Room E (107)

Session Title 26E3 / [T05] Plasmonics and Metamaterials VI
Date & Time Wednesday, 26 August, 15:45 ~ 17:45
Session Chair Q-Han Park (Korea University, Korea)

[26E3-1] 15:45~16:15 Invited Talk

Plasmon Lasers: Development, Features and Applications

Ren-Min Ma

Peking University, China

Plasmon lasers are a new class of lasers that surpassed the diffraction limit of light which stimulates the exploration of nanometer-scale laser science and the development of high performance devices.

[26E3-2] 16:15~16:30

Effective Engineering of Sub-wavelength-scale Plasmonic Cavities

Myung-Ki Kim, Hongchul Sim, and Yong Hee Lee

KAIST, Korea

We suggest cladding and geometric engineering methods for effective field engineering of sub-wavelength-scale plasmonic cavities, which enable 90% coupling to the integrated waveguide and extreme 3D field confinement in a volume of ~10^{-7} λ^3 (~5×10×10nm^3).

[26E3-3] 16:30~16:45

The Measurement of Surface Plasmonic Transport on Silver Nanowires Arrays

Sean Sung-Yen Juang, Ming-Hui Lin, and Hsiang-Chen Chui

National Cheng Kung University, Taiwan

We measured the scattering intensity of the anodic aluminum oxide embedded the silver nanoparticles (Ag/AAO) to observe signals transport on silver nanowires arrays and calculate out the propagation surface plasmons length is about 2 μm.

[26E3-4] 16:45~17:00

Surface Plasmon Absorption Characteristics of Gold Deposited on Optical Fibers

Shuji Taue, Yuya Utsunomiya, and Hideki Fukano

Okayama University, Japan

We deposited gold films on optical fiber surfaces and annealed them to analyze the absorbance in the visible and near infrared wavelength range. The corresponding relations between the absorption spectra and the structural images of the deposited gold were identified.

[26E3-5] 17:00~17:15

Giant Modulation Depth in the Photoexcited Topological Surface Plasmons Exceeding 2,400%

Sangwan Sim[1], Houk Jang[1], Nikesh Koirala[2], Matthew Brahlek[2], Ji Ho Sung[3], Jun Park[1], Soonyoung Cha[1], Seongshik Oh[2], Jong-Hyun Ahn[1], Moon-Ho Jo[2,3], and Hyunyong Choi[1]

[1]Yonsei University, Korea, [2]Rutgers the State University of New Jersey, USA, [3]POSTECH, Korea

We present ultrafast optical modulation of plasmons in a topological insulator Bi_2Se_3 micro-ribbon array. Unprecedented giant modulation depth up to 2,400 % is obtained with very low fluence of optical control pulse.

[26E3-6] 17:15~17:30

Propagation of Quantum Signal in Plasmonic Waveguides

Xifeng Ren, Yongjing Cai, Ming Li, Changling Zou, Xiao Xiong, Hualin Lei, Biheng Liu, Guoping Guo, and Guangcan Guo

University of Science and Technology of China, China

Here we introduce two works on quantum plasmonics: high-visibility on-chip quantum interference of single surface plasmons and transmission of quantum polarization entanglement in a nanoscale hybrid plasmonic waveguide. Our works can bridge nanophotonics and quantum optics.

[26E3-7] 17:30~17:45

Non-polarizing Subtractive Structural Color Filters Based on Aluminum Plasmonics

Vivek Raj Shrestha[1], Sang-Shin Lee[1], Eun-Soo Kim[1], and Duk-Yong Choi[2]

[1]Kwangwoon University, Korea, [2]The Australian National University, Australia

We report non-polarizing subtractive structural color filters based on surface plasmon-induced suppressed transmission via two-dimensional array of aluminum nanopatches over a glass substrate. Three subtractive primary colors i.e. cyan, magenta and yellow are demonstrated with high transmission efficiencies reaching 75 %.

Room F (108)

Session Title 26F3 / [T07] Optical Metrology and Sensing VI
Date & Time Wednesday, 26 August, 15:45 ~ 17:45
Session Chairs Kaoru Minoshima (Univ. of Electro-Communications, Japan)
Jungwon Kim (KAIST, Korea)

[26F3-1] 15:45~16:15 Invited Talk

Ultrahigh-Precision Measurement and Optimization of Timing Jitter in Mode-Locked Lasers

Jungwon Kim

KAIST, Korea

I introduce novel attosecond-resolution measurement methods of timing jitter spectra in mode-locked lasers. Based on the accurate measurements, the jitter of various types of fiber lasers could be optimized to the unprecedented sub-femtosecond regime.

[26F3-2] 16:15~16:30

High-precision 3-D Surface Measurement of Step-structures Using Femtosecond Lasers

Young-Jin Kim[1,2], Minah Choi[2], Jiyong Park[2], Sangwon Hyun[2], Woodeok Joo[2], and Seung-Woo Kim[2]

[1]Nanyang Technological University, Singapore, [2]KAIST, Korea

Femtosecond pulse lasers provide novel possibilities to high-precision optical profilometry for quality assurance of step-structures on 3D microelectronic products based on its time and frequency domain characteristics.

[26F3-3] 16:30~16:45

Carrier-envelope Phase Stabilized Octave-spanning Laser with Monolithic Scheme

Zijiao Yu, Hainian Han, Lei Hou, and Zhiyi Wei

Chinese Academy of Sciences, China

We first demonstrated a carrier-envelope phase (CEP) stabilized octave-spanning oscillator based on the monolithic scheme. Nearly-60 dB CEP offset beat note (RBW=100 kHz) was achieved. The locked CEP residual phase noise is 55 mrad, corresponding to timing jitter of only 23 as.

[26F3-4] 16:45~17:00

Reducing the Linewidth of a Diode Laser at 243 nm by Frequency Stabilization

Lei Hou, Hainian Han, Long Zhang, Dehua Li, and Zhiyi Wei

Chinese Academy of Sciences, China

We have realized locking of external cavity diode laser to a vibration-insensitive high finesse Fabry–Perot cavity using PDH technique. Linewidth to 1 MHz was obtained at 243 nm by enhanced frequency-doubled second harmonic of diode laser.

[26F3-5] 17:00~17:15

Measurement of Specular Surfaces by One-Shot and Closed Form Solutions

Zhenzhou Wang

Chinese Academy of Sciences, China

This paper describes a method of measuring the shapes of specular surfaces with one-shot-projection of structured laser patterns. The closed form solution are achieved for both incident rays, reflected rays and their intersections (samples of surface points).

[26F3-6] 17:15~17:30

Displacement Measurement by Single-grating Heterodyne Interferometry

Shuhua Yan, Guochao Wang, Cunbao Lin, and Yukun Luo

National University of Defense Technology, China

We presented a displacement measurement system based on single-grating heterodyne interferometry. Our prototype system was demonstrated to achieve a relative measurement accuracy of better than 69 nm with standard deviations of less than 28 nm.

[26F3-7] 17:30~17:45

Simultaneous Microwave Frequency Transfer and Time Synchronization Based Mode-locked Pulse Train over 120 km Fiber

Xing Chen[1], Jinlong Lu[1], Jian Zhang[1], Yifan Cui[1], Xing Lu[1], Xusheng Tian[2], Cheng Ci[2], Bo Liu[2], Hong Wu[2], Tingsong Tang[3], Kebin Shi[1], and Zhigang Zhang[1]

[1]Peking University, China, [2]Nankai University, China, [3]Beijing Satellite Navigation Center, China

We demonstrate feed-forward digital compensation technique applied in both precise frequency transfer and time synchronization. The fractional frequency instability was 6.18x10^{-20} at 2000 s and RMS variation of time synchronization was sub-40 ps.