

LSSE <Room 316>

Tuesday, 18 April

[LSSE1] 13:00-15:05
Keynote 1
Chair: Akihiko Nishimura
Japan Atomic Energy Agency

LSSE-OP 13:00
Opening Remarks

LSSE1-01 13:05 **keynote**

Chemical species of actinides by Time Resolved Laser-induced Fluorescence Spectroscopy

Toshihiko Ohnuki
Fukushima Reconstruction and Revitalization Unit, Institute of Innovative Research (IIR), Tokyo Institute of Technology
TRLFS determined the numbers of change of NH₂O with pH, and NH₂O and RE/M of trivalent lanthanide of Eu(III). These results suggest that chemical species of lanthanides and probably actinides dominate the sorption on microbial cells.

LSSE1-02 14:05 **Invited**

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Satoshi Wada
RIKEN
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Wednesday, 19 April

[LSSE2] 9:40-10:30
Carbon Neutral 1
Chair: Satoshi Wada
RIKEN

LSSE2-01 9:40

LSSE
Takeharu Murakami
LSSE
LSSE

LSSE2-02 10:10

UV powered H₂S Decomposition for Hydrogen Production

Hassnain Abbas Khan¹, Ali Elkhazraji¹, Mohammad Abou-Daher¹, Damian P San Roman Alerigi³, Adrian C Cavazos Sepulveda², Aamir Farooq¹
¹*Clean Combustion Research Center, King Abdullah University of Science and Technology*,
²*Saudi Aramco PE&D*, ³*EXPEC Advanced Research Center, Saudi Aramco*
This study employed a picosecond Ti:sapphire UV laser for the photolysis of H₂S to produce hydrogen gas and sulfur. Experiments were carried out at ambient conditions in a photoreactor and the products were analyzed with a gas chromatograph.

----- Coffee Break 10:30-11:00 -----

[LSSE3] 11:00-12:00
Carbon Neutral 2 / Agri-Photonics 1
Chair: Satoshi Wada
RIKEN

LSSE3-01 11:00

LSSE
Naoki Uchiyama
ATSUMITEC Co., Ltd.
LSSE

LSSE3-02 11:30

From observation to symulation - Trial for visualizatiion of whole material flow on ecosystem -

Shigeharu Moriya
RIKEN
LSSE

----- Lunch 12:00-13:00 -----

[LSSE4] 13:00-14:30
Agri-Photonics 2
Chair: Satoshi Wada
RIKEN

LSSE4-01 13:00

Robust
Yukihiro Takahashi
Hokkaido University
LSSE2023_01

LSSE4-02 13:30

LSSE
Yasutaka Hanada
LSSE
LSSE

LSSE4-03 14:00 **Invited**

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Tetsuya Abe
Topcon/RIKEN
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Tuesday, 20 April

[LSSE5] 11:00-11:40
Industrial applications
Chair: Akihiko Nishimura
Japan Atomic Energy Agency

LSSE5-01 11:00

Laser Energy Transmission using 910nm Near-infrared LD and PID control
Jizhao Li, Yuki Uehara, Taku Saiki
Kansai University
Automatic laser tracking system for energy transmission had been developed in 2D. Also, properties on transmitted electricity and optimized PID gain of Neural Network PID controller based on machine learning were reported here.

LSSE5-02 11:20

Development of Axial-flux Motor using Sintered IronNano-polycrystalline Body and Its Application to Magnetic Levitation and Propulsion System

Yuki Uehara, Saishou Ri, Daiki Nishimori, Taku Saiki, Mitsuru Inada
Kansai University
We report on rotational speed and torque characteristics of axial-flux motor using sintered iron nano-polycrystals and on levitation force characteristics of magnetic wheel motor using permanent magnet and control of motor using CMAC PID controller.

----- Lunch 11:40-13:10 -----

[LSSE6] 13:10-15:00
SpaceTechnology/ExtremCondition
Chair: Toshikazu Ebisuzaki
RIKEN

LSSE6-01 13:10

Laser Ablation Propulsion: Fundamental Research and Application to Space Debris Deorbit
Yusuke Nakamura
Department of Aerospace Engineering, Nagoya University
LSSE

LSSE6-02 13:40 **Invited**

Laser-induced breakdown spectroscopy for space exploration
Yuichiro CHO
The University of Tokyo
Laser-induced breakdown spectroscopy (LIBS) is a versatile tool for space exploration. We present the results of our LIBS experiments to analyze the composition and age of lunar rocks during future lunar lander missions.

LSSE6-03 14:10

Geophotonics: laser & photonic applications for subsurface
Damian Pablo San Roman Alerigi¹, Sameeh Issa Batarseh¹, Oliverio Alvarez², Weichang Li²
¹*EXPEC Advanced Research Center, Saudi Aramco*, ²*Houston Research Center, Aramco Americas*
Lasers and photonics could enable unique applications in the extreme environments of energy production, subsurface exploration, and environmental assessment. These features include contactless characterization, subsurface stimulation, and in-situ photochemistry.

LSSE6-04 14:30 **Invited**

R&D of Heat Resistant FBG Sensors for Reactor Decommission and its Related Applications

Akihiko Nishimura¹, Tsugio Ide², Nobuyuki Ishihara², Koji Takasaki¹
¹*JAEA*, ²*deltafiber.jp*
R&D of Heat Resistant FBG Sensor is introduced for Reactor decommissioning for the usage under high temperature and/or high radiation environment. A robotic arm for decommission will have a cutting edge force-feed back system.

----- Coffee Break 15:00-15:30 -----

[LSSE7] 15:30-17:10
Remote Sensing
Chairs: Takashi Fujii
The University of Tokyo
Noboru Hasegawa
QST

LSSE7-01 15:30

High-power solid-state lasers for atmospheric lidar
Norihito Saito
RIKEN
This study aims to develop high-power all-solid-state lasers which enable to profile hyperfine transition lines of Na, He, N²⁺, etc. by Doppler-free saturation spectroscopy towards the lidar observation of atmospheric phenomena.

LSSE7-02 16:00

Portable coherent Doppler lidar incorporating on-board FPGA for various application
Yuli Han, Dongsong Sun
University of Science and Technology of China
We report the development of a portable coherent Doppler lidar system incorporating on-board FPGA for real-time data processing. The feature of the FPGA as well as the superiority of such configuration is introduced.

LSSE7-03 16:20

Measurements of Snow Depth Using Lidar Measurements of Multiple Scattering Path Length Distribution
yongxiang hu, Zhaoyan Li
NASA Langley Research Center
Based on the Monte Carlo simulations of ICESat-2 measurements of 532-nm laser light propagation in snow, we find that average lidar backscattering path length always equals to twice of the snow depth, and the average path length - snow depth relationship is independent of snow sensity, snow grain size and single scattering phase function. This snow depth technique is demonstrated by the ICESat-2 measurements.

LSSE7-04 16:40 **Invited**

Development of laser-induced breakdown spectroscopy system for on-site diagnostics of porcelain insulators
Takashi Fujii, Momoka Ono, Akiko Kumada
The University of Tokyo
We developed a portable laser-induced breakdown spectroscopy system for onsite diagnostics of pollution of porcelain insulators. The emission intensity ratios of Na/K and Cl/Ca can be used for stable calibration curves for a wide range of salt deposit density.

LSSE <Room 316>

Friday, 21 April

[LSSE8] 9:00-10:30
Keynote2/Infrastructure1
 Chair: Noboru Hasegawa
QST

LSSE8-01 9:00 **keynote**

Development of portable neutron source system

Yoshie Ohtake
RIKEN
 Tentative

LSSE8-02 10:00 *Invited*

Development of outdoor inspection technology using lasers in ILT

shinri Kurahashi, Toshihiro Somekawa
Institute for Laser Technology

To improve the efficiency of inspections for the aging social infrastructure, a laser-based inspection technique for concrete structures has been developed. Inspection of facilities in use was conducted to demonstrate the possibility of evaluation of soundness.

----- Coffee Break 10:30-11:00 -----

[LSSE9] 11:00-12:10
Infrastructure 2
 Chair: Takashi Fujii
The University of Tokyo

LSSE9-01 11:00 *Invited*

The possibility of the laser hammering system for the existing concrete structures damaged by internal swelling reaction

Taito Miura¹, Noboru Hasegawa², Masaharu Nishikino², Shingo Asamoto³
¹Nagoya University, ²National Institutes of Quantum Science and Technology, ³Saitama University

The non-destructive inspection for evaluating concrete structure damaged by ISR was assessed. The possibility that the change in mechanical property due to ISR is estimated by steel ball-falling test and laser hammering system was confirmed.

LSSE9-02 11:30 *Invited*

Development of remote inspection system for the bridge concrete using high power lasers

Noboru Hasegawa¹, Masaharu Nishikino^{1,2}, Hajime Okada^{1,2}, Shuji Kondo^{1,2}, Katsuya Sakamoto², Shigeru Kogure², Satoshi Tomoto³, Yuki Yamada³, Hikaru Nakamura⁴

¹QST KPSI, ²Photon-Labo. Co., Ltd., ³CTI Engineering Co., Ltd., ⁴Nagoya University

We have demonstrated a remote inspection for bridge using laser hammering system. Under the conditions of 30 m distance and laser incident angle of 45 degrees, we succeeded in detecting defects inside the bridge concrete.

LSSE-CL 12:00

Closing Remarks