazunobu Ohnuki, Makoto Inagaki, Satoshi Fukutani, Yuji Shibahara

**2022 Fall Meeting of the Atomic Energy Society of Japan, Ibaraki, Japan (Sep. 7-9, 2022) S0818B (in Japanese)**

The development of an accelerator-based thermal neutron field and an accelerator-based old neutrons source using P-HITS code.  
Riichiro Nakamura, Masahiro Hino, Hiroki Tanaka, Yasutoshi Kuriyama, Yoshihisa Iwashita, Masakazu Sugiyama,  
Nobuhiro Sato, Yutaka Abe, Masaji Arai, Yuji Kawabata, Ken Nakajima  
**Proceedings of the 57th KURNS Scientific Meeting, Online/Kumatori, Japan (Feb. 14-15, 2023) 7-9 (in Japanese)**

## Reviews

Basic Knowledge of Neutron: Generation of Neutrons Accompanied with the High-Energy Photon Therapy  
Akihiro Nohtomi  
**Japanese Journal of Medical Physics (Igakubutsuri) 42(3) (2022) 149 (in Japanese)**

Toward construction of cross-organizational education system for nuclear engineering  
Kurosaki Ken, Kozaki Tamotsu, Nakashima Hiroshi, Obara Toru, Wakabayashi Genichiro, Pyeon Cheolho,  
Matsuyama Shigeo, Abe Hiroshi, Uno Masayoshi, Yamamoto Akio  
**Journal of the Atomic Energy Society of Japan 64(9) (2022) 520-524 (in Japanese) (doi)10.3327/jaesjb.64.9\_520**

## Others

Evaluation Test of Quantitative 3-D Measurement of Gamma Dose in the Reactor Building by ETCC  
T. Tanimori, S. Sonoda, A. Takada, M. Tsuda, K. Tahara, K. Kobayashi, H. Nagai, T. Sato, H. Nakayama, M. Tanigaki,  
A. Taniguchi  
**KURNS Progress report 2021 (2022) 254**