

**II. PUBLICATION LIST**  
**(APRIL 2021 – MARCH 2022)**

## 1. Slow Neutron Physics and Neutron Scattering

### Papers

Overscreening Induced by Ionic Adsorption at the Ionic Liquid/Electrode Interface Detected Using Neutron Reflectometry with a Rational Material Design

Nishi Naoya, Uchiyashiki Junya, Oda Tatsuro, Hino Masahiro, Yamada Norifumi L.

**Bulletin of the Chemical Society of Japan** **94(12)** (2021) **2914-2918** (doi) 10.1246/bcsj.20210328

Direct observation of magnetic Friedel oscillation at Fe(001) surface

Mitsui Takaya, Sakai Seiji, Li Songtian, Ueno Tetsuro, Watanuki Tetsu, Kobayashi Yasuhiro, Masuda Ryo, Seto Makoto, Akai Hisazumi

**Hyperfine Interactions** **242** (2021) **37** (doi) 10.1007/s10751-021-01772-0

Muon-Induced Single-Event Upsets in 20-nm SRAMs: Comparative Characterization with Neutrons and Alpha Particles

Kato Takashi, Tampo Motonobu, Takeshita Soshi, Tanaka Hiroki, Matsuyama Hideya, Hashimoto Masanori, Miyake Yasuhiro

**IEEE Transactions on Nuclear Science** **68(7)** (2021) **1436-1444** (doi) 10.1109/TNS.2021.3082559

Pure Nuclear Bragg Reflection due to Combined Magnetic and Quadrupole Interaction in Fe<sub>3</sub>O<sub>4</sub>

Nakamura Shin, Mitsui Takaya, Kurokuzu Masayuki, Shimomura Susumu

**Journal of the Physical Society of Japan** **90(10)** (2021) **104713** (doi) 10.7566/JPSJ.90.104713

Element-specific magnetic hysteresis loops observed in hexagonal ErFeO<sub>3</sub> thin films

Yokota Hiroko, Kobori Yu, Jitsukawa Shunsuke, Sakai Seiji, Takeda Yukiharu, Mitsui Takaya, Kobayashi Yasuhiro, Kitao Shinji

**Materials Research Express** **8(8)** (2021) **086402** (doi) 10.1088/2053-1591/ac1aa9

Quasielastic Neutron Scattering for Analyzing Transport Dynamics of Chemically-Bound Hydrogen in Minerals Takuo OKUCHI

**Nihon Kessho Gakkaishi** **2** (2021) **129-134** (in Japanese) (doi) 10.5940/jcrsj.63.129

Double-focusing geometry for phase correction in neutron resonance spin-echo spectroscopy

Funama F., Tasaki S., Hino M., Oda T., Endo H.

**Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment** **1010** (2021) **165480** (doi) 10.1016/j.nima.2021.165480

Phase correction method in a wide detector plane for MIEZE spectroscopy with pulsed neutron beams

Oda Tatsuro, Endo Hitoshi, Ohshita Hidetoshi, Seya Tomohiro, Yasu Yoshiji, Nakajima Taro, Hino Masahiro, Kawabata Yuji

**Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment** **1012** (2021) **165616** (doi) 10.1016/j.nima.2021.165616

Neutron flat-panel detector using In–Ga–Zn–O thin-film transistor

Fujiwara Takeshi, Miyoshi Hiroaki, Mitsuya Yuki, Yamada Norifumi L., Wakabayashi Yasuo, Otake Yoshie, Hino Masahiro, Kino Koichi, Tanaka Masahito, Oshima Nagayasu, Takahashi Hiroyuki

**Review of Scientific Instruments** **93(1)** (2022) **013304** (doi) 10.1063/5.0066557

Neutron reflectometry-based in situ structural analysis of an aligning agent additive for the alignment of nematic liquid crystals on solid substrates

Nemoto Fumiya, Yamada Norifumi L., Hino Masahiro, Aoki Hiroyuki, Seto Hideki

**Soft Matter** **18(3)** (2021) **545-553** (doi) 10.1039/d1sm01355f

### Proceedings

Conceptual design of neutron source driven by the proton cyclotron at Institution for Integrated Radiation and Nuclear Science, Kyoto University.

Riichiro Nakamura, Masahiro Hino, Hiroki Tanaka, Yasutoshi Kuriyama, Yoshihisa Iwashita

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022)** **25** (in Japanese)

Present Status of Source Development of Various-Element Mössbauer Spectroscopy using KUR and LINAC at KURNS

Shinji Kitao, Yasuhiro Kobayashi, Masayuki Kurokuzu, Makoto Seto, Hiroyuki Tajima, Hiroyuki Yamashita, Taku Fujihara, Takumi Kubota

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022)34** (in Japanese)

Structural Analysis of Additives in Lubricants by Means of Small Angle X-Ray Scattering

Tomoko Hirayama, Shoei Nanbo, Wataru Yagi, Yoriyuki Takashima, Nobuhiro Sato, Masaaki Sugiyama

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 38** (in Japanese)

Structural analysis of DLC films using positron, soft x-ray and high energy ion beams

Kazuhiro Kanda, Tomohiro Mishima, Fuminobu Hori, Atsushi Yabuuchi, Atsushi Kinomura

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 41** (in Japanese)

Understanding relationship between structure and property in disordered materials via topological analyses

Yohei Onodera

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 64-66** (in Japanese)

Improvement of Spectral Resolution for  $\beta$ -NMR Spectroscopy in Liquids

M. Mihara, K. Matsuta, M. Fukuda, R. Wakabayashi, Y. Otani, Y. Kimura, 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. Nagatomo, A. Kitagawa, and S. Sato

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VIII" Online, (Jan. 15, 2021) 41-44** (in Japanese)

## Others

中性子の波紋と超高分解能写真フィルム(原子核乾板)で重力を撮る

Naotaka Naganawa

**名古屋大学アイソトープ総合センターTracer 71 (2022) 3-8** (in Japanese)

## 2. Nuclear Physics and Nuclear Data

### Papers

Tritium release behavior from neutron-irradiated FLiNaBe mixed with titanium powder

Kubo Kaito, Katayama Kazunari, Oya Makoto, Tsukahara Katsuya, Fukada Satoshi, Tanaka Teruya, Sagara Akio, Yagi Juro, Inuma Yuto

**Fusion Engineering and Design 171 (2021) 112558** (doi) 10.1016/j.fusengdes.2021.112558

Proton radiation hardness of x-ray SOI pixel sensors with pinned depleted diode structure

Hayashida Mitsuki, Hagino Kouichi, Kohmura Takayoshi, Kitajima Masatoshi, Yarita Keigo, Oono Kenji, Negishi Kousuke, Tsuru Takeshi G., Tanaka Takaaki, Uchida Hiroyuki, Kayama Kazuho, Kodama Ryota, Mori Koji, Takeda Ayaki, Nishioka Yusuke, Hida Takahiro, Yukumoto Masataka, Arai Yasuo, Kurachi Ikuo, Kitamura Hisashi, Kawahito Shoji, Yasutomi Keita

**Journal of Astronomical Telescopes, Instruments, and Systems 7(3) (2021) 036001**

(doi) 10.1117/1.JATIS.7.3.036001

Measurements of the neutron capture cross section of  $^{243}\text{Am}$  around 23.5 keV

Kodama Yu, Katabuchi Tatsuya, Rovira Gerard, Kimura Atsushi, Nakamura Shoji, Endo Shunsuke, Iwamoto Nobuyuki, Iwamoto Osamu, Hori Jun-ichi, Shibahara Yuji, Terada Kazushi, Nakano Hideto, Sato Yaoki

**Journal of Nuclear Science and Technology 58(11) (2021) 1159-1164** (doi) 10.1080/00223131.2021.1943557

Thermal-neutron capture cross-section measurement of Tantalum-181 using graphite thermal column at KUR

Nakamura Shoji, Shibahara Yuji, Endo Shunsuke, Kimura Atsushi

**Journal of Nuclear Science and Technology 58(10) (2021) 1061** (doi) 10.1080/00223131.2021.1908187

Nuclear Resonance Vibrational Spectroscopic Definition of the  $\text{Fe(IV)}_2$  Intermediate Q in Methane Monooxygenase and Its Reactivity

Jacobs Ariel Benjamin, Banerjee Rahul, Deweese Dory Ellen, Braun Augustin, Babicz Jeffrey Thomas, Gee Leland Bruce, Sutherland Kyle David, Böttger Lars Hendrik, Yoda Yoshitaka, Saito Makina, Kitao Shinji, Kobayashi Yasuhiro, Seto Makoto, Tamasaku Kenji, Lipscomb John D., Park Kiyoungh, Solomon Edward I.  
**Journal of the American Chemical Society** **143(39)** (2021) **16007-16029** (doi) 10.1021/jacs.1c05436

Development of All-in-one Phantom Dosimeter to Measure Multidimensional Dose Distribution for Co-60 Radiotherapy Unit

H. Y. Shin, J. H. Kim, S. W. Song, J. H. Kim, B. Lee, J. H. Moon and C. H. Pyeon

**JOURNAL OF THE KOREAN PHYSICAL SOCIETY** **78** (2021) **829-836**

(doi) 10.1007/s40042-021-00129-8

Neutron beam filter system for fast neutron cross-section measurement at the ANNRI beamline of MLF/J-PARC  
Rovira Gerard, Kimura Atsushi, Nakamura Shoji, Endo Shunsuke, Iwamoto Osamu, Iwamoto Nobuyuki, Katabuchi Tatsuya, Terada Kazushi, Kodama Yu, Nakano Hideto, Hori Jun-ichi, Shibahara Yuji

**Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment** **1003** (2021) **165318** (doi) 10.1016/j.nima.2021.165318

Effect of neutron-photon converter materials (Cd, Gd, and Sm) on the positron production in a reactor-based slow positron beamline

Atsushi Yabuuchi

**Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms** **513** (2022) **44-49** (doi) 10.1016/j.nimb.2021.12.008

Enhancement of the parity-violating energy difference of H<sub>2</sub>X<sub>2</sub> molecules by electronic excitation

Kuroda Naoya, Oho Takumi, Senami Masato, Sunaga Ayaki

**Physical Review A** **105(1)** (2022) **12820** (doi) 10.1103/PhysRevA.105.012820

Enforced stripping of negative muons from  $\mu\text{He}^+$  ions to stimulate muon-catalyzed fusion by cyclotron resonance acceleration

Yoshiharu Mori

**Progress of Theoretical and Experimental Physics** **2021(9)** (2021) **093G01** (doi) 10.1093/ptep/ptab111

## Proceedings

<sup>61</sup>Ni Mössbauer Spectroscopy for Hofmann-like Coordination Polymers

T. Kitazawa, H. Okada, D. Ueda, Y. Kobayashi, S. Kitao, T. Kubota and M. Seto

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VII" Online, (Jan. 15, 2021) 10-15** (in Japanese)

Development of Time- and Energy-Resolved Mössbauer Spectroscopy

S. Kitao, R. Masuda, H. Taniguchi, H. Tajima, Y. Yoda, and M. Seto

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VII" Online, (Jan. 15, 2021) 1-3** (in Japanese)

Mössbauer spectroscopy in Fe-Ag Hofmann-type SCO complex

K. Kitase, M. Takahashi and T. Kitazawa

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VII" Online, (Jan. 15, 2021) 4-9** (in Japanese)

Observation of Dynamic Behavior of Indium Doped SrTiO<sub>3</sub> Studied by Means of the Perturbed Angular Correlation Method

S. Komatsuda, W. Sato, and Y. Ohkubo

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VII" Online, (Jan. 15, 2021) 49-53** (in Japanese)

Synchrotron-Radiation-Based Mössbauer Spectroscopy on High-Energy Resonant Nuclei using a He-free Cryostat

S. Tsutsui

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VII" Online, (Jan. 15, 2021) 16-21** (in Japanese)

Experimental plan for displacement damage cross sections using 120-GeV protons at Fermi National Accelerator Laboratory

Yosuke IWAMOTO, Makoto YOSHIDA, Shin-ichiro MEIGO, Katsuya YONEHARA, Taku ISHIDA, Keita NAKANO, Shin-ichiro ABE, Hiroki IWAMOTO, T. SPINA, K. AMMIGAN, N. MOKHOV, Atsushi YABUUCHI, and Toshimasa YOSHIIE

**Symposium on Nuclear Data 2020 (SND2020) Wako, Japan, (Jan. 26-27, 2020) 138-143**

## Books

Measurements of Displacement Cross Section of Tungsten under 389-MeV Proton Irradiation and Thermal Damage Recovery

Iwamoto Yosuke, Yoshida Makoto, Matsuda Hiroki, Meigo Shin Ichiro, Satoh Daiki, Yashima Hiroshi, Yabuuchi Atsushi, Shima Tatsushi

Materials Science Forum Vol. 1024

Prof. Kenji Kikuchi

**Trans Tech Publications, Ltd. (2021) (doi) 4028/www.scientific.net/MSF.1024.95**

## Others

Neutron filtering system for fast neutron cross-section measurement at ANNRI

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

**JAEA-conf20211 (2022)**

Thermal-neutron capture cross-section measurement of  $^{237}\text{Np}$  using graphite thermal columnS.

Nakamura, S. Endo, A. Kimura, Y. Shibahara

**KURNS Progress Report 2020 (2021) 94**

## 3. Reactor Physics and Reactor Engineering

### Papers

Rapid Discrimination of Extracellular Vesicles by Shape Distribution Analysis

Ryuzaki Sou, Yasui Takao, Tsutsui Makusu, Yokota Kazumichi, Komoto Yuki, Paisrisarn Piyawan, Kaji Noritada, Ito Daisuke, Tamada Kaoru, Ochiya Takahiro, Taniguchi Masateru, Baba Yoshinobu, Kawai Tomoji

**Analytical Chemistry 93(18) (2021) 7037-7044 (doi) 10.1021/acs.analchem.1c00258**

Application of dynamic mode decomposition to exponential experiment for spatial decay constant determination  
Yamamoto Toshihiro, Sakamoto Hiroki

**Annals of Nuclear Energy 162 (2021) 108506 (doi) 10.1016/j.anucene.2021.108506**

First demonstration experiment of the neutron rotation method for detecting nuclear material

Komeda M., Toh Y., Tanabe K., Kitamura Y., Misawa T.

**Annals of Nuclear Energy 159 (2021) 108300 (doi) 10.1016/j.anucene.2021.108300**

Novel Method of Search for Transparent Optical Materials with Extremely High Melting Point

Kurashima Yutaro, Kurosawa Shunsuke, Murakami Rikito, Yamaji Akihiro, Ishikawa Shiori, Pejchal Jan, Kamada Kei, Yoshino Masao, Toyoda Satoshi, Sato Hiroki, Yokota Yuui, Ohashi Yuji, Yoshikawa Akira

**Crystal Growth & Design 21(1) (2021) 572-578 (doi) 10.1021/acs.cgd.0c01396**

SiC p+n Junction Diodes Toward Beam Monitor Applications

Kishishita Tetsuichi, Kosugi Ryoji, Fujita Yowichi, Fukao Yoshinori, Kojima Kazutoshi, Masumoto Keiko, Nishiguchi Hajime, Tanaka Manobu M., Tanaka Yasunori

**IEEE Transactions on Nuclear Science 68(12) (2021) 2787-2793 (doi) 10.1109/TNS.2021.3118788**

Role of Al Substitution in the Enhancement of High-Temperature Thermoelectric Properties of ZnO Compound  
Pilasuta Panida, Paengson Supasit, Singsoog Kunchit, Seetawan Tosawat

**Integrated Ferroelectrics 222(1) (2022) 28-37 (doi) 10.1080/10584587.2021.1961513**

Flow regime and void fraction predictions in vertical rod bundle flow channels

Han Xu, Shen Xiuzhong, Yamamoto Toshihiro, Nakajima Ken, Sun Haomin, Hibiki Takashi

**International Journal of Heat and Mass Transfer 178 (2021) 121637**

(doi) 10.1016/j.ijheatmasstransfer.2021.121637

Evaluation of Gas Entrainment Flow Rate by Free Surface Vortex

TORIKAWA Tomoaki, ODAIRA Naoya, ITO Daisuke, ITO Kei, SAITO Yasushi, MATSUSHITA Kentaro, EZURE Toshiki, TANAKA Masaaki

**JAPANESE JOURNAL OF MULTIPHASE FLOW 36(1) (2022) 63-69** (in Japanese)

(doi) 10.3811/jjmf.2022.004

Pressure Drop of Single-/Two-Phase Flow in Fin-Type Heat Sink

ZHANG Huanran, ODAIRA Naoya, TO Daisuke, ITO Kei, SAITO Yasushi, SHINOZAKI Masaru

**JAPANESE JOURNAL OF MULTIPHASE FLOW 36(1) (2022) 37-46** (in Japanese) (doi) 10.3811/jjmf.2022.001

Exact Monte Carlo calculation method for K-eigenvalue change using perturbation source method

Yamamoto Toshihiro, Sakamoto Hiroki

**Journal of Nuclear Science and Technology 58(8) (2021) 886-898** (doi) 10.1080/00223131.2021.1883144

KeV-neutron capture cross-section measurement of <sup>197</sup>Au with a Cr-filtered neutron beam at the ANNRI beamline of MLF/J-PARC

Rovira Gerard, Kimura Atsushi, Nakamura Shoji, Endo Shunsuke, Iwamoto Osamu, Iwamoto Nobuyuki, Katabuchi Tatsuya, Kodama Yu, Nakano Hideto, Sato Yaoki, Hori Jun-ichi, Shibahara Yuji, Terada Kazushi

**Journal of Nuclear Science and Technology 59(5) (2021) 647-655** (doi) 10.1080/00223131.2021.1997666

Monte Carlo Analyses 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) 257-265** (doi) 10.1080/00223131.2021.1961636

Uncertainty Quantification of Lead and Bismuth Sample Reactivity Worth at Kyoto University Critical Assembly

C. H. Pyeon, M. Yamanaka and M. Fukushima

**Journal of Nuclear Science and Technology 195(8) (2021) 877-889** (doi) 10.1080/00295639.2020.1870861

Thermal-hydraulic characteristics of upward two-phase flows in vertical large size square channels

Hibiki Takashi, Katono Kenichi, Shen Xiuzhong

**Nuclear Engineering and Design 384 (2021) 111490** (doi) 10.1016/j.nucengdes.2021.111490

Comparison of Theoretical and Machine Learning Models to Estimate Gamma Ray Source Positions using Plastic Scintillating Optical Fiber Detector

J. H. Kim, S. H. Kim, S. W. Song, J. H. Park, J. H. Kim, T. S. Lim, C. H. Pyeon and B. Lee

**Nuclear Engineering and Technology 53(10) (2021) 3431-3437** (doi) 10.1016/j.net.2021.04.019

Development of a multiwire proportional chamber with good tolerance to burst hits

Teshima N., Aoki M., Higashino Y., Ikeuchi H., Komukai K., Nagao D., Nakatsugawa Y., Natori H., Seiya Y., Truong N.M., Yamamoto K.

**Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment 999 (2021) 165228** (doi) 10.1016/j.nima.2021.165228

Applicability of Dynamic Mode Decomposition to Estimate Fundamental Mode Component of Prompt Neutron Decay Constant

F. Nishioka, T. Endo, A. Yamamoto, M. Yamanaka and C. H. Pyeon

**Nuclear Science and Engineering 196 (2022) 133-143** (doi) 10.1080/00295639.2021.1968225

Experimental Analyses of <sup>243</sup>Am and <sup>235</sup>U Fission Reaction Rates at Kyoto University Critical Assembly

C. H. Pyeon, A. Oizumi and M. Fukushima

**Nuclear Science and Engineering 195 (2021) 1144-1153** (doi) 10.1080/00295639.2021.1932220

Gamma-ray Spectroscopy using Inorganic Scintillator Coated with Reduced Graphene Oxide in Fiber-Optic Radiation Sensor

J. H. Kim, S. H. Kim, S. W. Song, T. S. Lim, J. H. Park, J. H. Kim, C. H. Pyeon, S. W. Hwang, B. S. Lee

**Photonics 12 (2021) 543-543** (doi) 10.3390/photonics8120543

Deterministic and stochastic methods for sensitivity analysis of neutron noise  
Yamamoto Toshihiro, Sakamoto Hiroki  
**Progress in Nuclear Energy 145 (2022) 104130** (doi) 10.1016/j.pnucene.2022.104130

## Proceedings

Characteristics of Two-Phase Flow in Packed Bed Systems  
Yasugi Noriaki, Fujitsu Akito, Odaira Naoya, Ito Daisuke, Ito Kei, Saito Yasushi  
**2021 28th International Conference on Nuclear Engineering, Online (Aug. 4-6, 2021) V004T14A066**  
(doi) 10.1115/ICONE28-64955

COMPARISON OF NEUTRON NOISE SOLVERS BASED ON NUMERICAL BENCHMARKS IN A 2-D SIMPLIFIED UOX FUEL ASSEMBLY

P.Vinai, H. Yi, A. Mylonakis, C. Demaziere B. Gasse, A. Rouchon, A. Zoia, A. Vidal-Ferrandiz, G. Verdu, T. Yamamoto

**Proceedings of International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering (M&C2021) Online (Jan. 3-7, 2021)**

Evaluation of Gas Entrainment Flow Rate by Free Surface Vortex  
Tomoaki Torikawa, Naoya Odaira, Daisuke Ito, Kei Ito, Yasushi Saito  
**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 18** (in Japanese)

Evaluation of interfacial area concentration for gas-liquid two-phase flow in coolant flow channels of MTR-type fuel assembly

Xiuzhong Shen, Toshihiro Yamamoto, Takashi Hibiki  
**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 46** (in Japanese)

Measurement of current induced on triaxial cables under gamma-ray irradiation  
Yasuhito Gotoh, Nobuhiro Sato, Yasuki Okuno, Masafumi Akiyoshi, Mitsuru Imaizumi, Tomohiro Kobayashi, Tamotsu Okamoto  
**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 17** (in Japanese)

Pressure drop of two-phase flow in fin-type heat sink  
Huanran Zhang, Naoya Odaira, Daisuke Ito, Kei Ito, Yasushi Saito  
**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 35** (in Japanese)

## Reviews

Issues on Criticality Safety Control of Fuel Debris  
Ken Nakajima  
**Insights Concerning the Fukushima Daiichi Nuclear Accident 2 (2021) 191-198**

Issues for regulatory compliance for nuclear fuel and RI facilities at universities  
Mitsuru Uesaka, Masami Uno, Takumi Saito, Sato Nobuaki, Tatsuya Suzuki, Takehiko Tsukahara, Ken Nakakjima, Toshiaki Hiyama, Hiroaki Muta  
**Journal of the Atomic Energy Society of Japan 63(4) (2021) 353-357** (in Japanese)

Task and recommendation for nuclear fuel and RI facilities at universities  
Masami Uno, Kozo Katsuyama, Takumi Saito, Nobuaki Sato, Tatsuya Suzuki, Takehiko Tsukahara, Ken Nakakjima, Toshiaki Hiyama, Fiminori Honda, Hiroaki Muta, Tomoo Yamamura  
**Journal of the Atomic Energy Society of Japan 64(2) (2022) 110-114** (in Japanese)

## Books

Part V 原子力教育・人材育成 (分担執筆)  
中島健(計 63 名による共著)  
The Nuclear Almanac 2022  
山脇道夫(「原子力年鑑 2022」編集委員会)  
**日刊工業新聞社 (2021)** (in Japanese)

## Others

事故耐性の高い軽水炉用制御棒の開発(4)京大炉による新型中性子吸収材の照射試験  
太田 宏一, 中村 勤也, 佐野 忠史, 高橋 佳之  
日本原子力学会 2021 年春の年会 2K03 (2021) (in Japanese)

## 4. Material Science and Radiation Effects

### Papers

Enhancement of Thermoelectric Properties of n-Type  $\text{Bi}_2\text{Te}_{3-x}\text{Se}_x$  by Energy Filtering Effect  
Kawajiri Yuhei, Tanusilp Sora-at, Kumagai Masaya, Ishimaru Manabu, Ohishi Yuji, Tanaka Junya, Kurosaki Ken  
**ACS Applied Energy Materials** 4(10) (2021) 11819-11826 (doi) 10.1021/acsaem.1c02560

Flexible Thermoelectric Paper and Its Thermoelectric Generator from Bacterial Cellulose/ $\text{Ag}_2\text{Se}$  Nanocomposites  
Palaporn Dulyawich, Mongkolthanasarak Wiyada, Faungnawakij Kajornsak, Kurosaki Ken, Pinitsoontorn Supree  
**ACS Applied Energy Materials** 5(3) (2022) 3489-3501 (doi) 10.1021/acsaem.1c04042

A simple method for fabricating flexible thermoelectric nanocomposites based on bacterial cellulose nanofiber and  $\text{Ag}_2\text{Se}$   
Dulyawich Palaporn, Wiyada Mongkolthanasarak, Sora-at Tanusilp, Ken Kurosaki, and Supree Pinitsoontorn  
**Applied Physics Letters** 120 (2022) 073901-1-073901-7 (doi) 10.1063/5.0077137

Effect of silica-nanoparticle fillers on the Johari-Goldstein- $\beta$  process in polymer nanocomposites  
Saito Makina, Mashita Ryo, Kanaya Toshiji, Kishimoto Hiroyuki, Yoda Yoshitaka, Seto Makoto  
**Hyperfine Interactions** 242 (2021) 58 (doi) 10.1007/s10751-021-01784-w

Mössbauer spectroscopy with polarized synchrotron beams at Fe/Au (111) interface  
Okabayashi Jun, Li Songtian, Sakai Seiji, Kobayashi Yasuhiro, Fujiwara Kosuke, Mitsui Takaya, Mitani Seiji  
**Hyperfine Interactions** 242(1) (2021) 59 (doi) 10.1007/s10751-021-01788-6

Crystallographic hydride phase analysis and hydrogenation properties of  $\text{Gd}_2\text{Co}_7$  with  $\text{Ce}_2\text{Ni}_7$ - and  $\text{Er}_2\text{Co}_7$ -type structures  
Iwase Kenji, Ishida Shuhei, Mori Kazuhiro  
**International Journal of Hydrogen Energy** 45(51) (2021) 27413-27420 (doi) 10.1016/j.ijhydene.2020.07.045

Anisotropy and stability of the mechanical properties of the W alloy plate reinforced with Y-Zr-O particles and prepared by a wet chemical method  
Zhao Zhi-Hao, Yao Gang, Luo Lai-Ma, Zan Xiang, Xu Qiu, Wu Yu-Cheng  
**International Journal of Refractory Metals and Hard Materials** 99 (2021) 105597  
(doi) 10.1016/j.ijrmhm.2021.105597

Gamma-ray irradiation effects on CdTe solar cell dosimeter  
Okamoto Tamotsu, Igari Tomoya, Fukui Takahiro, Tozawa Ryuto, Gotoh Yasuhito, Sato Nobuhiro, Okuno Yasuki, Kobayashi Tomohiro, Imaizumi Mitsuru, Akiyoshi Masafumi  
**Japanese Journal of Applied Physics** 60 (2021) SBBF02-1-SBBF02-5 (doi) 10.35848/1347-4065/abd6d8

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The influence of Gd<sub>2</sub>O<sub>3</sub> on shielding, thermal and luminescence properties of WO<sub>3</sub>-Gd<sub>2</sub>O<sub>3</sub>-B<sub>2</sub>O<sub>3</sub> glass for radiation shielding and detection material

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Vacancy migration energies in CrMnFeCoNi, CrFeCoNi, and CrFeNi alloys and their effect on atomic diffusion

Sugita Kazuki, Ogawa Ryusei, Mizuno Masataka, Araki Hideki, Yabuuchi Atsushi

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Synthesis and thermoelectric properties of Si-YbSi<sub>2</sub> nanocomposite sintered pack

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## Proceedings

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Experimental Study on planetary materials under high pressure conditions using laser shock technique

Yuhei Umeda, Norimasa Okazaki, Tosinori Sekine, Alessandra Benuzzi-Mounaix, Marco Guarguaglini, Yuichi Inubushi, Keiya Fukui, Nobuki Kamimuram Kento Katagiri, Ryosuke Kodama, Takesih Matsuoka, Kohei Miyanishi, Alessandra Ravasio, Takayoshi Sano, Keiichi Sueda, Tadashi Togashi, Makina Yabashi, Toshinori Yabuuchi, Takuo Okuchi

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Interaction of defects with hydrogen and helium in SUS316L

Yutaro Suzuki, Hidetsugu Tsuchida, Qiu Xu

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Synthesis and characterization of base metal alloy nanoparticles by irradiation reduction method  
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Non-destructive identification of chemical state for iron compounds by muon

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Temperature dependence of spin-lattice relaxation time of  $^{19}\text{O}$  in oxide fuel cell material YSZ

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Trial productions of  $\beta$ -detector for a  $4\pi$  clover detector and On-Line experiment using KUR-ISOL Y. Ishikawa, Y. Irie, M. Kanaji, M. Shibata and A. Taniguchi

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## Reviews

Investigations on Adsorption of Inorganic Ions in Aqueous Solution to Some Metal Oxides, Hydroxides and a Carbonate by the X-Ray Spectroscopic Method

OHASHI Hironori, YONEZU Kotaro, KAWAMOTO Daisuke, YOKOYAMA Takushi

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Direct Observation of Magnetic Friedel Oscillation at the Fe (001) Surface

Takaya Mitsui, Seiji Sakai, Makoto Seto, and Hisazumi Akai

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New Glasses Exhibiting Radiophotoluminescence for Dosimeter

Kadono Kohei

**Cchemical Industry 72(6) (2021) 367-372** (in Japanese)

ガラス構造のトポロジカル解析—無秩序に潜む秩序抽出へのデータ駆動型アプローチ

Y. Onodera

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Structure and dynamics of hydrogen in materials of Earth and planetary interiors

Takuo OKUCHI

**Japanese Magazine of Mineralogical and Petrological Sciences 50(2) 31-42 (2021)** (in Japanese)

Quasielastic Neutron Scattering for Analyzing Transport Dynamics of Chemically-Bound Hydrogen in Minerals  
Takuo Okuchi

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Takuo OKUCHI, Norimasa OZAKI

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Understanding diffraction patterns of disordered materials  
S.Kohara, Y.Onodera, O.Sakata

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Ultrafast in-situ Measurement of Crystal Structure Transformation during Hypervelocity Collisions of Asteroids  
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金属間化合物合金における空孔型欠陥と水素原子の相互作用に関する研究  
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事故耐性の高い軽水炉用制御棒の開発 (6) 新型中性子吸収材と炭化ケイ素の高温共存性  
中村勤也, 太田宏一

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照射還元を用いた卑金属系合金ナノ微粒子合成制御およびその特性評価  
朱科蒙, 山田智子, 松井利之, 堀史説, 徐虬, 田中慎吾, 田口昇

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鉄系合金における水素捕獲挙動に対する電子線照射効果  
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## 5. Geochemistry and Environmental Science

### Papers

Relationship of <sup>137</sup>Cs with Fungal Spore Tracers in the Ambient Aerosols from Fukushima after the 2011 Nuclear Accident, East Japan

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Suwa Tatsuya, Kobayashi Minoru, Nam Jin-Min, Harada Hiroshi

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Sato Ataru, Bernier-Latmani Rizlan, Hada Masahiko, Abe Minori  
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Investigation of the source region of the lunar-meteorite group with the remote sensing datasets: Implication for the origin of mare volcanism in Mare Imbrium  
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Cretaceous to Miocene NW Pacific Plate Kinematic Constraints: Paleomagnetism and Ar–Ar Geochronology in the Mineoka Ophiolite Mélange (Japan)  
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**Journal of Geophysical Research: Solid Earth** **5** (2021) e2020JB021492 (doi) 10.1029/2020JB021492

Transfer of <sup>137</sup>Cs to web-building spiders, *Nephila clavata*, and its pathways: a preliminary study using stable carbon and nitrogen isotope analyses  
Tanaka Sota, Kakinuma Hotaru, Adati Tarô, Atarashi-Andoh Mariko, Koarashi Jun  
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Multiple shock events recorded in the Northwest Africa 2139 LL6 chondrite: Implications for collisional histories of the LL chondrite parent body  
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**Meteoritics & Planetary Science** **56(12)** (2021) 2230-2249 (doi) 10.1111/maps.13768

Petrology, geochemistry, and geochronology of plutonic rocks from the present Southwest Indian Ridge: Implications for dropstone distribution in the Indian Ocean  
Sato Hiroshi, Machida Shiki, Senda Ryoko, Sato Keiko, Kumagai Hidenori, Hyodo Hironobu, Yoneda Shigekazu, Kato Yasuhiro  
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Tang Peng, Kita Kazuyuki, Igarashi Yasuhito, Satou Yukihiro, Hatanaka Koutarou, Adachi Kouji, Kinase Takeshi, Ninomiya Kazuhiko, Shinohara Atsushi  
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Temporal change of <sup>236</sup>U/<sup>238</sup>U and <sup>235</sup>U/<sup>238</sup>U isotopic ratios in atmospheric deposition in Tokyo and Akita from 1963 to 1979  
Ohno Takeshi, Sato Naoki, Shikimori Junko, Ijichi Yuta, Fukami Yusuke, Igarashi Yasuhito  
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## Proceedings

Mass balance trend of organochlorine in a sediment core from Beppu Bay  
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Estimation of trace elements in foods and amounts of intake of wild monkey (*Macaca fuscata*)  
Michiko Fukushima, Yamato Tsuji, and Yuto Iinuma  
**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 32** (in Japanese)

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Norio Ito and Akira Mizohata  
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S. Nakashima, T. Basuki, and K. Inada

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Masahiko Takahagi

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Yoko Fujikawa

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Hiroaki Ozaki, Yoko Fujikawa

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Yoko Fujikawa

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MATSUSHITA Shoko, HASEGAWA Takuma, HIRAOKA Marina, HAYASHI Aki, SUZUKI Yusuke

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- A Novel RNA Synthesis Inhibitor, STK160830, Has Negligible DNA-Intercalating Activity for Triggering A p53 Response, and Can Inhibit p53-Dependent Apoptosis  
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Pro108Ser mutation of SARS-CoV-2 3CL<sup>pro</sup> reduces the enzyme activity and ameliorates the clinical severity of COVID-19

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Takeshi Saito

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 42** (in Japanese)

A study of small neutron source using proton accelerator for generation of intensity collimated neutron beam

Masahiro Hino, Riichiro Nakamura, Yutaka Abe

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 14** (in Japanese)

Deuterated/undeuterated positions in denatured/refolded hen egg lysozyme

Akiko Kita and Yukio Morimoto

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 31** (in Japanese)

Dynamics of a multi-domain protein studied by small angle X-ray scattering and molecular dynamics simulations  
Masahiro Shimizu, Aya Okuda, Ken Morishima, Yasuhiro, Yunoki, Rintaro Inoue, Nobuhiro Sato, Reiko Urade, Masaaki Sugiyama

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Hydrogen trapping in Fe-Al Intermetallic Compounds with supersaturated vacancies

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Integrated approach for structural analysis of protein in polydisperse solution with small angle scattering and analytical ultracentrifugation (AUC-SAS)

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Overall structure of a fully assembled complex in the cyanobacterial circadian clock analyzed by an integrated biophysical and computational approach

Hirokazu Yagi, Yasuhiro Yunoki, Atsushi Matsumoto, Ken Morishima, Rintaro Inoue, Koichi Kato, Hidetoshi Kono, and Masaaki Sugiyama

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Solution structure of multi-domain protein ER-60

Aya Okuda

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Hidetoshi Satoh, Shintaro Ochi, Kosuke Mizuno, Shohei Ujita, Miyu Toyoda, Yuichi Nishiyama, Kasumi Tada, Yosuke Matsushita, Yuichi Deguchi, Keiji Suzuki, Yoshimasa Tanaka, Hiroshi Ueda, Toshiya Inaba, Yoshio Hosoi, Akinori Morita, and Shin Aoki,  
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Gota Ishigami, Takehito Seki, Hidehisa Someya, Yasuyuki Yamada, and Shin Aoki,  
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**Journal of The Japanese Society for Cataract Research 33(1) (2021) 59-61** (in Japanese)

The Post-Translational Modifications of Amino Acid in Crystallin and Their Contributions to Aged Lens  
Noriko Fujii  
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## 7. Neutron Capture Therapy

### Papers

Dodecaborate Conjugates Targeting Tumor Cell Overexpressing Translocator Protein for Boron Neutron Capture  
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Development of an irradiation method for superficial tumours using a hydrogel bolus in an accelerator-based  
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HIF-1 $\alpha$  affects sensitivity of murine squamous cell carcinoma to boron neutron capture therapy with BPA

Sanada Yu, Takata Takushi, Tanaka Hiroki, Sakurai Yoshinori, Watanabe Tsubasa, Suzuki Minoru, Masunaga Shin-ichiro

**International Journal of Radiation Biology** **97(10)** (2021) **1441-1449** (doi) 10.1080/09553002.2021.1956004

Prevention and early management of carotid blowout syndrome for patients receiving head and neck salvage boron neutron capture therapy (BNCT)

Lan Tien-Li, Chang Feng-Chi, Wang Chun-Wei, Igawa Kazuyo, Wu Szu-Hsien, Lo Wen-Liang, Chen Yi-Wei

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Measurement of spatial fluence distribution of neutrons and gamma rays using MAGAT-type gel detector doped with LiCl for BNCT at Kyoto University Reactor

Tanaka Kenichi, Kajimoto Tsuyoshi, Mitsuyasu Aruma, Ito Yuto, Hayashi Shin-ichiro, Sakurai Yoshinori, Tanaka Hiroki, Takata Takushi, Bengua Gerard, Endo Satoru

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Technical note: Optical imaging of lithium-containing zinc sulfate plate in water during irradiation of neutrons from boron neutron capture therapy (BNCT) system

Yamamoto Seiichi, Yabe Takuya, Hu Naonori, Kanai Yasukazu, Tanaka Hiroki, Ono Koji

**Medical Physics** **49(3)** (2021) **1822-1830** (doi) 10.1002/mp.15424

Dodecaborate-Encapsulated Extracellular Vesicles with Modification of Cell-Penetrating Peptides for Enhancing Macropinocytotic Cellular Uptake and Biological Activity in Boron Neutron Capture Therapy

Hirase Shiori, Aoki Ayako, Hattori Yoshihide, Morimoto Kenta, Noguchi Kosuke, Fujii Ikuo, Takatani-Nakase Tomoka, Futaki Shiroh, Kirihata Mitsunori, Nakase Ikuhiko

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Reactor-based boron neutron capture therapy for 44 cases of recurrent and refractory high-grade meningiomas with long-term follow-up

Takai Satoshi, Wanibuchi Masahiko, Kawabata Shinji, Takeuchi Koji, Sakurai Yoshinori, Suzuki Minoru, Ono Koji, Miyatake Shin-Ichi

**Neuro-Oncology** **24(1)** (2022) **90-98** (doi) 10.1093/neuonc/noab108

Accelerator-based BNCT for patients with recurrent glioblastoma: a multicenter phase II study  
Kawabata Shinji, Suzuki Minoru, Hirose Katsumi, Tanaka Hiroki, Kato Takahiro, Goto Hiromi, Narita Yoshitaka, Miyatake Shin-Ichi  
**Neuro-Oncology Advances** 3(1) (2021) vdab067 (doi) 10.1093/nojnl/vdab067

Fluorescent boron carbide quantum dots synthesized with a low-temperature solvothermal approach for boron neutron capture therapy  
Singh Paviter, Kaur Manjot, Singh Kulwinder, Meena Ramovatar, Kumar Manjeet, Yun Ju-Hyung, Thakur Anup, Nakagawa Fumiko, Suzuki Minoru, Nakamura Hiroyuki, Kumar Akshay  
**Physica E: Low-dimensional Systems and Nanostructures** 132 (2021) 114766  
(doi) 10.1016/j.physe.2021.114766

First measured optical image of Cerenkov-light in water during irradiation of neutron beam from boron neutron capture therapy (BNCT) system  
Yabe Takuya, Yamamoto Seiichi, Hu Naonori, Kanai Yasukazu, Tanaka Hiroki, Ono Koji  
**Radiation Measurements** 146 (2021) 106633 (doi) 10.1016/j.radmeas.2021.106633

Evaluation of a treatment planning system developed for clinical boron neutron capture therapy and validation against an independent Monte Carlo dose calculation system  
Hu Naonori, Tanaka Hiroki, Kakino Ryo, Yoshikawa Syuushi, Miyao Mamoru, Akita Kazuhiko, Isohashi Kayako, Aihara Teruhito, Nihei Keiji, Ono Koji  
**Radiation Oncology** 16(1) (2021) 243 (doi) 10.1186/s13014-021-01968-2

First optical observation of  $^{10}\text{B}$ -neutron capture reactions using a boron-added liquid scintillator for quality assurance in boron neutron capture therapy  
Nohtomi Akihiro, Maeda Hideya, Sakamoto Naoya, Wakabayashi Genichiro, Takata Takushi, Sakurai Yoshinori  
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Chronic pathophysiological changes in the normal brain parenchyma caused by radiotherapy accelerate glioma progression  
Tsuji Yuichiro, Nonoguchi Naosuke, Okuzaki Daisuke, Wada Yusuke, Motooka Daisuke, Hirota Yuki, Toho Taichiro, Yoshikawa Nobuhiko, Furuse Motomasa, Kawabata Shinji, Miyatake Shin-Ichi, Nakamura Hiroyuki, Yamamoto Ryohei, Nakamura Shota, Kuroiwa Toshihiko, Wanibuchi Masahiko  
**Scientific Reports** 11 (2021) 22110 (doi) 10.1038/s41598-021-01475-0

Thermal Neutron Measurements Using Thermoluminescence Phosphor Cr-doped  $\text{Al}_2\text{O}_3$  and Cd Neutron Converter  
Oh Ryoken, Yanagisawa Shin, Tanaka Hiroki, Takata Takushi, Wakabayashi Genichiro, Tanaka Masaya, Sugioka Natsumi, Koba Yusuke, Shinsho Kiyomitsu  
**Sensors and Materials** 33(6) (2021) 2129-2135 (doi) 10.18494/sam.2021.3328

## Proceedings

Feasibility study on energy-dependent neutron flux monitor using multi-core SOF detector  
M. Ishikawa, R. Ogawara, K. Baba, S. Ishiguri, H. Handa,  
**Proceedings of 19th International Congress of Neutron Capture Therapy, Granada, Spain (Sep. 5-10, 2021)**

Development of ionization chamber for fast neutron monitoring in accelerator-based BNCT  
Nishiki Matsubayashi, Akinori Sasaki, Takushi Takata, Yoshinori Sakurai, Hiroki Tanaka  
**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022)** 43 (in Japanese)

Development and experimental verification of dose calculation algorithm for boron neutron capture therapy  
Mai Nojiri, Takushi Takata, Yoshinori Sakurai, Hiroki Tanaka  
**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022)** 24 (in Japanese)

Experimental verification of Absolute Epi-thermal and Fast Neutron Flux Intensity Detectors for BNCT  
Shoya Tada, Kazushi Aoki, Daisuke Hatano, Shingo Tamaki, Sachie Kusaka, Hiroki Tanaka  
**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022)** 12 (in Japanese)

Study on improvement of neutron distribution by overlapping of irradiation fields using intensity modulators in accelerator-based BNCT

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

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 30** (in Japanese)

The effect of boron neutron capture therapy on normal tissues

Minoru Suzuki

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 2** (in Japanese)

Advanced veterinary care at Hokkaido University veterinary teaching hospital and collaboration between human medicine and veterinary medicine

Mitsuyoshi Takiguchi

**Proceedings of the Symposium on the expansion of boron neutron capture therapy to the field of veterinary medicine.-Challenges and potential for interdisciplinary research-, Online (2021 Mar. 4) 86-95** (in Japanese)

Boron Neutron Capture Therapy

Minoru Suzuki

**Proceedings of the Symposium on the expansion of boron neutron capture therapy to the field of veterinary medicine.-Challenges and potential for interdisciplinary research-, Online (2021 Mar. 4) 1-5** (in Japanese)

Collaboration of Radiation Research between Medical and Veterinary Science at Gifu University

Masayuki Matsuo

**Proceedings of the Symposium on the expansion of boron neutron capture therapy to the field of veterinary medicine.-Challenges and potential for interdisciplinary research-, Online (2021 Mar. 4) 71-85** (in Japanese)

Current status of cyclotron-based neutron source for BNCT

Hiroki Tanaka

**Proceedings of the Symposium on the expansion of boron neutron capture therapy to the field of veterinary medicine.-Challenges and potential for interdisciplinary research-, Online (2021 Mar. 4) 6-13** (in Japanese)

Current status of PET medical care in small animals

Masahiro Natsuhori

**Proceedings of the Symposium on the expansion of boron neutron capture therapy to the field of veterinary medicine.-Challenges and potential for interdisciplinary research-, Online (2021 Mar. 4) 52-62** (in Japanese)

Examination of route of boron administration to brain tumor for BNCT-Looking for clinical usefulness of the intracerebroventricular injection of BPA to brain tumor for rat-

Sachie Kusaka

**Proceedings of the Symposium on the expansion of boron neutron capture therapy to the field of veterinary medicine.-Challenges and potential for interdisciplinary research-, Online (2021 Mar. 4) 100-103** (in Japanese)

Importance of  $^{18}\text{F}$ -FBPA PET in BNCT

Kayako Isohashi

**Proceedings of the Symposium on the expansion of boron neutron capture therapy to the field of veterinary medicine.-Challenges and potential for interdisciplinary research-, Online (2021 Mar. 4) 14-25** (in Japanese)

Radiation Therapy in Veterinary Medical Center in Yamaguchi University

Munekazu Nakaichi

**Proceedings of the Symposium on the expansion of boron neutron capture therapy to the field of veterinary medicine.-Challenges and potential for interdisciplinary research-, Online (2021 Mar. 4) 41-51** (in Japanese)

The past, present and future of comparative oncology aimed at overcoming cancer in humans and animals

Kohji Maruo

**Proceedings of the Symposium on the expansion of boron neutron capture therapy to the field of veterinary medicine.-Challenges and potential for interdisciplinary research-, Online (2021 Mar. 4) 63-70** (in Japanese)

Translational and clinical-veterinary studies of Boron Neutron Capture Therapy for Head and Neck cancer

Mandy Schwint

**Proceedings of the Symposium on the expansion of boron neutron capture therapy to the field of veterinary medicine.-Challenges and potential for interdisciplinary research-, Online (2021 Mar. 4) 26-40**

## Reviews

Current Status of Accelerator-Based Boron Neutron Capture Therapy (BNCT)

Hiroki Tanaka

**Japanese Journal of Medical Physics (Igakubutsuri) 41(3) (2021) 117-121** (in Japanese)

Realization of the World's First Accelerator BNCT System Using a Cyclotron

Hiroki Tanaka, Toshinori Mitsumoto, Koji Ono

**Journal of the Particle Accelerator Society of Japan 17(2) (2021) 81-85** (in Japanese)

DOI: (doi) 10.50868/pasj.17.2\_81

Activities on neutron measurement standards for BNCT

Akihiko Masuda, Tetsuro Masuda, Harano Hideki

**JSAP Annual Meetings Extended Abstracts 46 (2021) 72-76** (in Japanese)

Progress of Boron Neutron Capture Therapy and Biological Problems

Natuko Kondo, Yoshinori Sakurai, Takushi Takata, Hiroki Tanaka, Minoru Suzuki

**Radiation Biology Research Communications 57(1) (2022) 63-70** (in Japanese)

ポリビニルアルコールに秘められた可能性: ホウ素送達システムへの応用

Takahiro Nomoto

**The Japanese Society for Biomaterials (JSB) 39(2) (2021) 128-129** (in Japanese)

放射線医学 頭頸部腫瘍に対するホウ素中性子捕捉療法の現状

Minoru Suzuki

**医学のあゆみ 277(2) (2021) 182-183** (in Japanese)

## 8. Neutron Radiography and Radiation Application

### Papers

Application of Machine Learning Methods to Neutron Transmission Spectroscopic Imaging for Solid-Liquid Phase Fraction Analysis

Kamiyama Takashi, Hirano Kazuma, Sato Hiroataka, Ono Kanta, Suzuki Yuta, Ito Daisuke, Saito Yasushi

**Applied Sciences 11(13) (2021) 5988** (doi) 10.3390/app11135988

Efficacy of Boron Neutron Capture Therapy in Primary Central Nervous System Lymphoma: In Vitro and In Vivo Evaluation

Yoshimura Kohei, Kawabata Shinji, Kashiwagi Hideki, Fukuo Yusuke, Takeuchi Koji, Futamura Gen, Hiramatsu Ryo, Takata Takushi, Tanaka Hiroki, Watanabe Tsubasa, Suzuki Minoru, Hu Naonori, Miyatake Shin-Ichi, Wanibuchi Masahiko

**Cells 10(12) (2021) 3398** (doi) 10.3390/cells10123398

Proof-of-principle Experiment of  $^4\text{He}$  Excimer Cluster Generation via Neutron- $^3\text{He}$  Absorption Reaction for Visualization of Velocity Fields in Superfluid  $^4\text{He}$

Matsushita T., Sonnenschein V., Iguchi T., Ito D., Kitaguchi M., Kiyonagi Y., Guo W., Saito Y., Shinohara T., Shimizu H.M., Suzuki S., Tsuji Y., Tomita H., Hayashida H., Hishida M., Hiroi K., Hirota K., Maruyama T., Waki S., Wada N.

**Hamon 30(4) (2021) 192-196** (in Japanese) (doi) 10.5611/hamon.30.4\_192

Density Functional Study on Compounds to Accelerate the Electron Capture Decay of  $^7\text{Be}$

Yoshida Akira, Abe Minori, Hada Masahiko

**Journal of Physical Chemistry A 125(29) (2021) 6356-6361** (doi) 10.1021/acs.jpca.1c01491

### Proceedings

Effects of water accumulation in the proton exchange membrane and the gas diffusion layer on the power generation performance of PEFC

K. Mine, H. Murakawa, K. Sugimoto, H. Asano, D. Ito and Y. Saito

**International Conference on Power Engineering2021, Online (Jan. 17-21, 2021 ) C224**



Beam quality determination of a boron neutron capture therapy irradiation system using microdosimetry

Naonori Hu

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 50** (in Japanese)

Direct Observation of Lubricant Behaviour in Machine Elements by Means of Neutron Phase Imaging Tomoko Hirayama, Sun Lin, Yoshichika Seki, Takenao, Shinohara, Masahiro Hino, Riichiro Nakamura

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 49** (in Japanese)

Effect of Internal Moisture Movement on Spalling for High-strength Concrete Exposed to High Temperature

Azusa Miyabe, Yuhei Nishio, Masamichi Tamura, Daisuke Ito, Kanematsu Manabu

**Proceedings of the Concrete Structure Scenarios, JSMS 21 (Jan. 2021) 413-418** (in Japanese)

Verification of the Applicability of Water Cherenkov Detector to Active Neutron Method and Development of a Prototype Detector

K. Tanabe, M. Komeda, Y. Toh, Y. Kitamura, T. Misawa, H. Sagara

**The 2021 IEEE Nuclear Science Symposium and Medical Imaging Conference, Yokohama, Japan (Jan. 16-23, 2021)** (in Japanese)

Frost Deposition Distribution Estimated by X-ray and Neutron Cooperative Imaging

R. Kuroda, T. Makihara, Y. Oda, R. Matsumoto, N. Odaira, D. Ito, Y. Saito

**The Second Asian Conference on Thermal Sciences, 2nd ACTS, Online (Jan. 3-7, 2021) ACTS-1314**

## Others

複合ラジオグラフィによる熱交換器の着霜評価

黒田 陸斗, 松本 亮介, 小田 豊, 榎原 拓郎, 斎藤 泰司, 伊藤 大介, 大平 直也

**2021 年度日本冷凍空調学会年次大会講演論文集 (2021) A122** (in Japanese)

## 9. TRU and Nuclear Chemistry

### Papers

Coprecipitation with samarium hydroxide using multitracer produced through neutron-induced fission of  $^{235}\text{U}$  toward chemical study of heavy elements

Y. Kasamatsu, M. Nagase, H. Ninomiya, E. Watanabe, Y. Shigekawa, N. Kondo, K. Takamiya, T. Ohtsuki, N. Shiohara, A. Shinohara

**Applied Radiation and Isotopes 179 (2022) 110006** (doi) 10.1016/j.apradiso.2021.110006

Supercritical hydrothermal synthesis of  $\text{UO}_{2+x}$ : stoichiometry, crystal shape and size, and homogeneity observed using  $^{23}\text{Na}$ -NMR spectroscopy of  $(\text{U}, \text{Na})\text{O}_{2+x}$

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

**CrystEngComm 23(48) (2021) 8660-8672** (doi) 10.1039/d1ce00996f

Phase transformation of mixed lanthanide oxides in an aqueous solution

Md. Moniruzzaman, T. Kobayashi, T. Sasaki

**Journal of Nuclear and Radiochemical Sciences 21 (2021) 15-27**

Solubility of Mixed Lanthanide Hydroxide and Oxide Solid Solutions

Md. Moniruzzaman, T. Kobayashi, T. Sasaki

**Journal of Nuclear Fuel Cycle and Waste Technology 19(3) (2021) 353-366**

Solubility of  $\text{PuO}_2(\text{am,hyd})$  and the Formation of Pu(IV) Carbonate Complexes in Carbonate Solutions Containing  $0.1\text{--}5.0 \text{ mol}\cdot\text{dm}^{-3} \text{ NaNO}_3$

Kobayashi Taishi, Fellhauer David, Sasaki Takayuki

**Journal of Solution Chemistry 50(4) (2021) 443-457** (doi) 10.1007/s10953-021-01080-9

Towards highly accurate calculations of parity violation in chiral molecules: relativistic coupled-cluster theory including QED-effects

Sunaga Ayaki, Saue Trond

**Molecular Physics 119 (21-22) (2021) SI** (doi) 10.1080/00268976.2021.1974592

Hydrofluorocarbon Diluent for CMPO Without Third Phase Formation: Extraction of Uranium(VI) and Lanthanide(III) Ions

Tabata Chihiro, Nakase Masahiko, Harigai Miki, Shirasaki Kenji, Sunaga Ayaki, Yamamura Tomoo  
**Separation Science and Technology** 57(7) (2022) 1097-1110 (doi) 10.1080/01496395.2021.1970767

## Proceedings

Crystal structure and magnetism of uranium phthalocyanine complex

Chihiro Tabata

**GIMRT Joint International Symposium on Radiation Effects in Materials and Actinide Science (GIMRT-REMAS2020) Sendai, Japan, Online (Sep. 30- Oct. 3, 2020)**

Isotope fractionation behavior of molybdenum in saturated calcium chloride solution

Kota Suzuki, Chizu Kato, Takeshi Ohno, Satoshi Fukutani, Toshiyuki Fujii

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 45** (in Japanese)

Development of measurement method for gas-liquid two-phase flow in a packed bed of spheres

Noriaki Yasugi, Naoya Odaira, Daisuke Ito, Kei Ito, Yasushi Saito

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 28** (in Japanese)

Study of Isotope Separation via Chemical Exchange Reaction

Ryuta Hazama, Takaaki Yoshimoto, Anawat Rittirong, Yoichi Sakuma, Toshiyuki Fujii, Satoshi Fukutani, Yuji Shibahara, Ayaki Sunaga

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 44-47** (in Japanese)

Chemical and electronic properties of Actinide compounds and their applications

Tomoo Yamamura, Chihiro Tabata, Yoshinori Haga, Tsuyoshi Yaita, Hiroshi Yamagami, Hiroshi Amitsuka, Kenji Ishida, Fusako Kon, Yuma Kaneko, Eikai Hayasaka, Tatsuya Suzuki, Z. Ma, F. H. Ikhwan, Rin Murayama, Irvin Mardongan, Yuji Shibahara, Satoshi Fukutani, Kenji Shirasaki, Hidetoshi Kikunaga, Kohshin Washiyama, Atsushi Shinohara, Takashi Yoshimura, Masanobu Nogami, Yokota Masayoshi, Kita Daiki, Minoru Abe, Masahiko Hada, Ayaki Sunaga, Ataru Sato, Rei Yoshida, Hiroki Shishido, Hidetoshi Hashizume, Masahiko Nakase, Miki Harigai, Hidetaka Nakai, Tohru Kobayashi

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 3-7** (in Japanese)

Effect of iron on dissolution behavior of pentavalent uranium solid phase

Ryutaro Tonna, Takayuki Sasaki, Taishi Kobayashi, Shun Sekimoto

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 39** (in Japanese)

Effect of oxalic acid on vanadium redox

Naoya Wada, Hideyuki Sugihara, Akihiro Uehara, Satoshi Fukutani, Chizu Kato, Toshiyuki Fujii

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 37** (in Japanese)

Revealing the origins of volatile elements in CAIs from Zn isotopes

Chizu Kato Frédéric Moynier, Toshiyuki Fujii

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 19** (in Japanese)

Solid-liquid extraction experiment of Group 2 elements using crown ether toward the chemical study of nobelium.  
Eisuke Watanabe, Yoshitaka Kasamatsu, Nakanishi Ryohei, Saki Otaka, Koichi Takamiya, and Atsushi Shinohara

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 10** (in Japanese)

Solvent extraction characteristics of tin from nitric acid solution

Shin Takahashi, Chizu Kato, Satoshi Fukutani, Tatsuro Matsumura, Hideya Suzuki, Toshiyuki Fujii

**Proceedings of the 56th KURNS Scientific Meeting, Online (Feb. 9-10, 2022) 23** (in Japanese)

## Review

アルファ線核医学治療のための薬剤開発の考察—その 5—IAEA Technical Meeting 報告:  $\alpha$  線核種ならびに TAT 薬剤の最新動向—

矢野恒夫, 長谷川功紀, 山村朝雄, 渡部直史, 巽光朗, 佐藤達彦, 角永悠一郎, 樺山一哉, 深瀬浩一, 平林容子, 藤井博史, 米倉義晴

**Pharmaceutical and Medical Device Regularoty Science 52(2) (2021) 85-106** (in Japanese)

アルファ線核医学治療のための薬剤開発の考察(その 6)

矢野恒夫, 長谷川功紀, 石井明子, 渡部直史, 巽光朗, 角永悠一郎, 樺山一哉, 深瀬浩一, 米倉義晴, 平林容子, 佐藤達彦, 藤井博史

**PharmTechJapan 37(11) (2021) 85-94** (in Japanese)

アルファ線核医学治療のための薬剤開発の考察(その 7)

矢野恒夫, 長谷川功紀, 石井明子, 渡部直史, 巽光朗, 角永悠一郎, 樺山一哉, 深瀬浩一, 米倉義晴, 平林容子, 佐藤達彦, 藤井博史

**PharmTechJapan 38(1) (2022) 85-94** (in Japanese)

## 10. Health Physics and Waste Management

### Papers

Behaviour of Fossil and Biogenic Carbon in Sewage Sludge Treatment Processes and Their Impacts on Greenhouse Gas Emissions

Liu C., Oshita K., Takaoka M., Fukutani S.

**Chemical Engineering Transactions 89 (2021) 97-102**

EXISTENCE FORMS OF RADIOACTIVE CS CONSIDERING SOIL PROPERTIES AND VERTICAL DISTRIBUTION IN FOREST SOIL

Maiko Ikegami, Satoshi Fukutani, Yoko Shimada, Tomoyuki Takahashi, Shu SATO, Minoru YONEDA

**Journal of Japan Society of Civil Engineers, Ser. G (Environmental Research) 77(7) (2022) III\_277 -III\_284** (in Japanese) (doi) 10.2208/jscejer.77.7\_III\_277

Fluorescence pulses derived from thin poly (ethylene terephthalate) in response to charged particles

Nakamura Hidehito, Mori Kazuhiro, Shirakawa Yoshiyuki

**Physica Scripta 96(12) (2021) 125307** (doi) 10.1088/1402-4896/ac237f

ANALYSES OF H\*(10) DOSE RATES MEASURED IN ENVIRONMENT CONTAMINATED BY RADIOACTIVE CAESIUM: CORRECTION OF DIRECTIONAL DEPENDENCE OF SCINTILLATION DETECTORS

Tsuda S, Tanigaki M, Yoshida T, Okumura R, Saito K

**Radiation Protection Dosimetry 193(3-4) (2021) 228-236** (doi) 10.1093/rpd/ncab060

### Proceedings

X-ray and neutron diffraction measurements of trivalent and tetravalent metal hydroxide solid phases

Reo Nanjo, Taishi Kobayashi, Takayuki Sasaki, Kazuhiro Mori

**Proceedings of the 56th KURNS Scientific Meeting Online (2022 Feb. 9-10) 29** (in Japanese)

### Reviews

Thoron and NORM for Past 30 Years in Japan

Takeshi Iimoto, Shinji Tokonami, Hidenori Yonehara, Sadaaki Furuta, Michikuni Shimo

**Radiation Environment and Medicine 10(2) (2021) 55-66**

## 11. Accelerator Physics

### Papers

Technical Note: Range verification of pulsed proton beams from fixed - field alternating gradient accelerator by means of time - of - flight measurement of ionoacoustic waves

Nakamura Yuta, Takayanagi Taisuke, Uesaka Tomoki, Unlu Mehmet Burcin, Kuriyama Yasutoshi, Ishi Yoshihiro, Uesugi Tomonori, Kobayashi Masanori, Kudo Nobuki, Tanaka Sodai, Umegaki Kikuo, Tomioka Satoshi, Matsuura Taeko  
**Medical Physics** **48(9)** (2021) **5490-5500** (doi) 1002/mp.15060

## Proceedings

Instrumentation R&D for the studies of SRF thin-film structures at KEK and Kyoto University

Y. Iwashita, Y. Kuriyama, H. Tongu, Y. Fuwa, H. Hayano

**2021 International Conference on RF Superconductivity (SRF2021) Virtual Conference (Jun. 28 - Jly. 2, 2021)**

Development of a Hybrid Detector for Simultaneous Measurement of Thermal Neutron Flux and  $\gamma$ -ray Dose Rate for Therapeutic

Hiroaki Kato, Nishiki Matsubayashi, Takushi Takata, Tetsuya Mukawa, Keita Suga, Yoshinori Sakurai, Hiroki Tanaka

**Proceedings of the 56th KURNS Scientific Meeting Online (Feb. 9-10, 2022) 37** (in Japanese)

Evaluation of Radiation-Induced Demagnetization of Permanent Magnets using KUR

Yasuhiro Fuwa, Yasutoshi Kuriyama, Yoshihisa Iwashita, Koichi Takamiya, Tomohiro Takayanagi

**Proceedings of the 56th KURNS Scientific Meeting Online (Feb. 9-10, 2022) 40** (in Japanese)

次世代粒子加速器に向けた多角的研究

Yasutoshi Kuriyama

**Proceedings of the 56th KURNS Scientific Meeting Online (Feb. 9-10, 2022) 60-63** (in Japanese)

Towards an accelerator driven neutron source facility using a 30 MeV Cyclotron

Yasutoshi Kuriyama, Riichiro Nakamura, Hiroki Tanaka, Yoshihisa Iwashita, Masahiro Hino

**Proceedings of the 56th KURNS Scientific Meeting Online (Feb. 9-10, 2022) 36** (in Japanese)

Development of a Small Beta-NMR System Using Halbach Array Permanent Magnet

Y. Kimura, M. Mihara, K. Matsuta, M. Fukuda, Y. Otani, G. Takayama, T. Izumikawa, N. Noguchi, M. Ogose, Y. Sato, K. Takatsu, T. Ohtsubo, H. Takahashi, S. Momota, H. Okumura, T. Moriguchi, A. Ozawa, A. Kitagawa, and S. Shinji

**Proceedings of the Specialists' Meeting on "Nuclear Spectroscopy and Condensed Matter Physics Using Short-Lived Nuclei VII", Online, 37-40 (2021 Jan. 15)** (in Japanese)

## 12. Other

### Papers

Nonlinear effects of hydration on high-pressure sound velocities of rhyolitic glasses

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