# International Symposia on
# Creation of Advanced Photonic and Electronic Devices 2022
# and
# Advanced Quantum Technology for Future 2022

March 8 (Tue), 2022
Kyoto University, Kyoto, Japan

**Poster Session (12:00 - 13:30)**

12:00-12:40 Core time for ODD number posters
12:50-13:30 Core time for EVEN number posters

**Opening (14:00 - 14:10)**

Koichiro Tanaka (Kyoto University), Tsunenobu Kimoto (Kyoto University)

**Oral Session 1: Atomically Thin Materials (14:10 - 15:10)**

14:10-14:40 Exploring Excitonic Excitations in Momentum Space
Keshav M. Dani (Okinawa Institute of Science and Technology Graduate University)
14:40-15:10 Extreme nonlinear optics in atomically thin-layer semiconductors
Kento Uchida (Kyoto University)

Break (15:10 - 15:15)

**Oral Session 2: Quantum Simulation (15:15 - 16:15)**

15:15-15:45 Rydberg atoms for quantum simulation and computation
Jaewook Ahn (Korea Advanced Institute of Science and Technology (KAIST))
15:45-16:15 Quantum Simulation of Exotic Hubbard Models with Ultracold Atoms
Shintaro Taie (Kyoto University)

Break (16:15 - 16:20)

**Oral Session 3: Quantum Spintronics (16:20 - 17:20)**

16:20-16:50 The Dynamics of Spin-photon Hybrids
Hans Huebl (Walther-Meißner-Institute)
16:50-17:20 Emergence of synthetic Rashba field in Si
Masashi Shiraishi (Kyoto University)

**Closing (17:20 - 17:30)**

Masashi Shiraishi (Kyoto University)

**Oral Session Abstract**

・Exploring Excitonic Excitations in Momentum Space
Keshav M. Dani (Okinawa Institute of Science and Technology Graduate School)
・Extreme nonlinear optics in atomically thin-layer semiconductors
Kento Uchida (Kyoto University)
・Rydberg atoms for quantum simulation and computation
Jaewook Ahn (Korea Advanced Institute of Science and Technology(KAIST))
・Quantum Simulation of Exotic Hubbard Models with Ultracold Atoms
Shintaro Taie (Kyoto University)
・The Dynamics of Spin-photon Hybrids
Hans Huebl (Walther-Meißner-Institute)
・Emergence of synthetic Rashba field in Si
Masashi Shiraishi (Kyoto University)

**Poster Session Abstract**

P-1 Shift Manipulation of Intrinsic Localized Mode in Klein Gordon Lattice with Soft On-site Potential
H. Araki and T. Hikihara

P-2 Output Series-Parallel Connection of DC-DC Converters by Passivity-Based Control
Y. Murakawa and T. Hikihara

P-3 Application of Genetic Algorithm to Digital Active Gate Drive
H. Takayama, S. Fukunaga, and T. Hikihara

P-4 Non-Hermitian Bulk Fermi Arc
T. Bessho, K. Kawabata, and M. Sato

P-5 The Generalized Thouless Pump and a Fermionic Matrix Product State
S. Ohyama, K. Shiozaki, and M. Sato

P-6 Classification of surface states in non-Hermitian semimetals
D. Nakamura and M. Sato

P-7 The competition skin modes and Anderson localized modes
Y. Nakai, N. Okuma, and M. Sato

P-8 Short-pulse high-peak-power operation of photonic-crystal lasers with global frequency distribution
R. Morita, T. Inoue, T. Ueda, and S. Noda

P-9 Fabrication and characterization of large-area photonic-crystal lasers
K. Izumi, M. Yoshida, M. D. Zoysa, K. Ishizaki, T. Inoue, and S. Noda

P-10 High-power continuous-wave operation of photonic crystal surface-emitting lasers
S. Katsuno, M. Yoshida, M. D. Zoysa, T. Inoue, K. Ishizaki, and S. Noda

P-11 Modeling of mutual synchronization phenomena in Bi2212 intrinsic Josephson junction terahertz oscillators

R. Kobayashi, K. Hayama, S. Fujita, and I. Kakeya

P-12 Development of a programmable quantum system using single Ytterbium atoms trapped in an optical tweezer array

D. Okuno, Y. Nakamura, T. Kusano, K.Yamamoto, Y. Takasu, H. Konishi, and Y. Takahashi

P-13 Spin readout of $^{173}$Yb atoms trapped in an optical lattice

Y. Takata, N. Kitamura, S. Taie, Y. Takasu, and Y. Takahashi

P-14 Measurement of spin correlation in spin-imbalanced system with SU($N$) symmetry

K. Honda, S. Taie, Y. Takasu, and Y. Takahashi

P-15 Trapping and rearrangement of single ytterbium atoms in an optical tweezer array

Y. Nakamura, D. Okuno, T. Kusano, K. Yamamoto, Y. Takasu, H. Konishi, and Y. Takahashi

P-16 Robustness of SPT Phase of $S$=1 Heisenberg Chain against the Coupling with the Conduction Electrons System.

R. Masui and K. Totsuka

P-17 q-deformed CCR and free probability

A. Miyagawa and B. Collins

P-18 Spectral bound for regular quantum graphs

J. Matsuda and B. Collins

P-19 Bell's inequality validation with the highest energy accelerator LHC

Y. Tsujikawa and T. Sumida

P-20 Effect of current-sharing of metal core on quench protection of spiral coated conductors

G. Xu and N. Amemiya

P-21 Reduction of Magnetization Loss of Copper-Plated Multifilament HTS Coated Conductor

M. Shigemasa, Y. Sogabe, A. Takahashi, and N. Amemiya

P-22 Nonlinear responses induced by dissipation

Y. Michishita and N. Nagaosa

P-23 Relation between the gap dependence of high harmonic generation and electric field intensity

A. Kofuji, and R. Peters

P-24 The non-Hermitian skin effect in f-electron systems

S. Kaneshiro and R. Peters

P-25 $^{121/123}$Sb-NQR study on the superconducting Dirac line-nodal material $CaSb_2$ under pressure

H. Takahashi, S. Kitagawa, K. Ishida, M. Kawaguchi, A. Ikeda, S. Yonezawa, and Y. Maeno

P-26 Investigation of spectral properties of photon-pairs generated in an on-chip ring resonator

K. Sugiura, R. Okamoto, S. T. Chu, B. E. Little, and S. Takeuchi

P-27 Wavelength-tunable broadband infrared quantum absorption spectroscopy in the mid-infrared region 2-5 μm

M. Arahata, Y. Mukai, T. Tashima, R. Okamoto, and S. Takeuchi

P-28 Direct observation of quantum interference in non-Fock states using Fourier transform of optical quantum circuit

G. Park, R. Okamoto, H. F. Hofmann, and S. Takeuchi

P-29 Creation of Silicon Vacancy Center in Detonation Nanodiamonds by High Temperature Annealing

K. Shimazaki, H. Kawaguchi, H. Takashima, T. F. Segawa, F. T.-K. So, D. Terada, S. Onoda, T. Ohshima, M. Shirakawa, and S. Takeuchi

P-30 Comparison of CW and pulsed laser excitation in Infrared quantum absorption spectroscopy

J. Kaur, Y. Mukai, R. Okamoto, and S. Takeuchi

P-31 Effect of incoherent carriers on high harmonic generation in monolayer $WSe_2$

K Nagai, K. Uchida, S. Kusaba, T. Endo, Y. Miyata, and K. Tanaka

P-32 Construction of polarization resolved magneto-optical spectroscopy system using ultranarrow frequency tunable terahertz wave

K. Eguchi, T. Arikawa, and K. Tanaka

P-33 Estimation of the quantum efficiency of the up-conversion system based on the repetition-synchronized oscillators

M. Hojo and K. Tanaka

P-34 Exciton levels and decays in monolayer transition metal dichalcogenides probed by nonlinear spectroscopy

S. Takahashi, S. Kusaba, K. Watanabe, T. Taniguchi, K. Yanagi, and K. Tanaka

P-35 Time-resolved mid-infrared spectroscopy of excitonic insulator candidate Ta2NiSe5

K. Morimoto, K. Uchida, and K. Tanaka

P-36 Deployment Model for Parallelized Service Function Chains

C. Zhang, T. Sato, and E. Oki

P-37 Anomaly and Superconnection

H. Kanno and S. Sugimoto

P-38 Performance evaluation of electron identification detectors for dilepton measurement

S. Nakasuga, M. Naruki for the J-PARC E16 collaboration

P-39 A Two-Step Method for Perishable Inventory Routing Problem with Stochastic Demands

Y. Wu and S. Tanaka

P-40 Robust Control of DC-DC Buck Converters

X. Yang and T. Hagiwara

P-41 Impurity effect on Superconducting Diode Effect

Y. Ikeda, A. Daido, and Y. Yanase

P-42 Novel parity transition in superconducting phase of $CeRh_2As_2$

K. Nogaki and Y. Yanase

P-43 Superconducting phase diagram and phase transition induced by quantum geometry: application to monolayer FeSe

T. Kitamura, A. Daido, and Y. Yanase

P-44 Ultrastrong coupling between vacuum photons and phonons of halide perovskite at terahertz frequencies

Z. Y. Zhang, H. Hirori, F. Sekiguchi, A. Shimazaki, Y. Iwasaki,
T. Nakamura, A. Wakamiya, and Y. Kanemitsu

P-45 In-plane Nonlinear Hall Response in Rock-Salt Structure Topological Crystalline Insulator

T. Nishijima, E. Shigematsu, R. Ohshima, Y. Ando, and M. Shiraishi

P-46 Current-induced out-of-plane torque originating from geometry

M. Aoki, Y. Ando, E. Shigematsu, R. Ohshima, T. Shinjo, and M. Shiraishi

P-47 Realization of low-magnetization damping in ultrathin Co by introducing nonmagnetic buffer layers

S. Yoshii, E. Shigematsu, R. Ohshima, Y. Ando, and M. Shiraishi

P-48 Investigation of magnon suppression from Y3Fe5O12 into metals

S. Mae, E. Shigematsu, R. Ohshima, Y. Ando, T. Shinjo, and M. Shiraishi

P-49 Enhanced deep UV emission from semipolar ***r***-plane AlGaN-based QWs with modified QW structures

R. Akaike, M. Funato, and Y. Kawakami

P-50 Formation and dynamics of stripe domains in liquid crystal gels

A. Ooka and J. Yamamoto

P-51 Undulation of Lamellae under Dynamic Coupling with Brownian motion of Colloidal particles

S. Yoshioka, T. Yanagishima, and J. Yamamoto

P-52 Investigation of time-reversal symmetry breaking in superconductors by magneto-optic Kerr effect

S. Yamane, Y. Hu, K. Obata, G. Mattoni, Y. Li, Y. Yao, Z. Wang,
J. Wang, C. Farhang, J. Xia, S. Yonezawa, and Y. Maeno

P-53 Superconducting Vortex lattice melting with strong Pauli paramagnetic effect

D. Nakashima and R. Ikeda

P-54 Category-Graded Effect System and Algebraic Theory

T. Sanada

P-55 Axion cloud evaporation during inspiral of black hole binaries

T. Takahashi, H. Omiya, and T. Tanaka

P-56 Mixed halo with Fuzzy Dark Matter and Cold Dark Matter

Y. Manita, T. Takahashi, H. Kawai, K. Hayashi, A. Taruya, T. Nishimichi, and M. Oguri

P-57 Time-invariant External Potential Curvature Estimation by Swarm formation
Y. Wang and T. Hikihara

P-58 Estimation of small magnetic field direction by changing pump and probe beam orientations of optically pumped magnetometer
K. Namita, Y. Ito, and T. Kobayashi

P-59 Observation of High-Order Harmonic Generation from Semiconductor Nanocrystal Films
K. Nakagawa, H. Hirori, and Y. Kanemitsu

P-60 Exciton-LO phonon interactions in lead halide perovskite nanocrystals studied by single dot spectroscopy
K. Cho and Y. Kanemitsu

P-61 Fate of edge states in nonlinear Floquet topological systems
K. Mizuta, K. Mochizuki, and N. Kawakami

P-62 Quantitative comparison between carbon acceptor density and carbon concentration in n-type GaN layers
K. Kanegae, M. Horita, T. Kimoto, and J. Suda

P-63 Enhanced channel mobility for 4H-SiC MOSFETs using hydrogen treatment before $SiO_2$ deposition and nitridation
K. Tachiki, K. Mikami, K. Ito, M. Kaneko, and T. Kimoto

P-64 Oxygen composition dependence on forming and resistive switching characteristics in Pt/TaOx/$Ta_2O_5$/Pt cells
T. Miyatani, T. Kimoto, and Y. Nishi

P-65 Body doping dependence of effective channel mobility for SiC MOSFETs with phosphorus treatment
K. Ito, M. Horita, J. Suda, and T. Kimoto

P-66 Carrier transport mechanism in heavily-doped SiC Schottky barrier diodes
M. Hara, H. Tanaka, M. Kaneko, and T. Kimoto

P-67 Expansion patterns of stacking faults from mechanical scratches on SiC epilayers
E. Do, M. Kaneko, and T. Kimoto

P-68 Electrical properties of ion-implanted layers in high-purity semi-insulating 4H-SiC substrates
Q. Jin, C. Koo, M. Kaneko, and T. Kimoto

P-69 Body doping dependence of channel mobility in both n- and p-channel 4H-SiC MOSFETs
K. Mikami, K. Tachiki, K. Ito, and T. Kimoto

P-70 Probing three-state Potts nematic fluctuations by ultrasound attenuation
K. Kimura, M. Sigrist, and N. Kawakami

P-71 Universal properties of dissipative Tomonaga-Luttinger liquids: A case study of a non-Hermitian XXZ spin chain
K. Yamamoto, M. Nakagawa, M. Tezuka, M. Ueda, and N. Kawakami

P-72 Universality in reservoir computing and higher-order statistics
R. Toshio, J. Haruna, and N. Nakano

P-73 Efforts to construct a new large gas detector to search for neutrinoless double beta decays
B. Sugashima and T. Nakaya

P-74 Design of Backup Resource Management Controller in Kubernetes
R. Kang, M. Zhu, F. He, and E. Oki

P-75 Crosstalk-Aware Lightpath Provisioning in Elastic Optical Networks
K. Takeda, T. Sato, B. C. Chatterjee, and E. Oki