OMC

Tuesday, 20 April

[OMC-1] 10:30-12:15
OMC-1
Chairs: Takashige Omatsu
Chiba University
Ryuji Morita
Hokkaido University

OMC-Opening 10:30

Opening Remarks

OMC-1-01 10:45 ***Invited***

Laser transverse modes with SU(2) representation

Yung-Fu Chen
National Yang Ming Chiao Tung University

We give a detailed overview of the theoretical description of the Hermite-Laguerre-Gaussian mode from the representation of SU(2) in the Jordan-Schwinger diagram.

OMC-1-02 11:15

Generation of geometrical Laguerre-Gaussian modes from a Nd:$GdVO_4$ laser with a degenerate cavity configuration

Yuanyuan Ma[1], Andrew J Lee[2], Helen M Pask[2], Katsuhiko Miyamoto[1,3], Takashige Omatsu[1,3]
[1]Chiba university, [2]MQ Photonics Research Centre, Macquarie University, [3]Molecular Chirality Research Center

We demonstrate the direct generation of geometrical Laguerre-Gaussian (LG) modes from an annular beam pumped Nd:$GdVO_4$ laser with a degeneracy cavity configuration. Such geometrical LG modes pave the way towards a myriad of applications, such as optical/quantum communication, optical trapping, and micro-fabrications.

OMC-1-03 11:30

Vector vortex generation from Raman laser cavity

Yoshihiro Nishigata[1], Shun Sasaki[1], Katsuhiko Miyamoto[1,2], Takashige Omatsu[1,2]
[1]Chiba University, [2]Molecular Chirality Research Center, Chiba University

The vector vortex mode generation from a $Ba(NO_3)_2$ Raman laser cavity pumped by a vector LG_{02} green laser was demonstrated. The 1st, 2nd, 3rd, and 4th Stokes outputs operated at a radially polarized mode. The maximum output energies of the 1st, 2nd, 3rd, and 4th Stokes were measured to be 0.33 mJ, 0.50 mJ, 0.32mJ and 0.03 mJ, respectively, at the maximum pump energy of 4.39 mJ.

OMC-1-04 11:45

Fiber optic one-dimensional Airy-like beam generation by creating an offset between the cylindrical lens and the fiber endface

Hyeonwoo Lee, Hyeung Joo Lee, Juwon Yoon, Kyunghwan Oh
Yonsei univerisity

Airy beam has been attracting the attention of current researchers for its unique characteristics such as self-healing property, non-diffractive nature, and self-accelerating beam trajectory. Here, we propose the generation of a fiber optic one-dimensional Airy-like beam using a micro-scale cylindrical lens. Furthermore, its intensity demonstrated a curved trajectory, which originates from the self-accelerating nature of the Airy-like beam.

OMC-1-05 12:00

Dispersion control of orbital angular momentum mode using a ring core with graded-index profile

Yong Soo Lee[1], Aeri Jung[1], Soeun Kim[2], Kyunghwan Oh[1]
[1]Yonsei University, [2]GIST

We propose an orbital angular momentum (OAM) photonic crystal fiber (PCF) that can control the dispersion of OAM mode by using a ring-core to which a graded-index profile is applied. Using the full-vectorial finite element method (FEM), the properties of the proposed OAM PCF were analyzed. We found that when the thickness of the ring-core to which the graded-index profile was applied is reduced, the dispersions of the modes guided to the core decrease overall.

[OMC-2] 15:30-17:00
OMC-2
Chairs: Masaaki Ashida
Osaka University
Sile Nic Chormaic
OIST

OMC-2-01 15:30

Optical trapping of Poly(N-isopropylacrylamide) gel particles using metalic nanostructures

Maho Kubota[1], Miyako Iida[1], Sayaka Hashimoto[1], Tatsuya Shoji[2], Yasuyuki Tsuboi[1]
[1]Osaka City University, [2]Kanagawa University

We investigated the optical trapping of gel particles with a new optical tweezers using nanostructured titanium crystals. When a laser beam was irradiated to the crystal, fluorescent gel particles were immediately trapped at the irradiation area. Furthermore, fluorescence spectroscopy analysis showed that fluorescence intensity increased upon trapping.

OMC-2-02 15:45

Analysis on spatial distribution of Poynting vectors for multimer plasmonic fields

Yuji Sunaba, Keiji Sasaki
RIES, Hokkaido University

We investigated the optical rotational manipulation in localized plasmonic fields with spin and orbital angular momenta. To clarify the force exerted on nanoparticles, we analyzed spatial distribution of Poynting vectors related to scattering force.

OMC-2-03 16:00

Orbital angular momentum mode generation using anisotrophic liquid crystal filled capillary

Hucksu Choi[1], Yongsoo Lee[1], Jonghee Eun[2], joonwo jung[2], Kyunghwan Oh[1]
[1]Yonsei University, [2]UNIST

It is known that chiral doped 5CB under a capillary boundary condition form a double-twist self-assembly structure. Since birefringence of 5CB has a negative charge, the double-twist structure is equivalent to the graded ring core waveguide. Since optical axis of LC structure has a topological charge, LP modes split into OAM modes. Also the chiral asymmetry of the waveguide made the nonzero OAM mode to be the highest effective index.

OMC-2-04 16:15

Spiral surface relief formation with Hermite-Gaussian beams with zero orbital angular momentum

Arata Tomita[1], Adam Vallés[1,2], Katsuhiko Miyamoto[1,2], Takashige Omatsu[1,2]
[1]Graduate School of Science and Engineering, Chiba University, [2]Molecular Chirality Research Center, Chiba University

We demonstrate the formation of spiral surface relief of azo-polymers by irradiation of a rotating Hermite-Gaussian beam with zero orbital angular momentum. This approach offers new fundamental physical insight of light matter interaction, and it paves the way towards advanced ultrahigh density optical data storages.

OMC-2-05 16:30 ***Invited***

Spin-orbit modal shaping of optical orbital angular momentum states

Etienne Brasselet
University of Bordeaux

When dealing with fields carrying orbital angular momentum usually, the control of both the azimuthal and the radial degrees of freedom remains an open fundamental and practical challenge. Here we present our recent developments of spin-orbit modal beam shapers in the context of light beams carrying orbital angular momentum.

Wednesday, 21 April

[OMC-3] 9:00-10:30
OMC-3
Chairs: Kei Murakoshi
Hokkaido University
Keiji Sasaki
Hokkaido University

OMC-3-01 9:00

Detection of Radiation Force due to Simultaneous Two-photon Absorption

Syoji Ito, Mizuki Hayasaka, Masato Mori, Masafumi Koga, Shinya Nakamura, Kenji Setoura, Hikaru Sotome, Hiroshi Miyasaka
Osaka Univesity

A polymer particle containing dye molecules was optically trapped with pulsed laser (800 nm, 200 fs). The trapping point shifted on the optical (Z-) axis towards the propagation direction of the femtosecond laser with increasing laser power. The Z-displacement was dependent on incident laser power and, from which we concluded that the positional shift along the Z-axis can be ascribed to the radiation force due to simultaneous two-photon absorption.

OMC-3-02 9:15

Optical trapping of amyloid fibrils of hen egg-white lysozyme

Ken-ichi Yuyama, Mai Miyazaki, Yasuyuki Tsuboi
Osaka City University

We demonstrate optical trapping of protein amyloid fibrils with the use of a tightly focused laser beam.Upon the focused laser irradiation, amyloid fibrils are attracted toward the laser focus and stably trapped there. After switching off the laser, the trapped amyloids start diffusion to the surrounding solution. Thus, optical force is effectively exerted on protein amyloid fibrils and useful to trap, assembly, and manipulate them.

OMC-3-03 9:30

Observation of Optical Molecuar Manipulation Dynamics at Solid-Liquid Interface via Surface Enhanced Raman Scattering

Nobuaki Oyamada, Hiro Minamimoto, Kei Murakoshi
Hokkaido University

Electric field induced by plasmon resonance could retard the Brownian motion at solid-liquid interface. We tried to reveal the factors for molecular manipulation within the localized electric field through SERS observations using Au array structure.

OMC-3-04 9:45

Optical trapping and assembly of particle clusters using hybrid plasmonic-photonic nanotweezers

Christophe Pin[1,2,3], Giovanni Magno[4,5], Aurore Ecarnot[4], Emmanuel Picard[2], Emmanuel Hadji[2], Vy Yam[4], Frédérique de Fornel[1], Béatrice Dagens[4], Benoît Cluzel[1]
[1]ICB, Université Bourgogne Franche-Comté, [2]CEA Grenoble, Université Grenoble Alpes, [3]RIES, Hokkaido University, [4]C2N, Université Paris-Saclay, [5]DEI, Politecnico di Bari

A periodic chain of gold nanorods coupled to a silicon waveguide is used to trap single beads and self-assembled bead clusters. The trapping efficiency and the stability of several cluster configurations are statistically analyzed.

OMC

Wednesday, 21 April

OMC-3-05 10:00

Size Separation of polymer gels using Plasmonic Optical Tweezers

Sayuri Wake[1], Tatsuya Shoji[2], Yasuyuki Tsuboi[1]
[1]Osaka City University, [2]Kanagawa University

We demonstrate plasmonic optical trapping of two types of thermoresponsive polymer gel particles labelled with fluorescent probes. The two types of polymer gel particles were trapped in accordance with their size in. Smaller gel particles were trapped near the irradiation area and larger gel particles were trapped outside of the smaller gel particles. We discuss a mechanism of separation of these particles.

OMC-3-06 10:15

Optical vortex induced microdroplet with a plasmonic nanocore

Haruki Kawaguchi[1], Kei Umesato[1], Kanta Takahashi[1], Keisaku Yamane[2], Ken-ichi Yuyama[3], Satoyuki Kawano[4], Katsuhiko Miyamoto[1,5], Takadhige Omatsu[1,5]
[1]Graduate School of Engineering, Chiba University, [2]Department of Applied Physics, Hokkaido University, [3]Department of Chemistry, Osaka City University, [4]Department of Mechanical Science and Bioengineering, Graduate School of Engineering Science, Osaka University, [5]Molecular Chirality Research Center, Chiba University

We demonstrate the creation of a microdroplet with a plasmonic Au nanoparticle core by employing the optical vortex laser-induced forward transfer technology. This Au particle is printed as a plasmonic nanocore with super spatial resolution.

[OMC-4] 11:00-12:00
OMC-4
Chair: Satoshi Ashihara
University of Tokyo

OMC-4-01 11:00

Optical trapping of a nanoparticle by a copper nanoantenna

Zhe Xu[1,2,3]
[1]Inspur Electronic Information Industry Co., Ltd., [2]State Key Laboratory of High-end Server & Storage Technology, [3]Inspur (Beijing) Electronic Information Industry Co., Ltd.

We demonstrate the optical trapping of a single dielectric nanoparticle in a microfluidic chamber using a coupled T-shaped copper plasmonic nanoantenna at 1064 nm wavelength for studying light–matter interactions. We present the finite element method numerical simulations to clarify the optical trapping process, including near-field distributions, optical forces, temperature rises, and thermal-induced fluid velocities.

OMC-4-02 11:15

Fluid convection driven by suspended particles in optical trapping

Tetsuro Tsuji[1], Chie Hosokawa[2,3], Tatsunori Kishimoto[2,4], Takumi Okubo[5], Suguru N. Kudoh[4], Satoyuki Kawano[5]
[1]Kyoto University, [2]Osaka City University, [3]National Institute of Advanced Industrial Science and Technology, [4]Kwansei Gakuin University, [5]Osaka University

We investigate a fluid convection induced by a focused laser beam in optical trapping. It is shown that the optical scattering force, which pushes suspended particles in the beam propagation direction, drags the fluid and can induce the convection. Such type of convection is significant compared with thermal convection for the dispersion of relatively large particles with the order of diameter 1 μm.

OMC-4-03 11:30

Analysis of small plastics in coastal surface water samples of Okinawa using optical tweezers-Raman spectroscopy

Domna G. Kotsifaki[1], Christina Ripken[1,2], Sile Nic Chormaic[1]
[1]Light-Matter Interactions for Quantum Technologies Unit, Okinawa Institute of Science and Technology Graduate University, Okinawa, Japan, [2]Marine Genomics Unit, Okinawa Institute of Science and Technology Graduate University, Okinawa, Japan

We employ an optical trapping-Raman spectroscopy technique for simultaneous characterization and monitoring of the physical and chemical properties of single small micro-plastics in a seawater environment. Through analysis of the data, we chemically identify the plastic and distinguish it from organic matter and/or mineral sediments. We categorize the particles based on their size and shapes. The technique paves the way for monitoring marine plastic pollution.

OMC-4-04 11:45

Optical Gradient Force on Gold Chiral Nanoparticles

Junsuke Yamanishi[1], Hyo-Yong Ahn[1], Shun Hashiyada[2], Ki Tae Nam[3], Hiromi Okamoto[1]
[1]Institute for Molecular Science, [2]RIKEN Center for Advanced Photonics, [3]Seoul National University

We investigate the CP-dependent gradient force on the chiral gold nanoparticles. We found that the dispersion of the position of the Brownian motion depends on the handedness of the incident light in both cases of D- and L-form particles.

[OMC-5] 13:30-15:00
OMC-5
Chair: Hajime Ishihara
Osaka University

OMC-5-01 13:30

Lensless phase retrieval based on convolutional neural network for holographic storage

Jianying Hao[1], Xiao Lin[1,2,3], Mingyong Chen[1], Yongkun Lin[1], Xiaodi Tan[1,2,3], Yuhong Ren[1]
[1]College of Photonic and Electronic Engineering, Fujian Normal University, [2]Fujian Provincial Key Laboratory of Photonics Technology, [3]Fujian Provincial Engineering Technology Research Center of Photoelectric Sensing Application

In this paper, a lensless non-interferometric phase retrieval method based on deep learning is proposed. We use a neural convolutional network to establish the relationship between the intensity images and the phase data pages. The phase can be retrieved directly by feeding the intensity image to the trained neural network.

OMC-5-02 13:45

Theoretical Study on Modeling and Sorting of Real Chiral Molecules by Using Resonant Optical Force

Takao Horai[1], Hiroki Eguchi[1], Takuya Iida[1], Hajime Ishihara[1,2]
[1]Osaka Prefecture University, [2]Osaka University

We theoretically study the chiral molecular sorting by using resonant optical force. Based on the coupled dipole model of a dye-molecule with chirality, we evaluate the optical force difference when irradiating the counter-propagating light waves with different circular polarizations. The result indicates the possibility of chiral molecular sorting by resonant optical force.

OMC-5-03 14:00

Low-damage and large scale optical condensation of useful bacteria with bubble-mimetic substrate

Kota Hayashi[1,2,3], Mamoru Tamura[1,3], Shiho Tokonami[2,3], Takuya Iida[1,3]
[1]Grad. Sch. Sci. in Osaka Pref. Univ., [2]Grad. Sch. Eng. in Osaka Pref. Univ., [3]RILACS in Osaka Pref. Univ.

The substrate to control spatial configuration of heat generation by photothermal effect based on laser irradiation on metallic nanostructure enabled to assemble microbes by light-induced convection without thermal damage.

OMC-5-04 14:15

Interaction optical torque induced by plasmon coupling

An'an Wu, Yoshito Y Tanaka, Tsutomu Shimura
The University of Tokyo

Interaction optical torque can be generated and enhanced by the plasmon coupling between twisted nanorods, depending its configuration. It implements the rotations to mutually perpendicular and parallel arrangements of the nanorods with different mode excitations.

OMC-5-05 14:30

Isotopic Hydrogen Evolution Reactions under Plasmonic Excitation

Hiro Minamimoto, Daiki Sato, Kei Murakoshi
Hokkaido University

The excitation of the localized surface plasmon leads to the generation of highly localized electric field. The huge field gradient within the field can manipulate molecular behavior, resulting in the modulation of chemical reactions. In this study, we have observed the effect of the plasmonic excitation on the plasmon-induced hydrogen evolution reactions through various photoelectrochemical measurements.

OMC-5-06 14:45

Laser processing simulation for Marangoni-driven needle formation under optical vortex

Mamoru Tamura[1], Takashige Omatsu[2], Takuya Iida[1]
[1]Osaka Prefecture University, [2]Chiba University

Using the simulation method to solve the thermo-fluid dynamics of molten metal under laser heating, we found the Marangoni effect can contribute to the needle formation in the optical vortex laser processing.

[OMC-6] 15:30-17:00
OMC-6
Chair: Ryuji Morita
Hokkaido University

OMC-6-01 15:30

Detection of the transverse spin of light by twisting anisotropic particles near an optical nanofiber waveguide

Georgiy Tkachenko[1], Ivan Toftul[2], Alexey Vylegzhanin[1], Viet Giang Truong[1], Mihail Petrov[2], Sile Nic Chormaic[1]
[1]Okinawa Institute of Science and Technology, [2]ITMO University

We report on a direct optomechanical detection of the transverse spin angular momentum of light by spinning an anisotropic microparticle in the evanescent field near a single-mode optical nanofiber waveguide.

OMC-6-02 15:45

Electromagnetic near-field responses of a chiral molecule on a metal surface

Hikaru Yoneji[1], Nobuhiko Yokoshi[1], Hajime Ishihara[1,2]
[1]Osaka Prefecture University, [2]Osaka University

We developed a generalized discrete dipole approximation method that treats both electric and magnetic polarizations simultaneously and investigated near-field electric and near-field magnetic fields for a single achiral/chiral molecule in the vicinity of gold nanostructures.

OMC-6-03 16:00 ***Invited***

Non-equilibrium Properties of an Active Nanoparticle in a Harmonic Potential

Falko Schmidt[2], Giovanni Volpe[2], Hana Sipova-Jungova[3], Mikael Käll[3], Alois Wurger[1]
[1]The University of Bordeaux, [2]University of Gothenburg, [3]Chalmers University

We study active gold nanoparticles in a near-critical water-lutidine mixture, heated and trapped by a focussed laser beam. As their mean free path becomes comparable to the trap radius, we observe a non-equilibrium probability density, differing signficantly from the Boltzmann distribution. The particles show orbital motion in the trap and dynamical polarization, that is, their position in the trap and the orientation of their active axis are correlated.

OMC-6-04 16:30 ***Invited***

Hydrodynamic micro manipulation on an optical tweezers platform

Une Butaite[1], David Phillips[1], Jonathan Taylor[2], Graham Gibson[2], Ying-Lung Ho[3], Mike Taverne[3]
[1]University of Exeter, [2]University of Glasgow, [3]University of Bristol

While extremely useful, optical tweezers are nonetheless limited by the types of materials that they can trap, and can be harmful for living organisms. In our work we propose a new platform where optically trapped micro-rotors immersed in water act as fluid impellers to facilitate real-time feedback control of any freely diffusing particle.

OMC

Thursday, 22 April

[OMC-7] 9:00-10:30
OMC-7
Chairs: Kyoko Kitamura
Kyoto Institute of Technology
Takashige Omatsu
Chiba University

OMC-7-01 9:00 ***Invited***

Optical fiber-based traps for particle trapping and manipulation
Sile Nic Chormaic
Okinawa Institute of Science and Technology Graduate University
Optical traps using optical fibers facilitate the trapping and characterization of different particles. We will introduce several configurations and illustrate the variety of measurements that can be made.

OMC-7-02 9:30

Optical trapping of nanoparticles suspended in water with a bull's eye-type plasmonic chip
Takashi Koizumi[1], Tomoya Nagasue[2], Keiko Tawa[2], Chie Hosokawa[1]
[1]Osaka City University, [2]Kwansei Gakuin University
We demonstrate surface plasmon resonance (SPR) based optical trapping of quantum-dot (QD) nanoparticles suspended in water with a bull's eye-type plasmonic chip. The particle dynamics of QD suspensions at the laser focus was evaluated by fluorescence correlation spectroscopy.

OMC-7-03 9:45

Tapered glass capillaries for the optical manipulation and sorting of nanoparticles: practical considerations
Christophe Pin, Ryohei Otsuka, Keiji Sasaki
Hokkaido University
Optical sorting techniques based on tapered glass capillaries are studied. Optical transport and sorting of fluorescent nanodiamonds based on their size is demonstrated. Methods to improve light-guiding properties and prevent uncontrolled liquid flow are discussed.

OMC-7-04 10:00

Deformation of Optical Vortex Beam by Off-axis Incident-beam from Spiral Phase Plate Center
Miki Kitazawa, Kyoko Kitamura, Shogo Ura
Kyoto Institute of Technology
An optical vortex beam (OVB) is obtained when a Gaussian beam is transmitted through an appropriately designed spiral phase plate (SPP). The OVB can be deformed by displacements of the optical axis of the incident Gaussian beam from the center of the SPP. We calculated the deformation of OVB using theoretical simulations and discussed the results. These results are important for fabrication of a SPP integrated laser.

OMC-7-05 10:15

Abrupt U-turn of the dielectric particle by anti-parallel fiber optic Bessel beams
Yoon juwon
The University of Yonsei
We suggest a new way of using Bessel beams to achieve n-dimensional optical control of high-refractive index microparticles. The non-diffractive property of this beam, the beam diameter is much longer than that of a general Gaussian beam and has a self-healing property that suppresses the deformation of the beam.

[OMC-8] 11:15-12:00
OMC-8
Chair: Christophe Pin
Hokkaido University

OMC-8-02 11:15

Acousto-optic annular beam shaping for optical traps and lattices
Dmitry V. Obydennov [1,2], Konstantin B. Yushkov[1], Vladimir Ya. Molchanov[1]
[1]National University of Science and Technology MISIS, [2]Lomonosov Moscow State University
We propose a novel concept of using a noncollinear AOTF as a spatial beam shaping device for programmable laser beam shaping. The AOTF transfer function symmetry is used to provide a ring-shaped field distribution.

OMC-8-03 11:30 ***Invited***

Environmental sensing with structured beams
Martin Philip John Lavery[1], Zhaozhong Chen[1], Mingjian Chen[2], David McKee[3], Alison Yao[3]
[1]University of Glasgow, [2]Xidian University, [3]University of Strathclyde
We will present an overview of research progress in the application of the novel optical interactions of spatially structured optical modes for environmental sensing, leading to increased measurement sensitivity of suspended particulates and environmental properties.

[OMC-9] 13:30-15:00
OMC-9
Chair: Yoko Miyamoto
The University of Electro-Communications

OMC-9-01 13:30 ***Invited***

Observation of the Dyakonov surface wave mode propagating at a hyperbolic metasurface at the visible frequency
Jingbo Sun, Yan Li, Yongzheng Wen, Ji Zhou
School of materials science and engineering Tsinghua University
We experimentally demonstrate the Dyakonov surface wave mode at visible frequency in a hyperbolic metasurface, which is highly directional and lossless, and has significant applications in two-dimensional photonic circuits and devices.

OMC-9-02 14:00

Incoherent Optical Tweezer on a Nanostructured Rare Metal
Sayaka Hashimoto, Ryota Takao, Ken-Ichi Yuyama, Tatsuya Shoji, Yasuyuki Tsuboi
Osaka City University
We demonstrate a technique of stable optical trapping of submicron polymeric beads on nanostructured rare metal surfaces (RMS) without the use of lasers. Fluorescent polymer beads with diameter $d = 20 – 500$ nm were successfully trapped on the nanostructured RMS by low-intensity focused illumination of incoherent light at λ =370 m from a Hg lamp.

OMC-9-03 14:15

Optical properties of semiconductor microspheres fabricated via laser ablation in superfluid helium
Yosuke Minowa, Tomoki Nagao, Masaaki Ashida
Osaka University
We fabricated semiconductor microspheres via pulsed laser ablation in superfluid helium. We demonstrated that the microspheres with voids can have a high-quality-factor whispering gallery mode if the void is positioned near the microsphere's center.

OMC-9-04 14:30

Autonomous vibration of a luminescent thin film arising from luminescence-induced optical force
Hideki Arahari[1], Hajime Ishihara[1,2]
[1]Osaka Prefecture University, [2]Osaka University
We propose an unconventional type of optical manipulation by luminescence-induced optical force (LiOF). Designing the dielectric environment surrounding materials, the LiOF can be generated. Here, we demonstrate that LiOF autonomously drives the motion of materials.

OMC-9-05 14:45

Accelerating Bessel-like beam
Hyeung Joo Lee, Hyeonwoo Lee, Kyunghwan Oh
Yonesei University
Optical tweezing technology is used for versatile micro-nano particle manipulations. For trajectory control, a variety of self-accelerating beams with bending trajectory have been investigated. However, because of their imperfection of low curvature in microscopic environment, we devised new all-fiber self-accelerating Bessel-like beam generator enhanced with high curvature. This research would contribute to living cell or micro particle manipulation.

[OMC-10] 15:30-17:00
Ashkin & Saenz Memorial
Chair: Takashige Omatsu
Chiba University

OMC-10 15:30

Panel Discussion

OMC-Closing 16:50

Closing Remarks

OMC

Poster (Live Poster Session: Thu. 22 April, 12:30-13:30)

[OMC-P]
Poster Session

OMC-P-01

Synthesis of ring-shaped Ag-Pt nanoparticles for the application to plasmon-enhanced electrocatalysts

Tatsuya Kameyama[1,2], Naoki Ota[1], Kosuke Sasamoto[1], Tsukasa Torimoto[1]
[1]Nagoya University, [2]JST-PRESTO

Ring-shaped Ag-Pt nanoparticles (NRs) showing an LSPR peak were prepared via galvanic replacement of Ag nanoplates with H_2PtCl_6. The intensity and wavelength of the peak was controllable by changing the chemical composition of the NRs. The Ag-Pt NRs exhibited an electrocatalytic activity for oxygen reduction reaction, which was enhanced by the photoexcitation of LSPR.

OMC-P-02

Design of AlN-subwavelength grating for deep ultraviolet wavelength reflector operating at 244 nm of wavelength

Yuusuke Takashima[1,2], Atsuki Sasada[1], Kentaro Nagamatsu[1,2,3], Masanobu Haraguchi[1,2,3], Yoshiki Naoi[1,2,3]
[1]Faculty of Science and Technology, Tokushima University, [2]Graduate School of Technology, Industrial and Social Science, Tokushima University, [3]Institute of Post-LED Photonics, Tokushima University

Highly reflective reflector (> 99.9%) operating at deep ultraviolet (DUV) wavelength region around 244 nm was proposed by using subwavelength grating (SWG) patterned AlN substrate.This extremely high reflectivity, polarization selectivity and compactness of our AlN-SWG are very useful for various DUV applications, such as cavity of DUV laser diodes.

OMC-P-03

An improved phase retrieval method in holographic data storage based on embedded encoding

changyu yu[1], S. Wang[1], Ruixian Chen[1], Jianying Hao[1], Qijing Zheng[1], Jinyu Wang[1], Xianying Qiu[1], Dakui Lin[1], Yi Yang[1], Hui Li[1,3], Xiaodi Tan[2], Xiao Lin[1]
[1]Fujian Normal University, [2]Fujian Provincial Key Laboratory of Photonics Technology, Fuzhou, [3]Fujian Provincial Engineering Technology Research Center of Photoelectric Sensing Application,Fuzhou

This paper proposes to use embedded data to improve the intensity of high-frequency information in the Fourier intensity distribution, thereby improving noise immunity. In simulation, the convergence speed of BER (the bit error rate) is faster under the same number of iterations.

OMC-P-04

Phase retrieval by aberration compensation in holographic data storage

Suping Wang[1], Changyu Yu[1], Ruixian Chen[1], Jianying Hao[1], Qijing Zheng[1], Jinyu Wang[1], Xianying Qiu[1], Dakui Lin[1], Yi Yang[1], Hui Li[1,3], Xiao Lin[1], Xiaodi Tan[2]
[1]Fujian Normal University, [2]Fujian Provincial Key Laboratory of Photonics Technology, Fuzhou, [3]Fujian Provincial Engineering Technology Research Center of Photoelectric Sensing Application, Fuzhou

In this paper, we mainly study the influence of spherical aberration on phase transformation. By establishing the light field with wavefront aberration, we study the influence of wavefront aberration on phase recovery and propose the image restoration algorithm for aberration compensation .The feasibility of the theory is proved.

OMC-P-05

Electrochromic performance of an all-solid-state ITO/WO_3/Li-NbO_3/V_2O_5/ITO electrochromic device deposited by magnetron sputtering

RI-JUN Li, Hsi-Chao Chen, Yu-Hung Yen, Tan-Fu Liu, Bo-Jun Guo, Chi-Yang Lai, Chu-Han Huang
National Yunlin University of Science and Technology

The proposal of the research was used vanadium pentoxide (V_2O_5) as an auxiliary discoloration layer was deposited by magnetron sputtering with different oxygen flow, and the cycle durability and transmittance variation were investigated using a spectrophotometer.

OMC-P-06

Collinear non-interferometric phase retrieval holographic data storage with single reference pixel

Qijing Zheng[1], Xianying Qiu[1], Jianying Hao[1], Ruixian Chen[1], Changyu Yu[1], Suping Wang[1], Kun Wang[1], Yi Yang[1], Dakui Lin[1], Hui Li[1,2], Xiao Lin[1], Xiaodi Tan[1,3]
[1]Fujian Normal University of China, [2]Fujian Provincial Engineering Technology Research Center of Photoelectric Sensing Application, [3]Fujian Provincial Key Laborator y of Photonics Technology

A method for collinear non-interferometric phase retrieval holographic data storage using a single reference pixel is proposed. Increasing the intensity of the reference beam can achieve phase retrieval using only one reference pixel. As the intensity of the reference beam becomes stronger within a certain range, the number of iterations gradually decreases.