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Der-Hou Room -- (B1)

WP • Poster Paper

WP-(1)-1**Slowly opened switch superior in giant pulse operation**

*Junewen Chen, Jun-Ting Lin and Mau-Shiun Yeh
Chung Hua University;*

Chung-Shan Institute of Science and Technology, Taiwan
Slowly opened Q-switch modulation superior in giant pulse operation. All of active and passive modulators: LiNbO₃, Plastic Dye Sheets, LiF:F²⁺, Cr⁴⁺:YAG, RG1000 Color Filters, InP and GaAs semiconductor slabs have been investigated and analyzed.

WP-(1)-2**Development of the diode pumped 1W solid state orange laser by dual pumping dual cavity**

*T. Eno, Y. Goto and M. Momiuchi
R&D center, TOPCON CORPORATION, Japan*

We have developed diode pumped solid state orange (593nm) laser by use of intracavity sum frequency mixing for Nd:YVO₄ dual pumping dual cavity (1342nm and 1064nm). The maximum orange power was 1.29W at 30W pumping.

WP-(1)-3**Broadband spectral shaping in a Ti:sapphire regenerative amplifier**

*Yuxin Leng, Lihuang Lin, Wenyao Wang, Yunhua Jiang, Bin Tang, Zhizhan Xu
Chinese Academy of Sciences, China.*

A 0.34-mm thick quartz plate is used in a Ti:sapphire regenerative amplifier for spectral shaping, the bandwidth of the amplified pulse is increased from ~18nm to ~35nm, and the amplified pulse is compressed to ~35fs.

WP-(1)-4**Thermal lensing compensation of diode laser pumping high power Nd:YAG laser**

Seong Sook Shin, Won Kweon Jang, Sungman Lee

Hanseu University; Korea Atomic Energy Research Institute, Korea
The compensation of thermal lensing effect in diode pumping high power cw Nd:YAG laser was achieved by using wave-plate inside cavity. Ray matrix simulation and experiments showed TEM₀₀ mode operation and improved beam quality factor.

WP-(1)-5**High power deep ultraviolet microchip laser using passive Q-switch**

*Yoshiharu Urata, Yuji Oki, Satoshi Wada
Megaopto corp.; Kyushu Univ., RIKEN, Japan*

A high power deep ultraviolet microchip laser was realized at 266nm. Cavity parameters of the passively Q-switched oscillator were optimized for achieving high peak power up to 80 kW with 850 ps light pulses duration.

WP-(2)-1**Noise in actively mode-locked external cavity laser**

Nuran Dogru and M. Sadettin Ozyazici

University of Gaziantep, Turkey
Noise of mode-locked hybrid soliton pulse source is described using coupled-mode equations. Mode-locking is difficult to achieve for some value of bias currents because of increasing noise. Hence, transform-limited pulses are not generated over a wide tuning range.

WP-(2)-2**The ESD protection improved by combining InGaN/GaN MQW LEDs with GaN Schottky diodes**

C. H. Chen, Y. K. Su, S. J. Chang, and H. Hung

Cheng-Shiu Institute of Technology; National Cheng Kung University, Taiwan
GaN Schottky diodes were built internally inside the GaN green LEDs by using etching and re-deposition techniques. By proper selecting the etching areas underneath the bonding pads, one can minimize the optical.....

WP-(2)-3**Lock-in-like light detection method for a gain-modulated photomultiplier-tube**

*Tetsuo Iwata and Takafumi Inoue
University of Tokushima, Japan*

In order to measure intensity and phase of a weak signal light varied in an intensive background light, we propose a novel lock-in-like light detection method using a photomultiplier-tube (PMT) whose gain is modulated sinusoidally.

WP-(2)-4**Characteristics of very-large-aperture, oxide-confined vertical-cavity surface-emitting lasers**

Hung-Pin D. Yang, Chun-Yuan Huang, Hsin-Chieh Yu, Chia-Pin Sung, and Jim Y. Chi

Industrial Technology Research Institute; National Cheng Kung University, Taiwan

We report the results of our very large aperture, oxide-confined vertical-cavity surface-emitting lasers (OC-VCSELs). The apertures of the laser-emitting windows are 300 to 500 μm in diameter. P-type metal grid lines were also formed within the aperture.....

WP-(2)-5**Electrical field and stress effects on metal induced crystallization of sputtered silicon**

Ching-Ming Hsu, Ian-Fu Chen, Ming-Chang Yu

Southern Taiwan University of Technology, Taiwan
The release of film stress during thermal annealing for a-silicon/aluminum/ glass structures tended to deteriorate the aluminum-induced crystallization (AIC) of sputtered silicon. The external electrical field below 640V/cm performed little effect on the crystallization enhancement.

WP-(2)-6**X-ray diffraction analysis of threading dislocation densities in epitaxial layers as grown by MOCVD**

H. Kang, N. Spencer, D. Nicol, Z. C. Feng, I. Ferguson, S. P. Guo, M. Pophristic, and B. Peres

Georgia Institute of Technology, EMCORE Corporation, USA

Threading dislocation densities in epitaxial layers were evaluated using two different X-ray analysis techniques: Williamson Hall (WH) plots and reciprocal space mapping (RSM). The crystalline epitaxial layers were grown by MOCVD. They were composed of columnar structures that can be estimated by coherence length and angular misalignment.....

WP-(2)-7**Improvement of the high-temperature characteristics of 1.52μm InGaAs laser with (InAlAs)_{0.4}(InGaAs)_{0.6} short-period superlattice barriers**

D. Heo, J. D. Song, W. J. Choi, J. I. Lee, Y. T. Lee, J. Jeong and I. K. Han

Korea Institute of Science and Technology (KIST); Kwang-Ju Institute of Science and Technology (KJIST); Korea University, Korea

A high-temperature characteristics of 1.52μm InGaAs ridge waveguide laser diode with InGaAs/InAlAs short period superlattices (SPSs) barriers is reported. The measured characteristic temperature of the laser, T₀, is 124K from 5 and 50°C and 81K from 50 and 80°C.....

WP-(2)-8**Postgrowth wavelength tuning of InGaAsP/InP multiple quantum wells using dielectric-cap disordering**

Tao-Wei Chou, Chun-Hung Lai, Chia-Hsuan Lin, T. J. Wang, W. H. Tsai, and H. H. Yee

National Taipei University of Technology (NTUT); Tatung University, Taiwan

Impurity-free quantum well disordering has been used for the wavelength tuning of strained InGaAsP/InP multiple-quantum-well (MQW) structures. By implementing different kinds of dielectric caps, damage enhanced and thermally induced quantum well intermixings were carried out for.....

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WP-(2)-9**Enhancement of proton-implanted GaAs VCSEL performance by transparent overcoating**

Fang-I Lai, L. H. Lai, Y. S. Chang, T. H. Shei, H. C. Kuo, and S. C. Wang
National Chiao Tung University, Taiwan

Deposition of thin metal film and ITO as transparent overcoating on proton-implanted GaAs VCSEL increases the laser output power by two-fold and the slope efficiency by five-fold, and also improves the kinks in L-I characteristics.

WP-(2)-10**F-P monitoring of FBG external cavity laser diode for DWDM application**

Tao Yu, Huafeng Zhao, Shan Huang, Lin Xue, Kaijun Zhou
Tsinghua Univ., China,

A novel FBG external cavity laser diode providing multiple DWDM wavelengths is presented. Novel structural technique is provided to achieve frequency tuning and modulation. The laser source facilitated F-P filter to generate ITU wavelengths and the stabilization reaches 10⁻⁷.

WP-(2)-11**Empirical formulas for refractive indices of InP based materials near and above the band gap**

E. Y. Lin, T. S. Lay, and T. Y. Chang
National Sun Yat-Sen University, Taiwan

A Kramers-Kronig model consisting of a broadened parabolic band plus an equivalent high-energy oscillator has been used to fit the existing refractive index data. The indices of InP based materials can be readily calculated.....

WP-(3)-1**Phase control of spectra in a two-level system driven by ultrashort two-color pulse fields**

Xiaohong Song, Chengpu Liu, Shangqing Gong, Shiqi Jin, Zhizhan Xu
Laboratory for High Intensity Optics, Shanghai Institute of Optics and Fine Mechanics, China

The spectra of two-color few-cycle pulses in a two-level medium are investigated by solving the full Maxwell-Bloch equations. It is shown that the spectra depend crucially on the relative phase ϕ of the two pulses.

WP-(4)-1**Quantum theory of Bragg solitons: A linearized approach**

Ray-Kuang Lee, Yinchieh Lai
National Center for High-Performance Computing; National Chiao-Tung University, Taiwan

We have developed a general quantum theory for bi-directional nonlinear optical pulse propagation problems and have used it to calculate the squeezing ratio of Bragg solitons for the first time. If the pulse shape of the local oscillator.....

WP-(4)-2**Unexpected population inversions on both optical transitions via the effect of spontaneous emission-induced coherence of a ladder system**

Hongmei Ma, Shangqing Gong, Chengpu Liu, Zhenrong Sun and Zhizhan Xu
Shanghai Institute of Optics and Fine Mechanics; East China Normal University, China

We study the effect of spontaneous emission-induced coherence on population inversion in a ladder-type three-level system. We show that this kind of coherence can lead to unexpected population inversions on both of the optical transitions.

WP-(4)-3**Measurement of magnetic birefringence of Neon and Helium atoms**

Kazuyuki Muroo, Masahiro Yoshino, and Yoshitaka Takubo
Tokyo University of Agriculture and Technology, Japan

A high-sensitivity ellipsometer determined experimentally the amplitudes of magnetic birefringence for Ne and He atoms. These amplitudes provide an absolute standard in detecting the vacuum magnetic birefringence which is predicted by the QED.

WP-(4)-4**Scarred mode lasing from a shape-oscillating liquid jet**

Sang-Bum Lee, Jai-Hyung Lee, and Kyungwon An
Seoul National University, Korea

We observed quadrupole-shaped oscillation in the cross section of a liquid jet ejected from an asymmetric orifice by analyzing the diffraction patterns. We also observed directionality of scarred mode lasing emission from quadrupole-deformed cavities formed.....

WP-(4)-5**Spectroscopy studies of the B¹Π_u state of Cs₂**

Chin-Chun Tsai, Yi-Chi Lee, Fang-Cheng Lin, and Thou-Jen Whang
National Cheng Kung University, Taiwan

More than 1000 rovibrational transitions between the B¹Π_u to X¹Σ_g⁺ states of Cs₂ were observed and analyzed which yield the potential parameters $T_e=13043.638(5)\text{cm}^{-1}$, $R_e=4.85\text{ \AA}$, $D_e=2338.5(8)\text{ cm}^{-1}$, $B_e=0.01077(1)\text{ cm}^{-1}$, and $\omega_e=34.37(4)\text{ cm}^{-1}$

WP-(4)-6**Vortices in the quantum stream of potential-well scattering**

Ming-Houng Hsu and Keh-Ning Huang

Institute of Atomic and Molecular Sciences, Academia Sinica; National Taiwan University, Taiwan
Vortices around nodes where the wave function vanishes are studied in the potential scattering. They can be visualized in quantum streamlines which follow the directions of current densities in space. We consider an incident particle.....

WP-(4)-7**Rainbow phenomena in particle scatterings**

Ju-Tang Hsiao and Keh-Ning Huang
National Taiwan University; Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan

The Scattering of a particle in quantum mechanics and the scattering of electromagnetic waves have certain analogies. The quantum scattering of a particle is analyzed as the interference among components characterized by number of reflections.....

WP-(4)-8**Measurement of transient absorption change of NO₂ at 3.46 mm using difference frequency generation**

Satoru Tanoue, Shigeru Yamaguchi, Kazufumi Yasumoto, Nobuyoshi Ohtani, Masamori Endou, Katuhiko Sunako, Takakazu Morita, Kenzo Nanri and Tomoo Fujioka

Tokai University, Japan
Rapid NO₂ detection by mid-infrared coherent light source based on difference frequency generation that used a fiber laser as pumping source was demonstrated. High resolution spectroscopic measurements of NO₂ are reported.

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WP-(4)-9**Measurement of oxygen isotope ratios using tunable diode laser absorption spectroscopy**

Sang Eon Park, Do-Young Jeong, Jaewoo Kim, Kwang-Hoon Ko, E. C. Jung,

Cheol-Jung Kim

Lab. for Quantum Optics, Korea Atomic Energy Research Institute, Korea

Tunable diode laser absorption spectroscopy was performed for analysis of oxygen isotope ratio in water sample enriched by the membrane distillation method. The maximum deviation of measured δ -value was $\pm 4\%$.

WP-(5)-1**Dissipative solitons in discrete systems**

Kenichi Maruno, Adrian Ankiewicz, and Nail Akhmediev

Kyushu University, Japan;

Australian National University, Australia

We study, analytically, the discrete complex cubic Ginzburg-Landau equation. We have found a set of exact solutions which includes, as particular cases, periodic solutions in terms of elliptic Jacobi functions, and bright and dark soliton solutions.

WP-(5)-2**Second-harmonic generation in optically poled tellurite glasses doped with transition elements**

Katsuhisa Tanaka, Yoshinori Yonesaki, Jinhai Si, and Kazuyuki Hirao

Kyoto Institute of Technology; Kyoto University; Photon Craft Project, ICORP, Japan

Second-harmonic generation (SHG) has been observed in optically poled niobium tellurite glasses doped with vanadium and/or rare-earth elements. The second-harmonic intensity is enhanced by co-doping of vanadium and rare-earth element such as Tb and Pr.....

WP-(5)-3**Enhancing QPM efficiency in periodic poling**

Jongbae Kim, Jung Jin Ju, and Min-su Kim

Basic Research Laboratory, ETRI, Korea

QPM efficiency in periodic poling is enhanced if periodic electrodes of a shortened width are used. The maximized conversion efficiency and the optimized width of the periodic electrodes are determined from the nonlinearity distribution.

WP-(5)-4**Electric field measurements by combining nonlinear frequency conversion technique with electro-optic effect**

Kazunori Kuriaki, Nilesh J. Vasa, Shigeru Yokoyama, Mitsuo Maeda, and Hirohito Takeshita

Kyushu University; Kyushu Electric Power Co., Inc., Japan

A novel electric field measurement method by combining a nonlinear frequency conversion technique, such as second-harmonic generation, with electro-optic effect is proposed and its feasibility for electric field measurements due to dc and impulse voltages is investigated.

WP-(5)-5**Simple method for determining Gaussian beam waist using lens Z-scan**

S. J. Lee, Y. L. Lee, S. Y. Woo, W. Hwang, J. H. Lee, J. H. Kim, and C. H. Kwak

Yeungnam University; Advanced Photonics Research Institute, KJIST, Korea

We present a simple method for determining Gaussian beam waist at the focus by using lens Z-scan, which is replaced a nonlinear Kerr medium by a thin lens in conventional Z-scan.

WP-(5)-6**The upconversion mechanism of Tb³⁺ complex containing N,N',N''-tris(2-hydroxybenzamido) triethylamine**

L. Luo, Winnie Po-Wan Lai, Wing-Tak Wong, K. F. Li, and K. W. Cheah

The University of Hong Kong; Hong Kong Baptist University, Hong Kong; Guangdong University of Technology, China

Tb³⁺ complex containing N,N',N''-tris(2-hydroxybenzamido) triethylamine was synthesized and its indirect upconversion sensitization luminescence was studied using two-photon excitation method. The results indicate there exist a phonon-assisted and a resonant energy transfer processes in different excitation range.

WP-(5)-7**Measurement and analysis of photoinduced birefringence in a methylorange-doped PVA film**

E. J. Kim, H. R. Yang, S. Y. Woo, S. J. Lee, J. H. Lee, and C. H. Kwak.

Yeungnam University, Korea

We fabricated methylorange (MO) doped PVA thin film for various concentrations of methylorange and measured the photoinduced birefringence of MO/PVA thin film by means of the pump-probe technique. The experimental results were analyzed by adopting empirical stretched-exponential kinetics.

WP-(5)-8**Simultaneous measurements of two wave mixing gain and diffraction efficiency in photorefractive BaTiO₃ crystal**

C. H. Sohn, S. J. Lee, E. J. Kim, H. R. Yang, S. Y. Woo, and C. H. Kwak

Yeungnam University, Korea

We present a novel method for simultaneously measuring two wave mixing gain and diffraction efficiency and measured transient gain coefficients against tilt angle between the grating wave vector and c-axis in a photorefractive BaTiO₃ crystal.

WP-(5)-9**Large phase shift z-scan analysis for thick Kerr medium**

C. H. Kwak, S. J. Lee, and Y. L. Lee

Yeungnam University; KJIST, Korea

We developed a large phase shift-thick sample Z-scan theory, which is applicable to a range of sample thickness from thin sample limit to the thick sample regime and all the range of nonlinear phase shifts.

WP-(5)-10**Dynamic of the spectral and angular selectivity of the tunable collinear acousto-optical filter**

V. E. Appelt, R.S. Kruglov, and A.S. Zadorin

State University of Control Systems and Radio Electronics, Russia

An acousto-optical filter (AOF) using in area of the high-speed dynamic spectroscopy and filtering of complicated optical fields has been considered. The transition process of forming of the diffractive wave $E_1(r,t)$

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WP-(5)-11**Superradiant multiple-pulse emission from a dipole-ordered state prepared by localized photons**

Akira Shojiguchi, Kiyoshi Kobayashi, Suguru Sangu, Kazuo Kitahara, and Motoichi Ohtsu
ERATO Localized Photon Project, Japan Science and Technology; International Christian University; Interdisciplinary Graduate School of Science and Engineering, Japan
 Multiple pulse generation from a dipole-ordered state is predicted, which can be achieved by local state manipulation of an N two-level system interacting with localized photons. The origins of the phenomenon are discussed by comparison with Dicke's superradiance.

WP-(5)-12**Nonlinear processes in organic molecules under high-power laser excitation**

T. N. Kopylova, V. A. Svetlichnyi, G. V. Mayer, R. T. Kuznetsova, A. V. Reznichenko, and V. M. Podgaetskii
Tomsk State University, Russia
 Nonlinear optical behavior of organic molecules of various composition excited with pulse lasers has been investigated both experimentally and theoretically. To develop optical radiation limiters, the effect of the parameters of exciting radiation.....

WP-(5)-13**Bandwidth analysis of third harmonic generation in optical thin films**

Gia-Wei Chern, Tzu-Min Liu, Shi-Wei Chu, and Chi-Kuang Sun
National Taiwan University, Taiwan
 We have studied the dependence of the THG bandwidth on various laser and material parameters. It is found that the bandwidth of a THG signal is strongly dependent on the relative distance of laser focal.....

WP-(5)-14**Nanosecond nonlinear absorption and refraction in C60/toluene solution**

Chen-Wei Chen, Chih-Chien Wang, Damien Liu, Jung-Kuang Hu, Tzer-Hsiang Huang, and Tai-Huei Wei
Chung Cheng University; Wu Feng Institute of Technology, Taiwan
 Investigation of nanosecond nonlinear absorption and refraction in C60 /toluene assures the contributions of the triplet-triplet excitation and the thermal effect, in addition to the singlet-singlet excitation that was verified in our previous picosecond study.

WP-(5)-15**Self-focusing of low intensity cw laser radiation in nickel alloy coated beam splitter**

Xiangsu Zhang, Shou Liu, and Xiaoyun Chen
Xiamen University, China
 Self-focusing of 488 nm laser radiation with intensity around 42 W/cm² has been observed in a nickel alloy coated beam splitter. The experimental results demonstrate that laser self-focusing occurs when the beam passes through.....

WP-(5)-16**Giant phase shifts in non-resonant Bragg and gap soliton collisions**

Lasha Tkeshlashvili, Kurt Busch, and Suresh Pereira
Universität Karlsruhe, Germany
 We study the phase shift experienced by colliding Bragg and gap solitons. We demonstrate analytically and numerically that in fiber Bragg grating systems, the shift is on the order of several millimeters.

WP-(6)-1**Generation of interacting pulse pairs in passively mode-locked fiber lasers**

Nail Akhmediev, J. M. Soto-Crespo, Ph. Grelu, and F. Belhache
Australian National University, Australia; Instituto de Optica, Spain; Universite de Bourgogne, France
 We study solitons pairs in passively mode locked fiber lasers. We found that when the two solitons constitute a stable pair, their phase difference is in quadrature while their allowed distances take a discrete set.

WP-(6)-2**Mode-locking stability observation of a Kerr-lens mode-locked Ti:sapphire laser, analyzed by a recently developed realtime spectrum analyzer**

Hiroshi Takahashi, Yuji Suzuki, Shingo Ono, Nobuhiko Sarukura, and Tadashi Nakamura
The Graduate University for Advanced Studies; Institute for Molecular Science; Textronix Japan., Ltd., Japan
 The mode-locking stability of a Kerr-lens mode-locked Ti:sapphire is investigated by a newly developed real-time spectrum analyzer, which can seamlessly acquire the time-domain signals and provide time-varying power spectrum.

WP-(6)-3**The frequency dependent mode-locking behavior of an optical-injection-locked erbium-doped fiber laser**

Gong-Ru Lin and Jung-Rung Wu
National Chiao Tung University; National Taipei University of Technology, Taiwan
 The effect of modulation-frequency detuning on the pulsewidth, peak power, locking bandwidth, phase noise and jitter performances of a harmonic mode-locked EDFL with a gain-switched Fabry Perot laser diode based optical gain modulator are characterized.

WP-(6)-4**Intracavity-dispersion-compensated diode-pumped mode-locked Yb:YAG laser**

Sadao Uemura, Yohei Kobayashi, Kenji Torizuka, and Takao Kobayashi
National Institute of Advanced Industrial Science and Technology (AIST); Fukui University, Japan
 We present a design for intracavity-dispersion-compensated diode-pumped mode-locked Yb:YAG laser, in which the intracavity group delay dispersion and third order dispersion are simultaneously cancelled near the lasing wavelengths.

WP-(6)-5**Spectral change depending on the sequence of optical elements in a femtosecond Ti:sapphire laser**

Yong Ho Cha, Byoungduk Yoo, Yong Joo Rhee, and Cheoljung Kim
Korea Atomic Energy Research Institute, Korea
 We have numerically and experimentally verified that the sequence of optical elements in a femtosecond Ti:sapphire laser affects the output spectrum. With the same net dispersion in a cavity, the width and the shape of output spectrum was significant changed.....

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WP-(6)-6**Description of electronic dynamics of molecules in a strong laser field by a time-dependent molecular orbital approximation***Tsuyoshi Kato and Hirohiko Kono Tohoku University, Japan*

We propose a theory to calculate the electronic dynamics (time-dependent electronic wave function) of molecules in a strong laser field based on a time-dependent natural orbitals expansion.

WP-(6)-7**Measurement of the group-delay dispersion of optical elements using white-light interferometry***Tayyab Imran, Kyung-Han Hong, Tae Jun Yu, and Chang Hee Nam Korea Advanced Institute of Science and Technology (KAIST); Advanced Photonics Research Institute, K-JIST, Korea*

We have measured the group-delay dispersion of femtosecond optics using a compact white-light cross-correlator based on a Michelson interferometer. The dispersion characteristics of broadband tunable mirrors, broadband chirped mirrors.....

WP-(6)-8**Evolving optical parameters from laser trace by genetic algorithm***Su-Frang Shu Ching-Yun University, Taiwan*

A genetic algorithm is used to retrieve the traces of frequency-resolved optical gating to determine the ultrafast laser parameters. This technique provides global searching ability and more accurate results.

WP-(7)-1**Radiation properties of organic compounds in gel-matrix and thin gel-films under laser excitation***A. A. Shaposhnikov, R. T. Kuznetsova, G. V. Mayer, T. A. Pavivh, S. M. Arabey, and T. N. Kopylova*

Siberian Physical-Technical Institute at Tomsk State University, Russia; Molecular and Atomic Physics Institute of Academia of Science of Belorussia, Belorussia
The spectral-luminescent and lasing characteristics of gel-matrix and films with thickness of some micrometers doped by organic luminophores were investigated. The peculiarities of radiation properties and photostability of these compounds in solid media compare with solutions.....

WP-(7)-2**Zone melting Czochralski (ZMCz) growth of bismuth silicon oxide and lithium niobate single crystals***C. B. Tsai, C. H. Ho, T. Y. Wang, H. J. Chen, R. Gopalakrishnan, and C. W. Lan*

National Taiwan University, Taiwan
In this report the design and fabrication zone-melting Czochralski (ZMCz) system (induction heating) and the growth of Bismuth silicon oxide and Lithium Niobate have been presented.

WP-(7)-3**Sub-400 nm ultra-violet luminescence of (4'-methoxy)-9-phenylcarbazole***K. F. Lia, L. Luo, Louis M. L. Leung, and K. W. Cheah Hong Kong Baptist University, Hong Kong*

Intense ultra-violet photoluminescence at 380nm (3.26eV) was observed from a small organic molecule, (4'-methoxy)-9-phenylcarbazole (MeOKPA). Its linear and non-linear optical properties were discussed. In conclusion, it may be most widely used for organic LED application.

WP-(7)-4**1.3 μm light emission from $\text{Al}_2\text{O}_3/\text{Si}_{1-x}\text{Ge}_x/\text{Si}$ MOS tunnel diodes***C. Y. Lin, H. Y. Lee, Albert Chin, Y. T. Hou, M. F. Li, S. P. McAlister, and D. L. Kwong*

National Chiao Tung Univ., Taiwan; National Univ. of Singapore, Singapore; National Research Council, Ottawa, Canada; Univ. of Texas, USA
Light emission at $\sim 1.3\mu\text{m}$ was measured at room temperature in $\text{Al}_2\text{O}_3/\text{Si}_{1-x}\text{Ge}_x$ MOS tunnel diodes on Si substrates. The merit of this MOS LED is its compatibility with VLSI and photon energy.

WP-(7)-5**The spectral shift of 100GHz DWDM narrow bandpass interference filter***Jin-Cherng Hsu, Kuan-Tin Lin, Huang-Lu Chen, and Ching-Chin Chen*

Fu Jen Catholic University, Taiwan
The 100GHz narrow band pass filter (NBP filter), the total number of the layers being 187, is deposited by electron gun with ion-assisted deposition (IAD). When we grind, polish and cut the filter to 1.4 mm x 1.4 mm x 1 mm chips.....

WP-(7)-6**Optical spectroscopy of neodymium-doped tantalum pentoxide slab waveguides***B. Unal, M. C. Netti, N. M. B. Perney, M. Hassan, D. P. Shepherd, J. J. Baumberg, and J. S. Wilkinson*

University of Southampton; Mesophotonics Limited, UK
Neodymium doped tantalum pentoxide waveguides were fabricated by RF sputtering from a Nd doped Ta_2O_5 target. Waveguide losses, absorption spectra, fluorescence spectra and excited-state lifetime were measured, and show promise for realisation of waveguide lasers.

WP-(7)-7**Influence of crystallinity on the bulk laser-induced damage threshold in $\text{CsLiB}_6\text{O}_{10}$ for high-power UV laser source***M. Nishioka, F. Kawamura, M. Yoshimura, Y. Mori, and T. Sasaki*

Osaka University, Japan
Crystallinity of CLBO could be improved by solution-stirring TSSG method. They possessed high laser-induced damage thresholds, and the qualities were adequately uniform throughout the crystals. 40-W 266-nm output was obtained by using these high-quality crystals.

WP-(7)-8**Enhanced PL of high density ($=4.7 \times 10^{11} / \text{cm}^2$) InAs QDs by using graded interface of GaAs/AlAs/GaAs***S. K. Park, J. Tatebayashi, and Y. Arakawa*

University of Tokyo, Japan
We have achieved an enhanced PL of high density ($=4.7 \times 10^{11} / \text{cm}^2$) InAs QDs by using graded interface of GaAs/AlAs/GaAs. The graded interface applied for the purpose of improving surface state helps to obtain high intensity PL spectra of InAs QDs.....

WP-(7)-9**Effects of film deposition rate and thermal annealing on optical and microstructural evolution of amorphous Ta_2O_5 and SiO_2 films***Wen-Jen Liu, and Chia-Hung Chien*

I-Shou University, Taiwan
The influences of deposition rate and thermal annealing for the surface roughness, optical properties, and microstructural evolution of single SiO_2 and Ta_2O_5 films on the D263T quartz glass by using plasma ion-assisted deposition were investigated.

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WP-(7)-10**Optical Properties of a Novel Dye in Yellow Florescent Organic LEDs**

Wallace. C.H. Choy, K.W. Cheah, Y.S. Wu, and C.H. Chen
University of Hong Kong; Hong Kong Baptist University, Hong Kong; National Chiao Tung Univ., Taiwan

In this paper, time-resolved PL, lifetime and crystallization of a novel organic, 2,8-di(t-butyl)-5,11-di[4 (t-butyl)phenyl]-6,12-diphenylnaphthacene, which is considered to be potential candidate to substitute the conventionally used 5,6,11,12-tetraphenylnaphthacene for a higher efficient yellow-color organic LED, were investigated.

WP-(8)-1**Evolutionary optimisation and co-design of gratings and fibres**

Leon Poladian and Steven Manos
University of Sydney, Australia
Different algorithms available to both design and optimise either novel fibres or gratings are compared. In the presence of complicated constraints an evolutionary approach is more flexible than attempt a direct synthesis of a design.

WP-(8)-2**Design and analysis of optical sub-assembly (OSA) used in high speed parallel transmission package**

Samuel I-En Lin and Yang-Liang Liu

Chung-Chou Institute of Technology, Taiwan

This paper experimentally shows the coupling efficiency of proposed structure used for high-speed parallel transmission. The 3D finite element modeling was used to investigate the mechanical stress performance and thermal analysis.....

WP-(8)-3**Horn effect and abnormality in waveform evolution of 10Gbit/s and 40Gbit/s modulated optical pulses**

L. Yu
OFCEB, Science Park, Shenzhen, China

Waveform evolution and horn effect (HE) of 10Gbit/s and 40Gbit/s modulated optical pulses in fibre are studied. HE and its position, determined by dispersion rather than non-linearity, have strong relation with waveform distortion induced by non-linearity .

WP-(8)-4**Evidence of multi-hump temporal solitons in passively mode-locked fiber lasers**

D. Y. Tang, B. Zhao, P. Shum, C. Lu, W. S. Man, and H. Y. Tam
Nanyang Technological University, Singapore; Hong Kong Polytechnic University, Hong Kong

We present the first experimental evidence of multi-hump temporal cavity solitons. Numerical simulation confirmed the existence of such kind of solitons in passively mode-locked fiber lasers.

WP-(8)-5**Study on the monitoring of resin flow and curing in the vacuum assisted resin transfer molding process using a long-period fiber Bragg grating**

Seunghwan Chung, Youngki Yoon, Byoungho Lee, and Woo Il Lee

Seoul National University, Korea

The long-period fiber grating (LPG) has received considerable attention in various fiber-optic sensor implementations. In this study, we apply LPG for estimation of the resin flow and transformation in vacuum assisted resin.....

WP-(8)-6**Mode coupling phenomena in long-period fiber gratings formed with micro bending**

Chung-Yi Chiu, Su-Fang Chen, Yean-Woei Kiang, Hua-Kuang Liu and C. C. Yang

National Taiwan University, Taiwan

Coupling with HE_{2m} modes resulted in a coupling coefficient variation period the same as that of micro bending. However, the coupling with HE_{1m} modes led to a period only one-half the micro bending period.

WP-(8)-7**Implementation process of a reflective-type electrical tunable SOI optical filter**

Shyh-Lin Tsao, Shu-Fen Hu, Jiang-Hung Tien, and Chun-Wei Tsai

National Taiwan Normal University; National Nano Device Laboratories, Taiwan

In this paper, we implement a wavelength tunable filter based on polysilicon covered SOI wafer. The SOI filter is achieved by e-beam writing a reflective wavelength tunable grating on MMI SOI waveguide.

WP-(8)-8**Fiber alignment shifts in butterfly laser packaging by laser welding technique: measurement and finite-element-method analysis**

Y. C. Hsu, W. K. Huang, M. T. Sheen, and W. H. Cheng

National Sun Yat-sen University, Taiwan

The post-weld-shift (PWS) induced fiber alignment shifts of fiber ferrule-clip (FFC) joints in butterfly laser packaging within two types of clip designs by laser welding technique have been studied experimentally and numerically

WP-(8)-9**Integrated optical chip for fiber optical gyroscope fabricated by high temperature proton exchange**

Y. Korkishko, V. Fedorov, S. Kostritskii, A. Alkaev, E. Paderin, E. Maslennikov, V. Krizak, and D. Apraksin

Optolink Ltd., Moscow Institute of Electronic Technology, PROTON, Russia

Multifunctional integrated optical chip (MIOC) for fiber optical gyroscope with linear digital output is developed. The technology is based on recently proposed High-Temperature Proton Exchange method. MIOC is used for industrial closed-loop fiber optic gyro.

WP-(8)-10**The novel Z-bend waveguide on SOI structure**

Yu-Pin Liao and Ruei-Chang Lu
Ching Yun Institute of Technology; National I-Lan Institute of Technology, Taiwan

A novel Z-bend waveguide on SOI structure with two tapered waveguides is proposed. The normalized transmitted power is much higher than conventional SOI Z-bend.

WP-(8)-11**Wavelength shift and split of cladding mode resonance in micro-bended long-period fiber grating under torsion**

Oleg V. Ivanov and Lon A. Wang
National Taiwan University, Taiwan

A resonance wavelength shift proportional to the square of the twist angle has been observed for various cladding modes in micro-bended long-period fiber gratings. The resonance peaks split, reduce their amplitude, and finally disappear with increasing twist rate.

WP-(8)-12**Surface polaritons in symmetric non-uniform structures with losses**

G. P. Chernikov and A. M. Ishkhanyan

Russian Research Center "Kurchatov Institute", Institute of Nuclear Fusion, Russian Federation; Engineering Center of Armenian National Academy of Sciences, Armenia

The conditions for a short-range polariton to exist in a symmetric three-layer model of a planar structure in which the dielectric permittivity goes to zero at a single plane according to a square law are investigated.....

Wednesday 13:30 – 15:30 December 17, 2003

Der-Hou Room -- (B1)

WP · Poster Paper

WP-(8)-13**A full-vectorial multidomain spectral collocation modal analysis of dielectric optical waveguides***Chia-Chien Huang, Chia-Chih Huang, and Jaw-Yen Yang**National Taiwan University, Taiwan*

A novel method using multidomain spectral collocation method is proposed for vector modal analysis of dielectric optical waveguides. Comparing to the published data, the calculated results show good agreement.

WP-(8)-14**Dual-stage erbium-doped fiber amplifier using a grating-assisted Michelson interferometer***Lih-Gen Sheu, Ying-Tso Lin, and Yinchieh Lai**Van Nung Institute of Technology; Industrial Technology Research Institute; National Chiao-Tung University, Taiwan*

We experimentally demonstrate a new dual-stage EDFA incorporating a grating-assisted Michelson interferometer. The proposed amplifier has significant improvement in the small signal gain and the dynamic range over the amplifier using only an interstage isolator.

WP-(9)-1**Lagrange interpolation method for single CCD digital still cameras***Yan-Chun Chiu, Yong-Tong Zou, Hsiu-Chen Hsu, and Ming-Wen Chang**Yuan Ze University, Taiwan*

A new color interpolation method is proposed in this paper. We use the correlation of R, G, and B pixel, 'Lagrange Interpolation', and edge indicator to interpolate the DSC of single CCD.

WP-(9)-2**Tunable CWDM by utilizing ordered structures in magnetic fluid films***S. Y. Yang, H. E. Horng, Y. W. Huang, Chin-Yih Hong, and H. C. Yang**Academia Sinica; National Taiwan Normal University; Da-Yeh University, Taiwan*

In this report, we explore a new method to fabricate a tunable coarse WDM (CWDM) by utilizing the ordered structure in the magnetic fluid films under external magnetic fields.....

WP-(9)-3**A new all-optical switching device by using the nonlinear Mach-Zehnder interferometer with a control waveguide***Yaw-Dong Wu, Mao-Hsiung Chen, and Rong-Zhan Tasy*
National Kaohsiung University of Applied Sciences; National Sun Yat-Sen University, Taiwan

We propose a new all-optical switching device by using the nonlinear Mach-Zehnder interferometer with a straight control waveguide. The numerical results show that this device could function as an all-optical switch.

WP-(9)-4**Design of computer generated phase holograms by using iterative Fourier transform algorithm***Mei-Li Hsieh and Chun-Cheng Lin*
National Taiwan Normal University, Taiwan

The design method of computer generated phase holograms by using Iterative Fourier Transform Algorithm (IFTA) is described. Computer simulation results of the IFTA method with different phase quantization levels are presented.

WP-(10)-1**The measurement of two dimensional distribution of linear birefringence vector of quarter wave plate***Kao-Jane Lung and Hui-Kang Teng**Nan-Kai College, Taiwan*

The linear birefringence vector of quarter wave plate in two-dimensional distribution is determined simultaneously by polarization-shifting method with a common-path optical interferometer.

WP-(10)-2**Zonal control with coupling factor using an adaptive optics system at KAERI***Young-Seok Seo, Sung-Hoon Baik, Seung-Kyu Park, Min-Suk Kim, Chin-Man Chung, Byung Heon Cha, and Cheol-Jung Kim*
Korea Atomic Energy Research Institute, Korea

The closed-loop wavefront correction was performed using zonal control algorithm. Also, we proposed a new control algorithm using zonal control with coupling factor. We can compensate for an arbitrary wavefront distortion of laser beam in a real.....

WP-(10)-3**Determination of vertical distributions of aerosol optical parameters by use of multi-wavelength lidar data***Masanori Yabuki, Hiroaki Kuze, and Nofel Lagrosas**Chiba University; National Institute of Polar Research, Japan*

We propose a lookup table method to derive vertical distributions of aerosol optical parameters from multi-wavelength observations using a Mie-scattering lidar. The method is characterized by the capability of treating generalized aerosol size distributions.....

WP-(10)-4**Comparison of amplitude and phase methods for position sensitive detector with high performance signal processing***Jovan M. Elazar and Slobodan J. Petricevic**Ben Gurion University, Israel; Faculty of Electrical Engineering, Yugoslavia*

This paper examines amplitude and phase methods for extracting position information from the PSD. Comparison of performance levels of both methods is performed employing a new, high performance electronic detection circuit.

WP-(10)-5**Studies of silver nanoparticles in aqueous solution by surface plasmon resonance***Tzu-Chiang Chen, Yao-Leng Lin, Wen-Kuan Su, and Liann-Be Chang**National Defense University, Taiwan*

The effects of Ag nanoparticles in aqueous solution on surface plasmon resonance (SPR) reflectivity is reported. The nanoparticles aqueous solution was produced by laser ablation method. Using a "Kretschmann" configuration surface plasmon resonance sensor.....

WP-(10)-6**Measurement accuracy of profilometry based on two-photon absorption***Naoya Sako, Soichiro Imoto, Yosuke Tanaka, and Takashi Kurokawa**Tokyo University of Agriculture and Technology, Japan*

We evaluated the measurement accuracy of the profilometry based on two-photon absorption. It was confirmed that the measurement accuracy was inversely proportional to distance and scanning frequency range.

Wednesday 13:30 – 15:30 December 17, 2003

Der-Hou Room -- (B1)

WP · Poster Paper

WP-(11)-1**Substrate and oxygen-annealing effects on the pulsed-laser-deposited $\text{La}_{0.5}\text{Ca}_{0.5}\text{Mn}_{1-x}\text{M}_x\text{O}_3$ (M=Fe, Ni) thin films**

L. -S. Hsu, C. -J. Liu, T. -W. Wu, and D. Luca

National Chang-Hua University of Education, Taiwan

The effects of using different substrates and oxygen-annealing conditions on pulsed-laser deposited thin films of $\text{La}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$ doped with 5% Fe or Ni correlate with their structural, magnetoresistance, and electronic properties.

WP-(11)-2**Laser microfabrication of bearing structures for fluid bearing motor system**

K. D. Ye, Q. D. Zhang, M. H. Hong, and T. C. Chong

Data Storage Institute, Singapore

We present a method to fabricate bearing grooves on the motor component using 355nm DPSS laser combine with CNC software and a 4-axis motion system. The groove depth of the bearing structure can be control precisely within micrometer level.

WP-(12)-1**Analytical estimation of spatial and temporal temperature distributions in multicomponent biological tissues irradiated by a short laser pulse**

V. V. Barun and A. P. Ivanov

Belarus National Academy of Sciences, Belarus

A simple procedure is proposed to analytically study light and heat propagation through multicomponent biological tissues irradiated by a light pulse. an optical and thermal tissue model is discussed and compared with published data.

WP-(12)-2**Two photons excitation fluorescence microscopy with annular aperture**

Fanrong Xiao, Guiying Wang, and Zhizhan Xu

Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China

In this paper we show that the use of an annular aperture in two-color excitation fluorescence microscopy is interest because the side maxima is effectively suppressed and large area detection of two photons imaging is also possible.

WP-(12)-3**Reduction of superficial thermal injury using cryogen cooling during laser-assisted cartilage reshaping of composite cartilage grafts; preliminary investigation**

KI Tsang , LI Chiu , Bjf Wong , and Cj Chang

University of California, USA; Chang Gung Memorial Hospital, Taiwan

Higher dosimetry makes more reshaping and more superficial epidermal injury. More cryogen spray cooling makes more protection against superficial epidermal injury and less reshaping.

WP-(12)-4**Development of a high speed and deep scanning optical coherence tomography system**

M. Hasegawa, S. Matsumura, T. Nakagawa, H. Yokoyama, M. Tokuda, M. Akiba, K. P. Chan, and N. Tanno

Microtomography Co.; JSTC Regional Joint Research Project; Yamagata University, Japan

An optical coherence tomography system employing an array of retroreflectors mounted on a rotating disk has been developed for ophthalmology. Backscatter signals from the anterior segment and retina of the eye can be detected in a single A-scan.

WP-(12)-5**CCD-based microarray scanner system**

Zhou Qiang, Zong Guanghua, and Bi Shusheng

Beijing University of Aeronautics and Astronautics, China

The fluorescence detection of microarray is analyzed. The guidelines for optical system of microarray scanner based on CCD is proposed. A novel CCD-based microarray scanner system is developed in terms of the guidelines.....

WP-(12)-6**Micro-spectroscopy of two-photon autofluorescence from PC12 cells**

Elena Perevedentseva and Fu-Jen Kao

National Sun Yat-sen University, Taiwan

The two-photon autofluorescence from PC12 cells and cell medium components was investigated. Both the PC12 cells and the medium exhibit autofluorescence in the spectral regime of 505-530 nm. We have found that the autofluorescence intensity from cells depends sensitively on the cells' conditions.

WP-(12)-7**Application of optical coherence tomography to monitoring the subsurface morphology of archaic jades**

Chih-Wei Lu, I-Jen Hsu,

Hsiang-Chen Wang, Meng-Tsan Tsai, C. C. Yang, and M. L. Yang

National Taiwan University; National Palace Museum, Taiwan

We demonstrate the use of optical coherence tomography for scanning archaic jades from the Liangzhu and the Qijia cultures in ancient China for understanding the subsurface structures of the whitening process or the secondary alteration.

WP-(13)-1**Delay time measurement and comparison of protection strategies with one-link broken terrestrial SDH optical fiber networks in Taiwan**

Lan-Chih Yang and Shyh-Lin Tsao

Yuan Ze University; National Taiwan Normal University, Taiwan

In this paper, we describe the protection strategies of terrestrial optical fiber networks in Taiwan. Delay time problem of one-link broken is studied. We find the best protection strategy in a shortest delay time.

Wednesday 13:30 – 15:30 December 17, 2003

Der-Hou Room -- (B1)

WP · Poster Paper

WP-(13)-2**Dispersion-order-selectable chromatic dispersion compensation module based on non-uniformly compressed fiber grating**

Jaejoong Kwon and ByoungHo Lee
Seoul National University, Korea
 We propose a simple method to tune dispersion profile of chirped fiber Bragg grating by compressing the grating attached on a tapered structure. The order of dispersion profile was selected by inserting / extracting some part of structure.

WP-(13)-3**A synchronous modulation and inter-mixing technique for sensitivity and error-rate analysis of SONET OC-3/155 Mbps PIN-TIA**

Gong-Ru Lin and Yu-Sheng Liao
National Chiao Tung University, Taiwan
 We present a novel synchronous modulation and inter-mixing technique to measure the sensitivity and to evaluate the bit-error-rate of SONET OC-3/SDH STM-1 p-i-n photodiode receivers with transimpedance amplifier (PIN-TIA) without using any bit-error-rate tester (BERT).

WP-(13)-4**Tri-directional transmission systems using polarization control technique**

Shien-Kuei Liaw, Keang-Po Ho, Fan-Yi Chiang, and Fu-Chun Hung
National Taiwan University of Science and Technology, Taiwan
 Polarization control is used in a tri-directional wavelength-reused system to reduce power penalty causing by coherent mixing of the signal with Rayleigh backscattering noise. For a 25 + 25 km, 10 Gb/s tri-directional transmission system.....

WP-(14)-1**Shifting mutation with new population in genetic algorithm for fiber Bragg grating parameter synthesis**

Su-Frang Shu and Ci-Ling Pan
National Chiao Tung University, Taiwan
 A new population genetic algorithm with T-matrix is proposed and used to approach the parameter retrieval much more speedy and precisely in the design of Fiber Bragg Grating filter. The precision depends on computer only.

WP-(14)-2**The study of the brightness uniformity of a diffuser in outdoors LCD with Monte Carlo simulation**

Hong-Chi Chen and Chih-Chieh Kang
Southern Taiwan University of Technology, Taiwan
 To improve the brightness uniformity of outdoors LCD, a Monte Carlo simulation is developed. By examining the effects of scatter size, volume fraction and the thickness, design parameters for a diffuser is optimized.

WP-(14)-3**Efficient model of an incident beam for analyzing of coupling efficiency of micro-optic devices for the optical communication**

Hun-Yong Park, Myoung-Jin Kim, Seung-Gol Lee, Beom-Hoan O, Se-Geun Park, and El-Hang Lee
Inha University; Korea Electronics Technology Institute, Korea
 In this paper, two kinds of modeling method such as the annular modeling and the cell modeling were introduced and compared with each other. It was found from the comparison that the later would be more accuracy.....

WP-(15)-1**Reflective type VOA using off-axis light attenuation scheme**

Chihchung Chen, Chengkuo Lee, Yenjyh Lai, Wen-Chih Chen, and Ming Hung Tsai
Asia Pacific Microsystems, Inc., Taiwan
 A new reflective micromirror combined with input/output fibers configured in an off-axis light path is presented for variable optical attenuator (VOA) application with 50 dB attenuation range and 0.9 dB insertion loss.

WP-(15)-2**Time-multiplexed plasma-etching of high numerical aperture paraboloidal micromirror arrays**

Kerwin Wang and Karl F. Böhringer
University of Washington, USA
 This paper presents a time-multiplexed plasma-etching method for high numerical aperture paraboloidal micromirrors. By designing the appropriate opening and spacing of etching windows, one can fabricate micromirror arrays with varying focal lengths within one batch.

WP-(16)-1**Light transmittance through corrugated film**

Tzueng-Rong Yang and Mykhaylo M. Dvoynenko
National Taiwan Normal University, Taiwan
 The light transmittance through corrugated metal and dielectric films was calculated. It was found the transmission has resonance features when surface polariton or guided modes are excited. The phenomena could be used for produce of optical filters.

WP-(16)-2**One-dimensional dual-periodically modulated photonic crystal and its transmission characteristic**

H. Lu, Q. Qin, S. N. Zhu, H. Liu, C. Zhang, Y. Y. Zhu, and N. B. Ming
Nanjing University, China
 We report a one-dimensional dual periodical dielectric multilayer film designed for photonic multi-channel filters. A theoretical design method is proposed with an experimental verification.

WP-(16)-3**THz emission from a multifunctional active atomic device in photonic crystals**

Hiroyuki Nihei and Atsushi Okamoto
Polytechnic College AOMORI; Hokkaido University, Japan
 We demonstrate that ultrafast emission is obtained from a multifunctional active atomic device using photonic crystals, which can be used for an optical THz oscillator in addition to a memory and a switch.

WP-(16)-4**Steady-state fluorescence spectrum of a two-level atom in three-dimensional photonic crystals**

Ray-Kuang Lee and Yinchieh Lai
National Center for High-Performance Computing; National Chiao-Tung University, Taiwan
 We theoretically calculate the stationary resonance fluorescence spectrum from a two-level atom which is embedded in a photonic bandgap crystal and is resonantly driven by a classical pump light. Non-Markovian noises caused by the non-uniform.....

WP-(16)-5**Properties of defect states in one-dimensional photonic crystals with structural defect layer made by left-handed material**

Ya-Na Xu, Ben-Yuan Gu, and He-Zhou Wang
Zhongshan Univ; Chinese Academy of Sciences, China
 The defect states in 1-D photonic crystals with defect layer made by left-handed material are investigated. The dispersions of photons strongly depend on the positive or negative refractive index and the thickness of defect layer.

Wednesday 13:30 – 15:30 December 17, 2003

Der-Hou Room -- (B1)

WP · Poster Paper

WP-(16)-6**FDTD simulation of a 1x2 beam splitter using photonic bandgap grating on SOI wafer**

Shyh-Lin Tsao, Hsin-Chun Huang, and Tze-Yu Lin
National Taiwan Normal University, Taiwan

In this paper, we propose a novel 1x2 SOI PBG optical beam splitter. The 1x2 PBG beam splitter is designed with 180 degree output bending angles. The size of this novel beam splitting device are $8\mu\text{m} \times 3.44\mu\text{m}$.

WP-(16)-7**Proposal of a novel method for reduction of propagation loss of photonic crystal waveguides**

Ya-Lun Tsai, Chii-Chang Chen, Chien-Chieh Lee, Jenq-Yang Chang, and Gou-Chung Chi
National Central University, Taiwan

By sedimentation of the microspheres on the air-holes of the 2D PC, the forbidden bandgap can prevent from the scattering effect to confine the light in guiding region and reduce the propagation loss.

WP-(16)-8**Two-dimensional photonic crystal beamsplitters**

Hung-Ta Chien, Chii-Chang Chen, and Pi-Gang Luan
National Central University, Taiwan

We demonstrate a beamsplitter in 2-dimensional square-lattice photonic crystals with two orthogonal line defects, and a point defect placed in the intersection of the two line defects. This structure divides the input power into each output ports.

WP-(16)-9**Nano-fabrication techniques for near-field photonic crystals**

Xiaosong Gan, Baohua Jia, and Min Gu
Swinburne University of Technology, Australia

In this paper, we demonstrate a unique technique of fabricating two-dimensional nano-structures for photonic crystals under evanescent field. The new technique is based on a novel near-filed probe-scanning total internal reflection (STIR) microscope.

WP-(16)-10**Numerical analysis of two-dimensional photonic crystal directional couplers**

Kuan-Ming Chen, Yen-Cheng Lu, Tzu-Hao Wang, Jyh Yang Wang, Horng-Shyang Chen, Yean-Woei Kiang, Hua-Kuang Liu, and C. C. Yang
National Taiwan University, Taiwan

2-D photonic crystal directional couplers of various line defect patterns were numerically analyzed with the plane-wave and FDTD methods for showing the coupling length dependence and other propagation and coupling characteristics.

WP-(17)-1**Ellipsometric characterization of Si nano-particles formed in SiO₂ films as an electro-luminescence element**

Shuichi Kawabata, Keisuke Sato, Tomio Izumi, and Moriaki Wakaki
Tokyo Polytechnic University; Tokai University, Japan

The size and the number density of Si nano-particles formed in the SiO₂ film are of most important factors in the fabrication of the light emitting devices. The concentration ratio of Si nano-particles dispersed in the film.....

WP-(17)-2**Effects of hole injection layer on the luminescent properties of white-light organic light-emitting diodes**

Sheng-Che Pang, Ching-Wu Wang, Shih-Fang Chen, and Yeong S. Lin
National Chung-Cheng University; I-Shou University, Taiwan

Effects of hole injection layer on the luminescent properties of white-light organic light-emitting diodes have been systematically investigated. Evidence showed that by adding m-MTDATA as the hole injection layer the brightness of the white-light OLEDs could be significantly improved.....

WP-(SS1)-1**Improved characteristics of reactive-ion-etching damage for n-GaN epitaxial layers after post-etch treatments**

J. Y. Chang, H. F. Hong, and H. H. Yee
National Taipei University of Techn.; Institute of Nuclear Energy Research, Taiwan

Reactive ion etched (RIE) surfaces of n-type GaN epitaxial films were investigated. It is found that the recovery of crystal damage in optical properties can be achieved up to 60 – 65 % of the photoluminescence (PL) peaks.....

WP-(SS2)-1**Novel approach of performing elementary quantum operations using spatial phase**

K. Mishima, M. Hayashi, and S. H. Lin
Academia Sinica; National Taiwan University, Taiwan

We propose a new idea of controlling elementary quantum operations among semiconductor quantum dots by using the spatial phase and predict the advantage over the present-day quantum computer architecture.

WP-(SS2)-2**Enhanced visible photoluminescence of multi-energy silicon ion implanted SiO₂ films**

Kuo-Cheng Yu and Gong-Ru Lin
National Chiao Tung University, Taiwan

Complete activation of irradiative defects in multi-recipe Si⁺-implanted PECVD grown 500nm-thick SiO₂ on Si via annealing at 1100°C in Ar ambient for 60 min has been observed with maximum visible photoluminescence at 442 nm.

14:30-18:30**Industrial Forum –Solid State Lighting Technology and Market Trends**

Y. S. Liu, ITRI, Taiwan, Chair

Room 101 -- (1F)	Room 105 -- (1F)	Room 106 -- (1F)	Room 107 -- (1F)	Room 110 -- (1F)
<p>16:00-18:00 W4D · High-field Laser Physics J. Wang, Academia Sinica, Taiwan, Presider</p>	<p>16:00-18:00 W4E · Confocal, Multi-Photon and Nonlinear Optical Microscope M. Gu, Swinburne University of Technology, Australia, Presider</p>	<p>16:00-18:00 W4H · Optical Storage (II) Y. Kawata, Shizuoka University, Japan, Presider</p>	<p>16:00-18:00 W4A · DWDM Systems Marie Yang, Presider</p>	<p>16:00-18:00 W4G · THz Radiation and Imaging M. Hangyo, Osaka Univ., Japan, Presider</p>
<p>16:00-16:30 W4D-(3)-1 (Invited) Fast ignition research with a PW laser <i>Ryosuke Kodama, Osaka University, Japan</i> <i>Ryosuke Kodama, Yasukazu Izawa and FI consortium Osaka University, Japan</i> We have developed PW-laser system to demonstrate fast heating of imploded plasmas. Significant enhancement of thermal neutron yield has been realized, confirming the high heating efficiency at near equivalent power to the ignition condition.</p>	<p>16:00-16:30 W4E-(12)-1 (Invited) Nano-imaging of biomolecules with near-field Raman microscope <i>Satoshi Kawata Osaka University, Japan</i></p>	<p>16:00-16:30 W4H-(9)-1 (Invited) Collinear holography <i>Hideyoshi Horimai OPTWARE Corporation; Japan</i> Collinear Holographic Memory is proposed and demonstrated. "Reference beam" and "signal beam" are bundled on the same axis, and irradiated on the recording medium through a single objective lens. This method enables us to reconstruct the hologram image with a collinear optical configuration.</p>	<p>16:00-16:30 W4A-(13)-1 (Invited) Transparent optical networking: application scenarios <i>A. Gladisch T-Systems, Deutsche Telekom, Germany</i></p>	<p>16:00-17:00 W4G-(6)-1 (Tutorial) Recent progress of terahertz wave tomographic imaging <i>X. -C. Zhang Rensselaer Polytechnic Institute, USA</i></p>

Int'l Reception Hall -- (1F)

16:00-18:15
W4F · THz-Wave Nonlinear Optics
Michitoshi Hayashi, National Taiwan University, Taiwan, Presider

16:00-16:30 W4F-(5)-1 (Invited)
Widely tunable Terahertz-wave parametric generator with achromatic injection-seeding
Kazuhiro Imai, Kodo Kawase, Hiroaki Minamide, and Hiromasa Ito
Photodynamics Research Center, RIKEN; Tohoku University, Japan
An achromatically injection-seeded terahertz-wave parametric generator was constructed with MgO:LiNbO₃ crystals and a tunable seeder using a stationary dispersion-compensated optical arrangement. We obtained smooth tuning over the 0.6 - 2.6THz by adjusting the seeder wavelength alone.

Ever Green Room -- (10F)

16:00-18:00
W4B · GaN Light Sources
M. Troccoli, Harvard University, USA, Presider

16:00-16:30 W4B-(2)-1 (Invited)
Progress in GaN based blue and ultraviolet light emitting devices
S. C. Wang
National Chiao Tung University, Taiwan
We present the recent progress in the developments of GaN based light emitting devices. Three main development areas namely laser liftoff (LLO)-LEDs, vertical cavity surface emitting laser (VCSEL) and vertical cavity (VC)-LED, and quantum confined GaN structures.....

Spanish Room -- (10F)

16:00-18:00
W4C · Modeling of Photonic-Crystal/Periodic Structures
H. C. Chang, National Taiwan University, Taiwan, Presider

16:00-16:30 W4C-(14)-1 (Invited)
Finite element analysis of photonic crystal fibers
Masanori Koshiba
Hokkaido University, Japan
Using a full modal vector model, the birefringence, dispersion, confinement loss, and effective area in index-guiding photonic crystal fibers, also called holey fibers, are calculated. Through the real-model simulations, the polarization-dependent dispersion, confinement loss.....

Auditorium -- (10F)

14:30-18:30
Industrial Forum –Solid State Lighting Technology and Market Trends
Y. S. Liu, ITRI, Taiwan, Chair

Sky Lounge -- (12F)

16:00-18:00
W4J · Waveguide Devices (II)
G. K. Chang, Georgia Tech. U., USA, Presider

16:00-16:30 W4J-(8)-1 (Invited)
Incoherent interferometric measurement technique for PLC devices
Wei Chen, Zhipeng Wang, and Yung J. Chen
University of Maryland Baltimore County, USA
As an effective way of characterizing PLC devices, the incoherent interferometric technique measures discrete optical paths through the device so that detailed device/material properties and fabrication errors can be isolated.....

Room 101 -- (1F)

W4D · High-field Laser Physics
--- continued

**16:30-17:00 W4D-(3)-2
(Invited)**
**Research on high field laser
physics at the Institute of
Physics, CAS**
J. Zhang
Institute of Physics, China

Room 105 -- (1F)

W4E · Confocal, Multi-Photon
and Nonlinear Optical
Microscope --- continued

**16:30-17:00 W4E-(12)-2
(Invited)**
**Recent development of
fiber-optic two-photon
fluorescence endoscopy
devices**
Min Gu
*Swinburne University of
Technology, Australia*
We will give an overview of our work on
fibre-optic two-photon fluorescence
endoscopy devices that use a single
fibre coupler. The first device involves a
lens-based probe head and the second
includes a prism-based probe head.

Room 106 -- (1F)

W4H · Optical Storage (II) ---
continued

16:30-16:45 W4H-(9)-2
**Research on fabrication of
PQ:PMMA photopolymer**
*Shiuan-Huei Lin, June-Hua Lin,
and Ken Y. Hsu*
*Institute of Electro-Optical
Engineering; National Chiao Tung
University, Taiwan*
We investigate the influence of relative
viscosity of the solution of PQ:PMMA
on optical quality of the bulk samples.
We present improved method to
produce the samples with high optical
quality. Holographic properties of the
samples have been measured.

16:45-17:00 W4H-(9)-3
**Scaling behavior in holographic
associative memory**
*Raphael A. Guerrero and Rutsy B.
Arangcon*
*Ateneo de Manila University;
University of the Philippines,
Philippines*
We show that the recall strength of a
holographic associative memory
demonstrates scaling behavior. Scale
invariance of the associated recall with
fractional content of the data input is
observed. Experimental results using
photorefractive volume holography are
presented.

Room 107 -- (1F)

W4A · DWDM Systems ---
continued

16:30-16:45 W4A-(13)-2
**Improved performance of a
hybrid DWDM system by using
optical VSB filters**
*Hai-Han Lu, Heng-Sheng Su, and
Shah-Jye Tzeng*
*National Taipei University of
Technology, Taiwan*
A six-wavelength hybrid
dense-wavelength-division-multiplexing
(DWDM) system with CATV, 256-QAM
and OC-48 (2.5 Gb/s) video and digital
trunking applications which use the
optical vestigial sideband (VSB) filters
to improve system performances was
proposed and demonstrated.

16:45-17:00 W4A-(13)-3
**Performance of DPSK-WDM
systems against nonlinear
polarization fluctuation**
*Guo-Wei Lu, Kit Chan, Lian-Kuan
Chen, and Chun-kit Chan*
*The Chinese University of Hong
Kong, Hong Kong*
We experimentally investigate and
compare the system degradation due to
nonlinear polarization fluctuation in
10-Gb/s WDM systems. The DPSK
format shows a 6-dB enhancement in
input power dynamic range over the
OOK format.

Room 110 -- (1F)

W4G · THz Radiation and
Imaging --- continued

Int'l Reception Hall -- (1F)

W4F · THz-Wave Nonlinear Optics --- continued

**16:30-16:45 W4F-(5)-2
Terahertz-frequency-interval dual-wavelength optical pulse generation with semiconductor lasers**

H. Yokoyama, Y. Ohta, Y. Sasaki, H. Taniguchi, and H. Ito
Tohoku University, Japan
Generation of automatically synchronized dual-wavelength optical pulses was successfully demonstrated by using a combination of semiconductor lasers and a four wave mixing device. These dual-wavelength optical pulses have a terahertz interval frequency.....

**16:45-17:00 W4F-(5)-3
A fast frequency-tunable ring-cavity THz-wave parametric oscillator**

Hiroaki Minamide, Tomofumi Ikari, Kazuhiro Imai, Youichi Ishikawa, and Hiromasa Ito
Photodynamics Research Center, RIKEN, Tohoku University, Japan
We report on a rapid frequency-tunable THz-wave parametric oscillator (TPO) with a ring-cavity configuration. A three-mirrored cavity was used as the TPO cavity, which contained a MgO:LiNbO₃ nonlinear optical crystal. Fast frequency tuning.....

Ever Green Room -- (10F)

W4B · GaN Light Sources --- continued

**16:30-16:45 W4B-(2)-2
GaN-based blue laser diodes with deeply etched high-reflectivity DBR mirrors**

Tadashi Saitoh, Masami Kumagai, Hailong Wang, Takehiko Tawara, Toshio Nishida, Testuya Akasaka, and Naoki Kobayashi
NTT Corporation, Japan; The Hong Kong Polytechnic University, Hong Kong
A high mirror reflectivity of 62% is obtained for InGaN/GaN lasers using a deeply etched semiconductor/air DBR structure. The optimum design for the DBR mirrors with tilted sidewalls differs from the conventional $\lambda/(4n)$ design.

**16:45-17:00 W4B-(2)-3
Large piezoelectric effects on photoluminescence properties in 10nm-thick InGaN quantum wells**

H. Gotoh, T. Tawara, Y. Kobayashi, N. Kobayashi, and T. Saitoh
NTT Corporation, Japan
The piezoelectric effects in InGaN quantum wells are examined using the time-resolved photoluminescence (PL) technique. An extremely large change in PL properties is found in a 10-nm thick quantum well with increasing excitation intensity.

Spanish Room -- (10F)

W4C · Modeling of Photonic-Crystal/Periodic Structures --- continued

**16:30-16:45 W4C-(14)-2
Analysis of a holey optical fiber with circularly distributed holes**

Vipul Rastogi and Kin Seng Chiang
City University of Hong Kong, Hong Kong
With the help of the radial effective-index method, we analyze a holey fiber that has circularly distributed holes instead of conventional hexagonally arranged holes. The extended single-mode operation of the fiber is established.....

**16:45-17:00 W4C-(14)-3
Polarization splitting with dual-core holey fibers**

Lin Zhang and Changxi Yang
Tsinghua University, China
We report on a polarization splitter based on holey fibers. The holey fiber consists of two high-birefringence cores. The splitting ratio is better than -11dB and splitter length is 1.7mm.

Auditorium -- (10F)**Sky Lounge -- (12F)**

W4J · Waveguide Devices(II) --- continued

**16:30-16:45 W4J-(8)-2
Light propagation in periodic waveguide-resonator structure - Theory and applications**

Philip Chak, J. E. Sipe, and Suresh Pereira
University of Toronto, Canada; Institute fur Theorie der Kondensierten Materie, Germany
We present a systematic study of the optical properties of waveguide-microresonator structures. Using numerical simulations, we show that an asymmetrically apodized Kerr nonlinear microresonator structure with 5 microresonators can be used as an all-optical diode.

**16:45-17:00 W4J-(8)-3
Design and analysis of athermal silica-based PLC devices using bimetal plate temperature compensator**

Ding-wei Huang, Shu-mei Yang, Shih-jung Chang, and Tsung-hsuan Chiu
Industrial Technology Research Institute, Taiwan
Athermal silica-based PLC devices using bimetal plate temperature compensator is designed and analyzed with corrected theory and finite element analysis. With the help of finite element analysis of thermal stress.....

December 17, Wednesday

Room 101 -- (1F)

W4D · High-field Laser Physics
--- continued

17:00-17:15 W4D-(3)-3
Development of future all-solid-state, ultraviolet, terawatt laser system using Ce:LiCaF as a gain medium
Shingo Ono , Yuji Suzuki , Alex Quema , Hiroshi Takahashi , Nobuhiko Sarukura, Hiroki Sato, and Tsuguo Fukuda
Institute for Molecular Science; Tohoku University, Japan
The 25-fs, 290-nm pulses are successfully generated by the hollow-fiber pulse compression. Additionally, a coaxially pumped, large-aperture ultraviolet power-amplifier is demonstrated to have 98-mJ output. These elements will be the key devices for TW-class UV CPA laser systems.

17:15-17:30 W4D-(3)-4
210 nm ultraviolet generation using blue-violet laser diode and BBO SHG crystal
Kenji Ohara, Minako Sako, and Koji Nonaka
Kochi University of Technology, Japan
Ultra-violet light of 210 nm wavelength is generated by using 420 nm blue-violet laser diode and BBO SHG crystal. We believe this is the first observation of 210 nm deep ultraviolet coherent light generation.....

Room 105 -- (1F)

W4E · Confocal, Multi-Photon and Nonlinear Optical Microscope --- continued

17:00-17:15 W4E-(12)-3
Converse-flexoelectric movement of lipid-vesicle membranes characterized by differential confocal microscopy
Po-Hsiang Wang, Hui-Yu Chiang, and Chau-Hwang Lee
Academia Sinica, Taiwan
We use differential confocal microscopy to detect the movement of lipid-vesicle membranes under injected current and find the movement at 50 nA can be more than 600 nm, which is larger than that in cell membranes by three orders of magnitude.

17:15-17:30 W4E-(12)-4
Polarimetric imaging of SHG light for spatial distribution measurement of collagen orientation in biological tissue
T. Yasui, K. Shimabayashi, Y. Tohno, and T. Araki
Osaka Univ.; Nara Medical Univ., Japan
We propose a new optical method to indicate distribution of structural orientation of the collagen in biological tissue based on a two-dimensional polarimetric imaging of collagen-induced second-harmonic-generation light.

Room 106 -- (1F)

W4H · Optical Storage (II) --- continued

17:00-17:15 W4H-(9)-4
Use of quantum dot nanocrystals for spectrally encoded optical data storage
James W. M. Chon and Min Gu
Swinburne University of Technology, Australia
In this paper, we demonstrate the spectral encoding capability of quantum dot nanocrystals (QDs), which can be applied to optical data storage to greatly improve storage density.

17:15-17:30 W4H-(9)-5
Self-diagnostic techniques for free-space optical switching
Hsiao-Hua Chu and Melanie J Holmes
University of Cambridge; Cambridge Photonics Ltd., UK
We report novel methods for confirming pixel functionality and assisting optical alignment in a free space optical switch based on pixellated holograms in liquid crystal over silicon technology.

Room 107 -- (1F)

W4A · DWDM Systems --- continued

17:00-17:15 W4A-(13)-4
Homodyne crosstalk tolerance enhancement by all-active MZI-SOA wavelength converters
Y. C. Ku, K. Chan, W. Hung, C. K. Chan, L. K. Chen, and Frank Tong
The Chinese University of Hong Kong, Hong Kong
In this paper, we propose and experimentally investigate the use of all-active MZI-SOA wavelength converters to suppress the homodyne crosstalk of high-speed optical signals. Crosstalk tolerance is found to be enhanced by >19-dB for 2.5-Gbps data and about 7-dB for 10-Gbps data.

17:15-17:30 W4A-(13)-5
The gain stability of Raman amplifier in WDM system
Jeng-Cherng Dung, Han-Yang Cheng, and Sien Chi
National Chiao Tung University, Taiwan
Experiments on a six-channel WDM system with DRA show the gain variation of less than 0.05 dB under the situation of dropping channels. The gain variation arising from the add/drop channels and the change of input signal powers.....

Room 110 -- (1F)

W4G · THz Radiation and Imaging --- continued

17:00-17:15 W4G-(6)-2
Simultaneous measurement of thickness and water content of thin black ink films for printing using THz-radiation
H. Ohtake, Y. Suzuki, S. Ono, H. Murakami, N. Sarukura, T. Hirosumi, and T. Okada
Institute for Molecular Science; AISIN SEIKI CO., LTD.; Mitsubishi Heavy Industry Co., Ltd., Japan
A simple, non-contact and simultaneous measurement for thickness and water content of black ink films is performed using THz-radiation from its frequency-dependent and independent absorption characteristics of black ink films.

17:15-17:30 W4G-(6)-3
Terahertz radiation imaging system based on 2D-EO sampling with a CMOS Camera
Masahiko Tani, Taijiro Yonera, Michael Herrmann, and Masanori Hanyo
Osaka University; Communications Research Lab, Japan
We have developed an imaging system for terahertz radiation based on two-dimensional electro-optic sampling. In place of a CCD camera, it uses a high-speed CMOS camera operated in a differential mode synchronized to the pump laser.

December 17, Wednesday

Int'l Reception Hall -- (1F)

W4F · THz-Wave Nonlinear Optics --- continued

**17:00-17:15 W4F-(5)-4
Reflection imaging system with terahertz-wave parametric oscillator**

Tomofumi Ikari, Kodo Kawase, Hiroaki Minamide, Youichi Ishikawa, and Hiromasa Ito
Photodynamics Research Center, RIKEN; Tohoku University, Japan
We demonstrated the reflection imaging system using a terahertz-wave parametric oscillator (TPO). Reflection images were acquired on a test sample consisting of bands of aluminum film, as well as on pig tissue.

**17:15-17:30 W4F-(5)-5
Observation of THz region vibrational spectra in biomolecules**

Youichi Ishikawa, Hiroaki Minamide, Tomofumi Ikari, and Hiromasa Ito
RIKEN PDC; Tohoku University, Japan
We report on THz spectroscopy of biomolecules using a THz-wave parametric oscillator (TPO). We successfully observed the absorption peaks of related compounds including the structural isomers. The peaks for salicylic acid was in agreement with reported peaks.....

Ever Green Room -- (10F)

W4B · GaN Light Sources --- continued

**17:00-17:30 W4B-(2)-4
(Invited)**

GaN based white LED
Hisaki Kato, Toshiya Uemura, Naoki Shibata, Hisao Yamaguchi, and Takemasa Yasukawa
Toyoda Gosei Co., Ltd., Japan
We have developed the new type GaN based white LEDs utilizing a combination of short wavelength LEDs and phosphors, which have a high color rendering index and high luminous intensity.

Spanish Room -- (10F)

W4C · Modeling of Photonic-Crystal/Periodic Structures --- continued

**17:00-17:15 W4C-(14)-4
Rigorous analysis of guided modes of photonic crystal waveguides using lattice sums technique**

Kiyotoshi Yasumoto and Hongting Jia
Kyushu University, Japan
A rigorous approach for modal analysis of two-dimensional photonic crystal waveguides consisting of a lattice of circular rods is presented, using the lattice sums and the generalized reflection and transmission matrices for the multilayered system.

**17:15-17:30 W4C-(14)-5
Modal analysis of photonic crystal planar waveguides using a finite difference method**

Chin-ping Yu and Hung-chun Chang
National Taiwan University; Taiwan
A finite difference solution method is formulated for solving modes propagating on photonic crystal planar waveguides. The photonic crystal is composed of either air columns or dielectric rods and both TE and TM modes are obtained.

Auditorium -- (10F)**Sky Lounge -- (12F)**

W4J · Waveguide Devices (II) --- continued

**17:00-17:15 W4J-(8)-4
A nonreciprocal wavelength-interleaving bidirectional coherent fiber transversal filter**

Yicheng Lai, W. Zhang, J. A. R. Williams, and I. Bennion
Aston University, UK
A bidirectional nonreciprocal wavelength-interleaving coherent fiber transversal filter structure is demonstrated. Stable, low loss operation is achieved with reconfigurable response for interleaved channel spacing of 0.8nm with >30dB isolation and ultra-low chromatic dispersion.

**17:15-17:30 W4J-(8)-5
Simple wavelength selective optical add/drop filter for WDM systems**

Seung-Hyun Cho, Jae-Dong Park, Byung-Whi Kim, Min-Ho Kang, and Dong-Wook Shin
Electronics and Telecommunications Research Institute; Information and Communication University; Hanyang University, Korea
We propose a novel structure of wavelength selective optical add/drop filter comprising two tap couplers and a fiber Bragg grating. The device has unique features including a simpler structure and a lower implementation cost.

December 17, Wednesday

Room 101 -- (1F)

W4D · High-field Laser Physics
--- continued

17:30-17:45 W4D-(3)-5
Recent progress in table-top multi-terawatt laser system at SIOM

L. H. Lin, Z. Z. Xu, X. D. Yang, R. X. Li, H. H. Lu, W. Y. Wang, Y. X. Leng, Z. Q. Zhang, Y. H. Jiang, S. Q. Jin, D. J. Ying, and W. Q. Zhang
Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China

We present a 10-Hz, 23-TW Ti:sapphire laser system based on chirped pulse amplification and a 16.7-TW laser system based on optical parametric chirped pulse amplification for high-field laser physics research at SIOM, CAS.

17:45-18:00 W4D-(3)-6
Scaling of ion energies with size of atomic clusters irradiated by high-intensity femtosecond laser pulses

Shaohui Li, Cheng Wang, Xiangxin Wang, Jiansheng Liu, Pinpin Zhu, Ruxin Li, Guoquan Ni, and Zhizhan Xu
Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China

Energies of ions emitted from large rare gas clusters irradiated by high intensity femtosecond laser pulses have been measured and the dependence of the average energy of ions on cluster sizes have been studied experimentally.

Room 105 -- (1F)

W4E · Confocal, Multi-Photon and Nonlinear Optical Microscope --- continued

17:30-17:45 W4E-(12)-5
Muti-harmonic generation biopsy of skin

Cheng-Chi Chen, Shi-Wei Chu, I-Hsiu Chen, Chi-Kuang Sun, Yung-Chih Chen, and Bai-Ling Lin
National Taiwan University; Development Center for Biotechnology; National Taiwan Normal University, Taiwan

Avoiding the on-focus photodamage and phototoxicity problem of two-photon-fluorescence excitation, harmonic generation biopsy based on a ~1300 nm light source provides a truly non-invasive and highly penetrative optical sectioning of skin.

17:45-18:00 W4E-(12)-6
Two-photon UV fluorescence excitation of the amino acids by a frequency doubled femtosecond optical parametric oscillator

Te-Chen Yang and Fu-Jen Kao
National Sun Yat-sen University, Taiwan

In this study, we have demonstrated the use of a frequency-doubled femtosecond optical parametric oscillator in generating two-photon excitation that is equivalent to ultraviolet (UV) light with wavelength less than 300 nm.....

Room 106 -- (1F)

W4H · Optical Storage (II) --- continued

17:30-18:00 W4H-(9)-6
(Invited)
Miniature lens for correcting elliptical and astigmatic laser diode beam as applied to optical storage and communications

Suganda Jutamulia
Newtonics, USA

A novel miniature correcting lens is proposed to correct the elliptical and astigmatic laser diode beam without generating frequency and intensity fluctuations, which can be applied to optical storage and communications.

Room 107 -- (1F)

W4A · DWDM Systems --- continued

17:30-18:00 W4A-(13)-6
(Invited)
Architecture for next generation optical networks

Ron Skoog and Ann VonLemen
Telcordia Technologies, USA

Room 110 -- (1F)

W4G · THz Radiation and Imaging --- continued

17:30-17:45 W4G-(6)-4
Magnetic-field dependence of THz-radiation from femtosecond-laser- irradiated InAs up to 27 T

Hiroshi Takahashi, Yuji Suzuki, Alex Quema, Ryoichiro Yoshioka, Shingo Ono, Nobuhiko Sarukura, Masato Hosomizu, Takeyo Tsukamoto, Shingo Saito, Kiyomi Sakai, Gen Nishijima, and Kazuo Watanabe

The Graduate University for Advanced Studies; Institute for Molecular Science; Tokyo University of Science; Communication Research Laboratory; Tohoku University, Japan

Magnetic field dependence of THz-radiation from InAs surface was investigated up to 28-T. It is found that THz-radiation power exhibits oscillation-behavior with increasing magnetic-field, and the maximum power is obtained at around 3-T.

17:45-18:00 W4G-(6)-5
THz emission characteristics dependence on gap spacing of biased photoconductive antennas

Rone-Hwa Chou, Tze-An Liu, and Ci-Ling Pan
National Chiao Tung University, Taiwan

The terahertz (THz) emission experiments on the biased photoconductors fabricated with SI-GaAs were performed using single femtosecond pulses under the same excitation.

18:30-20:00
Conference Banquet

December 17, Wednesday

Int'l Reception Hall -- (1F)

W4F · THz-Wave Nonlinear Optics --- continued

17:30-17:45 W4F-(5)-6
Effective field theory for pulse propagation in nonlinear photonic crystals

J.E. Sipe, Navin Bhat, Philip Chak, and Suresh Pereira
University of Toronto, Canada;
Institute für Theorie der Kondensierten Materie, Germany
 Using a canonical formulation of Maxwell's equations, we introduce an effective-field theory for the nonlinear optics of photonic crystals of arbitrary dimensionality. Application to the study of nonlinear pulse propagation in photonic crystal is highlighted.

17:45-18:15 W4F-(5)-7 (Invited)
Coherent THz waves based on difference-frequency generation

Yujie J. Ding and Wei Shi
Lehigh University, USA
 During this presentation, we will summarize our recent results and describe our future directions on efficient generation of coherent and tunable THz waves based on parametric processes in a variety of second-order nonlinear materials.

Ever Green Room -- (10F)

W4B · GaN Light Sources --- continued

17:30-17:45 W4B-(2)-5
Low-threshold lasing of optically pumped InGaN vertical-cavity surface-emitting lasers with dielectric mirrors

Takehiko Tawara, Hideki Gotoh, Tetsuya Akasaka, Naoki Kobayashi, and Tadashi Saitoh
NTT Corporation, Japan
 III-nitride VCSELs are fabricated by removing SiC substrate from the III-nitride cavity, and subsequent wafer bonding of the cavity and DBRs. Low-threshold lasing action in InGaN VCSELs with dielectric DBRs is observed at room temperature by optical pumping.

17:45-18:00 W4B-(2)-6
High-quality InN grown by rf-plasma assisted molecular beam epitaxy as novel material for optical communication

Mizue Kawai, Akihiko Kikuchi, and Katsumi Kishino
Sophia University, Japan
 High quality InN films were grown by rf-plasma assisted molecular beam epitaxy. The fundamental bandgap was evaluated to be 0.7 eV. The room temperature photoluminescence (PL) intensity was improved with the narrow PL-FWHM of 88 meV by optimizing the V/III supply ratio and buffer layer.....

Spanish Room -- (10F)

W4C · Modeling of Photonic-Crystal/Periodic Structures --- continued

17:30-17:45 W4C-(14)-6
Radiation loss of grating-assisted directional couplers using the Floquet-Bloch theory

Chih-Cheng Chou, Nai-Hsiang Sun, Jerome K. Butler, and Gary A. Evans
I-Shou University, Taiwan;
Southern Methodist University, USA
 Floquet-Bloch theory is used to determine the radiation loss of a grating- assisted directional coupler. Also, an analytic formula for the radiation loss is derived. Results from both the Floquet-Bloch theory and the analytic formula are compared with...

17:45-18:00 W4C-(14)-7
Analysis of transmission and reflection characteristics of contra-directional coupling in corrugated waveguides

Nai-Hsiang Sun, Szu-Chou Chang, Jerome K. Butler, and Gary A. Evans
I-Shou University, Taiwan;
Southern Methodist University, USA
 Floquet-Bloch theory and Mahmoud-Beal's method are used to calculate the spectrum and the power distribution of contra-directional coupling in dielectric waveguides. Results from the Floquet-Bloch theory and the Mahmoud-Beal method are in close agreement with that of the

Auditorium -- (10F)**Sky Lounge -- (12F)**

W4J · Waveguide Devices (II) --- continued

17:30-17:45 W4J-(8)-6
Fiber fuse terminator

S. Yanagi, S. Asakawa, M. Kobayashi, Y. Shuto, and R. Nagase
Nippon Telegraph and Telephone Corporation, Japan
 We developed a fiber fuse terminator to ensure the safe operation of high power optical network systems. The performance of this fiber fuse terminator was satisfactory as regards an optical input of 2 W.

17:45-18:00 W4J-(8)-7
Delayed self-heterodyne linewidth measurement of fiber Bragg grating laser

Tadashi Nezu, Yosuke Tanaka, and Takashi Kurokawa
Tokyo University of Agriculture and Technology, Japan
 We realized highly stable lasing using a fiber Bragg grating laser. The spectral linewidth measured by delayed self-heterodyne method was less than 1 kHz.

18:30-20:00
Conference Banquet

December 17, Wednesday