

Final Program

**The Eighth International Symposium on  
Radiation Safety and Detection Technology**

**ISORD-8**



Seongsan Ilchulbong

July 14 – 17, 2015  
Lotte City Hotel Jeju,  
Jeju-si, Jeju Special Self-Governing Province, Korea

Innovative Technology Center for Radiation Safety (iTRS),  
Hanyang University, Korea  
Korean Association for Radiation Protection, Korea



## **Invitation**

It is my great pleasure and honor to extend a warm invitation to you to attend the 8th International Symposium on Radiation Safety and Detection Technology (ISORD-8) to be held in Jeju Island, Korea from July 14 to 17, 2015. The objective of ISORD is to provide a forum in which participants exchange their views and information on radiation safety and detection technology, and also address general issues in radiation protection. The participants include international experts in the field such as scientists, medical doctors, and industrial engineers. Over the past 14 years, ISORD has been organized every two years in Korea, Japan, China, and Malaysia with over 300 participants from all around the world. ISORD-8 is the third symposium to be held in Korea. ISORD-8 will offer high quality technical activities including keynote speeches, research sessions, and poster sessions. I hope you join ISORD-8 in Jeju Island, which is listed as one of the world's new 7 wonders of nature. It is also known as "Sam-Da-Do" which translates as "the island abundant with three things: stones, winds and women". (Stones are the result of the volcanic eruptions; winds refer to typhoons; and the island used to have more women than men since men sailed out to sea.) Jeju has long been a popular honeymoon place for its temperate climate and fascinating scenery of Halla Mountain and the white sand beaches. I look forward to welcoming all participants of ISORD-8 and discussing radiation safety and detection technology. I hope you will enjoy your stay in Jeju Island, as well. Thank you!

Kyo-Youn Kim  
Conference Chair  
Korea Atomic Energy Research Institute

## Conference Organization

**Organizer:** Innovative Technology Center for Radiation Safety (iTRS)  
Korean Association for Radiation Protection, Korea

### Organizing Committee

<b>Chair</b>	Kyo-Youn KIM	Korea Atomic Energy Research Institute
<b>Vice Chair</b>	Hee-Seock LEE	Pohang Accelerator Laboratory
<b>Honorary Chairs</b>	Takashi NAKAMURA	Tohoku University
	Jong Kyoung KIM	Korea Atomic Energy Research Institute/ Hanyang University
<b>Secretary</b>	Senlin LIU	China Institute of Atomic Energy
	Chang-ho SHIN	Hanyang University
<b>Korean Members</b>	Kwang Pyo KIM	Kyung Hee University
	Bong-Hwan KIM	Korea Atomic Energy Research Institute
	Soonyoung KIM	RADCORE, Co., Ltd
	Eun-Hee KIM	Seoul National University
	Jungho KIM	Korea Research Institute of Standards and Science
	Chan Hyeong KIM	Hanyang University
	Hee Geun KIM	Central Research Institute, Korea Hydro and Nuclear Co., Ltd
	Hee Reyoung KIM	Ulsan National Institute of Science and Technology
	Min BAEK	Nuclear Safety and Security Commission
	Seung Haeng LEE	Korea Institute of Nuclear Safety
	Young-Ouk LEE	Korea Atomic Energy Research Institute
	Wonho LEE	Korea University
	Sung-Joon YE	Seoul National University Hospital
Seungryong CHO	Korea Advanced Institute of Science and Technology	
<b>Chinese Members</b>	Byung-il CHOI	Korea Radioactive Waste Agency
	Jang Ho HA	Korea Atomic Energy Research Institute
	Won Tae HWANG	Korea Atomic Energy Research Institute
	Ling CHEN	China Institute of Atomic Energy
	Zhiping LUO	China Institute of Atomic Energy
	Liye LIU	China Institute for Radiation Protection
	Rui QIU	Tsinghua University

	Detao XIAO	University of South China
	Zhaorong SHANG	Nuclear and Radiation Safety Center, Ministry of Environmental Protection
	Chaofeng CHEN	Suzhou Nuclear Power Research Institute
<b>Japanese Members</b>	Tetsuo IGUCHI	Nagoya University
	Yoshihito NAMITO	High Energy Accelerator Research Organization
	Chikara ITOH	Japan Atomic Energy Agency
	Shinya HOHARA	Kinki University
	Hideki TOMITA	Nagoya University
	Hiroyuki TAKAHASHI	University of Tokyo
	Kenji ISHIBASHI	Kyushu University
<b>Australian Members</b>	Uma RAJAPPA	Health Protection Unit, Queensland
	Brad CASSELS	Department of Health, Victoria
	Tony HOOKER	South Australian Environment Protection Authority
<b>Taiwanese Member</b>	Rong-Jiun SHEU	National Tsing Hua University

## **Supporting Organization**

Ministry of Science, ICT and Future Planning, Korea

Nuclear Safety and Security Commission, Korea

Korea Atomic Energy Research Institute, Korea

Korea Institute of Nuclear Safety, Korea

Korean Nuclear Society, Korea

Pohang Accelerator Laboratory, Korea

Korea Radioactive Waste Agency, Korea

Japan Health Physics Society, Japan

Radiation Engineering Division of AESJ, Japan

Chinese Society of Radiation Protection, China

Australian Radiation Protection Society, Australia

Health Physics Society Taiwan Chapter, Taiwan

Malaysian Radiation Protection Association, Malaysia

## General Information

### Registration

The registration desk is on the 4<sup>th</sup> floor, Lotte City Hotel Jeju. All symposium participants are requested to register and collect the symposium materials at the registration desk. The registration desk will be open during the following hours:

July 13, 2007	15:00 - 19:30
July 14, 2007	08:00 - 18:00
July 15, 2007	08:00 - 18:00
July 16, 2007	08:00 - 11:00

The registration fee covers the welcome reception, and banquet in addition to the symposium materials, admission to the technical sessions, coffee, and a group photo.

### Oral Presentation Guidelines

Twenty minutes including 5 min Q&A will be assigned for each oral presentation (thirty minutes for invited talks). A notebook PC and a beam projector will be prepared in the presentation room and, therefore, the presenter need to bring only the presentation file in a CD or in a memory stick. Before the session beginning, you need to copy your presentation file (e.g., MS PowerPoint file) to the notebook. We recommend that you check your presentation file in preview room.

Oral presenter are kindly requested to let the session chair know about his/her short curriculum vitae if you didn't send to ISORD8 office in advance. The curriculum vitae will be used to introduce you in oral session by session chairs.

### Poster Presentation Guidelines

The size of the poster should be 90 cm (W) x 120 cm (H). **The poster should be posted before 15:00 on July 14th (Tue) and until a dinner on 15th (Wed).** Unposted papers will not be accepted for full paper publication. **All poster presenters are requested to be at the front of their own poster during the poster session, July 15th (Wed) 13:20 – 14:40 pm.**

## **Satellite Meeting - Registration**

This satellite meeting is free for attending. The registration sheet is prepared on the registration desk. All participants who want to attend, are kindly requested to fill his/her name into the sheet with a signature.

## **Technical Tour**

The technical tour is canceled due to insufficient number of participants.

## **Sightseeing in Jeju**

Two recommended tour programs were already announced at ISORD8 web pages. The reservation desk of a local travel company is located near the registration desk. You can get more information of sightseeing courses at the travel company desk and reserve your preferred tour directly. The advanced reservation is strongly recommended.

The biggest duty free shop, Lotte, is also available on the 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> floor at the same venue hotel.



## Program Summary

### Monday, July 13

Time	Room A	Room B	Room C
15:00-18:00	Registration		
17:00-18:30	Reception		

### Tuesday, July 14

Time	Room A	Room B	Room C
08:00-09:00	Registration		
09:00-09:40	Opening Ceremony (Opening Remark, Welcome Speeches)		
09:40-10:40	Plenary Session I		
10:40-11:00	Coffee Break		
11:00-12:00	Plenary Session II		
12:00-12:10	Group Photograph		
12:10-13:40	Lunch		
13:40-15:20	Special Session (Beyond Fukushima)		
15:20-15:40	Coffee Break		
15:40-16:40	Session R1-(I)	Session R2-(I)	
16:40-17:00	Coffee Break		
17:00-18:00	Session R1-(I)	Session R2-(I)	

### Wednesday, July 15

Time	Room A	Room B	Room C
08:40-10:20	Session R1-(II)	Session R2-(II)	
10:20-10:40	Coffee Break		
10:40-12:00	Session R1-(III)	Session R2-(III)	
12:00-13:20	Lunch		
13:20-14:20	Poster Standing Session (Hall)		
14:20-16:00	Session R1-(IV)	Session R2-(IV)	
16:00-16:20	Coffee Break		
16:20-18:00	Session R1-(V)	Session R3-(I)	
19:00-20:30	Symposium Dinner (Room A+B+C)		

### Thursday, July 16

Time	Room A	Room B	Room C
09:00-10:20	Session R5-(I)	Session R3-(II)	Session R4-(I)
10:20-10:40	Coffee Break		
10:40-12:00	Session R5-(II)	Session R3-(III)	Session R4-(II)
12:00-12:30	Closing Session		
12:30-18:00	Go To Technical Tour (Gyeongju and Pohang)		

### Friday, July 17

Time	
09:00-12:00	Satellite Meeting: Effects of Low Doses of Radiation ( Room C )
09:00-18:00	Technical Tour (KORAD in Gyeongju and PAL in Pohang)

Session R1: Radiation Transport and Shielding

Session R2: Radiation Detection and Sensor Technology

Session R3: Radiation Dosimetry

Session R4: Environmental Radiation Measurements and Assessments

Session R5: Radiological Emergency Planning and Preparedness

Session R6: Radiological Risk Management  
Session R7: Radioactive Waste and Current Radiological  
Session R8: Education, Training and Policy in Radiation Safety

# Program

## Monday, July 13

**15:00-17:00 Registration**

**17:00-18:30 Reception**

## Tuesday, July 14

**08:00-9:00 Registration**

### Room A

**09:00-09:40 Opening Ceremony**

Opening Remarks:

Kyo-Youn KIM (*Conference Chair, ISORD-8*)

Welcome Address:

Takashi NAKAMURA (*Fuji Electric Co., Ltd / Tohoku University, Japan*)

Zhiping LUO (*China Institute of Atomic Energy, China*)

Jong Kyung KIM (*Korea Atomic Energy Research Institute / Hanyang University., Korea*)

**09:40-12:00 Plenary Session**

**Chair: Kunwoo CHO (KINS)**

**I1 Analysis of Atmospheric Concentrations of FP Nuclides from NaI(Tl) Detector Pulse Height Distributions Routinely Measured at Environmental Monitoring Facilities**

Hiromi YAMAZAWA, *Nagoya University*

**I2 Development of Monte Carlo-Point Kernel Coupled System for Fast 3D Radiation Transport Calculation**

Yuanjie BI, *China Institute of Atomic Energy*

**10:40-11:00 Coffee Break**

**I3 IAEA Program in Radiation Safety and Monitoring**

Pil-Soo HAHN, *IAEA*

**I4 ICRP-110 Reference Phantoms Conversion Project**

Chan Hyeong KIM, *Hanyang University*

**12:00-12:10 Photograph**

**12:10-13:40 Lunch**

**13:40-15:20 Special Session (Beyond Fukushima)**

**Chair:** Mamoru BABA (Tohoku University), Tae Woon KIM (KAERI)

**FS1 Radiological Impact Assessment by the Radioactive Materials Released from the Fukushima Accident**

Kyung-Suk SUH, *Korea Atomic Energy Research Institute*

**FS2 Status of Radiation Dose and Contamination Due to the Fukushima Accident**

Mamoru BABA, *Tohoku University*

**FS3 Radioactive Noble Gases Monitoring in Korea: Effects of Fukushima Accident**

Wanno LEE, *Korea Atomic Energy Research Institute*

**FS4 Reduction of Outdoor and Indoor Ambient Equivalent Dose after Decontamination in the Fukushima Evacuation Zones**

Hiroko YOSHIDA-OHUCHI, *Tohoku University*

**FS5 Evaluation of In-Plant Fission Product Behaviors on Fukushima Daiichi Accident**

Tae Woon KIM, *Korea Atomic Energy Research Institute*

**15:20-15:40 Coffee Break**

**15:40-16:40 Radiation Transport and Shielding (I)**

**Chair:** Kazuyoshi MASUMOTO (KEK), Jong Woon KIM (KAERI)

**R1-O-1 A Preliminary Study on Activation Analysis of ISOL Target Instruments for RAON Accelerator**

Jae Yong LEE, Song Hyun KIM, Do Hyun KIM, and Chang Ho SHIN, *Hanyang University*

**R1-O-2 Research on Shielding Performance Measurements of Spent Fuel Transportation Package**

Hongchao SUN, Guoqiang LI, Xuexin WANG, Dajie ZHUANG, Shutang SUN, *China Institute for Radiation Protection, Shanxi Taiyuan*

**R1-O-3 Measurements of Secondary Neutrons Spectra from 50 MeV/u <sup>238</sup>U Beams with the Beryllium Stripper**

Joo-Hee OH, Nam-Suk JUNG, Leila MOKHTARI ORANJ, Hee-Seock LEE, PAL/POSTECH, Noriaki NAKAO, *Shimizu Corporation*, Yoshitomo UWAMINO, *RIKEN*, Seung-Kook KO, *University of Ulsan*

**16:40-17:00 Coffee Break**

**17:00-18:00 Radiation Transport and Shielding (I)**

**Chair:** Kazuyoshi MASUMOTO (KEK), Jong Woon KIM (KAERI)

**R1-O-4 A Verification on Response Accuracy in Using Fission Matrix Based Monte Carlo Simulation Method**

Myeong Hyun WOO, Song Hyun KIM, Gwang Min SUN, *Korea Atomic Energy Research Institute*, Chang Ho SHIN, *Hanyang University*

**R1-O-5 A High Efficiency Transport Method for Monte Carlo Calculation of Maze and Duct Shielding**

Xin WANG, Junli LI, Rui QIU, *Tsinghua University*, Zhen WU, Chunyan LI, *Nuctech Company Limited*

**R1-O-6 Verification of Multi-response CADIS Method for Variance Reduction of Monte Carlo Calculations**

Do Hyun KIM, Song Hyun KIM, and Chang Ho SHIN, *Hanyang University*

## **Room B**

### **15:40-16:40 Radiation Detection and Sensor Technology (I)**

**Chair:** Isao Murata (Osaka University), Jang Ho HA (KAERI)

**R2-O-1 Feasibility of CNR improvement in a sparse-view cone-beam computed tomography using an anti-scatter grid**

Sanghoon CHO, and Seungryong CHO, *KAIST*

**R2-O-2 Research of the Emergency Warning Instrument Related to Radiation Sources Location**

Linsheng JIA, Jiangang ZHANG, Rongyao TANG, Baowei CHEN, *China Institute for Radiation Protection*

**R2-O-3 Standardization of  $^{68}\text{Ge}/^{68}\text{Ga}$  Based on Electron Capture Events by  $4\pi\beta$  (LS)- $\gamma$  Coincidence Counting**

Agung AGUSBUDIMAN, *Korea University of Science and Technology (UST)*, Kyeong Beom LEE, Jong Man LEE, *Korea University of Science and Technology (UST)*, *Korea Research Institute of Standards and Science (KRISS)*

**16:40-17:00 Coffee Break**

### **17:00-18:00 Radiation Detection and Sensor Technology**

**(I) Chair:** Isao Murata (Osaka University), Jang Ho HA (KAERI)

**R2-O-4 CAMs Testing Study**

Fu SHEN, Pingping XI, Dan MEN, Zhilong ZHANG, CuiMing FU, Zhenyong LU, Yi YANG, Tao MA, Liu YANG, *China Institute for Radiation Protection*

**R2-O-5 Comparison of CdTe and Si-PIN X-ray Sensor for X-ray Fluorescence Application**

Hyojeong CHOI, *Sungkyunkwan University*, Young Soo KIM, Han Soo KIM, Dong Jin KIM, Jang Ho HA, *Korea Atomic Energy Research Institute*, Jong Seo CHAI, *Sungkyunkwan*

*University*

**R2-O-6 Development of Light-weight Neutron Survey Meter**

Tomoya NUNOMIYA, Shigeru ABE, Takahiro AMANO, *Fuji Electric Co., Ltd.*, Takashi NAKAMURA, *Fuji Electric Co., Ltd / Tohoku University*

**Wednesday, July 15**

**Room A**

**08:40-10:20 Radiation Transport and Shielding (II)**

**Chair:** Kenji ISHIBASHI (*Kyushu University*), Cheol Woo LEE (*KAERI*)

**R1-O-7 A Study on Activation Characteristics as Target Properties for Cold Neutron Activation Analysis**

Jong Woo KIM, Song Hyun KIM, Chang Ho SHIN, *Hanyang University*, Gwang Min SUN, *Korea Atomic Energy Research Institute*

**R1-O-8 Availability Analysis and Ruggedized Model of Image Sensors in Accident of Nuclear Power Plant**

Shu Liang ZOU, Shoulong XU, *University of South*

**R1-O-9 Detail Analysis of the KAERI nTOF Facility**

Jong Woon KIM and Young-Ouk LEE, *Korea Atomic Energy Research Institute*

**R1-O-10 Measurement of Neutron Production Double-differential Cross-sections on Carbon Bombarded with 430 MeV / nucleon Carbon Ions**

Yutaro ITASHIKI, Youichi IMAHAYASHI, Nobuhiro SHIGYO, Yusuke UOZUMI, *Kyushu University*, Daiki SATOH, *Japan Atomic Energy Agency*, Tsuyoshi KAJIMOTO, *Hiroshima University*, Toshiya SANAMI, *High Energy Accelerator Research Organization*, Yusuke KOBAYASHI, Naruhiro MATSUFUJI, *National Institute of Radiological Sciences*

**R1-O-11 Comparison of MCNPX Physics Model Options in the Calculation of reaction on Carbon with 600-MeV/nucleon Proton and 290-MeV/nucleon Oxygen ions**

Arim LEE, Donghyun KIM, Nam-Suk JUNG, Joo-Hee OH, Leila MOKHTARI ORANJ, Hee-Seock LEE, *PAL/POSTECH*

**10:20-10:40 Coffee Break**

**10:40-12:00 Radiation Transport and Shielding (III)**

**Chair:** Liye LIU (*China Institute for Radiation Protection*), Song Hyun KIM (*Hanyang University*)

**R1-O-12 Gas and water activation by electron accelerators for medical use -Reevaluation of photon**

**activation yields of  $^{11}\text{C}$ ,  $^{13}\text{N}$  and  $^{15}\text{O}$  -**

Kazuyoshi. MASUMOTO, Hiroshi MATSUMURA, *High Energy Accelerator Research Organization*, Kazuaki KOSAKO, *Shimizu Corporation*, Kotaro BESSHO, Akihiro TOYODA, *High Energy Accelerator Research Organization*

**R1-O-13 Verification on Real Uncertainty Estimation Method Based on Union Tally for Monte Carlo Particle Transport in Residual Radiation Analyses**

Gi Yeong HAN, Song Hyun KIM, Do Hyun KIM, Chang Ho SHIN, *Hanyang University*

**R1-O-14 A Study on UF<sub>6</sub> Transportation Accident Scenarios and Diffusion Model**

Shutang SUN, Guoqiang LI, Di ZHOU, Hongchao SUN, Feng YAN, Jiangang ZHANG, *China Institute for Radiation Protection*

**R1-O-15 Verification of Proton Beam Intensity at 100-MeV KOMAC Accelerator Facility**

Leila MOKTARI ORANJ, Nam-Suk JUNG, Joo-Hee OH, Dong-Hyun KIM, Hee-Seock LEE, *PAL/POSTECH*

**12:00-13:20 Lunch**

**13:20-14:20 Poster Session**

**14:20-16:00 Radiation Transport and Shielding (IV)**

**Chair:** Yuanjie BI (*China Institute of Atomic Energy*), Kwang Pyo Kim (*Kyunghee University*)

**R1-O-16 Activation Analysis in the accelerator components at RAON**

Sangjin LEE, Suna KIM, Sangbin LEE, Shinwoo NAM, *Institute for Basic Science*

**R1-O-17 Characterization of Hundreds of MeV  $^7\text{Li}(p,n)$  Quasi-monoenergetic Neutron Source at RCNP using a Proton Recoil Telescope**

Masayuki HAGIWARA, Yosuke IWAMOTO, *Japan Atomic Energy Agency*, Hiroshi IWASE, Hiroshi YASHIMA, *Kyoto University*, Daiki SATOH, *Japan Atomic Energy Agency*, Tetsuro MATSUMOTO, Akihiko MASUDA, *National Institute of Advanced Industrial Science and Technology*, Yoshihiro NAKANE, *Japan Atomic Energy Agency*, Atsushi TAMII, Tatsushi SHIMA, Kichiji HATANAKA, *Osaka University*, Takashi NAKAMURA, *National Institute of Advanced Industrial Science and Technology*

**R1-O-18 A Proposal on Evaluation Method of Neutron Absorption Performance to Substitute Conventional Neutron Attenuation Test**

Song Hyun KIM, Jae Hyun KIM, Chang Ho SHIN, *Hanyang University*, Jung Hun CHOE, In-Hak CHO, Hwan Seo PARK, *Korea Atomic Energy Research Institute*, Hyun Seo PARK, Jung Ho KIM and Yoon Ho KIM, *Korea Research Institute of Standards and Science*

**R1-O-19 Shielding Performance Measurements and Assessments on FCTC10 Container for Cobalt-60 Transport in Irradiation Industry**

Dajie ZHUANG, Guoqiang LI, Guoqing ZHANG, Xiaowei LUO, *China Institute for Radiation Protection*

**R1-O-20 A Preliminary Radiation Shielding Analysis for 500W Radioisotope Thermophotovoltaic (RTPV) System**

Seong Jae CHEON, Ser Gi HONG, *Kyung Hee University*

**16:00-16:20 Coffee Break**

**16:20-18:00 Radiation Transport and Shielding (V) and Radiological Risk Management (I)**

**Chair:** Rong Jiun SHEU (*National Tsing Hua University, Taiwan*), Kyung-O KIM (*KAERI*)

**R1-O-21 A Development of Underground Cavities Inspection System Using Cf-252 Neutron Source**

Che Wook YIM, Song Hyun KIM, Do Hyun KIM, Chang Ho SHIN, *Hanyang University*

**R1-O-22 Measurement of gamma-ray yield from thick carbon target irradiated by 5 and 9-MeV deuterons**

Shouhei ARAKI, Kazuhiro KONDO, Tadahiro KIN, Yukinobu WATANABE, Nobuhiro SHIGYO, Kenshi SAGARA, *Kyushu University*

**R6-O-1 Fission Product Yields Determination in the 12 MeV Bremsstrahlung Induced Fission of  $^{232}\text{Th}$**

H. NAIK, Bhabha Atomic Research Centre, G.N. KIM, *Kyungpook National University*, R. SCHWENGER, R. JOHN, R. MASSAVCZYK, A. JUNGHANS, *Institute of Radiation Physics*, A. GOSWAMI, *Bhabha Atomic Research Centre*

**R6-O-2 Glutathione for Protection Against Ionizing Radiation**

Muhammad B. GUSAU, A.D NDAWASHI, *National Institute of Radiation Protection and Research (NIRPR)*

**Room B**

**08:40-10:20 Radiation Detection and Sensor Technology (II)**

**Chair:** Zhiping LUO (*China Institute of Atomic Energy*), Jung Ho KIM (*Korea Research Institute of Standards and Science*)

**R2-O-7 Development of the Gamma Ray Tracking System in KRISS**

Jubong HAN, K. B. LEE, *KRISS*, Jong-Man LEE, S. H. LEE, Tae Soon PARK, J. S. OH, *UST*

**R2-O-8 Design and Implementation of a Long Distance Wireless Electronic Personal Dosimeter**

Bao-wei CHEN, Wei-min XIE, Zhong-jian Yang, Lin-sheng JIA, *China Institute for Radiation Protection*

**R2-O-9 Characterizations of Thallium bromide single crystals grown by Vertical Bridgman method for room temperature semiconductor gamma-ray radiation detector application**



Dong Jin KIM, Joon-Ho OH, Han Soo KIM, Young Soo KIM, Manhee JEONG, Woo Jin JO, *Korea Atomic Energy Research Institute*, Hyojeong Choi, *Korea Atomic Energy Research Institute, Sungkyunkwan University*, Jong Guk KIM, Seung Hee LEE, Jang Ho HA, *Korea Atomic Energy Research Institute*

**R2-O-10 Overview of New Important Approaches in Gamma Spectrum Analysis Algorithms**

Ri ZHAO, *Tsinghua University, China Institute for Radiation Protection*, Liye LIU, *China Institute for Radiation Protection*, Junli LI, *Tsinghua University*

**R2-O-11 Charged Particle Spectroscopy Utilizing CdTe Nanocrystal Assembly Formed by Layer-by-Layer Deposition Method**

Geehyun KIM, *Sejong University*, Yunlong ZHOU, Nikolas A. KOTOV, Mark D. HAMMIG, *University of Michigan*

**10:20-10:40 Coffee Break**

**10:40-12:00 Radiation Detection and Sensor Technology (III)**

**Chair:** Hongchao PANG (*China Institute of Atomic Energy*), Manhee JEONG (*KAERI*)

**R2-O-12 Preliminary research of CZT Based PET System development in KAERI**

Woo Jin JO, Manhee JEONG, Han Soo KIM, *Korea Atomic Energy Research Institute*, Sang Yeol KIM, *Notice Co.*, Jang Ho HA, *Korea Atomic Energy Research Institute*

**R2-O-13 Development and experimental test of neutron flux intensity monitor between ten and several hundred keV for BNCT**

Xingcai GUAN, *Lanzhou University*, Masanobu MANABE, Fuminobu SATO, Isao MURATA, *Osaka University*, Tieshan WANG, *Lanzhou University*

**R2-O-14 Spectrum measurement of high power and high energy (6 and 9 MeV) pulsed X-ray source for industrial use**

Hiroyuki Takagi, *Hitachi, Ltd.*, *Osaka University*, Isao Murata, *Osaka University*

**R2-O-15 Development of Gamma Vertex Imaging (GVI) System for Proton Dose Monitoring**

Han Rim LEE, Jong Hoon PARK, Sung Hun KIM, Chan Hyeong KIM, *Hanyang University*, Won Gyun JUNG, *Korea Institute of Radiological & Medical Sciences*

**12:00-13:20 Lunch**

**13:20-14:20 Poster Session (Hall on 4<sup>th</sup> floor)**

**14:20-16:00 Radiation Detection and Sensor Technology (IV)**

**Chair:** Ri ZHAO (*Tsinghua University/ China Institute for Radiation Protection*), Won Ho LEE (*Korea University*)

**R2-O-16 Measuring Thermo-luminescence Efficiency of CTLD1000 Detectors to Different Energy**

### **Photons**

Wei Min XIE, Bao Wei CHEN, Yi HAN, Zhong Jian YANG, *China Institute for Radiation Protection*

#### **R2-O-17 Developing uranium isotopic analysis code in Hypergam platform**

H.D. CHOI, *Seoul National University*, J.H. KIM, *Seoul National University, Korea Atomic Energy Research Institute*, J.H. PARK, *Korea Atomic Energy Research Institute*

#### **R2-O-18 Measurements of Sea-Level Cosmic-Ray Neutron Spectra in Taiwan using Standard Bonner Spheres and High-Sensitivity Bonner Cylinders**

Kuo-Wei LEE, *Institute of Nuclear Engineering and Science, Institute of Nuclear Energy Research*, Rong-Jiun SHEU, *Institute of Nuclear Engineering and Science, National Tsing Hua University*

#### **R2-O-19 Development of Nuclear Material Monitoring System Based on Compton Imaging Technology**

Young-su KIM, Jae Hyeon KIM, Hyun Su LEE, Han Rim LEE, Jong Hoon PARK, *Hanyang University*, Jin Hyung PARK, *Institute for Basic Science*, Chaehun LEE, Se-Hawn PARK, *Korea Atomic Energy Research Institute*, Chan Hyeong KIM, *Hanyang University*

#### **R2-O-20 Calculation of Low-Energy Reactor Neutrino Spectra**

Eka Sapta RIYANA, Shoya SUDA, Kenji ISHIBASHI, Hideaki MATSUURA, *Kyushu University*

**16:00-16:20 Coffee Break**

### **16:20-18:00 Radiation Detection and Sensor Technology (V) and Radiation Dosimetry (I)**

**Chair:** Rui QIU (*Tsinghua University*), Jang-Lyul KIM (*KAERI*)

#### **R2-O-21 Optical characterizations of TlBr single crystals for radiation detection applications**

Joon-Ho OH, Dong Jin KIM, Han Soo KIM, Young Soo KIM, Manhee JEONG, *Korea Atomic Energy Research Institute*, Tae Jung KIM, Han Gyeol PARK, Young Dong KIM, *Kyung Hee University*, Dongjun KIM, Kyoung-Kook KIM, *Korea Polytechnic University*, Jang Ho HA, *Korea Atomic Energy Research Institute*

#### **R2-O-22 Application of the point kernel method to estimate the internal contamination of pipes in nuclear reactors**

Sanqiang XIA, Liye LIU, Qinjian CAO, Yu WANG, Hua LI, Ri ZHAO, Wanchun XIONG, *China Institute for Radiation Protection*

#### **R3-O-1 The study of gamma knife dosimetry using Monte Carlo code MCNP**

Jinsen GUO, Yuanjie BI, Zhiping LUO, Ling CHEN, *China Institute of Atomic Energy*

**R3-O-2 Monte Carlo Calculation for Dose Estimation in Mammography Based on a 3D Detailed Breast Model**

Wenjing WANG, Rui QIU, Li REN, Huan LIU, Junli LI, *Tsinghua University*,

**R3-O-3 Probabilistic Internal Dose Assessments Using Monte Carlo and Bayesian Approach**

Siwan NOH, Jai-Ki LEE, *Hanyang University*, Jong-Il LEE, Jang-Lyul KIM, *Korea Atomic Energy Research Institute*

**19:00-21:00 Symposium Dinner (Room A + B +C)**

**Thursday, July 16**

**Room A**

**09:00-10:20 Radiological Emergency Planning and Preparedness (I)**

**Chair:** Tetsuo IGUCHI (Nagoya University), Seung Yeong JUNG (Korea Institute for Nuclear Safety)

**R5-O-1 Development of Nuclear Robot of KAERI in Radiation Field**

Young CHOI, Y. S. CHOI, S. H. KIM, Kyungmin JEONG, *Korea Atomic Energy Research Institute*

**R5-O-2 Development of Integrated Nuclear Emergency Command and Decision Support System for Nuclear Power Plant**

Yapeng YANG, Jiangang ZHANG, Zongyang FENG, Linsheng JIA, Xiaoxiao XU, Rongyao TANG, *China Institute for Radiation Protection*

**R5-O-3 The Nuclide Recognizing Prompt Environmental Radiation Distribution Monitoring System for Radiation Emergency Response**

Uk Jae LEE, Hee Reyoung KIM, *Ulsan National Institute of Science and Technology*

**R5-O-4 Current Issues of Applying State of the Art Techniques for Performing Level 3 PSA with MACCS2 Code in Korea**

Kiwhan CHUNG, Gun Hyo JUNG, So Eun SHIN, Yong Suk LEE, *Future & Challenge Technology Co. Ltd.*

**10:20-10:40 Coffee Break**

**10:40-12:00 Radiological Emergency Planning and Preparedness (II)**

**Chair:** Tomoya NUNOMIYA (Fuji Electric Co., Ltd.), Jeong-in KIM (Radiation Health Institute, KHNP)

**R5-O-5 Air Leakage Analysis of Research Reactor HANARO Building in Typhoon Condition for the Nuclear Emergency Preparedness**

Goan-Yup LEE, Hae-Choi LEE, Bong-Suk KIM, Jong-Su KIM, Pyung-Kyu CHOI, *Korea Atomic Energy Research Institute*

**R5-O-6 PWR Source Term Estimation Code Programming**

Zongyang FENG, Jiangang ZHANG, Rongyao TANG, Renze WANG, Dajie ZHUANG, Feng YAN, *China Institute for Radiation Protection*

**R5-O-7 Optimization of in-vivo monitoring program for radiation emergency response**

Wi-Ho HA, *Korea Institute of Radiological and Medical Sciences/Hanyang University*, Jaeryong YOO, Seokwon YOON, Min-Jeong PAK, *Korea Institute of Radiological and Medical Sciences*, Jong Kyung KIM, *Hanyang University*, *Korea Atomic Energy Research Institute*, Seung-Sook LEE, *Korea Institute of Radiological and Medical Sciences*

**R5-O-8 An Improvement of Estimation Method of Source Term to the Environment for Interfacing System LOCA for typical PWR using MELCOR code**

Seok-Jung HAN, Tae-Woon KIM, Kwang-Il AHN, *Korea Atomic Energy Research Institute*

## **Room B**

### **09:00-10:20 Radiation Dosimetry (II)**

**Chair:** [Hiroko YOSHIDA-OHUCHI \(Tohoku University\)](#), [Chan Hyeong KIM \(Hanyang University\)](#)

**R3-O-4 Research of New Gamma-Ray Buildup Factor Data and Its Influence Factors for Point Kernel Calculations**

Hua LI, *China Institute for Radiation Protection, Tsinghua University*, Liye LIU, Sanqiang XIA, Yuan ZHAO, Qinjian CAO, *China Institute for Radiation Protection*, Junli LI, *Tsinghua University*

**R3-O-5 Calculating Radiation Imaging Dose Using Monte Carlo Simulation For Image-guided Radiation Therapy**

Kihong SON, Seungryong CHO, Hoyoen LEE, *Korea Advanced Institute of Science and Technology*, Youngih HAN, Sang Gyu JU, Jinsung KIM, *Samsung Medical Center Sungkyunkwan University*

**R3-O-6 Microwave Dielectric Absorption Spectroscopy Aiming at Novel Dosimetry Using DNAs**

Yoshinobu IZUMI, Makoto HIRAYAMA, Youichirou MATUO, *University of Fukui*, Takeyoshi SUNAGAWA, *Fukui University of Technology*

**R3-O-7 Characteristics of Bremsstrahlung X-rays emitted from the Laser Produced Plasmas and Spectral Tomographic Analysis**

Yong-Joo RHEE, Sung-Mo NAM, Jae-Min HAN, Duck-Hee KWON, *Korea Atomic Energy*

*Research Institute, Yan ZHANG, Neng HUA, Kun LI, Jian-Qiang ZHU, Shanghai Institute of Optics and fine Mechanics, Young-Ouk LEE, Korea Atomic Energy Research Institute*

**10:20-10:40 Coffee Break**

### **10:40-12:00 Radiation Dosimetry (III)**

**Chair:** [FY HSU \(National Tsing Hua University, Taiwan\)](#), [Bong Hwan KIM \(KAERI\)](#)

**R3-O-8 Introduction to Individual Dose Measuring Methods for Nuclear Industry Workers in China**

*Hongjuan PAN, China Institute for Radiation Protection*

**R3-O-9 Absolute Measurement of Absorbed Dose to Water for <sup>60</sup>Co Gamma-rays using Fricke Dosimeter and its Medical Application to Gamma Knife Radiosurgery Facilities**

*Se Woon OH, Korea University of Science and Technology (UST)/ Korea Research Institute of Standards and Science, Hyun-Tai CHUNG, Seoul National University Hospital, Jae Pil CHUNG, Korea University of Science and Technology (UST)/ Korea Research Institute of Standards and Science, Young Min SEONG, Kook Jin CHUN, Korea Research Institute of Standards and Science*

**R3-O-10 Basic characteristics of nanoDot OSL dosimeter for diagnostic X-ray**

*Tohru OKAZAKI, Nagase Landauer, LTD., Hiroaki HAYASHI, Hiroki OKINO, Kazuki TAKEGAMI, Natsumi KIMOTO, Itsumi MAEHATA, Tokushima University, Ikuo KOBAYASHI, Nagase Landauer, LTD.*

## **Room C**

### **09:00-10:20 Environmental Radiation Measurement and Assessment (I)**

**Chair:** [Jinfeng LI \(China Institute of Atomic Energy\)](#), [Moon Hee HAN \(KAERI\)](#)

**R4-O-1 Radiological Consequence Analysis of LOCA for Kori Nuclear Power Plant Unit 2 Applying RG 1.183**

*Sang Joon YOON, Chan Su JANG, Jae Don CHOI, and Chang Sok CHO, KEPCO Nuclear Fuel*

**R4-O-2 A Simple radon exhalation rate detecting system**

*Zhiqiang LI, University of South China / Hengyang Normal University, Detao XIAO, Guizhi ZHAO, University of South China*

**R4-O-3 Experience in Radiological Environmental Impact Assessment of a Foreign Nuclear Facility**

*Moon Hee HAN, Hae Sun JEONG, Hyo Joon JEONG, A Reum KIL, Eun Han KIM, Won Tae HWANG, Korea Atomic Energy Research Institute*

**R4-O-4 Measurements of Cs-134 and Cs-137 in Fukushima Area Using Gamma-Ray Imaging Spectrometer named Polaris-H**

Jae Cheon KIM, Gi Dong KIM, Sun-Chan JEONG, *Institute for Basic Science*, Ki-Hyun KIM, *Sejong University*, Kayden Kim, *CGITEC*, Genichiro WAKABAYASHI, Shinya HOHARA, Hirokuni YAMANISHI, *Kinki University*.

**10:20-10:40**      **Coffee Break**

## **10:20-12:00 Environmental Radiation Measurement and Assessment (II)**

**Chair:**    **Hiromi YAMAZAWA (Nagoya University), Won Tae HWANG (KAERI)**

### **R4-O-5    HYPERGAM ver. 3.0: General Purpose Software for Gamma-ray Spectrum Analysis**

Gwang Min SUN, Byun Gun. PARK, *Korea Atomic Energy Research Institute*, Chang Su. PARK, *Korea Institute of Nuclear Safety*, Heedong CHOI, *Seoul National University*

### **R4-O-6    Assessment of terrestrial gamma radiation of Jeonnam and Jeonbuk province in Korea**

E.R. LEE, *Korea University of Science and Technology*, B.U. CHANG, Y.J. KIM, *Korea University of Science and Technology*, *Korea Institute of Nuclear Safety*, and K.P. Lee, *RadSearch Company*

### **R4-O-7    Radon emissions from an iron and steel plant in China**

Jinfeng LI, Chunhong WANG, Ziyang JIANG, *China Institute of Atomic Energy*, Zhijun HUANG, *China Institute of Atomic Energy, University of South China*, Baoyin WEN, Chuangao WANG, Yanqi ZHANG, Xiaoyun LI, Xingming TU, Xutao XU, Shuguo HOU, Ling CHEN, *China Institute of Atomic Energy*

## **12:00-12:30    Closing Session (Room A+B+C)**

### **Friday, July 17**

## **09:00-12:00 Satellite Meeting (Room C)**

**Chair:**    **Jin Kyu KIM (KAERI/University of Science and Technology), Seon Young NAM (Korea Hydro & Nuclear Power Co., LTD.)**

### **S-01    Biological Effects of Low Dose Radiation and On-going Challenges**

Jin Kyu KIM, *Korea Atomic Energy Research Institute, University of Science and Technology (UST)*, Yun Jong LEE, Jin-Hong KIM, *Korea Atomic Energy Research Institute*

### **S-02    Current Status of Research on the Biological Effect of Low-dose Ionizing Radiation in Korea**

Seon Young NAM, *Korea Hydro & Nuclear Power Co., LTD.*

## **PANEL DISCUSSION**

## Poster Session (Hall)

### R1 Radiation Transport and Shielding

- R1-P-1 A Study on Photo Neutron Effect in Fuel Failure Detection System**  
Ji Sung PARK, Gyuhong ROH, Byungchul LEE, *Korea Atomic Energy Research Institute*
- R1-P-2 The Performance Test of Anti-scattering X-ray Grid with Inclined Shielding Material by MCNP Code Simulation**  
Jun Woo Bae, Hee Reyoung KIM, *Ulsan National Institute of Science and Technology*
- R1-P-3 Current Status of ACE Format Libraries for MCNP at Nuclear Data Center of KAERI**  
Do Heon KIM, Choong-Sup GIL, Young-Ouk LEE, *Korea Atomic Energy Research Institute*
- R1-P-4 Estimation of Tritium Activity in the Heavy Water Reflector of the Research Reactor**  
Gyuhong ROH, Ji Sung PARK, Byungchul LEE, *Korea Atomic Energy Research Institute*
- R1-P-5 Quantitative Evaluation of Radiation Dose for Depleted Uranium in PRIDE**  
Il Je CHO, *Korea Atomic Energy Research Institute*, Kyoung Yong NOH, Soon Young KIM, *RADCORE, Co., Ltd.*, Yong Soo KIM, *Hengyang Normal University*
- R1-P-6 Comparison of Photon Compton Broadening with mcplib04 and mcplib84**  
Kyung-O KIM, Gyuhong ROH, Byungchul LEE, *Korea Atomic Energy Research Institute*
- R1-P-7 Neutron Activation Analysis for collimation system in RAON NSF Using Monte Carlo Simulation**  
Eunjoong LEE, *KAIST*, Sung-Chul YANG, Cheol Woo LEE, *Korea Atomic Energy Research Institute*
- R1-P-8 A Preliminary Shielding Analysis for Neutron Beam Dump in RAON Neutron Science Facility**  
Sung-Chul YANG, Cheol Woo LEE, Eunjoong Lee, Young-Ouk Lee, *Korea Atomic Energy Research Institute*, and J.C. Kim, *Institute for Basic Science*
- R1-P-9 The Fission Products Inventory Evaluation of a Fuel Assembly with Gadolinium Burnable Poison using TRITON in SCALE 6.1**  
Jae Hoon Song, Ha young Kim and Kyo Youn Kim, *Korea Atomic Energy Research Institute*
- R1-P-10 Activation Evaluation of the 13 MeV Cyclotron Facility**  
Jaeho LEE, Siwan NOH, Jai-Ki LEE, *Hanyang University*, Han-Ki JANG, Tae-Jin PARK, *Korean Association for Radiation Application*, In-Su JUNG, *Korea Institute of Radiological & Medical Sciences*
- R1-P-11 Evaluation of Shutdown dose distribution inside IFF facility of RAON Heavy-ion Accelerator Complex in Korea**  
Cheol Woo LEE, *Korea Atomic Energy Research Institute / Hanyang University*, Young-Ouk LEE, *Korea Atomic Energy Research Institute*, Jong Won KIM, Mijung KIM, *Institute for Basic*

*Science*

**R1-P-12 Difference of the neutron radiography image for the various boron-concrete**

Koichi OKUNO, *Hazama-Ando Corporation*

**R1-P-13 A proposal of activation reduction for concrete wall in a cyclotron vault**

Masaaki KUMAGAI, Yasuhiro SODEYAMA, Yukio SAKAMOTO, Akihiro TOYODA, Hiroshi MATSUMURA, Takaaki EBARA, Daichi YAMASHITA, Kazuyoshi. MASUMOTO, *High Energy Accelerator Research Organization*

**R1-P-14 1GeV Proton-induced Activation Analysis on the concrete shielding of RAON Accelerator Tunnel**

Suna KIM, *Konyang University*, Sangbin LEE, Shinwoo NAM, Sangjin LEE, *Institute for Basic Science* Bo Sun KANG, *Konyang University*

## **R2 Radiation Detection and Sensor Technology**

**R2-P-1 Development of Directional Detector with Array of BGO Scintillator Rods for Energetic Radiation Bursts Associated with Thundercloud Activity**

Tetsuo IGUCHI, Yasuhiro ARIMOTO, Tone TAKAHASHI, Jun KAWARABAYASH, Hideki TOMITA, *Nagoya University*, Tatsuo TORII, *Japan Atomic Energy Agency*

**R2-P-2 The APP development of smart phone for radiation dose monitoring**

Jin-Woo LEE, *Korea Atomic Energy Research Institute*, *Chonbuk National University*, Yun-Jong LEE, *Korea Atomic Energy Research Institute*, Gyo-Seong JEONG, *Korea Atomic Energy Research Institute*, *Chonbuk National University*, Jong-Il KIM, *Chonbuk National University*

**R2-P-3 Analysis of Zr-95 and Nb-95 in Domestic PWRs Using CZT Detector and Monte Carlo Method**

Seo Kon KANG, Byoung il LEE, Jeong In KIM, *Korea Hydro & Nuclear Power, Co., LTD*

**R2-P-4 Application of In-situ CdZnTe Detectors to Radioactivity Analysis for PWR Reactor Coolant System during Refueling Outage Period**

Jeong In KIM, Seo Kon KANG Byoung Il LEE, *Korea Hydro & Nuclear Power, Co., LTD*

**R2-P-5 Influence of Fiber Re-coating and Packaging on the Radiation Sensitivity of Fiber Bragg Grating Written in Ge-doped Fibers**

Jong Yeol KIM, Nam Ho LEE, Hyun Kyu JUNG, *Korea Atomic Energy Research Institute*

**R2-P-6 Recognition, Distance Measurement, and Display of the Location of a Radiation Source in 3 Dimensions**

Nam Ho LEE, Young Gwan HWANG, *Korea Atomic Energy Research Institute*, Soon Yong PARK, *Kyungbook National University*, Ken Euk YOUK, *Serve Bot Inc.*

**R2-P-7 The Study for Visualization and Distribution Measurements of Radiation Source Using Stereo Gamma Detector**



Young-Gwan HWANG, Nam-Ho LEE, *Korea Atomic Energy Research Institute*, Song Keun YOUNG, *HKC Co., Ltd*, Pathum RATHNAYAKA, Seung-Hae BAEK, Soon-Yong PARK, *Kyungpook National University*

**R2-P-8 Analysis of the transient radiation effects on Pulse Signal Processing IC**

Sang Hun JEONG, Nam Ho LEE, Yeong Gwan HWANG, Jong Yeol KIM, Min Woong LEE, *Korea Atomic Energy Research Institute*

**R2-P-9 A Versatile Luminescence Apparatus for Investigating the Physical Properties of Dosimetry Materials**

Chang Young PARK, Ki Soo CHUNG, *Gyeongsang National University*, In Su CHANG, Jung Il LEE Jang Lyul KIM, *Korea Atomic Energy Research Institute*

**R2-P-10 Experiment of Neutron Flux Intensity Monitor with GaN developed for BNCT**

Masanobu MANABE, Yusuke KASHIWAGI, *Osaka University*, Xingcai GUAN, *Osaka University / Lanzhou University*, Fuminobu SATO, *Osaka University*, Tieshan WANG, *Lanzhou University*, Isao MURATA, *Osaka University*

**R2-P-11 Cross Talk Experiment and its Analysis for Array-type CdTe Detector for BNCT-SPECT**

Masanobu MANABE, Nobuhide SARAUE, Fuminobu SATO, Isao MURATA, *Osaka University*

**R2-P-12 LET Distribution Measurement with a TEPC during Radiotherapy by TrueBeam Linac**

Sunghwan KIM, *Cheongju University*, Uk-Won NAM, Jae Jin LEE, Jeonghyun PYO, Bong-Kon MOON, Won-Kee PARK, *Korea Astronomy and Space Science Institute*, Yeonsu KIM, Geum Mun Baek KIM, *Asan Medical Center*, Oh-nam Yang, *Mokpo Science University*

**R2-P-13 Applications of Cosmic Ray Muon Tomography for Material Deformation Nondestructive**

Hengguan YI, Zhi ZENG, Ming ZENG, Xuewu WANG, Jianping CHENG, *Tsinghua University*

**R2-P-14 Development of Position-sensing Coplanar Grid CdZnTe Detector**

B. J. KIM, *Korea Research Institute of Standards and Science / University of Science & Technology(UST)*, K. B. LEE, J. M. LEE, T. S. PARK, *Korea Research Institute of Standards and Science*

**R2-P-15 Precise Calibration using Battery-resistor Circuit for the Traceability of IMC**

Young Jin PARK, J.M Lee, T.S PARK, K.B.Lee, Joo Bong HAN, Byung Joo KIM, *University of Science & Technology(UST) / Korea Research Institute of Standards and Science*

**R2-P-16 Establishment of Performance Testing Scheme for Hand-Held Radionuclide Identifier**

Tae Hyoung KIM, Sang In KIM, Insu CHANG, Jang Lyul KIM, Bong Hwan KIM, *Korea Atomic Energy Research Institute*

**R2-P-17 Study on Electrochemical Analysis of the Neutrino Detector Using Biological Product**

Shoya SUDA, Kenji ISHIBASHI, Eka Sapta RIYANA, *Kyushu University*, Yani Nur AIDA, *Syarif Hidayatullah State Islamic University*, Shohei NAKAMURA, *Infrastructure System*

*Company, Yoichi IMAHAYASHI, Mitsubishi Electric*

**R2-P-18 Characteristics of Radiation-Resistant Real-Time Neutron Monitor for Accelerator-Based BNCT**

Takemi NAKAMURA, Kaoru SAKASAI, Hiroshi NAKASHIMA, *Japan Atomic Energy Agency* Hiroaki KUMADA, *University of Tsukuba*

**R2-P-19 Study of Spatial Resolution in the X-ray Non-destructive Inspection**

Giyeon KIM, Hyunnam KIM, Hoyeon LEE, Sunhee WI, Donguk KANG, Myungsoo KIM, Kyungtaek LIM, Eunjung LEE, Chankyu KIM, Gyuseong CHO, *Korea Advanced Institute of Science and Technology*

**R2-P-20 A Study on X-ray Source Spectrum Reconstruction Method Using Laplace Transform and Attenuation Curves**

Seongjin MAENG, Jihye SEO, Dahye KWON, Ho Kyung HWANG, Sang Hoon LEE, *Kyungpook National University*

**R2-P-21 Design of a Collimator in a High Energy Gamma Camera Using Monte Carlo Simulation**

Kyeongjin PARK, Jieun CHANG, Jaewook KIM, Daehee LEE, Yewon KIM, Kyung Taek LIM, Chankyu KIM, Gyuseong CHO, *Korea Advanced Institute of Science and Technology*

**R2-P-22 The Research on the Method of Radon Continuous Measurement**

Lu Zhen GUO, Ling CHEN, Zhi Ping LUO, *China Institute of Atomic Energy*

**R2-P-23 Fabrication and Evaluation of a Flexible B<sub>4</sub>C Film with Large Area for Multi-cylinder type Neutron Detector**

Jongyul KIM, Chang Hui LIM, Myung Kook MOON, Sang Jin CHO, *Korea Atomic Energy Research Institute*

**R2-P-24 Development of a 2 $\pi$  Geometry CsI(Tl)/PIN Photodiode Detector for Radon Detection by Using a Charcoal Canister**

Han Soo KIM, Dong Jin KIM, Manhee JEONG, Young Soo KIM, Joon-ho OH, Woo Jin CHO, *Korea Atomic Energy Research Institute*, Hyojeong CHOI, *Korea Atomic Energy Research Institute, Sungkyunkwan University*, Cheol Ho LEE, *Hanyang University*, Seung Yeon CHO, *Yonsei University*, Jang Ho HA, *Korea Atomic Energy Research Institute*

**R2-P-25 Study on Electrochemical Analysis of the Neutrino Detector Using Biological Product**

Shoya SUDA, Kenji ISHIBASHI, Eka Sapta RIYANA, *Kyushu University*, Yani Nur AIDA, *Syarif Hidayatullah State Islamic University*, Shohei NAKAMURA, *Infrastructure System Company*, Yoichi IMAHAYASHI, *Mitsubishi Electric*

**R2-P-26 Development of Signal Processing System for Gamma-ray Imager with Stacked Scintillation Detectors Sensitive in All Directions**

Eiji TAKADA, Daiki MATSUI, *Toyama College*, Hiroaki SUGANO, Yuta FUWA, Tone TAKAHASHI, *Nagoya University*, Jun KAWARABAYASHI, *Tokyo City University*, Hideki

TOMITA, Tetsuo IGUCHI, *Nagoya University*

**R2-P-27 Calculation of Energy Response Compensation for Gamma Dosimeters**

Jin Yu LI, Wei Min XIE, Zhong Jian YANG, Bao Wei CHEN, *China Institute for Radiation Protection*

**R2-P-28 Research of the THGEM-based position-sensitive surface contamination survey meter**

Hongchao PANG, Jinfeng HUANG, Zhiping LUO, *China Institute of Atomic Energy*

**R2-P-29 Establishment of Performance Testing Scheme for Radiation Detection Portal Monitors at Workplace**

Sang In KIM, Insu CHANG, Jang Lyul KIM, and Bong Hwan KIM, *Korea Atomic Energy Research Institute*

**R2-P-30 The Capability Study of Multi-function Dose Rate Meter Basing on Hemisphere CdZnTe**

Ying WANG, Wenjun XIONG, Zhiping LUO, Jizeng MA, Ling CHEN, *China Institute of Atomic Energy*

**R2-P-31 Neutron Position sensitive scintillation detector using crossed wavelength shifting fiber and Si-photomultiplier readout array**

Yang LIU, Zhe LIU, Luzhen GUO, Lin CHEN, Zhiping LUO, *China institute of atomic energy*

**R2-P-32 Performance evaluation of high-resolution photon counting gamma camera system with pixel-matched parallel-hole collimator using Monte Carlo simulation**

Youngjin LEE, *Eulji University*, Woo-Ho SHIN, *Korea Association for Radiation Application*, Hee-Joung KIM, *Yonsei University*

**R2-P-33 Development and Performance of a Hand-Held CZT Detector for In-Situ Measurements at the Emergency Responses**

Young-Yong JI, Kun Ho CHUNG<sup>1</sup>, Chang-Jong KIM, *Korea Atomic Energy Research Institute*, Yoon JIN, *Satrec Initiative*, Wannoo LEE, Mun Ja KANG, *Korea Atomic Energy Research Institute* and Sang Tae PARK, *Kongju National University*

**R2-P-34 Upgrade of Neutron Energy Spectrometer Using Onion-like Single Bonner Sphere**

T. MIZUKOSHI, K. WATANABE, A. YAMAZAKI, A. URITANI, T. IGUCHI, *Nagoya University*, T. OGATA, T. MURAMATSU, *Mitsubishi Heavy Industries LTD.*

**R2-P-35 Performance Test of a Portable Alpha-Particle Spectrometer**

Sung-Woo KWAK, Seunghoon PARK, Jung-Ki SHIN, and Heejun CHUNG, *Korea Institute of Nuclear Non-proliferation and Control*

**R2-P-36 Development of Scintillator Stucked Gamma-Camera Sensitive for all Directions**

Jun KAWARABAYASHI, Tokyo City University, Hiroaki SUGANO, Yuta FUWA, Tone TAKAHASHI, Hideki TOMITA, *Nagoya University*, Tetsuo IGUCHI, *Tokyo City University*, Daiki MATSUI, Eiji TAKADA, *National Institute of Technology*

**R2-P-37 Quenching Effect in an Optical fiber type small size dosimeter irradiated with 290 MeV/u**

**carbon ions**

Yuho HIRATA, Kenichi WATANABE, Akira URITANI, Atsushi YAMAZAKI, *Nagoya University*, Yusuke KOBAYASHI, Naruhiro MATSUFUJI, *NIRS*

**R2-P-38 Frisch-grid CZT Detector Based Compact Spectroscopy System Development**

Manhee JEONG, Woo Jin JO, Han Soo KIM, *Korea Atomic Energy Research Institute*, Sang Yeol KIM, *Notice Co.*, Jang Ho HA, *Korea Atomic Energy Research Institute*

**R2-P-39 The Optimization and Improvement of the Beta Surface Contamination Position Resolution Detector Based on the Fiber and Plastic Scintillator**

Yantao QU, Hui WANG, Yang LIU, *China Institute of Atomic Energy*

**R2-P-40 Activation analysis of KIRAMS-13 cyclotron**

Cheol Ki JEONG, Goung Jin LEE, *Chosun University*

**R3 Radiation Dosimetry**

**R3-P-1 Uncertainty of the I-131 Inhalation Dose Coefficient for Workers**

Mee-ryeong KIM, Tae-Eun Kwon, Siwan Noh, Jai-Ki Lee, *Hanyang University*

**R3-P-2 Effective Dose Scaling Factors for Inhalation Dose Assessment Considering Radioactivity Distribution in NORM Aerosol**

Cheol Kyu CHOI, Yong Gun KIM, Si Young KIM, *Kyung Hee University*, Jae Kook LEE, *Korea Institute of Nuclear Safety*, Kwang Pyo KIM, *Kyung Hee University*

**R3-P-3 Probabilistic Assessment of Internal Dose to the Public due to Normal Operation of Nuclear Power Plant**

Hyungjoon YU, Hongsuk KIM, *Korea Institute of Nuclear Safety*, Jaiki LEE, *Hanyang University*

**R3-P-4 Dose Reconstruction Using Electronic Components from Cars and Electronic Home Appliances**

Jungil LEE, Insu CHANG, Jang-Lyul KIM, and Bong-Hwan KIM, *Korea Atomic Energy Research Institute*

**R3-P-5 Retrospective Accident Dosimetry Using Optically Stimulated Luminescence from Integrated Circuit (IC) Chips of Mobile Phones**

Jungil LEE, Insu CHANG, Jang-Lyul KIM, Bong-Hwan KIM, *Korea Atomic Energy Research Institute*

**R3-P-6 Thermoluminescence Characteristics of Electronic Components for Dose Reconstruction**

Insu CHANG, Jungil LEE, Sang In KIM, Jang Lyul KIM, *Korea Atomic Energy Research Institute*

**R3-P-7 Evaluation of Gamma-ray Dose Rates on the Upper Core Structure of the Experimental**

**Fast Reactor Joyo**

Chikara ITO, Takahiro YAMAMOTO, Shigetaka MAEDA, Hideaki ITOH, Takashi SEKINE,  
*Japan Atomic Energy Agency*

**R3-P-8 SAAD-POSL method for fast assessment of retrospective dosimetry with core-disc samples using building materials**

M.J. Kim, Y.J. Lee, *Neosiskorea Co. Ltd*, J.I. Lee, J.L. Kim, *Korea Atomic Energy Research Institute*, D.G. Hong, *Kangwon National University*

**R3-P-9 Evaluation of DNA damage using Microwave Dielectric Absorption Spectroscopy**

Makoto HIRAYAMA, Youichirou MATUO, *University of Fukui*, Takeyoshi SUNAGAWA, *Fukui University of Technology*, and Yoshinobu IZUMI, *University of Fukui*

**R3-P-10 Texture Features on the Fluence Map to Estimate the Complexity of VMAT Delivery**

So-Yeon PARK, Jong Min PARK, Joel CARLSON, Sung-Joon YE, *Seoul National University Hospital*

**R3-P-11 Comparison of Monte Carlo Simulations for Scattered Angle Distribution in Proton Therapy**

Yi-Chun LIN, C.Y. PAN, K.J., CHIANG, M.C. YUAN, *Institute of Nuclear Energy Research*, Y.W. TSAI, *National Central University*, P.K. TENG, C.H. LIN, *Institute of Physics*, T.C. CHAO, C.C. LEE, C.J. TUNG, *Chang Gung University*, A. E. CHEN, *National Central University*

**R3-P-12 Preliminary Evaluation of the Activity Concentration Limit for Consumer Goods Containing NORM**

Mee JANG, Kun Ho CHUNG, Young Yong JI, Jong Myung LIM, Mun Ja KANG Guen Sik CHOI, *Korea Atomic Energy Research Institute*

**R3-P-13 Development of the Graphite-Moderated Neutron Calibration Fields using <sup>241</sup>Am-Be sources in JAEA-FRS**

Sho NISHINO, Yoshihiko TANIMURA, *Japan Atomic Energy Agency*, Yoshiaki EBATA, *Institute of Radiation Measurements*, Michio YOSHIZAWA, *Japan Atomic Energy Agency*

**R3-P-14 Radiation Dose Estimation by Means of the Molecular Dosimetry in the Cultured Cells**

Jin Kyu KIM, *Korea Atomic Energy Research Institute, University of Science and Technology*, Mi Youg KANG, *Korea Atomic Energy Research Institute*, Remigius Ambrose KAWALA, *University of Science and Technology*, Tae Ho RYU, , Jin-Hong KIM, *Korea Atomic Energy Research Institute*, Jacobus P. SLABBERT, *Medical Directorate, iThemba LABS*

**R3-P-15 A MCNPX Simulation Method For 3d Scanned Model Of Object With Free Curved Surfaces**

Ji Seok KIM, Gwang Min SUN, Ha Ni BAEK, *Korea Atomic Energy Research Institution*

**R3-P-16 China Reference Adult Male Physical Phantoms for In-vivo Monitoring Equipment**

Wanchun XIONG, Yunshi XIAO, *China Institute for Radiation Protection*, Qingjian CAO, *China Institute of Atomic Energy*, Liye LIU, Ri ZHAO, Xiaofeng WEI, Sanqiang XIA, Hua LI, Yuan ZHAO, Hongjuan PAN, Yu WANG, Ruwei MA, *China Institute for Radiation Protection*

## **R4 Environmental Radiation Measurement and Assessment**

### **R4-P-1 Attachment Behavior of Fission Products on Solution Aerosol**

Koichi TAKAMIYA, Toru TANAKA, Shinnosuke NITTA, Satoshi ITOSU, Shun SEKIMOTO, Yuichi OKI, Tsutomu OHTSUKI, *Research Reactor Institute, Kyoto University*

### **R4-P-2 Sensitivity Analysis on Impact Parameters for Dose Assessment at Radioactive Contaminated Zone**

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Han Young JOO, Rinah KIM, Chan Hee PARK, Joo Hyun MOON, *Department of Nuclear Energy System engineering, Dongguk University*

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Jeong-wan KWON, Hong-suk KIM, Chang-il CHOI, Ah-reum KIM, *Korea Institute of Nuclear Safety*

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Gyo-Seong JEONG, Jin-Woo LEE, *KAERI (Korea Atomic Energy Research Institute), Chonbuk National University*, Yun-Jong LEE, *KAERI (Korea Atomic Energy Research Institute)*, Jong-Il KIM, *Chonbuk National University*, Soo-il LEE, *SAE-AN Engineering Co.*

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Joo Yeon KIM, Sol Ah JANG, Je Ho Min and Tai-jin PARK, *Korean Association for Radiation Application*

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Yuichi OKI, Naoyuki OSADA, *Okayama University*, Toru TANAKA, *Kyoto University*, Koichi TAKAMIYA, Yoshihiro ISHI, Yasutoshi KURIYAMA, Tomonori UESUGI, Masaaki SAKAMOTO, and Tsutomu OHTSUKI, *Kyoto University Research Reactor Institute*

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Tae-Chul MOON, Chang-Yeal BAEG, Chun-Hyung CHO, *Korea Radioactive Waste Agency*

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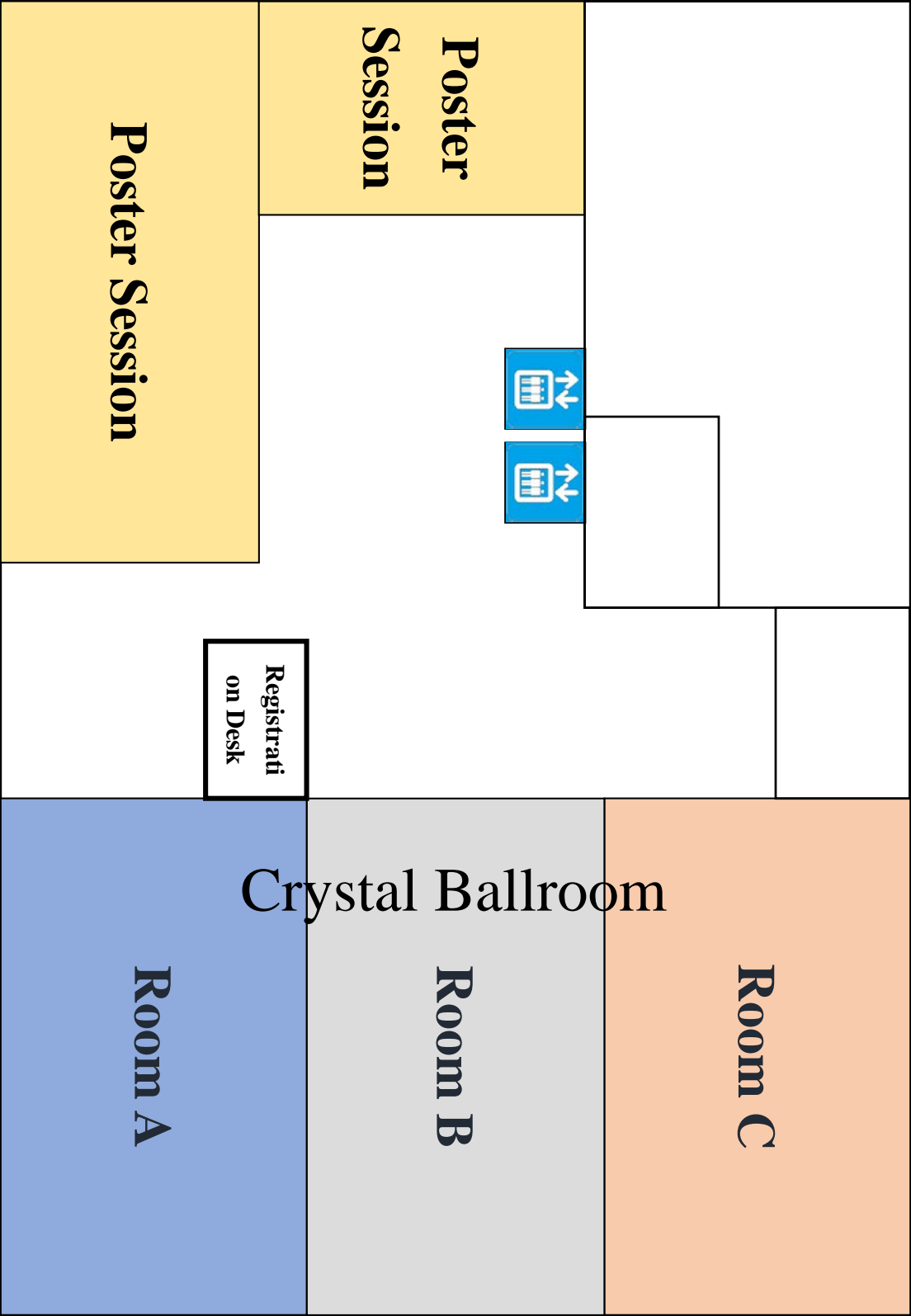
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