	Kauai Ballroom, Kona (NLO)	Kauai Ballroom, Halele'a (NLO)	Kauai Ballroom, Ko'olau (ISOM/ODS)
Sunday, 17 July			
14:00–18:00	**Registration Open,** *Kauai Court*		
Monday, 18 July			
7:00–18:30	**Registration Open,** *Kauai Court*		
8:00–8:15	**Opening Remarks**, *Kauai Ballroom, Kona*		**Opening Remarks**, *Kauai Ballroom, Ko'olau*
8:15–10:00	**NMA ● Materials I**, *Kauai Ballroom, Kona*		**OMA • Keynote/Nano-photonics** *(ends at 10:15)*
10:00–10:30	**Coffee Break & Exhibit Time**, *Kauai Court*		
10:30–12:30	**NMB ● Quantum Optics I**	**NMC ● Terahertz**	*(starts at 10:45)* **OMB • Holographic Memory**
12:30–19:30	**Free Afternoon for NLO Sessions** *(on your own)*		
14:00 -- 15:45			**OMC • Components**
15:45 -- 17:15			**OMD • ISOM/ODS Poster Session I**, *Puna Ballroom*
17:15--18:45			**OME • Media/Fabrication**
19:30–21:30	**NMD ● Nonlinear Absorption and Magnetization**	**NME ● Lasers and OPOs**	
Tuesday, 19 July			
7:30–18:00	**Registration Open**, *Kauai Court*		
8:00–10:00	**NTuA ● Plasmons and Solitons**	**NTuB ● Nonlinear Spectroscopy I**	**OTuA • Near-field/Plasmonics**
10:00–10:30	**Coffee Break & Exhibit Time**, *Kauai Court*		
10:30–12:30	**NTuC ● Solitons**	**NTuD ● Materials II**	**OTuB • Femtosecond Applications/Phase-change**
12:30–19:30	**Free Afternoon for NLO Sessions** (*on your own*)		
14:00--15:30			**OTuC • Drive Technologies/Signal Processing**
15:30--17:00			**OTuD • ISOM/ODS Poster Session II,** *Puna Ballroom*
19:00–21:00	**Evening Registration Open,** *Kauai Court*		
19:30–21:30	**NTuE ● Waveguides**	**NTuF ● Biophotonics, Optomechanics and Optofluidics**	*(starts at 19:00)* **OTuE • Special Session on Hybrid Recording**
Wednesday, 20 July			
7:30–17:30	**Registration Open**, *Kauai Court*		
8:00–10:00	**NWA ● Symposium Celebrating the 50th Anniversary of Nonlinear Optics I,** *Kauai Ballroom, Kona*		
10:00–10:30	**Coffee Break & Exhibit Time**, *Kauai Court*		
10:30–12:30	**NWB ● Symposium Celebrating the 50th Anniversary of Nonlinear Optics II,** *Kauai Ballroom, Kona*		**OWA • Micro-hologram** *(ends at 12:00)*
12:30–14:00	**Lunch Break** *(on your own)*		
14:00–15:30	**NWC ● Quantum Optics II**	**NWD ● Frequency Comb Generation**	**OWB • Volume Recording**
16:00--17:00			**OWC • ISOM/ODS Postdeadline Session**
15:30–17:30	**NWE ● NLO Poster Session**, *Puna Ballroom*		
18:00–21:00	**Luau,** ***Luau Gardens (Rain back-up: Ka Mala)***		
Thursday, 21 July			
7:30–12:30	**Morning Registration Open**, *Kauai Court*		
8:00–10:00	**NThA ● High Intensities**, *Kauai Ballroom, Kona*		
10:00–10:30	**Coffee Break & Exhibit Time**, *Kauai Court*		
10:30–12:30	**NThB ● Photonic Crystal and Waveguides Arrays**	**NThC ● Modelocked Lasers and Continuum Generation**	
12:30–19:30	**Free Afternoon** (*on your own*)		
19:00–21:00	**Evening Registration Open,** *Kauai Court*		
19:30–21:30	**NThD ● Nanophotonics**, *Kauai Ballroom, Kona*		
Friday, 22 July			
7:30–12:00	**Morning Registration Open**, *Kauai Court*		
8:00–10:00	**NFA ● Frequency Combs and Waveform Synthesis**, *Kauai Ballroom, Kona*		
10:00–10:30	**Coffee Break & Exhibit Time**, *Kauai Court*		
10:30–12:30	**NFB ● Nonlinear Spectroscopy II**		

NMA--NFB	NLO Sessions
OMA--OWC	ISOM/ODS Sessions

Joint International Symposium on Optical Memory & Optical Data Storage (ISOM/ODS) Abstracts

• Sunday, 17 July, 2011 •

Kauai Court, Registration Open, 14:00 – 18:00

• Monday, 18 July, 2011•

Kauai Ballroom, Ko'olau, Welcome Remarks, 08:00 – 08:15

OMA • Keynote/Nano-photonics

Kauai Ballroom, Ko'olau
08:15--10:15
Robert McLeod; Dept. of Electrical and Computer Eng, Univ. of Colorado at Boulder United States;
Yoshimasa Kawata; Shizuoka University Japan; Presiders

OMA1 • 08:15 Invited
Fundamental Understanding of Near Field Transducers, Lambertus Hesselink[1]; [1]*Department of Electrical Engineering, Stanford University, USA.* In this keynote presentation I will address fundamental principles underlying the operation of near field transducers. In particular emphasis will be placed on using vector field topology for improved understanding. Selected examples of near field transducers will be presented related to IT applications.

OMA2 • 08:45 Invited
The role of nanotechnology in data storage devices and systems, Masud Mansuripur[1]; [1]*College of Optical Sciences, The University of Arizona, USA.* As data storage technologies evolve, the balance among electronic, magnetic, and optical modes of storage shifts in unpredictable ways. Commercial success is tied to the ability to continually shrink the individual bit's spatial dimensions.

OMA3 • 09:15 Invited
High-speed Near Field Optical recording Using Plasmonic Flying Head, Liang Pan[1,2], Insik Park[1], Erick Ulin-Avila[1], Yi Xiong[1], Li Zeng[1], Cheng Sun[1,3], David Bogy[1,2], Xiang Zhang[1]; [1]*NSF Nano-scale Science and Engineering Center (NSEC), University of California Berkeley, USA;* [2]*Mechanical Engineering, Computer Mechanics Laboratory, Department of Mechanical Engineering, University of California, USA;* [3]*Mechanical Engineering, Northwestern University, USA.* We demonstrated the parallel maskless plasmonic nanolithography at 10 meter/second. This is a low-cost high-throughput nano-fabrication scheme which has the potential of a few orders of magnitude higher throughput than current maskless techniques.

OMA4 • 09:45 Invited
Plasmonic coupling of near-field optical disk, Din Ping Tsai[1,2]; [1]*Department of Physics, National Taiwan University, Taiwan;* [2]*National Instrument Technology Research Center, Taiwan.* We investigate surface plasmon polariton coupling between two nano-recording marks. The different coupling characteristics and the read-out reflection signal of disk- and ring-shapes recording marks will be discussed.

OMB • Holographic Memory

Kauai Ballroom, Ko'olau
10:45 -- 12:30
Yuzuru Takashima, Stanford Univ., USA;
Tsutomu Shimura; Univ. of Tokyo; Presiders

OMB1 • 10:45 Invited
Wavefront compensation for holographic data storage, Norihiko Ishii[1], Tetsuhiko Muroi[1], Nobuhiro Kinoshita[1], Koji Kamijo[1], Hiroshi Kikuchi[1], Naoki Shimidzu[1]; [1]*Science & Technology Research Laboratories, NHK (Japan Broadcasting Corporation), Japan.* We have been studying adaptive optics to compensate for hologram distortion optically and improve bit-error-rate of the reproduced data. This method is effective when photopolymer recording media, whose volume is changed by photopolymerization, is used.

OMB2 • 11:15
Fabrication of PDLC Diffuser Using Applied Magnetic Field and Holographic Multiplexing Technique, Satoshi Honma[1], Tatsuya Hasegawa[1], Yuta Ishihara[1], Toru Sekiguchi[1]; [1]*. Yamanashi Univ. Japan.* We propose a new fabrication method of PDLC diffuser for speckle-multiplexing holographic memories. Six random phase codes are generated by applying electric field to the filter. It increases recording density of the holographic memories dramatically.

OMB3 • 11:30
Holographic Diversity Detection of Spatial Quadrature Amplitude Modulation Signal for Dual-Stage Holographic Memory, Keisuke Kunori[1], Atsushi Okamoto[1], Akihisa Tomita[1], Masanori Takabayashi[1]; [1]*Hokkaido University, Japan.* We propose a new method to detect multi-level phase signals by generating 4-pieces of digital hologram by single shot hologram reading without using the reference light of a resolution higher than the signal page data.

OMB4 • 11:45
Self-Referential Holographic Data Storage by Phase-Modulation Technique, Masanori Takabayashi[1], Atsushi Okamoto[1]; [1]*. Hokkaido University, Japan.* A self-referential holographic recording geometry, in which signal beam works as reference beam for recording of itself, having many attractive advantages is newly proposed. The purely one-beam holographic operation is performed by simulation and experiment.

OMB5 • 12:00
High-Density Recording Method with RLL Coding for Holographic Memory System, Yusuke Nakamura[1], Ken-ichi Shimada[1], Toshiki Ishii[1], Hajime Ishihara[1], Makoto Hosaka[1], Taku Hoshizawa[1]; [1]*Yokohama Research Laboratory, Hitachi, Ltd., Japan.* A high-density recoding method with RLL coding and smaller Fourier plane filter has been developed. With this method, we confirmed a holographic drive system with 667GB capacity feasible.

OMB6 • 12:15
Region-Divided Adaptive Equalization for Holographic Memory, Makoto Hosaka[1], Toshiki Ishii[1], Taku Hoshizawa[1]; [1]*Yokohama Research Laboratory, Hitachi, Ltd., Japan.* Holographic memory channels suffer from disturbances. We revealed inter-pixel interferences vary even in the same page by the disturbances. Using the newly developed region divided adaptive equalization, we can improve SNR by 3.5 dB.

OMC • Components

Kauai Ballroom, Ko'olau
14:00 -- 15:45
Koichi Watanabe; Japan;
Ryuichi Katayama; Fukuoka Institute of Technology Japan; Presiders

OMC1 • 14:00 Invited
All-Semiconductor-Laser Light Sources Generating High-Peak-Power Picosecond Optical Pulses, Masaru Kuramoto[1,2], Masao Ikeda[1,2], Hiroyuki Yokoyama[2]; [1]*Advanced materials laboratory, Sony corporation, Japan;* [2]*New Industry Creation Hatchery Center, Tohoku University, Japan.* We have developed highly functional all-semiconductor-laser light sources at the wavelength of 400 and 800 nm. These light sources have been successfully applied for three-dimensional optical data storage as well as for two-photon fluorescence bioimaging.

OMC2 • 14:30 Invited
Development and Application of Highly Functional Ultrashort Pulse Fiber Lasers, Norihiko Nishizawa[1]; [1]*Electrical Engineering and Computer Science, Nagoya University, Japan.* We have demonstrated generation of wideband, ultrafast wavelength tunable ultrashort pulses and high quality super continuum based on ultrashort pulse fiber lasers. Their applications for ultrahigh resolution optical coherence tomography and NIR spectroscopy are described.

OMC3 • 15:00
Ultra-Compact Optical Module of Homodyne Detection, Hideharu Mikami[1], Takahiro Kurokawa[1], Koichi Watanabe[1]; [1]*Hitachi, Ltd., Central Research Laboratory, Japan.* We demonstrated ultra-compact and low-cost implementation of homodyne detection. The assembled module size was 10 x 30 mm2. Jitter of the attenuated BD-R readout signals was improved from 15% to 7.8% by applying the module.

OMC4 • 15:15
Experimental Demonstration of Reducing Interlayer Crosstalk of Multilayer Disc in a Three Beam Optical Disc Tester Using Polarizing Device, Eriko Tatsu[1], Shigeharu Kimura[1], Tatsuro Ide[1], Takahiro Kurokawa[1], Koichi Watanabe[1]; [1]*. Hitachi, Japan.* We demonstrated interlayer crosstalk reduction of multilayer disc by using a polarizing device in a three-beam optical disc tester experimentally. Application of the device to a dual-layer BD with 5 μm layer spacing showed satisfactory effect, roughly halving DPP signal fluctuation.

OMC5 • 15:30
Subwavelength Focusing Technique using a Plasmonic Lens, Minoru Takeda[1], Suguru Nakatani[1]; [1]*Kyoto Institute of Technology, Japan.* We fabricated a plasmonic lens with only a several micron diameter ring slit and confirmed that it can produces a subwavelength focusing spot not only in the near-field, but also in the quasi far-field region.

Kauai Court, Coffee Break, 15:45 – 16:15

OMD • ISOM/ODS Poster Session I

Puna Ballroom
15:45 --17:15

OMD1
Müller Matrix Characterisation of μ-SIL, Carlos Macias-Romero[1], Peter Török[1], Matthew R. Foreman[1]; [1].We report on the response of a micrometric solid immersion lens to different states of polarisation by means of confocal Müller matrix polarimetry.

OMD2
Why is My Grating Blue? Donald A. Chernoff[1], David L. Burkhead[1]; [1]. We describe practical manufacturing tolerances for optical and magnetic data patterns and how to measure accurately. Designers of nanophotonic devices should consider whether real-world performance will be degraded by normal variations in feature position, size or shape.

OMD3
Error Correcting Capable 2/4 Modulation Code Using the Trellis Coded Modulation in Holographic Data Storage, Yong-ok Kim[1], Gyuyeol Kong[1], Sooyong Choi[1]; [1].We propose error correcting capable 2/4 modulation code using the trellis coded modulation without data rate loss. We make a new symbol set for 2/4 modulation code and define distances between symbols.

OMD4
Fuzzy based Intelligence Method for Image Processing System in Holographic Data Storage System, Jang Hyun Kim[1]; [1]*Yonsei University, Republic of Korea.* A holographic data storage system has the advantages of a high data rate, rapid access and a multiplexing method. In this paper, we propose image processing method by fuzzy system and wavelet transform algorithm. It is intelligence algorithm in holographic data storage system.

OMD5
Estimating Facial Angle for Face Recognition System with Holographic Memory and Stereo-Vision Technology, Satoshi Honma[1], Yasuaki Yagisawa[1], Hidetomo Momose[1], Toru Sekiguchi[1]; [1].We have proposed facial recognition system FARSAHS. This system makes CG facial image reorientated to front of the virtual camera. This function maintain high recognition rate when the facial direction to camera changes.

OMD6
Optical Data Storage Induced by a Radially Polarized Beam, Xiangping Li[1], Min Gu[1]; [1]. In this paper we report on the application of a radially polarized beam in three-dimensional optical data storage. Super-resolution recording by employing an annual objective has been demonstrated.

OMD7
Shock Isolation of Optical Pickup in Optical Disk Drive, Wonseok Oh[1], Seungho Lim[1], Kyoung-Su Park[1], No-Cheol Park[1], Young-Pil Park[1], Jae-Sung Lee[2], Han-Baek Lee[2]; [1]*Center for Information Storage Device, Republic of Korea;* [2]*Hitachi-LG Data Storage, Republic of Korea.* This research investigates to analysis and to design the shock isolator to protect the pickup from the external shock during shipping.

OMD8
Optical Disc Drives: A Study of Variation, Guilin Jiang[1], Barry M. Lunt[1], Travis Niederhauser[2], Matthew Linford[1]; [1]*Brigham Young University, USA;* [2]*Millenniata, Inc., USA.* Optical disc drives vary significantly in their performance. Here we report a principal components analysis performed on data from new drives, which separates out the better performing drives and finds correlations among drive test variables.

OMD9
Iterative Decoding Method Using Two-Dimensional Single Parity Code for Holographic Data Storage, Taehyung Kim[1], Gyuyeol Kong[1], Sooyong Choi[1]; [1]*Yonsei University, Republic of Korea.* Iterative decoding method using two-dimensional single parity code which ensures high code rate and low complexity compared to its performance gain is proposed. The proposed scheme gives the error correction capability to constant weight block code.

OMD10

Optical Disc Life Expectancy: A Field Report, Barry M. Lunt[1], Douglas Hansen[2], Matthew Linford[1]; *[1]Information Technology, Brigham Young University, USA; [2].* The lifetime expectancy (LE) of optical discs has often been determined with accelerated testing. This paper reports on the LE of discs subjected only to normal controlled conditions of temperature, humidity and light.

OMD11

Iterative Two-dimensional Partial Response Maximum Likelihood Detection Method with Constant-Weight Constraint Code for Holographic Data Storage Systems, Gyuyeol Kong[1], Sooyong Choi[1]; *[1]School of Electrical and Electronic Engineering, Yonsei university, Republic of Korea.* We propose an iterative 2D PRML detector. Two reduction schemes, reduced-state trellis and constant-weight constraint, are used to make detector structure simple. The proposed 2D PRML detector uses iterative detection to prevent the performance degradation.

OMD12

High Density Recording with Guided-Layer Media, In-Gu Han[1]; *[1].*The possibility of a guided-layer recording system is confirmed with recording test using the two 405nm LDs. Recordable guided-media is fabricated with a recording layer and a guide layer. Recording capacity of 25 GB could be recorded on a flat recording layer.

OMD13

Simplified Decoding of Trellis-Based Error-Correcting Modulation Codes Using M-Algorithm for Holographic Data Storage, Jinyoung Kim[1], Jaejin Lee[1]; *[1].* We investigate the simplified decoding of the trellis-based error-correcting modulation codes using M-algorithm for holographic data storage. When the M-algorithm is used in trellis-based error-correcting modulation codes, the delay and complexity problem can be reduced.

OMD14

A Simple Decoding Scheme for the Balanced 6/8 Modulation Code, Gukhui Kim[1], Jinyoung Kim[1], Jaejin Lee[1]; *[1].*
We propose the demodulation algorithm, which uses hard decision demodulation and has the same performance as when demodulation algorithm is soft decision.

OMD15

InGeSbSnTe Phase Change Thin Film for Blu-Ray Rewritable Optical Recording, Sin-Liang Ou[1], Po-Cheng Kuo[1], Han-Feng Chang[2], Chin-Yen Yeh[2], Chao-Te Lee[3], Donyau Chiang[3]; *[1]Institute of Materials Science and Engineering, National Taiwan University, Taiwan; [2]CMC Magnetics Corporation, Taiwan; [3]Instrument Technology Research Center, National Applied Research Laboratories, Taiwan.* The crystallization temperature of the In10GexSb52-xSn23Te15 films (x = 2, 5, and 9) film is increased with increasing Ge content. The optimum jitter value of the film with 4X recording speed is 6.6%.

OMD16

Evaluation of the Performance in Multilayer Collinear Holographic Memory with Movable Random Phase Mask, Atsushi Shibukawa[1], Atsushi Okamoto[1], Akihisa Tomita[1], Masanori Takabayashi[1], Kunihiro Sato[2], Masatoshi Bunsen[3]; *[1]Hokkaido University, Japan; [2]Hokkai-Gakuen University, Japan; [3]Fukuoka University, Japan.* We demonstrated that introducing multi-layered technique into collinear holographic memory can realize higher quality holographic recording/reading and expand the storage density by a factor of 2 through homogeneous utilization of the recording medium.

OMD17

Nonlinear Equalization of the Super-RENS Read-out Signal Using the AANGD Algorithm with a Non-causal Structure, Seokhun Jeon[1], Sungbin Im[1]; *[1].* To mitigate the nonlinearity in a super-RENS read-out signal we carry out equalization with the AANGD algorithm. The experimental result demonstrates that the AANGD algorithm can effectively reduce the nonlinearity while maintaining lower computational complexity.

OMD18

Real-Time Optimization Method of Write Strategy for Optical Discs, Nobuo Takeshita[1], Tomo Kishigami[1], Koichi Ikuta[2]; *[1]Advanced Technology R&D Center, Mitsubishi Electric Corporation, Japan; [2]Advanced Technology R&D Center, Mitsubishi Electric Corporation, Japan.* Real-time write strategy optimization method for optical discs is proposed. Write strategy is continuously optimized during recording against the variation of recording characteristics and environments. Effectiveness is experimentally confirmed with BD and DVD discs.

OMD19
Withdrawn

OMD20
CuSi thin film for write-once blue laser optical recording, Sin-Liang Ou[1], Po-Cheng Kuo[1], Han-Feng Chang[2], Chin-Yen Yeh[2], Chao-Te Lee[3], Donyau Chiang[3]; *[1]Institute of Materials Science and Engineering, National Taiwan University, Taiwan; [2]CMC Magnetics Corporation, Taiwan; [3]Instrument Technology Research Center, National Applied Research Laboratories, Taiwan.*
The thermal property, optical property and recording characteristics of the CuSi (16 nm) film were investigated. The optimum jitter value of the film with 1X recording speed is 7.5% at 6 mW.

OMD21
Thermal mode photo-resistor process discussion and applications, Hsiu-Wen Wu[1]; *[1]Department Opto-Electric engineering, National Dong Hwa University, Taiwan.* In this study, we report on use the thermal lithography technology to prepare the submicron structure for antireflection application.

OMD22
High-Speed Full Motion Analysis Based on FFT-BPM for Collinear Holographic Memory, Hisatoshi Funakoshi[1], Atsushi Okamoto[2], Masanori Takabayashi[2], Yuta Wakayama[2], Atsushi Shibukawa[2]; *[1]Faculty of Education, Gifu University, Japan; [2]Graduate School of Information Science and Technology, Hokkaido University, Japan.* Our new analysis tool can be capable of calculations more than 30 times faster than the previous method and enables to estimate practical memory densities including not only recording and reconstruction process but also error correction process.

OMD23
Modified 2D SOVA with 2D PR target for Holographic Data Storage, Keunhwi Koo[1], Soo-Yong Kim[2,1], Jae Jin Jeung[1], Sang Woo Kim[1]; *[1]Electrical Engineering, POSTECH, Republic of Korea; [2]Emerging SOC Group, Semiconductor Division, Samsung Electronics, Republic of Korea.* Existing modified Two Dimensional Soft Output Viterbi Algorithm (2D SOVA) for Holographic Data Storage (HDS) uses a 1D SOVA about two different 1D PR targets (vertical and horizontal directions) and changed cost function of the 1D SOVA. In this paper, we propose modified 2D SOVA with 2D PR target and new cost function of the 1D SOVA. For this cost function is structurally modified from the 2D PR target form, the proposed method has a better performance of Bit Error Rate (BER) than the existing method.

OME • Media/Fabrication

Kauai Ballroom, Ko'olau
17:15 -- 18:45
Atsushi Nakamura; Panasonic Corp. Japan;
Adam Urness; United States; Presiders

OME1 • 17:15 Invited
Identification of Vacancy Ratio in Crystalline GeTe Films, Fei Tong[1], Xiangshui Miao[1]; *[1].*
XRD, XPS, SQUID and magnetism calculation based on spin-polarized DFT of GeTe crystalline films with different Co-doping have been studied to identify the vacancies in GeTe. The results show that Co occupies Ge vacancy and forms Co-Te bond, and confirm 8% vacancy ratio in GeTe.

OME2 • 17:45
Lithographic Fabrication of Multi-Layered Optical Data Storage, Adam Urness[1]; *[1]University of Colorado, USA.*
We present a new fabrication method for multi-layer ROM. Individual layers of an initially-liquid holographic photopolymer are photo-patterned via mask projection and post-cured to a solid. The process is repeated to efficiently print high-density disks

OME3 • 18:00
An Approach for Measurements of Optical Constants for Molten Sb2Te3 by Spectroscopic Ellipsometer, Masashi Kuwahara[1], Rie Endo[2], Kouichi Tsutsumi[3], Fukuyoshi Morikasa[4], Tishio Fukaya[1], Masahiro Susa[2], Michio Suzuki[3], Tomoyoshi Endo[4]; *[1]; [2]Tokyo Institute of Technology, Japan; [3]J. A. Woollam Japan Co., Japan; [4]Thermo Riko Co., LTD., Japan.* We have succeeded in measuring optical constants from 350 nm to 1000 nm in wavelength for molten Sb2Te3 using a novel system consisting of a spectroscopic ellipsometer and an infrared heating system.

OME4 • 18:15
Improvement of Reconstructed Absorption Distribution in Data Storage Medium using Absorbers Embedded in Artificial Scattering Medium, Masaya Nonaka[1], Kouichi Nitta[1], Osamu Matoba[1]; *[1].* We presented an improvement method of reconstructed absorption distribution in data storage medium with absorbers embedded in artificial scattering medium. Numerical results showed that thresholding operation reduced dramatically the size of the reconstructed absorption width.

OME5 • 18:30
Evaluation of Data Stability and Analysis of Degradation Factors for Archival Application of DVD+R Media, Kwan-Yong Lee[1]; *[1]Center for information Storage Device, Yonsei University, Republic of Korea.* For the archival application of optical disks, the degradation factors and mechanism of DVD+R were studied through the observation of microstructure and chemical composition change at recording marks and reflective layer after the acceleration test.

• Tuesday, 19 July, 2011 •

OTuA • Near-field/Plasmonics

Kauai Ballroom, Ko'olau
08:00 -- 10:00
Din Ping Tsai; Department of Physics, National Taiwan University Taiwan; Presiders

OTuA1 • 08:00 Invited
Nanophotonic Polishing of Substrate for Application to Hard-Disk and Optical-Disk Processing, Takashi Yatsui[1], Wataru Nomura[1], Motoichi Ohtsu[1]; [1]*Univ of Tokyo, University of Tokyo, Japan.* We report that nanophotonic polishing of a silica substrate using a phonon-assisted photochemical reaction drastically reduced the average surface roughness for application to hard-disk and optical-disk processing.

OTuA2 • 08:30 Invited
Application of SIL based Near Field Recording Technology to High Speed Nano Patterning, No-Cheol Park[1], Byung-Kwon Min[2], Young-Pil Park[1], Hyunseok Yang[1], Kyoung-Su Park[1], Sung-Mook Kang[1]; [1]*Center for Information Storage Device, Republic of Korea;* [2]*Department of Mechanical Engineering, Yonsei University, Republic of Korea.* In this paper, we present a low-cost and high-throughput approach to maskless nanolithography that uses a plasmonic solid immersion lens (SIL) optical head which consists of a SIL and a sharp-ridge nanoaperture for a high strong nanometer-size optical spot.

OTuA3 • 09:00
High-Speed and Precise Gap Servo System for Near-Field Optical Recording, Daiichi Koide[1], Takeshi Kajiyama[1], Haruki Tokumaru[1], Yoshimichi Takano[2], Yuta Nabata[3], Tokoku Ogata[3], Toshimasa Miyazaki[3], Kiyoshi Ohishi[3]; [1]*NHK (Japan Broadcasting Corp.), Japan;* [2]*NHK Engineering Service, Japan;* [3]*Nagaoka University of Tehcnology, Japan.* We propose a high-speed and precise gap servo of reducing harmonics of axial run-out disturbance-feed-forward control for near-field recording. We could perform gap servo at 11000 rpm applying RHD-FFC using SIL head and 100GB disk.

OTuA4 • 09:15
Trans-ABS Power Coupling Efficiency of Near Field Transducers for HAMR Calculated with Finite Element Modeling, Matt Chabalko[1], Tuviah E. Schlesinger[1], Daniel D. Stancil[1], Yi Luo[1], James A. Bain[1]; [1]*Electrical and Computer Engineering, Carnegie Mellon University, USA.* We compute the efficiency of coupling between the end of various small plasmonic waveguide NFTs and magnetic media for HAMR. Coupling ranges from 10-80% and is a strong function of geometry and material properties.

OTuA5 • 09:30
Withdrawn

OTuA6 • 09:45
Shift and Polarization Multiplexing for SIL based Near-Field Holographic Recording, Cheol-Ki Min[1], Do-Hyung Kim[2], Janghyun Cho[2], No-Cheol Park[1], Kyoung-Su Park[1], Hyunseok Yang[1], Young-Pil Park[1]; [1]*Department of Mechanical Engineering, Yonsei University, Republic of Korea;* [2]*Center for Information Storage Device, Yonsei University, Republic of Korea.* In this paper, we investigate a SIL based near-field holographic recording that combines the advantages of two systems, such as tightly focused spot of SIL in NFR and two multiplexing methods of holographic storage.

OTuB • Femtosecond Applications/Phase-change

Kauai Ballroom, Ko'olau
10:30—12:30
Masud Mansuripur; College of Optical Sciences, The University of Arizona United States; Takashi Kikukawa; TDK Corp Japan; Presiders

OTuB1 • 10:30 Invited
Ultrafast Coherent Switching of Phase-Change in Rewritable Optical Media, Muneaki Hase[1], Kotaro Makino[1], Junji Tominaga[2]; *[1]Institute of Applied Physics, University of Tsukuba, Japan; [2]Nanodevice Innovation Research Center, National Institute of Advanced Industrial Science and Technology, Japan.* We demonstrate in Ge2Sb2Te5 superlattice that the phase change from amorphous into crystalline states can be manipulated within ~ 1 picosecond by coherent excitation of the local lattice vibration using a pair of femtosecond laser pulses.

OTuB2 • 11:00 Invited
Femtosecond nanoscale phase-change dynamics in GeSbTe thin films,T. Hira[1], Y. Hongo[1], K. Tajima[1], N. Kitamura[1], T. Homma[1], Toshiharu Saiki[1]; *[1]Department of Electronics and Electrical Engineering, Keio University, Japan.* Sub-picosecond nonthermal amorphization of a GeSbTe thin film with femtosecond laser pulse excitation and complete switching of the surface plasmon resonance of a single Au nanoparticle that accompanies an ultrafast phase change were demonstrated.

OTuB3 • 11:30 Invited
Femtosecond Laser Based Polarization Multilevel Storage, Wenhao Huang[1], Yanlei Hu[1]; *[1].* We summarize femtosecond laser based high-density data storage achieved by various photochemical mechanisms, including photochromism, photobleaching and microexplosion, and focus on rewritable polarization-multiplexed and multilevel storage in photoisomeric material.

OTuB4 • 12:00 Invited
Nano Phase Change for Data Storage and Beyond, Luping Shi[1]; *[1]Data Storage Institute, A*star, Singapore.*
This work has systemically investigated the nano-phase change in terms of the materials' different properties against the dimension. The future development trend after reaching scaling limitation is discussed.

OTuC • Drive Technologies/Signal Processing

Kauai Ballroom, Ko'olau
14:00—15:30
Hajime Ishihara; Hitachi, Ltd. Japan;
Satoru Higashino; Sony Corp. Japan; Presiders

OTuC1 • 14:00
A Robust Adjacent Track Servo System with Linear Positioning Method, Yoshiyuki Urakawa[1], Yoshihiko Deoka[1], Yuichi Suzuki[1], Tomoharu Mukasa[1], Junichi Horigome[1]; *[1]Core Device Development Group, Sony Corporation, Japan.* A multi-layer disk without guide groove enables a large capacity and price competitive optical disk. We propose a novel tracking servo system which is robust and accurate for disks without groove.

OTuC2 • 14:15
Read Data Transfer Rate Estimation on Optical Phase Multilevel Recording, Atsushi Kikukawa[1], Hideharu Mikami[1], Tatsuro Ide[1], Kentaro Osawa[1], Koichi Watanabe[1]; *[1].* The inter-symbol interference in optical phase multilevel recording was solved by using multilevel PRML and it was estimated that the read data transfer rate can be at least doubled provided that signal-to-noise ratio is equivalent to current optical drives.

OTuC3 • 14:30
Inter-track Crosstalk Canceling PRML Decoder for High Density Optical Disc, Hajime Ishihara[1], Yusuke Nakamura[1], Taku Hoshizawa[1]; *[1]Yokohama Research Laboratory, Hitachi, Ltd., Japan.* To correspond to density growth by applying narrower track pitch, we developed an inter-track crosstalk canceling PRML decoder. As the result, we confirmed the feasibility of 44GB capacity a layer on a simulation model.

OTuC4 • 14:45
High Precision Feedforward Tracking Control System for Next Generation Optical Disks, Tokoku Ogata[1], Yuta Nabata[1], Tatsuya Nakazaki[1], Kiyoshi Ohishi[1], Toshimasa Miyazaki[1], Masaki Sazawa[1], Daiichi Koide[2], Yoshimichi Takano[2], Haruki Tokumaru[2];*[1]Nagaoka University of Technology, Japan; [2]Science and Technology Research Laboratories, Japan Broadcasting Corp., Japan.* This paper proposes a new high-precision feedforward tracking control system in single-rate sampling. The experimental results confirm that the proposed system well suppresses the tracking error on condition of disk rotation speed 7200[rpm] DVD. Therefore, the proposed system realizes high-precision tracking control.

OTuC5 • 15:00
Dynamic Characteristics of Optical Disk over 15,000 rpm Close to a Rigid Wall, Seungho Lim[1], Wonseok Oh[1], Byunghan Ko[1], Ungrae Cho[2], Kyoung-Su Park[1], No-Cheol Park[1], Young-Pil Park[1], Han-Baek Han[3]; *[1]Center for Information Storage Device, Republic of Korea; [2]LIG Nex1 Co. Ltd., Republic of Korea; [3]Hitachi-LG Data Storage Korea, Inc., Republic of Korea.* In this research, the dynamic characteristics of optical disk in slim drive over 15,000 rpm are identified considering the aerodynamic effect using CFD, FEM, and analytical method.

OTuC6 • 15:15
System Identification Using Embedded Dynamic Signal Analyzer, Soo-Yong Kim[1,2], Xuezhen Mao[1], Junho Huh[1], Keunhwi Koo[2], Sang Woo Kim[2]; *[1]Emerging SOC Development, Samsung Electronics Co., Republic of Korea; [2]Eletrical Engineering, Pohang University of Science and Technology, Republic of Korea.* To identify system dynamics of a control system, proposed embedded dynamic signal analyzer (EDSA) enables system to sense stability criterion. The EDSA consists of a digital resonator and a signal processing block.

Kauai Court, Coffee Break, 15:30 – 16:00

OTuD • ISOM/ODS Poster Session II

Puna Ballroom
15:30—17:00

OTuD1
Soft-Decision Viterbi Decoding Scheme and A New Reliability Metric for 4/6 Modulation Code in Holographic Data Storage, Yong-ok Kim[1], Gyuyeol Kong[1], Sooyong Choi[1]; *[1].* We propose the soft-decision Viterbi decoding with higher data rate for 4/6 modulation code. In order to define the branch metric on trellis, we introduce a new reliability for 4/6 modulation code.

OTuD2
Nonlinear Equalizer for Signal Improvement of Holographic Data Storage, Yasuyuki Yamagishi[1]; *[1].* In this paper, we applied Volterra equalizer and QMMSE equalizer to reconstructed images suffered from ISI due to aberration from the optical systems for the improvement of signal quality.

OTuD3
Line Tracking Applied Data Acquisition Method for Holographic Data Storage System, Jae-Seong Lee[1]; *[1].* The virtual detector is used which follows rows of image such as track of CD, acquiring pixel value in such location. The suggested method could compensate the image distortion without any data density loss.

OTuD4
Simplified Two-Dimensional Partial Response Maximum Likelihood Detection Method Using a Priori Information for Holographic Data Storage Systems, Gyuyeol Kong[1], Sooyong Choi[1]; *[1]School of Electrical and Electronic Engineering, Yonsei university, Republic of Korea.* We propose a simplified 2D PRML detector. Two types of the simplification, reduced-state trellis and PR target selection, are used. To overcome the performance degradation owing to the reduced-state trellis, we use a priori information.

OTuD5
Degradation Headroom: Another Issue for Archival Optical Discs, Barry M. Lunt[1], Erin Bourgeous[1], Bradley M. Lunt[1]; *[1].* Degradation headroom is the difference between the as-recorded quality of the written data, and the degree to which the written data can degrade and still be read. This is important for permanent recordable optical discs.

OTuD6
Super-Resolution Photonics for Advanced Storage Systems (SURPASS), Peter Török[1]; *[1]Imperial College London, United Kingdom.* SURPASS aims to develop and combine two superresolution technologies, namely near field detection with μSILs and "active" material layers with a view to applications in data storage and microscopy. We report on current progress.

OTuD7
Manipulation of Multi-Dimensional Plasmonic Spectra for Information Storage, Wei Ting Chen[1], Pin Chieh Wu[1], Chen Jung Chen[1], Chun-Jen Weng[2], Hsin-Chen Lee[3], Ta-Jen Yen[3], Chieh-Hsiung Kuan[4], Masud Mansuripur[5], Din Ping Tsai[1,2]; *[1]Department of Physics, National Taiwan University, Taiwan; [2]Instrument Technology Research Center, National Applied Research Laboratory, Taiwan; [3]Department of Materials Science and Engineering, National Tsing Hua University, Taiwan; [4]Department of Electrical Engineering, National Taiwan University, Taiwan; [5]College of Optical Sciences, The University of Arizona, USA.* We demonstrate a concept to enhance the capacity of optical data storage through plasmonic resonances of metallic nano-structures. Metallic nano-structures exhibit strong variations in their optical spectra due to surface plasmon resonances. It should be possible to store and retrieve data from each plasmonic spectra.

OTuD8
Turbo equalization between Partial Response Maximum Likelihood Detector and Viterbi decoder for 2/4 Modulation Code in Holographic Data Storage Systems, Gyuyeol Kong[1], Sooyong Choi[1]; *[1]School of Electrical and Electronic Engineering, Yonsei university, Republic of Korea.* We propose the turbo equalization between the PRML detector and joint Viterbi decoder combined by 2/4 modulation and convolutional decoder. By iterative process, we obtain better BER performance compared with the conventional 1D PRML detector.

OTuD9
Two-Dimensional Equalization Using Bilinear Recursive Polynomial Model for Holographic Data Storage Systems, Taehyung Kim[1], Gyuyeol Kong[1], Sooyong Choi[1]; *[1].* In order to improve the performance of equalization in quadratic holographic channel, an equalizer using two-dimensional binary recursive polynomial (BRP) model and its modified form of equalizer using BRP with decision feedback (BRPDFE) are proposed.

OTuD10
A Dual Layer Blu-ray Recordable Disc with Improved Archive Lifetime, Kun-Long Li[1], Ying-Yen Huang[1], Yung-Hui Hung[1], Cheng-Pi Li[1], Min-Hao Pan[1]; *[1]CMC Magnetics Corporation, Taiwan.* A dual layer BD-R disc with improved archive lifetime is introduced. After hundreds hours high temperature chamber test, measured jitter value remains within Specification. Arrhenius plot shows the theoretical archive lifetime more than 50 years in this dual layer BD-R disc.

OTuD11
Soft-Encoding Scheme of 3/4 Tone-Controllable Code for Channel Iteration of LDPC Code on the Holographic Data Storage, Donghyuk Park[1], Jaejin Lee[1]; *[1].* In holographic data storage system, if we use the LDPC code as an error correction code then we need the soft-encoding scheme for channel iteration. So, we proposed the soft encoder of 3/4 tone-controllable code.

OTuD12
Double-Referential Collinear Holographic Memory and Spatial Quadrature Amplitude Modulation, Keisuke Zukeran[1], Atsushi Okamoto[1], Atsushi Shibukawa[1], Masanori Takabayashi[1]; [1].A double-referential method, in which the reference light necessary for phase detection can be generated as diffraction light of the optical hologram automatically, is newly proposed. 16-SQAM signals can be reconstructed through dual-stage holography.

OTuD13
Hyper Numerical Aperture Blu-ray Disc Recording,Youngsik Kim[1], Tom D. Milster[1]; [1]*College of Optical Sciences, University of Arizona, USA.* We develop a hyper numerical aperture Blu-ray disc(HBD) recording system with a solid immersion lens(SIL). We use a phase change recording media with a 100μm cover-layer. The HBD pick-up consists of a SIL with a numerical aperture of 1.41 and a laser of 408nm.

OTuD14
Increasing Storage Density of Page-based Holographic Data Storage System by Image Restoration using PSF of Nyquist Aperture, Sang-Hyuck Lee[1], Sung-Yong Lim[2], Nakyeong KIm[2], No-Cheol Park[1], Hyunseok Yang[2], Kyoung-Su Park[1], Young-Pil Park[1]; [1]; [2]*Yonsei University, Republic of Korea.* The Nyquist aperture is used to increase the storage density. To reduce the bit errors caused by the Nyquist aperture, we applied an image restoration method which restores the degraded image in the enhanced spatial frequency domain using its PSF as a restoration filter.

OTuD15
Measurements of Nonlinear Mark Edge Shift for Phase Change Optical Disk Systems, Takaya Tanabe[1], Kohei Okubo[1], Tsutomu Ansai[1]; [1]*Ibaraki National College of Technology, Japan.* A method for evaluating the nonlinear mark edge shift of the phase change optical disk using auto-correlations of readout signals was presented and verified.

OTuD16
Nondestructive Readout of Photochromic Memory using Photocurrent Switching, Tsuyoshi Tsujioka[1]; [1]*Osaka Kyoiku University, Japan.* The photoisomerization of diarylethene (DAE) molecules switched the photocurrent. The switching is based on an ionization potential change of the DAE molecules. Excellent ON-OFF ratio and more than 800x10^3 readout cycles was demonstrated.

OTuD17
Super-resolution photoinduction-inhibition nanoscopy enabled three-dimensional optical data storage, Xiangping Li[1], Yaoyu Cao[1], Min Gu[1]; [1]*Centre for Micro-Photonics, Swinburne University of Technology, Australia.* In this paper we report on the using photoinduction-inhibition method to break the diffraction limit. Super-resolved recording bits as well as their application in three-dimensional optical data storage have been demonstrated

OTuD18
Nano- structure on Si-substrate by Using Innovative Nano-lithography Processes, You-Chen Weng[1]; [1]*department of Opto-electronic Engineering, National Dong Hwa Unversity, Taiwan.* using inorganic photo resist material with composition GeSbSnOx to nanolithrography process ,to fabricate nano honeycomb structure .The reflectance of the nanostructure in near visible light is 8~13%.

OTuD19
Signal Properties and Microstructure of Write-Once Blu-ray Disc Containing Cu-Al Alloy/Si Bi-layer as the Recording Medium, Hung-Chuan Mai[1], Tsung-Eong Hsieh[1], Shiang-Yao Jeng[2]; [1]*Department of Materials Science and Engineering, National Chiao Tung University, Taiwan;* [2]*Prodisc Technology Inc, Taiwan.* Signal properties and microstructure of write-once blu-ray (BD-R) disc containing Cu-Al alloy/Si bi-layer were investigated. Recording mechanism correlated to the formation of Cu- and Si-rich solid-solution phases and preliminary annealing in the marks was observed.

OTuD20

Research For Crosstalk And Black Matrix For 3D Display, Der-Ray Huang[1], Tzu-Chien Lin[1], Fu-Ha0 Chen[2]; *[1]Department of Opto-Electronic Engineering, NDHU, Taiwan; [2]Electro-Optics Laboratories, ITRI, Taiwan.* In 3D-lenticular display often use slanted lenticular to reduce Dead-zone problem, but in this kind of display the crosstalk will increasing with the slant angle ; to resolve this issue . By this way, we can eliminate the problems of overlapping and cresstalk, according to the simulation of ASAP we can verify the results is a feasible way to the 3D-lenticular display. In this research, I propose a spatial multiplexed auto-stereoscopic display with binocular parallax , motion parallax , multi-viewing zones and high resolution .

OTuD21

Nanofabrication for multi states of Ge2Sb2Te5 by femto-second laser induced forward transfer, Ming Lun Tseng[1], Bo Han Chen[1], Cheng Hung Chu[1], Chia Min Chang[1], Hai-Pang Chiang[2], Din Ping Tsai[3,4]; *[1]Physics, National Taiwan University, Taiwan; [2]Institute of Optoelectronic Sciences, National Taiwan Ocean University, Taiwan; [3]Instrument Technology Research Center, National Applied Research Laboratories, Taiwan; [4]Research Center for Applied Sciences, Academia Sinica, Taiwan.* The nano patterns of phase-change material Ge2Sb2Te5 are fabricated by the femto-second laser-induced forward transfer. The size and the phase state of the Ge2Sb2Te5 patterns can be effectively controlled by varying the laser fluence and film thickness. Also, the multilevel electronic states of fabricated patterns are observed through the C-AFM . This research has great potential in the area of the optical and the electrical data storage.

OTuE • Hybrid Recording (Special Session)

Kauai Ballroom, Ko'olau
19:00—21:30
Lambertus Hesselink; Department of Electrical Engineering, Stanford University United States;
No-Cheol Park; Center for Information Storage Device Korea, Republic of Korea; Presiders

OTuE1 • 19:00 Invited

Energy Assisted Magnetic Recording, Francis Liu[1]; *[1]Western Digital, USA.* Abstract not available.

OTuE2 • 19:30 Invited

Adjoint FDTD for Nanophotonic Device Optimization, Paul Hansen[1], Yuxin Zheng[2], Eugene Perederey[1], Lambertus Hesselink[1,2]; *[1]Applied Physics, Stanford Univ-Geophysics Dept, USA; [2]Electrical Engineering, Stanford University, USA.* We present a numerical technique for optimization of nanometallic structures. The sensitivity of optical behavior with respect to the nanostructure's shape may be efficiently obtained with two FDTD simulations and used for automatic optimization.

OTuE3 • 20:00 Invited

Hybrid Recording Technology, Tom Clinton[1]; *[1]Research, Hitachi Global Storage Technologies, USA.* Abstract not available.

OTuE4 • 20:30 Invited

Near Field Optical Characterization and Mechanical Flying Stability for HAMR., Young-Joo Kim[1]; *[1]School of Mechanical Engineering, Yonsei University, Republic of Korea.* Abstract not available.

OTuE5 • 21:00 Invited

Future of magnetic recording, Liu Bo[1]; *[1]Intermag, Canada.* Abstract not available.

• Wednesday, 20 July, 2011 •

OWA • Micro-hologram

Kauai Ballroom, Ko'olau
10:30—12:00
Yuzuru Takashima; Stanford University, Electrical Engineering Department United States;
Kimihiro Saito; Sony Corporation Japan; ; Presiders

OWA1 • 10:30 Invited
Recent Progress on Micro-holographic Data Storage, Eugene P. Boden[1], Kwok P. Chan[1], Dmitry V. Dylov[1], Evgenia M. Kim[1], Peter W. Lorraine[1]; P. J. McCloskey[1], M. J. Misner[1], A. Natarajan[1], Victor Ostroverkhov1; J. E. Pickett[1], Xiaolei Shi[1], Yuzuru Takashima[1,2], V. H. Watkins[1]; *[1]GE Global Research Center, USA; [2]Stanford University, USA.* Advances in micro-holographic materials and systems are presented. New materials show improved index change (10x) and sensitivity (100x) at >3x lower intensity vs. previously reported. Experimental results supporting single-sided optical drive concept is presented.

OWA2 • 11:00 Invited
Subdiffraction Microholograms in a Single-Photon, Uniformly Inhibited System, Robert R. McLeod[1], Benjamin A. Kowalski[1], Michael Cole[1]; *[1]Dept. of Electrical and Computer Eng, Univ. of Colorado at Boulder, USA.* Microholograms well below the diffraction limit are demonstrated in a photopolymer system with uniformly distributed inhibitor. This enables both increased storage density and increased readout signal via suppression of out-of-focus exposure. A model of the micron-scale reaction kinetics of the system is presented.

OWA3 • 11:30
Experimental Demonstration of Optical Phase Multi-Level Recording in Microhologram, Hideharu Mikami[1], Kentaro Osawa[1], Koichi Watanabe[1]; *[1]Hitachi, Ltd., Central Research Laboratory, Japan.* Optical phase was experimentally recorded in microholograms. Four-level phase modulation was successfully regenerated from weak 30-nW microholograms with errors of +7.0/-12.2 degrees, suggesting a further increase in the number of levels is possible.

OWA4 • 11:45
Proposal for Rewritable Microholographic Recording Using Polarization-Sensitive Materials,
Ryuichi Katayama[1], Shin Tominaga[2]; *[1]Fukuoka Institute of Technology, Japan; [2]NEC Corporation, Japan.* Rewritable microholographic recording using polarization-sensitive materials, in which polarization directions of a beam are recorded, is proposed. Polarization states for beams in the medium are switched with switchable waveplates. Recording and readout principles are explained.

OWB • Volume Recording

Kauai Ballroom, Ko'olau
14:00—15:30
James Chon; Swinburne University of Technology Australia;
Tom Milster; University of Artizona United States; Presiders

OWB1 • 14:00 Invited
Progress on Micro-reflector optical disc system, Kimihiro Saito[1], Seiji Kobayashi[1]; *[1]Sony Corporation, Japan.*
We review the Micro-Reflector optical disc system and report on an approach to investigate void formation recording mechanism with a computer simulation.

OWB2 • 14:30 Invited

Recent Progress On Gold Nanorod Based 5D Optical Storage, James W. Chon[1]; [1]*Centre for Micro-Photonics, Faculty of Engineering and Industrial Sciences, Swinburne University of Technology, Australia.* In this talk, I will discuss how the detuned scattering from gold nanorods can potentially replace the two-photon luminescence readout scheme in the future optical storage medium based on gold nanorods.

OWB3 • 15:00

Reduction of Interlayer Crosstalk in Multilayer Optical Disc by using Phase-Diversity Homodyne Detection, Tatsuro Ide[1], Kentaro Osawa[1], Hideharu Mikami[1], Koichi Watanabe[1]; [1]. We studied interlayer crosstalk in using phase-diversity homodyne detection on a multilayer optical disc. Simulations and experiments on a dual-layer disc having a layer spacing less than 10 μm showed that phase-diversity homodyne detection provided higher tolerance to interlayer crosstalk than the conventional intensity detection.

OWB4 • 15:15

Design and Implementation of Zoom Objectives for Multi-layer Optical Data Storage, Yuzuru Takashima[1]; [1].
A zoom objective lens has been designed and implemented based on a newly proposed power arrangement having a constant focal length and a linear movement of single zooming component for selection of recording layers.

Kauai Court, Coffee Break, 15:30 – 16:00

Kauai Ballroom, Ko'olau, Postdeadline Papers, 16:00 – 17:00

Key to Authors and Presiders
(**Bold** denotes Presider or Presenting Author)