

C O N T E N T S

Page

PREFACE

I . HIGHLIGHTS OF THE YEAR

First observation of ^{20}B and ^{21}B S. Leblond <i>et al.</i>	1
Gamow–Teller giant resonance in ^{132}Sn M. Sasano, J. Yasuda <i>et al.</i>	2
First spectroscopy of the near drip-line nucleus ^{40}Mg H. L. Crawford, P. Fallon <i>et al.</i>	3
Interplay between nuclear shell evolution and shape deformation revealed by magnetic moment of ^{75}Cu Y. Ichikawa <i>et al.</i>	4
Mass measurements of neutron-rich Ni isotopes in Rare RI Ring A. Ozawa <i>et al.</i>	5
Discovery of ^{60}Ca and Implications For the Stability of ^{70}Ca O. B. Tarasov	6
Nuclear surface diffuseness revealed in nucleon-nucleus diffraction W. Horiuchi and A. Kohama	7
Proton- and deuteron-induced reactions on ^{107}Pd and ^{93}Zr at 20–30 MeV/nucleon M. Dozono <i>et al.</i>	8
Transverse momentum dependent fragmentation measurements in Belle R. Seidl	9
Measurement of elliptic flow of single electrons from semi-leptonic decay of charm and bottom hadrons in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV Y. Ueda <i>et al.</i>	10
The chiral propulsion effect Y. Hirono <i>et al.</i>	11
Superconducting RILAC booster N. Sakamoto <i>et al.</i>	12
Remodeling of acceleration cavity resonators for RIKEN Ring Cyclotron K. Yamada <i>et al.</i>	13
He gas stripper with N_2 gas-jet curtain H. Imao <i>et al.</i>	14
Upgrade of particle selection system for Rare RI Ring experiments Y. Abe <i>et al.</i>	15
Aberration correction study for high-resolution optics of BigRIPS using sextupole magnets T. Nishi <i>et al.</i>	16
In-gas-jet laser ionization spectroscopy at KISS Y. Hirayama <i>et al.</i>	17
Microgram-order palladium isotope separation by odd-mass-selective photoionization T. Sonoda and T. Kobayashi	18
Introducing silver atoms into superfluid helium for precision laser spectroscopy W. Kobayashi <i>et al.</i>	19
Magnetic properties of Alkali-metal Superoxide, NaO_2 F. Astuti <i>et al.</i>	20
Mass spectrometric speciation of mononuclear Re carbonyls in the gas phase Y. Wang <i>et al.</i>	21
Practical synthesis of ^{211}At -labeled immunoconjugate by double click method for α -emission cancer radiotherapeutics K. Fujiki and K. Tanaka <i>et al.</i>	22
Activation cross sections of α -induced reactions on $^{\text{nat}}\text{Zn}$ for Ge and Ga production M. Aikawa <i>et al.</i>	23

A novel mutation induced by Ar-ion-irradiation affect grain length and improve yield in rice	24
R. Morita <i>et al.</i>	
Recent progress in overcoming interspecific hybrid sterility in rice	25
Y. Koide <i>et al.</i>	
Improved and robust method to efficiently deplete repetitive elements from complex plant genomes	26
H. Ichida and T. Abe	

II. RESEARCH ACTIVITIES I (Nuclear, Particle and Astro-Physics)

1. Nuclear Physics

Breakup of ^9C studied at SAMURAI	27
A. I. Chilug, V. Panin <i>et al.</i>	
Cluster structure of neutron-rich beryllium isotopes investigated by cluster quasi-free scattering reaction	28
P. Li, D. Beaumel	
Particle identification in $^{11}\text{Li}(p, n)$ experiment at SAMURAI	29
Y. Hirai <i>et al.</i>	
Neutron-gamma separation performance of PANDORA in SAMURAI30 experiment	30
Y. Hirai <i>et al.</i>	
Gamow-Teller resonance in $^{14}\text{Be}(p, n)$ reaction	31
J. Gao and L. Stuhl	
Systematic study of one-proton and two-proton knockout reactions by deuterium target	32
M. Miwa <i>et al.</i>	
Study of spin-isospin response of ^{11}Li (SAMURAI30 experiment)	33
L. Stuhl <i>et al.</i>	
Overview of the experimental setup of SAMURAI30 to measure the $^{11}\text{Li}(p, n)$ reaction in inverse kinematics	34
M. Sasano, L. Stuhl <i>et al.</i>	
Neutron-neutron correlation in Borromean nucleus ^{11}Li via the (p, pn) reaction	35
Y. Kubota <i>et al.</i>	
Particle identification of light charged particle by $S\pi\text{RIT-TPC}$ in Sn-Sn isotopic reactions	36
M. Kaneko <i>et al.</i>	
Recent results of collective flow for $S\pi\text{RIT-TPC}$ experiment	37
M. Kurata-Nishimura <i>et al.</i>	
New implant-decay correlation method for β -delayed neutron emission measurements with the BRIKEN setup	38
O. Hall <i>et al.</i>	
Progress on the measurements of P_n -values and half-lives for understanding the formation of the r-process rare-earth peak	39
A. Tarifeño-Saldivia	
β decays of the heaviest $N = Z - 1$ nuclei and proton instability of ^{97}In	40
J. Park <i>et al.</i>	
Beta-gamma spectroscopy of neutron-rich ^{150}Ba	41
R. Yokoyama <i>et al.</i>	
Preliminary results on β -decay of the $T_z = -1$ nucleus ^{66}Se at RIBF	42
P. Aguilera <i>et al.</i>	
Study of β -decay of ^{71}Kr	43
A. Sveczer <i>et al.</i>	
Coexisting single-particle and octupole states in ^{133}Sn	44
G. Simpson <i>et al.</i>	
Inelastic scattering of neutron-rich Ni and Zn isotopes off a proton target	45
M. L. Cortés <i>et al.</i>	
Magnetic-moment measurement of the isomeric state of ^{130}Sn in the vicinity of doubly-magic nucleus ^{132}Sn	46
G. Georgiev <i>et al.</i>	
Track distortion due to ion back flow in CAT-S at RIBF113: $^{132}\text{Sn}(d, d')$ measurement	47
S. Ota <i>et al.</i>	
First mass measurements of neutron-rich calcium isotopes, $^{55-57}\text{Ca}$	48
S. Michimasa <i>et al.</i>	

Re-measurement of the $^4\text{He}(^8\text{He}, ^8\text{Be})$ reaction	49
S. Masuoka, S. Shimoura <i>et al.</i>	
Evaluation of $^{79}\text{Se}(n, \gamma)^{80}\text{Se}$ reaction by measuring $^{77,79}\text{Se}(d, p)^{78,80}\text{Se}$ reactions	50
N. Imai, M. Dozono <i>et al.</i>	
Fine tuning of isochronism in Rare RI Ring using resonant Schottky monitor	51
F. Suzaki <i>et al.</i>	
Preliminary analysis of the mass measurement experiment in the south-western region of ^{132}Sn with Rare RI Ring	52
H. F. Li <i>et al.</i>	
First online experiment of α -ToF detector with MRTOF-MS	53
T. Niwase <i>et al.</i>	
β - γ spectroscopy of ^{195}Os at KISS	54
M. Ahmed <i>et al.</i>	
Feasibility study of ^{199}Pt Q -moment measurement using in-gas-jet laser ionization spectroscopy at KISS	55
H. Choi <i>et al.</i>	
Electric field gradient of ZnO crystal measured by β -NQR of ^{23}Ne	56
H. Nishibata <i>et al.</i>	
^7Be target production to measure $^7\text{Be}(d, p)$ reaction for the primordial ^7Li problem in Big-Bang Nucleosynthesis	57
A. Inoue <i>et al.</i>	
New measurement of $^8\text{Li}(\alpha, n)^{11}\text{B}$ reactions	58
Y. Mizoi <i>et al.</i>	
Trojan Horse Method-based study of the $^{18}\text{F}(p, \alpha)^{15}\text{O}$ reaction at astrophysical energies: update on the 2015 run	59
S. Cherubini <i>et al.</i>	
Gamow-Teller transitions in ^6He with PANDORA	60
L. Stuhl <i>et al.</i>	
β -NMR measurements for ^{21}O at HIMAC	61
A. Gladkov <i>et al.</i>	
RI beam production at BigRIPS in 2018	62
Y. Shimizu <i>et al.</i>	
Measurement of production cross-section and momentum distribution of isotopes produced from ^{18}O beam	64
H. Takeda <i>et al.</i>	
Cross-section measurement of neutron-rich isotopes produced from an RI beam of ^{132}Sn using a two-step scheme	65
H. Suzuki <i>et al.</i>	
2. Nuclear Physics (Theory)	
Improvement of functionals in density functional theory using inverse Kohn-Sham method and density functional perturbation theory	67
D. Ohashi, T. Naito <i>et al.</i>	
Coulomb exchange functional with generalized gradient approximation for self-consistent Skyrme Hartree-Fock calculations	68
T. Naito, X. Roca-Maza <i>et al.</i>	
Joint project for large-scale nuclear structure calculations in 2018	69
N. Shimizu <i>et al.</i>	
Bubble nuclei within the self-consistent Hartree-Fock mean field plus pairing approach	70
L. Tan Phuc <i>et al.</i>	
Dineutron correlation and large quadrupole collectivity in deformed Mg isotopes near neutron drip line	71
M. Yamagami	
Isoscalar and isovector spin responses in sd -shell nuclei	72
H. Sagawa and T. Suzuki	
Self-consistent constrained HFB in odd-A nuclei	73
K. Sugawara-Tanabe and K. Tanabe	
Nuclear symmetry energy and the breaking of the isospin symmetry: how do they reconcile with each other ?	74
X. Roca-Maza <i>et al.</i>	
Neutron-proton pairing correlations and deformation for $N = Z$ nuclei in pf -shell using deformed BCS and HFB approach	75
E. Ha <i>et al.</i>	

Spin-singlet and spin-triplet pairing correlations on shape evolution in sd -shell $N = Z$ Nuclei	76
E. Ha <i>et al.</i>	
Low-lying collective excited states in non-integrable pairing models based on stationary phase approximation to the path integral	77
F. Ni <i>et al.</i>	
Study of giant dipole resonance in hot rotating light mass nucleus ^{31}P	78
D. Mondal <i>et al.</i>	
3. Nuclear Data	
Verification test of ^{107}Pd transmutation	79
Y. Miyake <i>et al.</i>	
Measurement of neutron production from 7 MeV/nucleon α incidence on a Bi target	80
K. Sugihara <i>et al.</i>	
EXFOR compilation of RIBF data in 2018	81
S. Jagjit <i>et al.</i>	
4. Hadron Physics	
Preliminary result of the transverse single spin asymmetry in very forward π^0 production in 510 GeV $p^\dagger + p$ collisions	83
M. H. Kim	
The stability of energy scale for RHICf photon measurement during the 2017 operation	84
K. Sato <i>et al.</i>	
Cross section and longitudinal single-spin asymmetry A_L for forward $W^\pm \rightarrow \mu^\pm \nu$ production in polarized $p + p$ collisions at $\sqrt{s} = 510$ GeV	85
R. Seidl	
Progress in analysis technique for extracting light-antiquark flavor asymmetry by SeaQuest at Fermilab	86
K. Nagai <i>et al.</i>	
Forward hadron calorimeter R&D	87
Y. Goto <i>et al.</i>	
Development of the intermediate silicon tracker for sPHENIX experiment at RHIC	88
I. Nakagawa	
Tracking performance simulation for INTT at sPHENIX	89
T. Todoroki <i>et al.</i>	
Preparation status of the J-PARC E16 experiment in 2018	90
S. Yokkaichi	
Spectroscopy of pionic atoms in $^{122}\text{Sn}(d, ^3\text{He})$ reaction and angular dependence of the formation cross sections	91
T. Nishi <i>et al.</i>	
Isotope identification in nuclear emulsion plate for double-hypernuclear study	92
S. Kinbara <i>et al.</i>	
5. Hadron Physics (Theory)	
Short range $\pi J/\psi - D\bar{D}^*$ interaction	93
Y. Yamaguchi <i>et al.</i>	
Proton decay matrix elements at physical quark mass	94
Y. Aoki <i>et al.</i>	
The $\pi\gamma \rightarrow \pi\pi$ transition and the ρ radiative decay width from lattice QCD	95
S. Meinel <i>et al.</i>	
Neutron stars from an effective quark theory of QCD	96
T. Tanimoto	
6. Particle Physics	
Baryon spectrum of an SU(4) composite Higgs theory	97
E. T. Neil <i>et al.</i>	
Updated empirical formulae of the masses of elementary particles	98
Y. Akiba	
A model of the empirical mass formulae of elementary particles	99
Y. Akiba	

7. Astrophysics and Astro-Glaciology

High-sensitivity sulfur isotopic measurements for Antarctic ice core analyses	101
K. Takahashi <i>et al.</i>	
Mass Measurements with the Rare-RI Ring for the $A = 130$ r-process Abundance Peak	102
S. Naimi	

8. Accelerator

Construction of New 28-GHz ECR ion source for RILAC	103
T. Nagatomo <i>et al.</i>	
Development of prototype superconducting linac for low-beta ions	104
N. Sakamoto <i>et al.</i>	
Performance test of bulk-niobium cavities for new superconducting linear accelerators	105
K. Yamada <i>et al.</i>	
Input power coupler for SRILAC	106
K. Ozeki <i>et al.</i>	
Development of RIKEN 28 GHz SC-ECRIS for the production of intense metal ion beam	107
Y. Higurashi <i>et al.</i>	
Beam energy adjuster for super-heavy element synthesis at RIKEN Ring Cyclotron	108
K. Yamada <i>et al.</i>	
Operation of high-temperature oven for 28-GHz superconducting ECR ion source	109
J. Ohnishi <i>et al.</i>	
Laser Energy Dependence of Plasma Instability by Solenoid Magnetic Field	110
T. Karino <i>et al.</i>	
Evaluation of beam orbit calculation method for the injection line of AVF cyclotron and performance evaluation of pepper-pot emittance monitor	111
Y. Kotaka <i>et al.</i>	
Updating control units around the AVF cyclotron	112
M. Komiyama <i>et al.</i>	
Reconstruction of RF system controller for RIKEN Ring Cyclotron	113
K. Yamada <i>et al.</i>	
Radiation monitoring for cycrotrons in RIBF	114
M. Nakamura <i>et al.</i>	
Development of beam interlock system driven by change in current of the magnet	115
K. Kumagai and A. Uchiyama	
Design of reliable control with star-topology fieldbus communication for an electron cyclotron resonance ion source at RIBF	116
A. Uchiyama	
Operation report for Nishina and RIBF water-cooling systems	117
T. Maie <i>et al.</i>	
Pressure measurement of plasma window with large diameter	118
N. Ikoma <i>et al.</i>	
Maintenance of vacuum conditions of RILAC	119
S. Watanabe <i>et al.</i>	

9. Instrumentation

Application of the Generic Electronics for Time Projection Chamber (GET) readout system for heavy radioactive isotope collision experiments	121
T. Isobe <i>et al.</i>	
PANDORA, a large volume low-energy neutron detector with real-time neutron-gamma discrimination	122
L. Stuhl <i>et al.</i>	
Measurement of total kinetic energy using LaBr ₃ (Ce) crystal in ZeroDegree spectrometer for two-step experiment	123
H. Suzuki <i>et al.</i>	
Prototype of new delay line with chip inductors for the PPAC	124
H. Sato <i>et al.</i>	
Development of electronics to allow vertex determination in the KISS MSPGC	125
P. Schury <i>et al.</i>	

Development of Plastic Scintillator Barrel for WASA at GSI	126
R. Sekiya <i>et al.</i>	
Energy dependence study of cylindrical drift chamber used for the MTV experiment	127
F. Goto <i>et al.</i>	
Development of long and high-density data bus for sPHENIX INTT detector	128
T. Hachiya <i>et al.</i>	
Performance evaluation of sensor module for INTT at sPHENIX	129
A. Suzuki <i>et al.</i>	
Slit system between the foci F2 and F3 of the BigRIPS separator	130
K. Yoshida <i>et al.</i>	
Fast beam interlock system for BigRIPS separator	131
K. Yoshida	
Thermal model simulation of high-power rotating target for BigRIPS separator	132
Z. Korkulu <i>et al.</i>	
Primary beam intensity calibration method using charge-states distribution	133
D. S. Ahn <i>et al.</i>	
Angle-tunable degrader system for OEDO	134
J. W. Hwang <i>et al.</i>	
Development of dispersion-matching optics of primary beam for SRC-BigRIPS system	135
S. Y. Matsumoto <i>et al.</i>	
SHE-Mass-II: an MRTOF-MS for Super Heavy Nuclei	136
M. Wada <i>et al.</i>	
Status and future plans of the MRTOF MS constructed at the SLOWRI facility	137
M. Rosenbusch <i>et al.</i>	
Development of multiple reflection time of flight mass spectrograph at KISS	138
J. Y. Moon <i>et al.</i>	
Offline test for RF carpet transportation in RF ion guide gas cell at the SLOWRI facility	139
A. Takamine <i>et al.</i>	
Study of extraction yield of multi-nucleon transfer reaction products by using cooled argon gas cell	140
Y. Hirayama <i>et al.</i>	
Yield analysis using target sliding system at KISS	141
Y. X. Watanabe <i>et al.</i>	
Present status of ERIS at the SCRIT electron scattering facility	142
T. Ohnishi <i>et al.</i>	
Electron-beam-current control at RTM injector	143
M. Watanabe <i>et al.</i>	
Modification of dc-to-pulse converter FRAC	144
S. Sato <i>et al.</i>	
Precise magnetic field measurement of WiSES	145
H. Wauke <i>et al.</i>	
MPV – Parallel Readout Extension of VME	146
H. Baba <i>et al.</i>	
Validation method to merge digital data acquisition with analog data-acquisition system in SAMURAI30 experiment	147
J. Gao, L. Stuhl	
Development of 1.5-mm thick liquid hydrogen target	148
S. Koyama and D. Suzuki	
Profile measurement of a large target cell of liquid hydrogen	149
M. Miwa <i>et al.</i>	
The stability of the liquid hydrogen target system during the SAMURAI 30 experiment	150
X. Sun <i>et al.</i>	
Design of an Ion Source for the eSHE project Toward Pioneering Electron Scattering on Superheavy Elements	151
S. Naimi	
Absolute optical absorption cross-section of Rb atoms injected into superfluid helium using energetic ion beams	152
K. Imamura <i>et al.</i>	

Baseline correction system of laser-microwave double resonance spectrum for atoms injected into superfluid helium by laser sputtering	153
M. Sanjo <i>et al.</i>	
Attempt to measure relaxation time of atomic bubble surrounding alkaline atoms in superfluid helium	154
Y. Takeuchi <i>et al.</i>	
Development of offline ion source for collinear laser spectroscopy of RI beams	155
M. Tajima <i>et al.</i>	
Development of active nuclear spin maser with time-separated feedback scheme for Xe-EDM search	156
T. Sato <i>et al.</i>	
Epithermal neutron spin filter with dynamic nuclear polarization using photo-excited triplet electron	157
S. Takada <i>et al.</i>	
Measurement of impurity nuclides in 10.75 MeV/nucleon ^{136}Xe beam in the atmosphere	158
T. Kambara and A. Yoshida	
Computing and network environment at the RIKEN Nishina Center	159
T. Ichihara <i>et al.</i>	
CCJ operations in 2018	160
S. Yokkaichi <i>et al.</i>	

III. RESEARCH ACTIVITIES II (Material Science and Biology)

1. Atomic and Solid State Physics (Ion)

Effects of asymmetrically-introduced splayed columnar defects on the peak effect in $(\text{Ba}, \text{K})\text{Fe}_2\text{As}_2$	161
T. Tamegai <i>et al.</i>	
Control of the electrical conductivity in diamond by ion implantation	162
H. Yamazaki <i>et al.</i>	
Investigation of single event effects observed in SiC-SBDs	163
Y. Nakada <i>et al.</i>	
Energy dependence of MeV-ion microbeam size extracted from tapered glass capillary optics	164
M. Ikekame <i>et al.</i>	
Development of UV microbeam irradiation system by glass capillary optics	165
S. Kawamura <i>et al.</i>	

2. Atomic and Solid State Physics (Muon)

Magnetic ordered states of hole-doped pyrochlore iridates $(\text{Y}_{1-x-y}\text{Cu}_x\text{Ca}_y)_2\text{Ir}_2\text{O}_7$ investigated by μSR	167
J. Angel <i>et al.</i>	
Generalization of muon spin relaxation function to study the pseudogap state of the underdoped $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$	168
M. D. Umar and I. Watanabe	
Magnetic order in defective reduced graphene oxides (rGO) investigated using μSR	169
R. Asih <i>et al.</i>	
Ground state of quasi-one dimensional competing spin chain $\text{Cs}_2\text{Cu}_2\text{Mo}_3\text{O}_{12}$	170
T. Goto and K. Matsui	
Superconductivity in single crystals of λ -(BETS) $_2\text{GaCl}_4$ studied by transverse-field μSR	171
D. P. Sari <i>et al.</i>	
μSR study on ferrimagnetism of Na-K alloy clusters incorporated into zeolite LSX under high-pressure helium gas	172
T. Nakano <i>et al.</i>	
Quantum effects of muon on the electronic state of La_2CuO_4	173
M. R. Ramadhan <i>et al.</i>	
<i>Ab-initio</i> calculation and μSR study of the covalency effect in $\text{YBa}_2\text{Cu}_3\text{O}_6$	174
I. Ramli <i>et al.</i>	
Studies of electrical conductivity in 12-mer single-stranded DNA by using scanning tunneling microscope	175
H. Rozak <i>et al.</i>	
Magnetic ordering of $(\text{Eu}_{1-x}\text{Ca}_x)_2\text{Ir}_2\text{O}_7$ studied using muon spin relaxation (μSR)	176
U. Widyaiswari <i>et al.</i>	
μSR study of the Cu-spin correlation in the electron-underdoped $\text{Pr}_{1.3-x}\text{La}_{0.7}\text{Ce}_x\text{CuO}_{4+\delta}$ ($x = 0.05$) single crystals	177
T. Adachi <i>et al.</i>	

Reduction in Néel Temperature of La ₂ CuO ₄ Nanoparticles S. Winarsih <i>et al.</i>	178
Muon spin relaxation after hydrogen absorption-desorption process in Pd M. Mihara <i>et al.</i>	179
Negative muon spin rotation with low-density gas target under transverse magnetic field to solve the proton radius puzzle S. Kanda <i>et al.</i>	180
Measurement of total muonium emission yield from silica aerogel using μ SR method K. Ishida <i>et al.</i>	181
3. Radiochemistry and Nuclear Chemistry	
Extraction behavior of rutherfordium as a cationic fluoride complex with a TTA chelate extractant from HF/HNO ₃ acidic solutions A. Yokoyama <i>et al.</i>	183
Coprecipitation experiment of element 102, No, with Sm(OH) ₃ using NH ₃ and NaOH solution H. Ninomiya <i>et al.</i>	184
Complex formation of Fr with crown ethers Y. Komori <i>et al.</i>	185
Anion and cation exchange of Pa in HF/HCl mixture solution for Db chemistry T. Yokokita and H. Haba	186
Study of anion exchange equilibrium of Zr and Hf in H ₂ SO ₄ for Rf experiment T. Yokokita <i>et al.</i>	187
Development of ²¹¹ At-labeled antibody for targeted alpha therapy Y. Kanayama <i>et al.</i>	188
RI imaging tracers for Na ⁺ /K ⁺ dynamics in a living body S. Motomura <i>et al.</i>	189
Measurement of activation cross sections of alpha particle induced reactions on iridium up to an energy of 50 MeV S. Takács <i>et al.</i>	190
Cross-section measurement of α -induced reactions on ^{nat} Er for ¹⁶⁹ Yb production M. Saito <i>et al.</i>	191
Activation cross sections of alpha-induced reactions on ^{nat} In for ^{117m} Sn production M. Aikawa <i>et al.</i>	192
Investigation of alpha particle induced reactions on natural silver in the 40–50 MeV energy range F. Ditrói <i>et al.</i>	193
Production cross sections of deuteron-induced reactions on natural palladium for Ag isotopes N. Ukon <i>et al.</i>	194
Production cross sections of ¹¹¹ Ag in deuteron-induced nuclear reactions on natural palladium K. Ooe <i>et al.</i>	195
Production cross sections of Mo, Nb and Zr radioisotopes from α -induced reaction on ^{nat} Zr T. Murata <i>et al.</i>	196
Activation cross sections of deuteron-induced reactions on niobium up to 24 MeV M. Aikawa <i>et al.</i>	197
New cross section data for production of zirconium-89 by alpha-induced reaction on yttrium target T. Murata <i>et al.</i>	198
Cross section measurement of the deuteron-induced reaction on ⁸⁹ Y to produce ⁸⁹ Zr M. Sakaguchi <i>et al.</i>	199
Activation cross sections of alpha particle induced reactions on natural nickel up to 50 MeV S. Takács <i>et al.</i>	200
Measurement of half-lives of ¹⁸¹ , ^{182a} , ^{182b} , ¹⁸³ , ^{184m} Re and ¹⁸⁷ W Y. Komori and H. Haba	201
Production of Np isotopes in nuclear reactions for standard material in accelerator mass spectrometry Y. Hayakawa <i>et al.</i>	202
Column chromatography of astatine using weak base anion exchange resin H. Ikeda <i>et al.</i>	203

Speciation analysis of oxidation states of astatine extracted into ethanol-water solutions Y. Shin <i>et al.</i>	204
Purification of ^{121m}Te by anion exchange chromatography T. Kubota <i>et al.</i>	205
Production of arsenic RI tracer from gallium oxide target by alpha beam irradiation H. Ikeda <i>et al.</i>	206
Production of ^{44m}Sc for multiple-isotope PET T. Fukuchi <i>et al.</i>	207
Adsorption experiments of ^{88}Y and ^{143}Pm on in HNO_3 T. Yokokita <i>et al.</i>	208
4. Radiation Chemistry and Biology	
Development of new cultivar of Hibiscus by C-ion beam irradiation S. Ochiai <i>et al.</i>	209
Effect of heavy ion beam irradiation on germination and mutation rate in local Toraja rice R. Sjahril <i>et al.</i>	210
Isolation of the chalky grain mutant 13–45 in rice (<i>Oryza sativa L.</i>) T. Katsube-Tanaka <i>et al.</i>	211
Molecular analysis of the stay-green mutant <i>dye1</i> induced by carbon ion beams in rice H. Yamatani <i>et al.</i>	212
An early-flowering einkorn wheat mutant with deletions of <i>PHYTOCLOCK 1/LUX ARRHYTHMO</i> and <i>VERNALIZATION 2</i> exhibits a high level of <i>VERNALIZATION 1</i> expression induced by vernalization K. Murai <i>et al.</i>	213
Effects of carbon-ion irradiation to male gametes on double fertilization in <i>Cyrtanthus mackenii</i> T. Hirano <i>et al.</i>	214
Death of pollen tetrads caused by chromosomal rearrangement Y. Kazama <i>et al.</i>	215
Estimation of efficient dose for heavy-ion beam mutagenesis by whole-genome mutational analysis in <i>Arabidopsis thaliana</i> K. Ishii <i>et al.</i>	216
Characterization of L-cysteine requiring mutants derived from heavy-ion-beam irradiated cells in the unicellular green alga <i>Parachlorella kessleri</i> T. Yamazaki <i>et al.</i>	217
Increase of lipid production upon outdoor cultivation of heavy-ion beam irradiation mutant <i>Parachlorella kessleri</i> PK4 and identification of its genetic variations T. Takeshita <i>et al.</i>	218
Pleiotropic mutant of plant-symbiotic edible mushroom <i>Tricholoma matsutake</i> induced by argon-ion beam H. Murata <i>et al.</i>	219
Comparison of biological effect between low- and high-LET irradiation on DSB repair in the filamentous fungus <i>Neurospora crassa</i> L. Ma <i>et al.</i>	220
Effect of different conditions of the mutant isolation system on rotifers by using heavy-ion beam irradiation K. Tsuneizumi <i>et al.</i>	221
The inhibitor of DNA-PK suppressed DNA repair after heavy-ion irradiation in quiescent mammalian cells M. Izumi and T. Abe	222
Phosphorylation and accumulation of low-dose high-LET heavy ion-induced bystander signaling molecules M. Tomita <i>et al.</i>	223
CR-39 imaging method to estimate microbeam profiles produced by tapered glass capillary optics Y. Hikima <i>et al.</i>	224
Stability test of ion microbeams produced by tapered glass capillary optics for biological use T. Ikeda <i>et al.</i>	225
IV. OPERATION RECORDS	
Program Advisory Committee meetings for nuclear physics and for materials and life experiments K. Yoneda <i>et al.</i>	227

Beam-time statistics of RIBF experiments	228
K. Yoneda and H. Ueno	
Electric power consumption of RIKEN Nishina Center in 2018	229
E. Ikezawa <i>et al.</i>	
Operation report of the ring cyclotrons in the RIBF accelerator complex	230
J. Shibata <i>et al.</i>	
RILAC operation	231
E. Ikezawa <i>et al.</i>	
Operation report on the RIKEN AVF cyclotron for 2018	232
K. Kobayashi <i>et al.</i>	
Present status of the liquid-helium supply and recovery system	233
T. Dantsuka <i>et al.</i>	
Present status of the BigRIPS cryogenic plant	234
K. Kusaka <i>et al.</i>	
Radiation safety management at RIBF	235
K. Tanaka <i>et al.</i>	
Operation of the Pelletron tandem accelerator	237
T. Ikeda <i>et al.</i>	
Fee-based activities by the industrial application research team	238
A. Yoshida <i>et al.</i>	

V. EVENTS

DIS2018 International Workshop	239
Y. Goto, for the QNP2018 LOC	
RIKEN Open Day 2018	240
K. Yoshida and T. Uesaka	
Workshop on “The r-process and unstable nuclei in multi-messenger astronomy”	241
N. Nishimura <i>et al.</i>	
TESLA Technology Collaboration Meeting 2019 at RIKEN Nishina Center	242
N. Sakamoto	
Participation in Hokkaido Science Festival	243
N. Miyauchi	
QNP2018 International Conference	244
Y. Goto, for the QNP2018 LOC	
RIBF “Hodan-kai” meeting on the future of exotic nuclear physics	245
T. Matsumoto	
Symposium on “Science and Technology Explored with Periodic Table” celebrating the “IYPT2019 in Japan”	246
H. Sakurai	

VI. ORGANIZATION AND ACTIVITIES OF RIKEN NISHINA CENTER

(Activities, Members, Publications & Presentations)

1. Organization	247
2. Finances	248
3. Staffing	248
4. Research publication	249
5. Management	250
6. International Collaboration	253
7. Awards	255
8. Brief overview of the RI Beam Factory	256
Nuclear Science and Transmutation Research Division	
Radioactive Isotope Physics Laboratory	258

Spin isospin Laboratory	267
Nuclear Spectroscopy Laboratory	273
High Energy Astrophysics Laboratory	278
Superheavy Element Research Group	283
Superheavy Element Production Team	285
Superheavy Element Device Development Team	289
Astro-Glaciology Research Group	291
Nuclear Transmutation Data Research Group	294
Fast RI Data Team	296
Slow RI Data Team	298
Muon Data Team	299
High-Intensity Accelerator R&D Group	302
High-Gradient Cavity R&D Team	303
High-Power Target R&D Team	304
Research Facility Development Division	
Accelerator Group	305
Accelerator R&D Team	307
Ion Source Team	309
RILAC Team	310
Cyclotron Team	311
Beam Dynamics & Diagnostics Team	313
Cryogenic Technology Team	315
Infrastructure Management Team	316
Instrumentation Development Group	317
SLOWRI Team	319
Rare RI-ring Team	323
SCRIT Team	325
Research Instruments Group	328
BigRIPS Team	329
SAMURAI Team	332
Computing and Network Team	335
Detector Team	337
Accelerator Applications Research Division	
Beam Mutagenesis Group	340
Ion Beam Breeding Team	341
Plant Genome Evolution Research Team	345
RI Application Research Group	347
Nuclear Chemistry Research Team	348
Industrial Application Research Team	355
Subnuclear System Research Division	
Quantum Hadron Physics Laboratory	357
Strangeness Nuclear Physics Laboratory	362
Radiation Laboratory	365
Meson Science Laboratory	369

RIKEN BNL Research Center	375
Theory Group	376
Experimental Group	378
Computing Group	382
RIKEN Facility Office at RAL	389
Safety Management Group	394
User Liaison Group	396
RIBF User Liaison Team	397
Outreach Team	398
Partner Institutions	399
Center for Nuclear Study, Graduate School of Science, The University of Tokyo	400
Wako Nuclear Science Center, IPNS (Institute of Particle and Nuclear Studies), KEK (High Energy Accelerator Research Organization)	411
Events (April 2018 – March 2019)	414
Press Releases (April 2018 – March 2019)	415

VII. LIST OF PREPRINTS

List of Preprints (April 2018 – March 2019)	417
---	-----

VIII. LIST OF SYMPOSIA, WORKSHOPS & SEMINARS

List of Symposia & Workshops (April 2018 – March 2019)	419
List of Seminars (April 2018 – March 2019)	419