

# 【Joint Sessions for Japan Radiology Congress】

## Opening Ceremony

- Opening Ceremony: April 14 (Fri.) 13:00–14:30 (Main Hall)

Performance: Ensemble Dunamiz

Keynote lecture

President:	Masumi Kadoya (Shinshu University)
	The 76th Annual Meeting of the Japan Radiological Society (JRS)
Conference President:	Tosiaki Miyati (Kanazawa University)
	The 73rd Annual Meeting of the Japanese Society of Radiological Technology (JSRT)
Congress Chair:	Koji Noda (QST/NIRS)
	The 113th Scientific Meeting of the Japan Society of Medical Physics (JSMP)
Chairman:	Kenichi Komatsu
	Japan Medical Imaging and Radiological Systems Industries Association (JIRA)

## Joint Special Lecture

- Joint Special Lecture1: April 14 (Fri.) 14:00–14:30 (Main Hall)

	Moderator: Shinshu Univ.	Masumi Kadoya
Hidetoshi Nakata's Special Talk	A former Japanese professional footballer	Hidetoshi Nakata

- Joint Special Lecture2: April 14 (Fri.) 17:20–17:50 (Main Hall)

	Moderator: QST/NIRS	Koji Noda
Prospect of Medicine with Quantum Science and Technology	QST	Toshio Hirano

## Joint Symposium

- Joint Symposium 1: April 14 (Fri.) 15:10–17:10 (Main Hall)

「What should we do for reaching the summit and the horizon of Radiology?」

	Moderator: International Univ. of Health and Welfare	Kuni Ohtomo
	Marunouchi Hosp.	Hiroshi Hirano
1. To the summit of Radiology, to the horizon of Radiology: from the point of view of Diagnostic Radiology	Juntendo Univ.	Shigeki Aoki
2. Interventional radiology, desirable now and future	Okayama Univ.	Susumu Kanazawa
3. The point of View from Radiation Oncologists	Keio Univ.	Naoyuki Shigematsu
4. Considering Collaborative Education: Medical Radiation Exposure	QST/NIRS	Yasuo Okuda
5. What Medical Physics Promotes in Radiology	Hokkaido Univ.	Toru Yamamoto

• Joint Symposium 2: April 15 (Sat.) 9:40–11:50 (Main Hall)

〔International standards and protocols for radiology〕

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|---|--------------------------------------|------------------|
|   | Moderator: Kindai Univ.              | Takahiro Yamada  |
|   | QST/NIRS                             | Shigekazu Fukuda |
| 1. International Electrotechnical Commission (IEC) standards for light ion beam medical electrical (ME) equipment | Shanghai Proton and Heavy Ion Center | Michael Moyers   |
| 2. IEC/TR 62926 for radiotherapy systems for moving targets   | Hokkaido Univ.                       | Yuichi Hirata    |
| 3. International Standards for Nuclear Medicine and Molecular Imaging   | Tohoku Univ.                         | Hiroshi Watabe   |
| 4. International Standards and Protocols of Dosimetry for Radiology with Activities of ISO/TC85/SC2/WG22          | Korea Univ.                          | Changbum Kim     |
| 5. Current status and update of the IAEA code of practice for external beam radiotherapy dosimetry                | IAEA                                 | Karen Christaki  |

• Joint Symposium 3: April 15 (Sat.) 13:00–15:00 (Main Hall)

〔Current Status and Issues of Radiological Protection in Pediatric Radiology〕

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|--|--|-----------------|
|  | Moderator: Oita Univ. of Nursing and Health Sciences | Michiaki Kai    |
|  | QST/NIRS   | Yoshiya Shimada |
| 1. Progress in Radiation Protection of Children in Large Part of the World and Issues for Future | Massachusetts General Hosp.                          | Madan M. Rehani |
| 2. Pediatric CT in Japan 2017: State of the art  | National Center for Child Health and Development     | Osamu Miyazaki  |
| 3. Skills to reduce radiation dose in pediatric orthopedic imaging                               | Shiga Medical Center for Children                    | Atsushi Fukuda  |
| 4. Revealed of the facts by Japan DRLs 2015 for Pediatric CT                                     | Hamamatsu Univ. Hosp.                                | Yasutaka Takei  |

**Reception for All Participants (Congress Party)**

- Reception for all participants (Congress Party): April 14 (Fri.) 18:15–19:30

(Yokohama Bay Hotel Tokyo B2F Queen's Grand Ballroom)

**Closing and Awards Ceremony**

- Closing and Awards ceremony: April 16 (Sun.) 15:00–16:15 (Main Hall)

〔Performance: JRC Festival Orchestra〕

# 【JSMP Program】

## (A) JSRT-JSMP Joint Session Plenary Lecture

(1) April 15 (Sat.) 15:10–16:10 (503)

Radiomics: The new frontier in quantitative image modeling

Moderator: Kyushu Univ. Hidetaka Arimura  
Univ. of Michigan Issam El Naqa

(2) April 16 (Sun.) 10:50–11:50 (503)

Current Trends of Patient Radiation Dose Monitoring and Tracking Systems

Moderator: Hokkaido Univ. of Science Takumi Tanikawa  
Kagawa University Hosp. Naoki Nishimoto

1. Part I (Technical Aspect)

Virginia Commonwealth Univ. Medical Center Pei-jan Paul Lin

2. Part II (Operational Infrastructure)

Virginia Commonwealth Univ. Medical Center Shelia Regan

## (B) Morning Educational Lecture

(1) April 14 (Fri.) 8:15–8:55 (418 + 419)

Moderator: HIPRAC Shuichi Ozawa  
Fundamentals of Diodes as Radiation Detectors – n Type versus p Type  
Sun Nuclear Corporation Jie Shi

(2) April 15 (Sat.) 8:15–8:55 (418 + 419)

Moderator: QST/NIRS Shinichiro Mori  
Mathematical Techniques for Markerless Tumor Motion Following Radiation Therapy  
Tohoku Univ. Noriyasu Homma

(3) April 16 (Sun.) 8:15–8:55 (418 + 419)

Moderator: Kyoto Univ. Mitsuhiro Nakamura  
Risk-based analysis for radiotherapy according to AAPM TG-100  
National Cancer Center Hospital Hiroyuki Okamoto

## (C) Lunch Time Lecture

(1) April 14 (Fri.) 12:00–12:50 (418 + 419)

Moderator: QST/NIRS Taiga Yamaya  
Development of State-of-The-Art Quality Assurance Dosimetry at CMRP:  
International Collaboration (Overview)  
Univ. of Wollongong Anatoly B. Rozenfeld

(2) April 15 (Sat.) 12:00–12:50 (418 + 419)

Moderator: Kyushu Univ. Hidetaka Arimura  
Deep Learning Techniques for Computer Aided Diagnosis  
Fujita Health Univ. Atsushi Teramoto

(3) April 16 (Sun.) 12:00–12:50 (418 + 419)

Radiation Protection for the lens of the eye

Moderator: QST/NIRS Shunsuke Yonai

1. Reduction of the dose limit by the ICRP and the current status

QST/NIRS Keiichi Akahane

2. The trend of the international and national standards for the dose of eye lens

AIST Tadahiro Kurosawa

**(D) JSRT-JSMP Joint Symposium**

April 14 (Fri.) 9:50–11:50 (501)

Radiological Physics and Technology

Moderator: Kumamoto Univ. Junji Shiraishi

Teikyo Univ. Shinji Kawamura

1. Radiological Physics and Technology: Brief History, Current Status and Future

RPT Editor-in-Chief Kunio Doi

2. Cited and non-cited articles – From the analysis of articles published in RPT

RPT Deputy Editor Masahiro Endo

3. Medical Physics 3.0

Duke Univ. Ehsan Samei

**(E) Information Exchange Meeting on Medicine Physics Education Course**

April 15 (Sat.) 13:00–14:30 (419)

Moderator: The Japanese College of Medical Physics Masahiro Fukushi

Teiji Nishio

**(F) JSMP-JSMBE Joint Session**

April 16 (Sun.) 11:00–11:50 (419)

Exchange meeting with Japanese Society for Medical and Biological Engineering (JSMBE)

Moderator: Kyoto Univ. Tsuyoshi Shiina

QST/NIRS Shigekazu Fukuda

NCVC Masaru Sugimachi

Kyoto Univ. Tsuyoshi Shiina

**(G) Session for students**

April 16 (Sun.) 14:00–14:50 (419)

“Are you satisfied with studying in Japan?”

Kindai Univ. Hajime Monzen

HIPRAC Shuichi Ozawa

**JSMP Board of Directors**

April 13 (Thu.) 12:00–17:00 (421)

**JSMP General Meeting of Members**

April 15 (Sat.) 17:10–18:10 (419)

## 【General Session】

April 13 (Thu.) PACIFICO Yokohama Conference Center 418

### 1. Radiation Therapy (photon/electron) 1 (IMRT/VMAT1) 13:00–13:50 Moderator: Yukio Fujita

- ★ **0-001** Dose error prediction based on the dose uncertainty accumulation of intensity-modulated radiation therapy  
Hospital of UOEH Eiji Shiba
- 0-002** Evaluation of dosimetric impact of the jaw position displacement in jaw tracking VMAT  
Juntendo Univ. Toru Kawabata
- ★ **0-003** PHITS Monte Carlo-dose verification of VMAT treatment plan with HD120MLC  
Kumamoto Univ. Naoki Nagaishi
- 0-004** Statistical analysis of patient-specific IMRT quality assurance  
Ryukyus Univ. Masashi Kinjyo
- 0-005** Feasibility study of transferring patients to a matched linear accelerator in case of machine breakdown in IMRT and VMAT plans  
NCCHE Hidenobu Tachibana

### 2. Radiation Therapy (photon/electron) 2 (IMRT/VMAT2) 14:00–15:00 Moderator: Seiichi Ota

- ★ **0-007** Comparison of VMAT and 3-D CRT treatment plans in multiple brain metastases  
Kumamoto Univ. Naoto Yamaura
- ★ **0-008** Dosimetric accuracy of dose calculation algorithms for VMAT in multiple brain metastases  
Kumamoto Univ. Kento Hoshida
- 0-009** Impact of different MLC controls in volumetric modulated arc therapy for total body irradiation (VMAT-TBI)  
Tokyo Metropolitan Univ. Yuta Takahashi
- 0-010** The analysis of the effect of implanted metal in spine for Volumetric Modulated Arc Therapy  
Osaka Univ. Reimi Taniguchi
- ★ **0-011** Comparison of 3D CRT and the Jaws-Only IMRT (JO-IMRT) planning parameters for head-and-neck cancer  
Dong Nai Hosp. Tai Duong Thanh
- ★ **0-012** Evaluation of Jaws-Only Intensity Modulated Radiation Therapy Treatment Plans using Octavius 4D System  
Dong Nai Hosp. Tai Duong Thanh

### 3. Radiation Therapy (photon/electron) 3 (IMRT/VMAT3) 15:10–16:10 Moderator: Akihisa Wakita

- 0-013** The model-based estimation of rectal dose in volume modulated arc radiotherapy for prostate cancer  
OMCC Yoshihiro Ueda
- ★ **0-014** Quantitative analysis for coldspots in dose distributions of IMRT for prostate cancer  
Univ. of Kyushu. Ryosuke Asamura
- ★ **0-015** Impact of shape variation on PTV margins in IMRT for prostate cancer  
Kyushu Univ. Hosp. Takaaki Hirose
- ★ **0-016** Planning study for esophageal cancer: A dosimetric comparison of conformal radiotherapy, VMAT and Hybrid-VMAT  
OMCC Masayoshi Miyazaki
- ★ **0-017** Advantage of FFF beam compared to FF beam for VMAT-SBRT plans in lung tumor  
Kumamoto Univ. Naoto Yamaura
- ★ **0-018** A comparison between dose calculation algorithms for VMAT-SBRT plans in lung tumor  
Kumamoto Univ. Takanori Matsuoka

## 4. Radiation Therapy (photon/electron) 4 (Respiratory Gating and Tracking Technique)

16:10–17:00

Moderator: Shuichi Ozawa

- 0-019** Basic study of respiratory gated irradiation using FFF beam  
Toho Univ. Sakura Medical Center Teruo Ito
- 0-020** A simple quality assurance system for respiratory-gated radiotherapy using pulse information from linac  
Komazawa Univ. Tomoyuki Kurosawa
- 0-021** Assessment of tracking accuracy by detecting laser position using CMOS camera in CyberKnife  
NCCH Hiroyuki Okamoto
- 0-022** Investigation of uncertainty in 4D dose accumulation for lung SBRT  
Tohoku Univ. Ryutaro Ikeda
- 0-023** Design and development of a non-rigid phantom that ventilates air for the quantitative evaluation of CT-based pulmonary ventilation imaging  
Komazawa Univ. Shin Miyakawa

## 5. Medical Image and Information

17:10–17:50

Moderator: Atsushi Myojoyama

- 0-024** Automatic chest X-ray screening with a deep neural network  
Teikyo Univ. Junichi Kotoku
- 0-025** Development of patient recognition system for radiotherapy  
Tokyo Metropolitan Univ. Takatomo Ezura
- ★ **0-026** A feasibility study for analyzing abnormal motion using relative cross correlation in tracking moving tumors in radiation therapy  
The Univ. of Tokyo Ritu Bhusal Chhatkuli
- ★ **0-027** Investigation of the correlation in radiomics features between EPID and digitally reconstructed radiography images  
Kyushu Univ. Mazen Soufi

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## 6. Radiation Therapy (particle) 1 (Measurement)

13:00–14:00

Moderator: Toshiyuki Toshito

- 0-028** Time-resolved analysis of Cherenkov light from positron emitter as a new probe to high-precision measurement of nuclear reaction cross section  
Waseda Univ. Takamitsu Masuda
- 0-029** Luminescence imaging of water during carbon-ion irradiation  
Nagoya Univ. Seiichi Yamamoto
- 0-030** Relationship between Luminescence Images and Dose Distributions in Water for Therapeutic Proton Beam  
Nagoya Univ. Takuya Yabe
- 0-031** Development of a low-energy X-ray camera for beam monitoring of particle therapy  
Nagoya Univ. Kouki Ando
- 0-032** Measurement of radiation quality of Pencil Carbon Ion Beams using a Silicon Detector  
Gunma Univ. Kohei Osaki
- 0-033** Proposal for dosimetry system using  $e^+e^-$  pair production events  
Chiba Univ. Shota Kimura

- 7. Radiation Therapy (particle) 2 (QA) 14:00–14:40 Moderator: Hideyuki Mizuno**
- 0-034** Commissioning of the small-field and large-field proton beams in line scanning therapy for the Eclipse Proton treatment planning system  
Aizawa Hosp. Yuya Sugama
- 0-035** Development of an online proton dose distribution monitoring system by using a fluorescent screen (I)  
The Wakasa Wan Energy Research Center Fuyumi Ito
- 0-036** Testing a ZnS:Ag scintillator as a QA tool for small-field carbon ion therapy  
Kitasato Univ. Takumi Narusawa
- ★ **0-037** Time saving lateral profile validation procedure utilizing simplified Monte Carlo calculation for patient specific QA of proton beam therapy  
Hitachi Ltd. Takahiro Yamada
- 8. Nuclear Medicine 1 14:50–15:50 Moderator: Masayori Ishikawa**
- ★ **0-038** Whole gamma imaging concept: feasibility study of triple-gamma imaging  
QST/NIRS Taiga Yamaya
- 0-039** Whole gamma imaging concept: Compton-PET imaging simulation for positron emitters  
Chiba Univ. Yusuke Okumura
- 0-040** Development of whole-body PET system with 3 mm resolution and 1M\$  
Chiba Univ. Kento Fujihara
- 0-041** Development of gamma-detectors for PET with position resolution of 0.5mm  
Chiba Univ. Yusaku Emoto
- 0-042** Development of a circular shape Si-PM-based detector ring for positron emission mammography (PEM) system  
Nagoya Univ. Kouhei Nakanishi
- 0-043** Development of second add-on PET/MRI prototype: Evaluation of PET imaging performance  
QST/NIRS Fumihiko Nishikido
- 9. Nuclear Medicine 2 15:50–16:50 Moderator: Hideaki Tashima**
- 0-044** Development of a head motion tracking system for the helmet PET  
QST/NIRS Yuma Iwao
- 0-045** Development of Monte Carlo Simulation Built-in Quantitative Iterative Reconstruction  
Kindai Univ. Hosp. Kenta Sakaguchi
- 0-046** Study on the cause of edge artifact in PSF-based image reconstruction and its mitigation by Map-EM method with L1 regularization  
Tokyo Metropolitan Univ. Hiroyuki Shinohara
- ★ **0-047** Joint estimation of activity and attenuation for a compact brain TOF-PET system : a simulation study  
Tokyo Institute of Technology Risako Tanaka
- ★ **0-048** Separation of two radionuclides in small animal SPECT system  
Hosei Univ. Shunsuke Shimodaira
- ★ **0-049** Multi-pinhole imaging with a triple head SPECT system  
Hosei Univ. Hayao Kubota
- 10. Nuclear Medicine 3 17:00–18:10 Moderator: Tomoyuki Hasegawa**
- ★ **0-050** Development of a four-layered DOI-PET detector with quadrisected crystals on the top layer  
Chiba Univ. Genki Hirumi

- ★ **0-051** Development of an isotropic DOI detector based on two-sided photon readout  
QST/NIRS Akram Mohammadi
- ★ **0-052** Comparison of yttrium-90 Compton image, SPECT, and PET  
Gunma Univ. Makoto Sakai
- ★ **0-053** Simulation study on parallel plane PET based positron marker tracking with a volume of response algorithm  
Hokkaido Univ. Ryo Ogawara
- ★ **0-054** Development of a small prototype system toward real-time OpenPET image-guided surgery  
QST/NIRS Hideaki Tashima
- ★ **0-055** CALCULATING ABSORBED DOSE IN THYROID DISEASE TREATMENT BY I-131, USING OLINDA/EXM.  
Nguyen Huu Huan high school Nguyen Thi Phuong Thao
- ★ **0-056** USING CARIMAS TO DETERMINE THE DISTRIBUTION OF RADIATION ACTIVITY IN PATIENTS FROM PET IMAGES  
Nguyen Huu Huan high school Nguyen Thi Phuong Thao

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11. Radiation Therapy (photon/electron) 5 (Treatment Planning and QA 1)

9:10–10:10

Moderator: Takeshi Kamomae

- 0-057** VMAT QA using MapCHECK2 and original phantom  
Tatebayashi Kosei Hosp. Ayaka Shinohara
- ★ **0-058** Evaluation of MLC error sensitivity for VMAT QA: a comparison of various QA devices and metrics  
The Univ. of Yamanashi Masahide Saito
- 0-059** Study of the difference in inhomogeneity correction of the treatment planning system and the gantry-mounted 3-dimensional detector  
Seirei Hamamatsu General Hosp. Yumiko Adachi
- 0-060** Design and Development of a new Clarkson method that accounts for lateral scatter in inhomogeneous media  
Komazawa Univ. Shunta Jinno
- ★ **0-061** Optimal Control Point for Practical Dose Calculation with AXB Algorithm in Lung Stereotactic Body Radiation Therapy  
Chulalongkorn Univ. Lukkana Apipunyasopon
- 0-062** Acceleration of the photon transport simulation by voxel-based Boltzmann transport calculation method using parallel computing  
Tokyo Metropolitan Univ. Takahito Chiba

12. Radiation Therapy (photon/electron) 6 (Treatment Planning and QA 2)

10:20–11:20

Moderator: Satoru Sugimoto

- ★ **0-063** Computer-assisted treatment planning approach with genetic algorithm-based optimization using similar cases for lung stereotactic body radiation therapy  
Univ. of Kyushu. Shu Haseai
- 0-064** Assessment of adaptive radiation therapy with deformable image registration software  
Kobe Univ. Naritoshi Mukumoto
- 0-065** Investigation to improve dose distribution by adjusting the beam parameters based on the dose calculation during a course of radiotherapy  
Tohoku Univ. Suguru Dobashi



- ★ **0-066** The automated contouring framework of clinical target volumes based on the Bayesian inference for a prostate cancer radiation therapy  
Univ. of Kyushu. Kenta Ninomiya
- 0-067** A concept for evaluation of time-variable dose-volume evaluating on the time-dose-volume manifold  
Osaka Univ. Yusuke Anetai
- 0-068** Evaluation of oxygen enhancement ratio (OER) derived from cell survival curves  
Hokkaido Univ. Ryota Yamada

**13. Radiation Therapy (photon/electron) 7 (QA 1) 14:40–15:40 Moderator: Keisuke Usui**

- ★ **0-069** Assessment of delivery accuracy of Dynamic WaveArc technique using dose reconstruction method  
Kyoto Univ. Hideaki Hirashima
- ★ **0-070** The shift of the effective point of measurement and displacement perturbation factor at cylindrical chambers in high energy Photon beams  
Gono Bishwabidyalay (Univ.) Paul Kumaresh Chandra
- 0-071** A source model for Monte Carlo dose calculation with the multi-point scattered model  
Tohoku Univ. Yoshiki Ishizawa
- 0-072** Comparison of measured Synergy and Infinity linear accelerators: multi-institutional study  
Suita Tokushukai Hospital Yuichi Akino
- 0-073** Consideration on the control of output dose in radiation therapy equipment  
Iwate prefectural Isawa Hosp. Koji Ishita
- 0-074** The analysis of multi-institutional beam data of Clinac iX & Novalis Tx linear accelerators  
OMCC Masaru Isono

**14. Radiation Therapy (photon/electron) 8 (QA 2) 15:50–16:50 Moderator: Yu Kumazaki**

- 0-075** Comparison of machine log-file and machine log-file with EPID image dose reconstruction methods using two commercial software programs  
Tohoku Univ. Yoshio Kon
- 0-076** Improvement of dose analysis method using dose gradient information  
Hokkaido Univ. Masayori Ishikawa
- 0-077** Fundamental study on pass rate change induced by various resolutions for film-based dose distribution analysis  
Hokkaido Univ. Isshi Nara
- ★ **0-078** Performance evaluation of TLD sheet toward the dosimetry in the build-up region  
Hiroshima Univ. Tatsuhiko Suzuki
- 0-079** Testing plastic scintillator disk for verification of the electron boost plan in breast cancer patients  
Kitasato Univ. Yuya Tatsuno
- 0-080** Measurement of an energy spectrum of linear accelerator using UVC camera  
Tokyo Metropolitan Univ. Kyohei Morita

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**15. Diagnostic Imaging 1 (X-Ray/CT 1) 9:10–10:00 Moderator: Shinji Abe**

- 0-081** Imaging properties of the digital mammography using pixelated-scintillator  
Osaka Univ. Masao Matsumoto
- ★ **0-082** Simulation study for effective reduction procedure of scattered X-rays toward high accuracy material identification based on photon counting technique  
Tokushima Univ. Takashi Asahara

- 0-083** Investigation of 940nm near-infrared-ray computed tomography scanner  
Iwate Medical Univ. Hosp. Yuichi Sato
- 0-084** Novel photon-counting low-dose computed tomography using a multi-pixel photon counter (2)  
Waseda Univ. Tsubasa Oshima
- ★ **0-085** Measurement of X-ray spectra using an LSO-small-photomultiplier detector and its application to quad-energy computed tomography  
Iwate Medical Univ. Satoshi Yamaguchi
- 16. Diagnostic Imaging 2 (X-Ray/CT 2) 10:00–10:50 Moderator: Shinichi Wada**
- 0-086** Characteristics of a high-spatial-resolution dual cadmium-telluride-array detector and X-ray imaging  
Iwate Medical Univ. Eiichi Sato
- 0-087** Image-quality improvement of quad-energy X-ray computed tomography using a readily available cadmium telluride detector  
Iwate Medical Univ. Yasuyuki Oda
- 0-088** Effect of the number of MDCT scanning detector rows on image quality  
Ryukyus Univ. Takahiro Fujimoto
- ★ **0-089** Usefulness of Combined Interpolation Method for Metal Artifact Reduction in Head and Neck Computed Tomography  
Miyagi Cancer Center Akira Ito
- 0-090** Image quality of virtual monochromatic imaging in dual-energy CT for detection of acute ischemic stroke  
Kitasato Univ. Hidetake Hara
- 17. Radiation Protection 11:00–11:50 Moderator: Hiroki Ohtani**
- 0-091** The protective effect of amino acids against plasmid DNA damage induced by X-ray irradiation  
Kitasato Univ. Kouhei Kamada
- 0-092** Study of generalization of X-ray CT sources for Monte Carlo calculation.  
QST/NIRS Yusuke Koba
- 0-093** Search for Reasons of Incidence of Lung Cancers by Measurement of Environmental Radiation based on Cherenkov Detection  
Chiba Univ. Hiroshi Ito
- ★ **0-094** Medical physicist's challenges in Nepal in absence of rules and regulations  
Bir Hosp. Adhikari Kanchan P.
- ★ **0-095** A space engineering application of therapeutic broad proton beam for a cosmic ray simulation  
WERC Kyo Kume
- 18. Radiation Therapy (particle) 3 (Positioning) 14:40–15:30 Moderator: Taeko Matsuura**
- 0-096** Comparison between current and advanced technique in image guidance for proton beam therapy in lung  
Univ. of Tsukuba Shunsuke Moriya
- 0-097** The positioning precision of In-room CT image-guided system in proton therapy facility and the first application to prostate cancer treatment.  
Fukui Prefectural Hosp. Yoshikazu Maeda
- ★ **0-098** Predicting Interfractional Motion in Carbon Ion Radiation Therapy from CBCT-Based Bayesian Statistics  
Gunma Univ. Daniel S. Bridges
- ★ **0-099** Analysis software to evaluate deviation of water-equivalent thickness along proton beam path between Plan CT and CBCT for proton therapy  
Hokkaido Univ. Takaaki Fujii

- ★ **0-100** Development of a Carbon-Knife system: Patient positioning and fixation system  
Gunma Univ. Keawsamur Mintra

19. Radiation Therapy (particle) 4 (Treatment Planning)

15:40–16:30

Moderator: Yoshikazu Maeda

- 0-101** Calculation of water equivalent ratio of metal materials in patient body in carbon ion radiotherapy  
SAGA HIMAT Genyu Kakiuchi
- 0-102** Revision of calibration method for CT-number to stopping-power ratio conversion in treatment planning of particle radiotherapy  
QST/NIRS Hosp. Nobuyuki Kanematsu
- ★ **0-103** Beam angle optimization incorporating anatomical heterogeneities for pencil beam scanning charged-particle therapy in head and neck cancer  
Tokyo Women's Med. Univ. Chie Toramatsu
- 0-104** Geometrical low-dose-gradient junctioning technique for spot scanning proton beam therapy  
Nagoya Proton Therapy Center Toshiyuki Toshito
- 0-105** A dosimetric evaluation method with setup, range and radiosensitivity uncertainties in fractionated carbon-ion therapy  
QST/NIRS Makoto Sakama

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20. Radiation Therapy (particle) 5 (BNCT, Other)

9:10–10:00

Moderator: Shunsuke Yonai

- 0-106** Development of remote-changeable Bonner-sphere spectrometer for characteristic estimation in neutron irradiation field for BNCT  
KURRI Yoshinori Sakurai
- 0-107** Dosimetric impact due to intratreatment positioning error in boron neutron capture therapy for the high-grade glioma  
STBRC Takahiro Kato
- 0-108** Development of a new production method for patient immobilization implement by combination with 3D Printing technique for BNCT  
Univ. of Tsukuba Hiroaki Kumada
- 0-109** An Approach for BNCT to be a General Radiation Therapy  
K2BNCT Science & Engineering Laboratory Tooru Kobayashi
- ★ **0-110** An application of microdosimetric kinetic model to targeted radionuclide therapy  
Gunma Univ. Yoshiyuki Hirano

21. Radiation Therapy (photon/electron) 9 (CBCT and SBRT)

10:00–11:00

Moderator: Akihiro Haga

- 0-111** Feasibility study on a new approach to make CT to electron density conversion table for CBCT-based dose calculation  
Keiyukai Sapporo Hosp. Yuta Kobayashi
- 0-112** Image quality improvement in cone-beam CT using super-resolution technique  
Teikyo Univ. Asuka Oyama
- ★ **0-113** Estimating target position from orthogonal cone-beam CT projections by dual-source kV X-ray imaging system with extracorporeal infrared marker  
Kyoto Univ. Hiraku Iramina

- 0-114** Improving the imaging of thoracic tumors using four-dimensional cone-beam CT with combined shared projection data  
Juntendo Univ. Keisuke Usui
- ★ **0-115** Computational analysis of rectum translation variability in prostate cancer radiation therapy  
Kyushu Univ. Mohammad Haekal
- ★ **0-116** Process of stereotactic body radiation therapy for liver cancer at hue central hospital.  
Hue Central Hosp. Le Trong Hung
- 22. Medical Physics Education** 11:00–11:20 Moderator: Hiraku Fuse
- ★ **0-117** Medical Physics in Bangladesh: Education and Profession  
Ahsania Mission Cancer and General Hospital Md Akhtaruzzaman
- 0-118** Educational outcomes of a medical physicist program in Japan for past ten years with "Ganpro"  
Tohoku Univ. Noriyuki Kadoya
- 23. Magnetic Resonance 1 (Function and Device)** 15:10–15:40 Moderator: Toru Yamamoto
- ★ **0-119** Reproducibility of the Asymptotic Analysis in Intravoxel Incoherent Motion MRI  
Kyoto Univ. Yenpeng Liao
- ★ **0-120** Arteriolar vasomotor function obtained from spectral analysis of MR signal fluctuation in human brain: deterioration by normal aging  
Hokkaido Univ. Minghui Tang
- 0-121** Development of small-sized dielectric pads for improved RF field homogeneity in MR imaging of the brain at 7T  
NICT Takashi Ueguchi
- 24. Magnetic Resonance 2 (Compressed Sensing)** 15:40–16:10 Moderator: Seiji Kumazawa
- 0-123** Study on the quantitative accuracy of three-dimensional brain MRI using compressed sensing  
Tokyo Metropolitan Univ. Hiroyuki Shinohara
- ★ **0-124** Optimization of random sampling for compressed sensing MRI  
Kyorin Univ. Ryutaro Kawamura
- ★ **0-125** The development of the random sampling method using the Hermitian symmetry for compressed sensing MRI  
Kyorin Univ. Takeyuki Hashimoto
- 25. Magnetic Resonance 3 (Contrast)** 16:20–17:00 Moderator: Masahiro Umeda
- 0-126** Enhancement of the transverse relaxation time shortening effect by oxygen molecules in viscous solution with cellular diffusivity  
Hokkaido Univ. Masayuki Taguchi
- 0-127** Gadolinium contrast agent enhances longitudinal relaxation rate strongly in solution with intracellular viscosity  
Teine Keijinkai Hosp. Ken Masuyama
- 0-128** Cancerous-region enhancement utilizing gadolinium-oxide nanoparticles and 7.0-T magnetic resonance imaging  
Iwate Medical Univ. Eiichi Sato
- 0-129** Development of a text-data based learning tool simulating the contrast of MR image  
Tokyo Metropolitan Univ. Hiroyuki Shinohara

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## 26. Brachytherapy 9:10–10:10 Moderator: Takashi Hanada

- 0-130** Development of an independent verification method using DICOM RT Plan in gynecology brachytherapy  
Chiba Univ. Yoshinobu Furuyama
- 0-131** Novel dosimetric measurement using RGD for HDR Brachytherapy with 3D printed deformable female pelvis phantom  
Tohoku Univ. Kota Abe
- 0-132** Development and principle verification for the total three-dimensional end-to-end evaluation system in brachytherapy  
Tokai Univ. Hosp. Tomoko Kikuchi
- ★ **0-133** A simple method for verification of HDR brachytherapy source position inside applicators using an electron beam from a linear accelerator  
Ryukyus Univ. Yasumasa Kakinohana
- ★ **0-134** Monte Carlo simulations analysis of dosimetric impacts of titanium applicator and tissue inhomogeneity for cervical intracavitary brachytherapy  
Kyushu Univ. Tran Thi Thao Nguyen
- ★ **0-164** External beam radiotherapy and high dose rate brachytherapy treatment for carcinoma cervix in cancer hospital  
B.P.Koirala memorial cancer Hosp. Chaurasia Pradumna Prasad

## 27. Radiation Measurement 1 (Neutron) 10:10–10:50 Moderator: Yuzuru Kutsutani-Nakamura

- ★ **0-135** A comparison of generating properties of  $^{128}\text{I}$  and  $^{134\text{m}}\text{Cs}$  in a self-activated CsI scintillator for different energy neutron fields  
Univ. of Kyushu. Ryo Kakino
- 0-136** Fundamental study of a simple neutron-distribution measurement method by the self-activation of CsI plates using a CCD camera  
Univ. of Kyushu. Masaaki Tokunaga
- 0-137** A design study of a handy neutron spectrometer for BNCT QA procedures  
Univ. of Kyushu. Ryosuke Kurihara
- 0-138** Optical photon transport simulation with GEANT4 for the paired SOF detector improvement  
Hokkaido Univ. Yuki Murayama

## 28. Radiation Measurement 2 (Solidstate Detector) 13:00–13:50 Moderator: Kyo Kume

- 0-139** Development of a compact dosimeter using a silicon X-ray diode and a long USB cable  
Iwate Medical Univ. Michiaki Sagae
- ★ **0-140** Development of a semiconductor dosimeter for radiation therapy using a microminiature substrate  
Iwate Medical Univ. Satoshi Yamaguchi
- ★ **0-141** Evaluation of two-dimensional dosimetry using  $\text{Al}_2\text{O}_3$  thermoluminescence slabs for robotic radiosurgery  
Tokyo Metropolitan Univ. Shin Yanagisawa
- ★ **0-142** Feasibility study of CBCT dose measurements with tissue-equivalent thermoluminescence sheet  
Juntendo Univ. Chie Kurokawa
- 0-143** A sensitivity calibration of radiophotoluminescent glass dosimeter for scattered therapeutic x-ray in water equivalent phantom  
Nagoya Univ. Shouichi Yokose

## 29. Radiation Measurement 3 (Ion Chamber and Dosimetry)

14:00–15:00

Moderator: Toru Kawachi

- 0-144** Characteristics of liquid ionization chamber for photon and electron beams  
Univ. of Tsukuba Hosp. Hideyuki Takei
- 0-145** Humidity effect of a free air type ionization chamber  
Komazawa Univ. Yuuki Sato
- 0-146** Study of uncertainty in positioning ionization chamber at reference depth for various water phantoms  
Fukui Univ. Hosp. Naoki Kinoshita
- 0-147** Kilovoltage x-ray beam dosimetry using a 0.6 cc ionization chamber with a  $N_{D,w}$   
The National Cancer Center Yukihiro Uchida
- ★ **0-148** New dosimetry based on  $^{60}\text{Co}$  absorbed dose-to-water calibration in diagnostic x-ray beams  
Kumamoto Univ. Suzuna Umeno
- 0-149** An Ion chamber calibration by the ionization current measurement in a high-energy photon beam from a clinical linac  
Komazawa Univ. Ken Hirayama

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## 30. Radiation Therapy (particle) 6 (Biological Dose) 9:10–10:00

Moderator: Makoto Sakama

- ★ **0-150** The effect of the oxygen enhancement ratio on clinical dose in carbon ion radiotherapy  
Gunma Univ. Athena Paz
- ★ **0-151** An estimation of cell survival using microdosimetric kinetic model and CR-39 in carbon ion irradiation  
Gunma Univ. Yoshiyuki Hirano
- 0-152** Skin damage caused by single doses of carbon ions  
Gunma Univ. Maika Yamaguchi
- 0-153** Biological washout effect of positron emitter after Carbon ion treatment  
Gunma Univ. Hosp. Takayoshi Ishii
- ★ **0-154** The protective effect of various amino acids on plasmid DNA damage induced by carbon ion irradiation  
Kitasato Univ. Katsunori Yogo

## 31. Radiation Therapy (particle) 7 (Irradiation Technique)

10:00–10:40

Moderator: Yoshikazu Tsunashima

- 0-155** Present status of full energy scanning for carbon-ion therapy at the NIRS-HIMAC  
QST/NIRS Yousuke Hara
- ★ **0-156** Development of a new ridge filter with honeycomb geometry for a pencil beam scanning system in particle radiotherapy  
QST/NIRS Ryohei Tansho
- ★ **0-157** Multiple Scattering Effect on Carbon CT Image.  
Gunma Univ. Sung Hyun Lee
- ★ **0-158** Charged particle computed tomography using different particles  
QST/NIRS Cécile Bopp

32. Radiation Therapy (particle) 8 (Respiratory Motion)

13:00–13:50

Moderator: Mutsumi Tashiro

- 0-159** Commissioning of Eclipse Treatment Planning System for Spot-scanning Nozzle in Hokkaido University Proton Therapy Center  
Hokkaido Univ. Hosp. Takaaki Yoshimura
- ★ **0-160** The retrospective interplay effect evaluation for real-time image-gated proton therapy using the fiducial marker motion and treatment machine log  
Hokkaido Univ. Shusuke Hirayama
- 0-161** Impact of 4D-CT ventilation imaging-based functional treatment planning for proton-SBRT  
Tohoku Univ. Yoshiro Ieko
- 0-162** Markerless tumor tracking by classification of deep machine learning  
Univ. of Tsukuba Toshiyuki Terunuma
- 0-163** A real-time single-shot energy subtraction image filter for markerless tumor tracking in radiotherapy  
QST/NIRS Shinichiro Mori