Quantum Radiation Energy Research Section

H. Ohgaki, Professor
T. Kii, Associate Professor (concurrent)
H. Zen, Assistant Professor
Jordi Cravioto Caballero, Program-Specific Assistant Professor

1. Introduction

Coherent-radiation energy with a wide wavelength tunability and a high power is an indispensable tool for exploiting cutting-edge science. The research in this section aims at generating and application of new quantum-radiation energy. Free-electron laser (FEL) is one of such radiation. We have been developing a mid-infrared FEL, KU-FEL. To extend study field wider wavelength region, a coherent A compact THz source, high Tc undulator for X-ray generation, and Laser Compton Gamma-ray (LCS) for isotope imaging have been carried out. Transdisciplinary research on renewable energy has also been promoted through international collaborations.

2. Free-electron Laser

FEL is a next generation light source because of its wide wavelength tunability where the conventional lasers cannot reach, potential high efficiency, and high peak power. However, the system is usually much larger and the cost is higher than conventional lasers. We are going to overcome these difficulties by exploiting an RF (radio-frequency) gun, a high Tc undulator, etc.

2.1 KU-FEL

The target wavelength of KU-FEL is MIR (Mid infra-red) regime, from 5 to 20 μm, with high-power and tunability for basic research on energy materials. Figure 1 shows a schematic drawing of the KU-FEL system. The KU-FEL consists of a 4.5-cell thermionic RF gun, a 3-m travelling wave accelerator tube, a beam transport system, and a 1.8-m undulator and a 5-m optical resonator. The FEL device now can cover the wavelength range from 3.4 to 28 μm. The maximum macro-pulse energy which can provide is around 60 mJ in a 2-μs macro-pulse at the wavelength of 9.8 μm. The FEL is routinely operated and opened for internal and external users.

For increasing the peak power of the KU-FEL, the photocathode operation of the 4.5-cell thermionic RF gun has been established. Under the photocathode operation, the micro-pulse energy of 100 μJ and the world highest extraction efficiency (9.4%) of the oscillator-type FEL has been achieved. Then the micro-pulse duration was shortened down to 150 fs (~4.2 cycles at 11 μm). In addition, Nonlinear compression of 8.6-μm FEL pulse has been achieved and the pulse duration was compressed from 146 to 106 fs (from 5.1 to 3.7 cycles) by passing through a 30-mm thick Ge plate.

For further increase of the peak power of KU-FEL, newly fabricated 1.6-cell RF gun has been installed at the upstream side of the accelerator tube. The initial commissioning of the new RF gun was successfully finished and FEL lasing with the electron beam generated from the gun has been achieved.

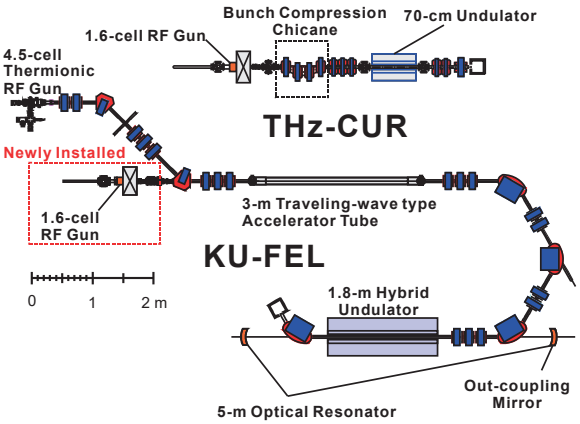

Fig. 1 Schematic drawing of the KU-FEL and THz-CUR

2.2 THz Coherent Undulator Radiation Source

A new compact terahertz coherent undulator radiation source (THz-CUR in Fig. 1) has been constructed. It consists of a 1.6-cell RF-gun, a solenoid magnet, a magnetic chicane bunch compressor, a triplet quadrupole magnet, a planar undulator, and a laser system for photocathode. In this device, short electron bunches are generated by the photocathode RF gun and the bunch compressor. The electron bunches are injected to the undulator and intense coherent undulator radiation can be generated.

The 1.6 cell RF gun used for the THz-CUR was replaced with an energy chirping cell attached RF gun for improving its performance under collaboration with Dr. Sakaue, Tokyo University. The gun utilizes a velocity bunching scheme for generating ultra-short electron bunch. A commissioning experiment has been done and the saturation of THz peak power due to the space charge effect can be success-

fully suppressed.

The polarization control method of the THz-CUR has been developed under collaboration with Dr. Kashiwagi, Tohoku University. The polarization state of the THz-CUR can be easily controlled from linear to left-handed circular and right-handed circular without significant power loss.

2.3 Application of MIR-FEL and THz-CUR

Many application researches of MIR-FEL and THz-CUR have been performed under the Joint Usage/Research Center for Zero Emission Energy Research of our Institute. In JFY2023, 17 external user groups used KU-FEL.

3. Bulk SC Staggered Array Undulator

An undulator with strong magnetic field will play an important role in future synchrotron light sources and FELs. We have developing a new undulator which consists of stacked bulk high critical temperature superconductors array and a solenoid magnet. The magnetic field strength is about three times higher than that of conventional permanent magnet undulators. (Fig.2)

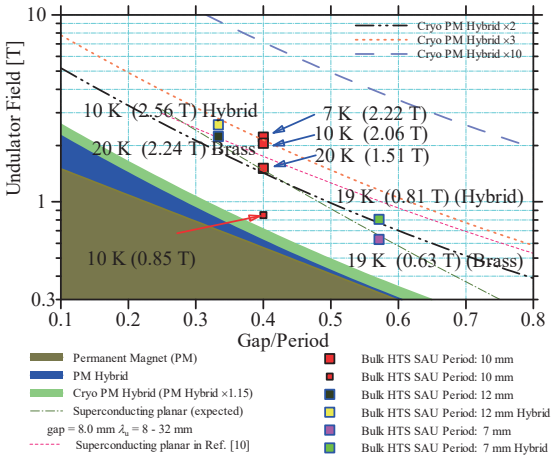

Fig. 2 Performance comparison

4. Isotope Imaging for Nuclear Safety and Security

Multi-isotope imaging method has been developed at BL1U beamline in UVSOR, Institute of Molecular Science. The enriched $^{206, 207, 208}$Pb and natural Pb target rods of 8 mmϕ was used for 1-D imaging experiment. The NRF gamma-rays emitted from the witness target consisted of enriched $^{206, 207, 208}$Pb rods were measured with two Ge detectors. The flux of the incident LCS gamma-ray beam (maximum energy of 5.53 MeV) with 2 mmϕ beam size was monitored by a plastic scintillator detector and whole absorption was measured by a $LaBr_3$(Ce) detector. The scanning step was 4 mm. As a result, two isotopes ($^{207, 208}$Pb) image was clearly obtained, but failed for ^{206}Pb whose NRF reaction rate is one order smaller than that of $^{207, 208}$Pb. Flat-LCS and standard LCS have been used for the measurement, and Flat-LCS enhanced lower energy (5.0-5.3 MeV) NRF peaks.

5. Social aspects of energy use

In 2023, more than 775 million people in the world are still without electricity. Recently, reports show that this figure has increased for the first time in decades. In Southeast Asia, almost 31 million people remain without access, but the study is insufficient compared to regions such as Africa and South Asia. Moreover, research focuses on economic, technological and institutional aspects of electrification, but studies focusing on social barriers and implications are still scarce. Therefore, our group investigates the social effects of electrification with a quality-of-life perspective by comparing experiences of rural electrification projects in Southeast Asia (Fig. 3). Applying mixed methods from the social sciences, we have found that solar systems can improve the education of children in rural households, reduce dependence on expensive and dangerous energy sources, and improve social interaction. However, economic disparities in the community can be exacerbated and concerns about changing lifestyles and limited system capacity are crucial aspects for successful projects. Our group also analyses how household roles affect efficient appliance purchasing in urban contexts and topics related to energy justice.

Fig. 3 Rural electrification survey sites 2016-2022

Acknowledgment

All our research works have been supported by the KAKENHI, Q-LEAP(MEXT), JASTIP(JST), UVSOR Collaboration Research, CSEAS DASU (Kyoto University), and the Laboratory for Complex Energy Processes Collaboration Research (IAE).

Collaboration Works

大垣英明, NSTDA（タイ）, JASTIP「日 ASEAN 科学技術イノベーション共同研究拠点－持続可能開発研究の推進」

大垣英明, University of Malaya（マレーシア）, JASTIP-net

Financial Support

1. Grant-in-Aid for Scientific Research

大垣英明, 基盤研究(B), F-LCS レーザーコンプトン散乱γ線による同位体イメージングの高度化に関する研究

大垣英明, 基盤研究(B), コヒーレントエッジ放射から紐解く自由電子レーザー相互作用（分担金）

紀井俊輝, 基盤研究(B), バルク超伝導体アンジュレータへの電子ビーム入射

全炳俊, 基盤研究(B), 共振器型自由電子レーザの引き出し効率飛躍的向上に関する研究

全炳俊, 基盤研究(B), 超短パルス自由電子レーザーによる長波長赤外強光子場科学の開拓（分担金）

全炳俊, 基盤研究(B), コヒーレントエッジ放射から紐解く自由電子レーザー相互作用（分担金）

全炳俊, 基盤研究(B), 究極的な高勾配加速を目指した自由電子レーザー逆過程加速に関する研究（分担金）

Cravioto Jordi, 基盤研究(B), 包括的 QoL 評価法の確立 : 東南アジアの僻地電化における幸福度と不公平

2. Others

大垣英明, 科学技術振興機構, 日ＡＳＥＡＮ科学技術イノベーション共同研究拠点－持続可能開発研究の推進－

大垣英明, 国際協力機構（JICA）, カンボジア国炭素中立社会に向けたクリーンエネルギー転換ロードマップ策定プロジェクト

大垣英明, 東京大学 光・量子飛躍フラッグシッププログラム（Q-LEAP）, 「先端レーザーイノベーション拠点「次世代アト秒レーザー光源と先端計測技術の開発」部門」「自由電子レーザーで駆動する高繰り返しアト秒光源のための基礎基盤技術の研究」

大垣英明, Paul Scherrer Institute（スイス）, Testing of REBCO bulk undulator prototype

大垣英明, （一財）新技術振興渡辺記念会, ＡＳＥＡＮ地域の科学技術コーディネート人材育成に関する調査

大垣英明, （公財）トヨタ財団イニシアティブプログラム, 異なる国・セクターを繋ぐ科学技術イノベーションコーディネーションに関する学びあい : 人材育成プログラムの開発と政策提言

Publications

H. Zen, R. Hajima, H. Ohgaki, Full characterization of superradiant pulses generated from a free-electron laser oscillator, Scientific Reports, 13, 6350, 2023

Y. Taira, S. Endo, S. Kawamura, T. Nambu, M. Okuizumi, T. Shizuma, M. Omer, H. Zen, Y. Okano, and M. Kitaguchi, Measurement of spatial polarization distribution of circularly polarized gamma rays produced by inverse Compton scattering, Physical Review A, 107, 6, 063503, 2023

S. Masuno, M. Hashida, H. Zen, Formation of periodic surface structures on semiconductors under mid-infrared free-electron laser irradiation, IEEJ Transactions on Fundamentals and Materials, 143, 10, 320-324, 2023

Y. Zhao, H. Zen, H. Ohgaki, Particle tracking simulation of a new photocathode RF gun in free-electron laser facility, KU-FEL, Particles, 6, 2, 638-646, 2023

Anugerah Yuka Asmara, AR. Rohman Taufiq Hidayat, B. Kurniawan, H. Ohgaki, T. Mitsufuji, J. Cravioto, Building a Sustainable Photovoltaic Innovation System in Indonesia Through Network Governance Perspective, Environment & Policy, Environmental Governance in Indonesia, 61, 463-485, 2023

Y. Uozumi, T. Furuta, Y. Yamaguchi, H. Zen, T. Kii, H. Ohgaki, E. Velicheva, V. Kalinnikow, Z. Tsamalaidze, P. Evtoukhovitch, Study of crystalline scintillator response with development of single-electron beam of 2–6 MeV at KU-FEL, Journal of Nuclear Science and Technology, 60, 9, 1125-1132, 2023

H. Okumura, S.G. Itoh, H. Zen, K. Nakamura, Dissociation process of polyalanine aggregates by free electron laser irradiation, Plos One, 18, 9, e0291093, 2023

H. Ohgaki, K. Ali, T. Kii, H. Zen, T. Hayakawa, T. Shizuma, M. Fujimoto, Y. Taira, Generation of flat-laser Compton scattering γ-ray beam, Physical Review Accelerators and Beams, 26, 093402, 2023

H. Zen, R. Hajima, H. Ohgaki, Nonlinear compression of naturally down-chirped superradiance pulses from a free-electron laser oscillator by thick germanium plates, Optics Express, 31, 24, 40928-40936, 2023

M. Katoh, H. Ota, J. Yamazaki, K. Hayashi, Y. Okano, E. Salehi, Y. Taira, A. Mano, M. Fujimoto, Y. Takashima, M. Hosaka, F. Sakamoto, T. Kaneyasu, H. Zen, Light Source Developments at UVSOR BL1U, Journal of Physics: Conference Series, 2687, 032005, 2024

R. Hajima, K. Kawase, H. Zen, H. Ohgaki, Carrier-Envelope Phase Stabilization in FEL Oscillators, Journal of Physics: Conference Series, 2687, 032013, 2024

T. Kii, T. Akasaka, and M. Tomita, Generationof Periodic Magnetic Field using Bulk MgB_2, IEEE Transactions on Applied Superconductivity, 10417004, 2024

K. Sota, K. Ando, H. Zen, T. Kii, H. Ohagaki, T. Nakajima, Morphological study of depth-controlled high quality holes and lines fabricated on a metal substrate with a thin metal film by picosecond laser pulses, Optics and Laser Technology, 175, 110853, 2024

J. Cravioto, H. Ohgaki, Can the circular economy be relevant for rural development? Insights from communities without electricity in South-East Asia, EGU General Assembly 2023, EGU23, 11487, 2023

H. Zen, H. Ohgaki, R. Hajima, Generation of Naturally Down-chirped Few-Cycle Pulse from Free-Electron Laser Oscillator and Its Pulse Compression, 2023 48th International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz), 2023

H. Zen, T. Kii, H. Ohgaki, Present status of Kyoto University Free-Electron Laser facility, KU-FEL, Proceedings of IPAC'23, 1866- 1869, 2023

H. Ohgaki, K. Ali, T. Kii, H. Zen, T. Hayakawa, T. Shizuma, Y. Taira, Generation and NRF Application of Flat-Laser Compton Scattering Gamma-ray Beam in UVSOR, Proceedings of IPAC'23, 1874-1876, 2023

R. Hajima, K. Kawase, H. Zen, H. Ohgaki, Carrier-Envelope Phase Stabilization in FEL Oscillators, Proceedings of IPAC'23, 5121-5123, 2023

M. Katoh, H. Ota, J. Yamazaki, K. Hayashi, Y. Okano, E. Salehi, Y. Taira, A. Mano, M. Fujimoto, Y. Takashima, M. Hosaka, F. Sakamoto, T. Kaneyasu, H. Zen, Light Source Developments at UVSOR BL1U, Proceedings of IPAC'23, 169-172, 2023

R. Hajima, K. Kawase, J.K. Koga, H. Zen, H. Ohgaki, Laser-induced gas breakdown by a train of femtosecond long-wave infrared FEL pulses, 2023 48th International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz), 2023

T. Kii, A Bulk Superconductor and Its Application to Insertion Devices, 67th ICFA Adv. Beam Dyn. Workshop Future Light Sources, 2023

大垣英明, UVSOR BL-1U におけるレーザコンプトンガンマ線を用いた非破壊同位体識別イメージング技術の基礎研究, 放射光, 36, 3, 133-139, 2023

紀井俊輝, バルク超伝導体の基礎とアンジュレータへの応用, 加速器, 20, 1, 10-19, 2023

坂上和之, 大谷将士, 岡安雄一, 鈴木研人, 全炳俊, 想田光, 学会活性化特別委員会の紹介, 加速器, 20, 2, 116-119, 2023

S. Deeum,T. Charoenchan, N. Janjamraj, S. Romphochai, S. Baum, H. Ohgaki, N. Mithulananthan, K. Bhumkittipich, Optimal Placement of Electric Vehicle Charging Stations in an Active Distribution Grid with Photovoltaic and Battery Energy Storage System Integration, Energies, 16,22, 7628、2023

S. Basu, K. Usher, H. Tamiya, R. Akasegawa, Y. Hui, Q. Chen, J. Cravioto, H. Ohgaki, Synergies and Trade-offs Quantification from Regional Waste Policy to Sustainable Development Goals: The Case of Kyoto City, Sustainable Development, 1-21, 2024

D.I. Avila-Ortega, S. Garcidueñas-Nieto, D. Moran, S. Cornell, J. Cravioto, P. Søgaard Jørgensen, C. Flo-res-Santana, R. García Ochoa, G. Engström,, Mexico's carbon inequality: Why income matters. Journal of Ecological Economics, ECOLEC-D-23-01421 (under review), 2024

Presentations

H. Ohgaki Roles of Relevant Stakeholders in the National Innovation System, The 1 st National Science Technology Innovation Day, Koh Pich Convention & Exhibition Center, 2023.3.27

H. Zen, T. Kii, H. Ohgaki, Present status of Kyoto University free-electron laser facility, KU-FEL, 14th International Particle Accelerator Conference, IPAC'23, The Venice Convention Centre, 2023.5.9

H. Zen, H. Ohgaki, R. Hajima, Improvement of extraction efficiency of oscillator-type mid-infrared free-electron laser at Kyoto University, 14th International Particle Accelerator Conference, IPAC'23, The Venice Convention Centre, 2023.5.9

R. Hajima, K. Kawase, H. Zen, H. Ohgaki, Carrier-envelope phase stabilization in FEL oscillators, 14th International Particle Accelerator Conference, IPAC'23, The Venice Convention Centre, 2023.5.9

H. Zen, K. Tanaka, Y. Zhao, H. Ohgaki, Commissioning of new photocathode RF gun for oscillator-type mid-infrared free-electron laser at Kyoto University, 14th International Particle Accelerator Conference, IPAC'23, The Venice Convention Centre, 2023.5.11

H. Ohgaki, K. Ali, T. Kii, H. Zen, T. Hayakawa, T. Shizuma, Y. Taira, Generation and NRF application of flat-laser Compton scattering gamma-ray beam in UVSOR, 14th International Particle Accelerator Conference, IPAC'23, The Venice Convention Centre, 2023.5.11

羽島良一, 川瀬啓吾, 全炳俊, 大垣英明, 早川恭史, 境武志, 赤外自由電子レーザーで駆動する高次高調波光源の研究, 光・量子ビーム科学合同シンポジウム 2023 (OPTO2023), 大阪大学レーザー科学研究所, 2023.6.13-14

J. Cravioto, H. Ohgaki, C.K. Tan, H.S. Che, Electrification effects on quality of life in Southeast Asia: A comparison of narratives in Malaysia and The Philippines, 6th International Conference on Clean Energy and Technology 2023, Penang, Malaysia, 2023.6

H. Ohgaki, Program Introduction “Mutual Learning of STI Coordination-Toyota Foundation”, Opening Ceremony of Project on Mutual Learning of Science, Technology and Innovation (STI) Coordination-Toyota Foundation”, Head Quarter, Ministry of Industry, Science, Technology & Innovation, 2023.7.31

H. Ohgaki, Opening and Program Introduction of “Mutual Learning of STI Coordination-Toyota Foundation”, Kick Off Workshop of Project on “Mutual Learning of Science, Technology and Innovation (STI) Coordination-Toyota Foundation”, National University of Battambang, Battambang, Cambodia, 2023.8.1

全炳俊, 紀井俊輝, 大垣英明, 京都大学自由電子レーザ施設の現状, 第 20 回日本加速器学会年会, 日本大学船橋キャンパス, 2023.8.29-30

全炳俊, 大垣英明, 羽島良一, ゲルマニウム厚板における中赤外自由電子レーザの自己圧縮, 第 20 回日本加速器学会年会, 日本大学船橋キャンパス, 2023.8.30

全炳俊, 田中虎太郎, 趙宇皓, 大垣英明, KU-FEL における新 1.6 空胴光陰極高周波電子銃の導入と Phase I コミッショニング, 第 20 回日本加速器学会年会, 日本大学船橋キャンパス, 2023.8.30

M. Pal, Q.M.B. Soesanto, S. Zhang, J. Fu, H. Ma, M.H. Imaduddin, J. Cravioto, H. Ohgaki, C. Qu, EV Transition: Consideration of Local So-cio-Environmental Impacts from Mining and Recycling, The 14th International Symposium of Advanced Energy Science, Kyoto University, 2023.8.30-31

川瀬啓悟, 羽島良一, 全炳俊, 大垣英明, 中赤外自由電子レーザによる気体のトンネルイオン化電子のエネルギー計測, 第 20 回日本加速器学会年会, 日本大学船橋キャンパス, 2023.8.31

清水康平, 平義隆, サレヒ エレハム, 太田紘志, 林憲志, 山崎潤一郎, 水口あき, 谷川貴紀, 坂本文人, 全炳俊, 加藤政博, UVSOR 光源加速器の現状 2023, 第 20 回日本加速器学会年会, 日本大学船橋キャンパス, 2023.8.31-9.1

本田洋介, 谷川貴紀, 全炳俊, 広帯域テラヘルツパルス蓄積のための光学共振器システムの開発, 第 20 回日本加速器学会年会, 日本大学船橋キャンパス, 2023.9.1

羽島良一, 川瀬啓悟, 全炳俊, 大垣英明, 早川恭史, 境武志, 自由電子レーザで駆動する高繰り返しアト秒光源の研究: 2023, 第20回日本加速器学会年会, 日本大学船橋キャンパス, 2023.9.1

H. Ohgaki, H. Zen, T. Kii, Present Status of KU-FEL and Collaboration Research for Carbon Negative Energy Science, The 14th International Symposium of Advanced Energy Science, 京都大学宇治キャンパス, 2023.9.1

谷﨑進也, 大垣英明, 紀井俊輝, 全炳俊, 早川岳人, 静間俊行, 平義隆, UVSOR における F-LCS ガンマ線ビーム発生に関する研究：実験, 日本原子力学会 2023 年秋の大会, 名古屋大学, 2023.9.6

S.I. Masuno, M. Hashida, H. Zen, M. Kusaba, S. Tokita, Pump probe measurement of the periodic surface structure formation by 11.4 micro-m laser, The 12th Asia-Pacific Laser Symposium (APLS), Premier Hotel-CABIN PRESIDENT-Hakodate, Hakodate, Hokkaido, Japan, 2023.9.6

H. Ohgaki, T. Takahashi, S. Kato, Energy Situation in the World and Japan, KU-CMU Summer Camp, Chiang Mai Univesity, Thailand, 2023.9.7

S. Tanizaki, H. Ohgaki, T. Kii, H. Zen, T. Hayakawa, T. Shizuma, Y.Taira, FLAT-LASER Compton Scattering GAMMA-RAY Beam for MULTI-ISOTOPE Imaging in UVSOR-III, Nuclear Phonics2023, Durham Convention Center, 2023.9.12

H. Ohgaki, Current Global Energy Situation and Carbon Neutral 2050, Five Day International Faculty Development Program EMERGING TECHNOLOGIES IN THERMAL ENERGY PRODUCTION AND STORAGE, Vishnu Educational Development and Innovation Center (VEDIC), Hyderabad, INDIA, 2023.9.15

R. Hajima, K. Kawase, J.K. Koga, H. Zen, and H. Ohgaki, Laser-induced Gas Breakdown by a Train of Femtosecond Long-wave Infrared FEL Pulses, 48th International Conference on Infrared Millimeter and Terahertz waves, Centre Mont-Royal, Montreal, Quebec, Canada, 2023.9.18

H. Zen, H. Ohgaki, and R. Hajima, Generation of Naturally Down-Chirped Few-cycle Pulse from Free-Electron Laser Oscillator and Its Pulse Compression, 48th International Conference on Infrared Millimeter and Terahertz waves, Centre Mont-Royal, Montreal, Quebec, Canada, 2023.9.18

曽田圭亮, 安東航太, 全炳俊, 紀井俊輝, 大垣英明, 中嶋隆, ピコ秒レーザーパルス照射による高品質極浅穴およびラインの作成, 第 84 回応用物理学会秋季学術講演会, 熊本市民会館, 2023.9.20

吉田恭平, 全炳俊, 蜂谷寛, 大垣英明, アンチストークス/ストークスラマン散乱分光法を用いたモード選択的励起フォノンの周波数に対する励起個数分布の観測, 第 84 回応用物理学会秋季学術講演会, 熊本城ホール, 2023.9.21

H. Ohgaki, ASEAN's Energy Outlook, 2023 International Conference on Power, Energy and Innovation (ICPEI), Amari Hotel, HuaHin, Thailand, 2023.10.19

J. Cravioto, Gauging the social effects of renewable energy transi-tions in rural SE Asia, Virtual international Lecture: selected classes on policy analysis. Faculty of Engineering, University of Brawijaya, Indonesia, 2023.10.24

J. Cravioto, Renewable energy transition: Status, challenges and policy considerations. Virtual seminar on renewable energy utilization policy to reduce the impact of cli-mate change, Faculty of Administrative Science, University of Brawijaya, Indonesia, 2023.10.25

J. Cravioto, Sustainable transitions, social vulnerabilities and use of energy in the residential sector, Lectures on sustainable urban energy planning, Faculty of Administrative Science, University of Brawijaya, Indonesia, 2023.10.25

大垣英明, 放射線の基礎, 京都府立莵道高等学校文部科学省原子力・エネルギー教育支援事業における講演会, 京都府立莵道高等学校, 2023.11.14

H. Ohgaki, Introduction of "Mutual Learning of STI Coordination-Toyota Foundation", Kick Off Workshop of Project on "Mutual Learning of Science, Technology and Innovation (STI) Coordination-Toyota Foundation", Thailand Science Park, 2023.11.16

H. Zen, Utilization of Infrared Free-Electron Laser at Kyoto University, Seminar on Particle Accelerators and Applications in Thailand, Mandaring Hotel, Bangkok, Thailand, 2023.11.24

J. Cravioto, H. Ohgaki, Rural Electrification and Quality of Life: Microsociological assessment in the ASEAN region, International Workshop on "Socio-economic impact of renewable energy on communities / issues and policies of solar energy policy to support the Indonesian long-term development planning 2025-2045", School of Industrial and System Engineering, Telkom University, Bandung, Indonesia, 2023.12.8

H. Ohgaki, Introduction of JASTIP, International Workshop on "Socio-economic impact of renewable energy on communities / issues and policies of solar energy policy to support the Indonesian long-term development planning 2025-2045", School of Industrial and System Engineering, Telkom University, Bandung, Indonesia, 2023.12.8

J. Cravioto, H. Ohgaki, Rural electrification and Qol: Microsociological as-sessments in the Southeast Asian region, International Seminar on “Socio Economic Impact of Renewable Energy on Communities” in Cooperation with “Analysing issues and Challenges of Solar Energy Policy to Support the Indonesian Long-Term Development Planning 2025-2045”, Telkom University, Bandung, Indonesia, 2023.12.8

Sanda Ny Aina Andriamanalina Rakotondramanana, J Cravioto Caballero, H. Ohgaki, Hery tiana Rakotondramiarana, Design Study of Concentrate PV System in an Off-grid Village in the High Plateau of Antananarivo, 4th International Joint Conference of Innovative Africa: Educational Networking Programs for Human Resource Development in Africa’s SDGs, Kyoto University Inamori Building Large Conference Room, 2023.12.18

全炳俊, KU-FEL における赤外自由電子レーザの非線形パルス圧縮, 第 30 回 FEL と High-Power Radiation 研究会, 名古屋大学東山キャンパス, 2023.12.25

谷崎進也, UVSOR における複数同位体イメージングに関する研究, 第 30 回 FEL と High-Power Radiation 研究会, 名古屋大学東山キャンパス, 2023.12.26

羽島良一, 川瀬啓悟, 全炳俊, 大垣英明, 境武志, 早川恭史, 赤外 FEL による強光子場科学の開拓, 第 37 回日本放射光学会年会･放射光科学合同シンポジウム, アクリエ姫路, 2024.1.11

全炳俊, 大垣英明, 光取出し窓変更およびアンジュレータ真空ダクト交換による KU-FEL の性能向上, 第 37 回日本放射光学会年会・放射光科学合同シンポジウム, アクリエ姫路, 2024.1.11

清紀弘, 全炳俊, 大垣英明, 早川恭史, 境武志, 高橋由美子, 早川建, 田中俊成, 電子バンチ観測のためのコヒーレントエッジ放射測定システムの改良, 第 37 回日本放射光学会年会・放射光科学合同シンポジウム, アクリエ姫路, 2024.1.11

J. Cravioto, Solar electrification and Quality of Life in rural Philip-pines: Mixed-research perspectives, Shiga Prefectural ZeZe High School, 2024.1.14

曽田圭亮, 安東航太, 全炳俊, 紀井俊輝, 大垣英明, 中嶋隆, ピコ秒レーザーを用いた高品質な極浅穴/線加工, レーザー学会学術講演会第 44 回年次大会, 日本科学未来館, 2024.1.18

M. Pal, Q.M.B. Soesanto, S. Zhang, J. Fu, H. Ma, M.H. Imaduddin, J. Cravioto, H. Ohgaki, C. Qu, Policy Comparison between China and Indonesia on Nickel Mining and Battery Recycling, The 8th Zhejiang-Kyoto-Ajou Joint Symposium on Energy Science, Hangzhou, China, 2024.1.22

H. Ohgaki, WP2 Activity, The 9th JASTIP-WP2 Annual Workshop, SD202, building no. 12, TSP, NSTDA, 2024.1.26

H. Ohgaki, J. Cravioto, RE Implementation: Study on Rural Electrification in ASEAN, The 9th JASTIP-WP2 Annual Workshop, SD202, building no. 12, TSP, NSTDA, 2024.1.26

J. Cravioto, How does solar energy electrification affect the quality of life?, A micro-sociological view from SE Asia, Shiga Prefectural ZeZe High School 2024.1.27

全炳俊, 田中虎太郎, Bi Zhuang, 大垣英明, KU-FEL におけるシングルショット引き出し効率計測系の開発・現状と課題, 2023 年度 ビーム物理研究会, 東北大学電子光理学研究センター, 2024.3.5

J. Cravioto, Developing Research Projects in Social and Interdisciplinary Research Fields, Social Research Guest Lecture, UPN “Veteran” Jawa Timur. Surabaya, Indonesia, 2024.3.8

北浦守, 全炳俊, 渡邊真太, 正井博和, 鎌田圭, 金敬鎭, 吉川彰, 3 価セリウムイオンをドープしたガーネット酸化物結晶における光誘起自由キャリアプラズマ吸収分光, 2024 年 第 71 回 応用物理学会春季学術講演会, 東京都市大学 世田谷キャンパス, 2024.3.23

全炳俊, 羽島良一, 大垣英明, 長波長赤外自由電子レーザの非線形パルス圧縮, 日本原子力学会 2024 年春の年会, 近畿大学東大阪キャンパス, 2024.3.28

H. Ohgaki, H. Zen, T. Kii, T. Hayakawa, T. Shizuma, Y. Taira, S. Tanizaki, Experimental Study on Multi-Isotope Imaging in UVSOR BL1U LCS Beamline, 日本原子力学会 2024 年春の年会, 近畿大学東大阪キャンパス, 2024.3.28