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The Japan Society of Applied Physics (JSAP)
The Magnetics Society of Japan (MSJ)
Optoelectronic Industry
and Technology Development Association (OITDA)
Center for Information Storage Device (CISD)
Yonsei University, Korea

ADVANCE PROGRAM

Deadlines

Post-Deadline Papers : July 27, 2004

Early Registration : September 10, 2004

ISOM'04

International Symposium on Optical Memory 2004

October 11~15, 2004

Lotte Hotel Jeju, Jeju Island, Korea

<http://www.isom.jp>

IN COOPERATION WITH

The Institute of Electrical and Electronics
Engineers (IEEE, LEOS)

Optical Society of America (OSA)

The International Society for
Optical Engineering (SPIE)

The Institute of Electronics, Information
and Communication Engineers (IEICE)

The Chemical Society of Japan

Information Processing Society of Japan

The Institute of Electrical Engineers of Japan

The Institute of Image Electronics Engineers
of Japan

The Institute of Image Information
and Television Engineers

The Japan Society of Precision Engineering

The Laser Society of Japan

Symposium Schedule

Date Time	Oct. 11 (Mon)	Oct. 12 (Tue)
08:00 -		
09:00 -		Opening & Keynote
10:00 -		Media-I
11:00 -		Coffee Break
12:00 -		Media-I
13:00 -		Lunch
14:00 -	Tutorial I	Drive Technology-I
15:00 -	Coffee Break	Coffee Break
16:00 -	Tutorial II	High Density-I
17:00 -		
18:00 -		
19:00 -	Welcome Reception	
20:00 -		
21:00 -		

Oct. 13 (Wed)	Oct. 14 (Thu)	Oct. 15 (Fri)
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	<div style="background-color: lightgreen; padding: 10px; text-align: center;">Banquet</div>	
<div style="display: flex; justify-content: center; gap: 20px; align-items: center;"> <div style="background-color: yellow; width: 20px; height: 10px; display: inline-block;"></div> Exhibition <div style="background-color: cyan; width: 20px; height: 10px; display: inline-block;"></div> Registration </div>		

Welcome to ISOM2004

WELCOME STATEMENT FROM THE ORGANIZING COMMITTEE CHAIRPERSONS



The first ISOM was held in Tokyo in 1987, when optical memories were in the early stage of development. Up to 1995, ISOMs were held every two years in Japan.

During this period, the technologies and industries of optical memories progressed rapidly and optical memories began to be used for archival file systems and personal computers. In response to the progress, the ISOM committees decided to hold ISOM every year and to hold a joint international symposium by ISOM and ODS every three years from 1993. The appearance of CD-R and optical memories developed based on phase change technology accelerated the growth of optical industries, and many companies in Asian countries started manufacturing optical memories and developing optical technologies. Therefore the ISOM committees decided to hold ISOM in other Asian countries besides Japan and also in the USA (ISOM/ODS). In 2001, ISOM was held in Taipei.

ISOM2004, which is the second symposium held in an Asian country besides Japan will be held on October 11-15 in Jeju Island in Korea, which is a very beautiful semi-tropical island. All the participants will be able to enjoy excellent presentations, enthusiastic discussions, and the beautiful scenery of Jeju Island.

In past ISOMs, lots of new technologies and new ideas were

presented and they have contributed to the current remarkable success of optical memories. Welcome to ISOM 2004. Let us make new contributions to the future optical memories.

A handwritten signature in black ink, reading "Tomoyuki Toshima". The signature is written in a cursive, flowing style with a long horizontal stroke extending to the right.

Tomoyuki Toshima
ISOM Organization Committee Co-Chairs

Welcome to ISOM2004

WELCOME STATEMENT FROM THE ORGANIZING COMMITTEE CHAIRPERSONS



First of all, I would like to cordially welcome all of you to ISOM2004, which will be held in Jeju Island, Korea.

Your attendance and participation will make this Symposium a meaningful and memorable experience.

Most of us may realize that ISOM has been successful in bringing people of similar interest together and providing an avenue for active cooperation.

I am certain that this ISOM2004 will provide an opportunity to the organized fair for all the participants to share not only their technological knowledge but also to cultivate friendship and promote joint cooperation.

Therefore, ISOM2004 will provide invaluable opportunity for developing technological innovation in the field of optical storage.

As we all know, in order to effectively handle with huge amount of various kinds of data with high density and speed and robust reliability with low cost, a new generation of optical storage is constantly in demand for storage business.

As a result, researchers and developers will continue to actively engage in maintaining high performance of the optical storage system.

Future optical storage technological developments can be achieved through mutual cooperation as well as competition.

In recognition of the multi-disciplinary nature of the optical memory technology, the researchers in this area must

closely and strategically cooperate in order to make a huge impact on integration among disciplines. Human networking is an important contributing factor to the successful development of new technologies.

Human relationship will be developed, and mutual cooperation and close relations among the participants will be cultivated, which will in turn, make a huge leap towards progress and achievement in the field of optical storage technology for high data density and transfer rate.

Additionally, I strongly believe this ISOM2004 will contribute greatly to the development of our field of optical storage technology as we participate in the technical and poster sessions.

ISOM2004 will, without a doubt, be a huge success, and I would like to express my deepest appreciation to everyone for their hard work and dedication.

I also believe that you have made tremendous achievement through your research, development, and production.

On behalf of the Organizing Committee, it is my great honor to welcome all of you to ISOM2004 in Jeju Island, which is also known as the "Hawaii of Korea."

Jeju Island has many precious cultural items, beautiful scenery, and pleasant weather, as thousands of travelers world-wide come to appreciate its rare and exotic beauty.

I look forward to meeting all of you in Jeju, one of Korea's most beautiful islands, filled with cool October breeze and a mild temperature.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Young-Pil Park". The signature is fluid and cursive, with a small vertical mark above the first letter of "Young".

Young-Pil Park

ISOM Organization Committee Co-Chairs

Introduction

As in the past, the upcoming symposium on October 11-15, 2004 is expected to offer professionals such as scientists, researchers and engineers an opportunity to exchange their ideas regarding the latest information and critical development in the field of the high-density information storage technology. The five-day gathering and the scientific program will provide an avenue for holding meaningful discussions for all those interested in the optical memory technology and its implications for the future.

Regarding the venue, Jeju Island is a beautiful semi-tropical island located off the southern tip of the Korean peninsula, which is the most popular destination for honeymooners in Korea. It offers picturesque beaches and slopes of Mt. Halla, a famous volcanic mountain 1,950 meters high, as well as convenient tourist facilities. Many international meetings and conferences take place on this island every year as it offers the kind of serenity and natural elegance that is well-suited for important gatherings.

On behalf of the organizing committee, we cordially invite you to partake in this forthcoming symposium in Korea.

Scope of the Symposium

ISOM2004 will discuss the current status of the optical memory system design and applications, together with new developments in the areas of media, lasers, basic theory, system sub-components, and a range of future technologies. In addition to ordinary contributed papers, a number of invited papers on important topics will be presented.

Topics to be covered in this symposium include, but are not restricted to:

Basic Theory

- Diffraction, Polarization
- Analysis of Mark Formation
- Magneto-Optical Effects
- Near-Field Optics, FDTD Analysis

Media

- Rewritable, Write Once, Read-Only, Partial-ROM Media
- Characterization, Recording and Readout Mechanisms
- Manufacturing Technology
- Substrates, Mastering
- Land/Groove Recording
- Super-RENS
- Tribology

Drive Technology

- Drive Integration
- Drive Optics, Mechanics and Electronics Design
- Servo and Accessing Methods
- Read Write Channels, Error Correction
- Modulation Code
- Copy Protection

Components

- Optical Heads, Actuators, MEMS Fabrication
- Lasers, Lenses, Diffractive Optics, Detectors
- Short Wavelength Sources
- Integrated Optical Heads and Components

Testing Methods and Devices

- Testing & Evaluation Methods for Drives, Media and Components
- Drive Testers, Media Testers

Optical Storage Systems and Applications

- Rewritable, Write Once, Read-Only, Partial-ROM Systems
- AVIT System Applications of Optical Recording
- Mobile Applications

High Density Recording

- Holography
- Scanning Probe and Near-Field Recording
- Multiwavelength Recording and Bistable Devices
- Photochromic and Photorefractive Materials
- Tera Byte and SubTera Byte Memories
- Volumetric Storage, Multi Level Recording
- Nano Memory and Materials

New World - Other Future Science and Technology available to Information Storage

Registration

Participants are advised to register in advance (before September 10, 2004) in order to receive the early registration discount. Please note that participants must submit their payment to be received by September 10, in order to qualify for the early registration.

Method of Registration

On-line registration for ISOM2004 is available at the local official homepage (<http://isom2004.yonsei.ac.kr>). On-line registration is highly recommended. In case where on-line registration is not convenient, you can register by submitting the Registration Form via fax, e-mail or postal mail along with your proof of payment (e.g. copy of the bank transfer slip). Photocopied forms are also accepted.

Registration Fee

Category	Until September 10	After September 10 and/or on site
Regular	US\$ 500	US\$ 570
Student & Retiree	US\$ 50	US\$ 50
Tutorial	US\$ 100	US\$ 100
Extra Banquet Ticket	US\$ 50	US\$ 50
Extra copy of Technical Digest	US\$ 50	US\$ 50

- The registration fee for the regular participants includes: admission to all technical sessions, welcome reception, banquet, and a copy of the technical digest.
- The registration fee for the students and retirees includes: admission to all technical sessions (which does not include technical digest.). For the student registration, full-time students should send a copy of their student ID via fax.

Method of Payment

Please note that any bank charge incurred for remittance will be the responsibility of the registrants.

The following payment methods are available:

◆ Credit Card

For foreign participants, VISA, MasterCard, and JCB are acceptable. Please clearly include the details of your credit card on the registration form. *(We cannot accept credit card from domestic participants [Koreans].)*

◆ **Bank Draft**

Bank drafts are to be made payable to "Young-Pil Park." Please indicate your name, mailing address, and contact number on the back of the bank draft. Personal or company checks will not be accepted.

◆ **Bank Transfer**

A direct bank transfer can be made to the account below. A copy of the receipt of the bank remittance should be attached to the Registration Form:

- Account Holder: Young-Pil Park
- Account Number: 126-203176-02-203
- Name of Bank: Woori Bank
(Yonsei Branch, Seoul, Korea)
- SWIFT Code: HVBKCRSE

Registration Confirmation

A written confirmation and an official receipt of your registration will be sent to you once we receive your registration form and payment.

Cancellation & Refund

Cancellation should be made in writing and sent to the Secretariat of the ISOM2004. The following cancellation policy will be applied:

Until September 30	After September 30
Administrative fee of US\$ 50 will be charged	No refund

- * All bank charge will be deducted from the amount refunded.
- * Please note that for administrative reason, refunds will be made after the symposium.

Social Program

The Social Programs will provide opportunities for participants to associate with and enjoy a leisurely time with their colleagues.

◆ **Welcome Reception**

- Time & Date: 19:00~21:00, October 11 (Mon)
- Place: Crystal Ballroom
- Free of charge for all registrants

◆ **Banquet**

- Time & Date: 19:00~21:00, October 14 (Thu)
- Place: Crystal Ballroom
- The Regular Participants can participate free of charge. Others who are interested should pay the appropriate fee of US\$ 50 in order to participate.

Hotel Reservation

Special discount rates for the symposium have been arranged at the following hotels. Please complete the Reservation Form and send it to the Secretariat of the ISOM2004 by September 20. All reservations will be accepted on a first-come, first-served basis.

Grade	Hotels	Room Type	Room Rate
			Single & Double
SDL	Lotte Hotel Jeju	Double/ Twin (Ocean view)	KRW 210,000 (approx US\$ 178)
		Double/ Twin (Mountain view)	KRW 170,000 (approx US\$ 144)
DLX	* The Suite Hotel	Double/ Twin	KRW 107,439 (approx US\$ 91)
1st	Hotel Hana	Double	KRW 60,000 (approx US\$ 51)
		Twin	KRW 72,000 (approx US\$ 61)
Condo	* Korea Condo	Condominium	KRW 90,000 (approx US\$ 76)

* All room rates are per night and do not include meals, a 10% service charge, and a 10% value-added tax. Foreign participants are exempted from the 10% value added tax.

* The exchange rate for the US dollar is approximately KRW 1,180 per US dollar as of July 2004.

* The rate for the *Korea Condo includes 10% VAT

* The rate for the *Suite Hotel for the weekend (Fri, Sat, and Sun) will be changed. (Weekend Rate: KRW 157,025 per night, which does not include meals, a 10% service charge and a 10% value-added tax.)

Deposit and Confirmation

Every hotel reservation must be accompanied by a deposit for one night for each room reserved. Alternatively, you can provide your credit card details on the form, in case of payment by credit card. Participants should settle the balance of their accounts with the hotel when they check out.

The secretariat of the ISOM2004 will send a confirmation letter upon receipt of the accommodation deposit.

Changes in the Reservation

All accommodation changes are to be handled by the Secretariat of the ISOM2004. All requests for the changes must be made in writing and forwarded directly to the Secretariat, and not to the hotel. Requests for the changes are accepted until September 20. The Secretariat of the ISOM2004 cannot guarantee granting requests for accommodation changes or bookings made after September 20.

Cancellation of the Hotel Reservation

All cancellations must be done in writing and forwarded to the Secretariat of the ISOM2004. Cancellations should not be sent to the hotel.

Until September 20	After September 20
100% refund	No refund

* All bank charges will be deducted from the amount refunded.

* Please note that refunds will be made after the symposium for administrative reasons.

Official Hotels

Lotte Hotel Jeju

2814-4, Saekdal-dong, Seoqwipo-city, Jeju-do, 697-808 Korea
Tel: +82-64-731-1000 / Fax: +82-64-731-4117
Website: www.hotellotte.co.kr/eng/cheju

The Suite Hotel

2812-10, Saekdal-dong, Seoqwipo-city, Jeju-do, 697-808 Korea
Tel: +82-64-738-3800 / Fax: +82-64-738-9990
Website: www.suites.co.kr/index_eng.html

Hotel Hana

2812-2, Saekdal-dong, Seoqwipo-city, Jeju-do, 697-808 Korea
Tel: +82-64-738-7001~2 / Fax: +82-64-738-7000
Website: www.hotelhana.co.kr/m1.html

Korea Condo

2822-5, Saekdal-dong, Seoqwipo-city, Jeju-do, 697-808 Korea
Tel: +82-64-738-4000/ Fax: +82-64-738-3493

Tour Reservation

For those interested in the tour, the following tours are to provide an opportunity to learn about the Korean culture and places.

Please complete the Reservation Form and send it to the Secretariat of the ISOM2004 by September 20.

Reservation is strongly recommended and the fee for the tour programs should be paid when you apply. All costs are based on a minimum number of participants. Please note that the tour program can be cancelled due to fewer than the minimum number of people.

The price of the Full-Day and Half-Day tours include: all "basic expenses" such as English tour guide, transportation, admission fee, travel insurance, and mineral water. (Full-day tours include lunch.)

Full-Day Tour

The Legend of Jeju

Rate: US\$ 80 per person (Min. 6 persons)

Time & Date: 09:00~17:00, October 11~15

Itinerary: Moksukwon Garden – Mystery Road – Jeju Nature & History Museum – Samseonghyul Hole – Yongduam Volcano Rock – Manjang Cave

Jeju Nature and Culture

Rate: US\$ 80 per person (Min. 6 persons)

Time & Date: 09:00~17:00, October 11~15

Itinerary: Sangumburi Crater – Jongdalri Seashore – Seongsan Ilchulbong Peak – Jeju Folk Village

Half-Day Tour

Jeju Adventure Tour

Rate: US\$ 55 per person (Min. 6 persons)

Duration: 08:30~12:30, October 11~15

Itinerary: Sangbanggulsa – Hendrik Hamel Monument – Chusa Exile Site – Bunjae Artpia

Jeju, the Tropical Island

Rate: US\$ 65 per person (Min. 6 persons)

Duration: 13:00~17:00, October 11~15

Itinerary: Yeomiji Botanical Garden – Yakcheonsa Temple – Oedolgae Headrock – Jeongbang Waterfall

Post-Conference Tours

Seoul & Korean Folk Village Tour (2 days, 1 night)

Rate: Double Occupancy US\$ 330 per person

Single Occupancy US\$ 370 per person

Date: October 16~17

Itinerary:

1st DAY: Korean Folk Village – Namdaemun Shopping

2nd DAY: Changdeokgung Palace – Huwon Garden – Blue House – Insadong Street – War Memorial Museum – Itaewon Street

Inclusive: accommodation (DLX Class, 1 night), airline ticket (Jeju-Seoul one-way), transportation (12 passengers/van), English tour guide, breakfast (1 time), lunch (2 times), dinner (1 time), admission fee, toll fee, parking fee, mineral water, and a tip for drivers.

Busan & Gyeongju Tour (3 days, 2 nights)

Rate: Double Occupancy US\$ 510 per person

Single Occupancy US\$ 590 per person

Date: October 16~18

Itinerary:

1st DAY: Gimhae Airport (Busan) – Jagalchi Fishery Market - Busan Tower – U.N. Cemetery – Taejongdae

2nd DAY: Gyeongju National Museum – Cheonmachong Tumuli Park – Anapji Pond – Bulguksa Temple – Seokguram Grotto

3rd DAY: Munmu Tomb – Depart for Seoul

Inclusive: accommodation (DLX Class, 2 nights), airline ticket (Jeju-Kimhae, one-way), transportation (12 passengers per van accommodation), English tour guide, breakfast (2 times), lunch (3 times), dinner (2 times), admission fee, toll fee, parking fee, mineral water, and driver's tip.

Changes in the Reservation

All changes and cancellations must be done in writing and forwarded to the Secretariat of the ISOM2004.

Until September 20	After September 20
100% refund	No refund

* All bank charges will be deducted from the amount refunded.

* Please note that refunds will be made after the symposium for administrative reasons.

Instruction for Speakers

Oral Presentation

- In order to run the program smoothly, presenters are requested to submit their presentation materials at the Preview Room to the staff prior to their presentation.
- Presiders are requested to be at the Preview Room before the session starts. All speakers are requested to get in touch with the presider 15 minutes before the commencement of the session.

Preview Room (Peal Room, 6th Floor)

- Time assigned

		Presentation	Discussion
Keynote	(30 min.)	30 min.	
Invited	(25 min.)	20 min.	5 min.
Contributed	(20 min.)	15 min.	5 min.

Please prepare your presentation to fit the allocated time.

- 35 mm single slide projectors and LCD projector will be available in the Preview Room where presenters may test their presentation materials.
- Anyone who needs a slide projector should go to the Preview Room and preview his/her slides at least half-day before his/her presentation. Those who borrow slide tray(s) from the Preview Room are required to return the slide tray(s) after their session. There will be staffs to assist the presenters in the Preview Room.
- Presenters using an LCD projector are requested to submit their presentation materials in a CD-ROM, zip drive diskette or USB driver to the Preview Room at least one day prior to their presentation. Only IBM computers and MS Power Point (.ppt) 97 or higher versions are available.
- If you choose to bring your own laptop computer, you will be requested to confirm the connection of your own laptop computer and the projector during break time or in the morning.
- In oral presentation, we recommend all authors to use more than 16-point font. The audience expects well-prepared presentations with clearly visible figures & captions, as well as good conclusion.

Poster Presentation

- The poster board surface for each presenter will be **two panels, 90 cm in width and 143 cm in height.**
- All presenters are requested to affix their posters from 08:00 to 09:00 on the day of the presentation and remove their posters from 18:00 to 19:00 on the same day.
- The Session presiders will check all the speakers during the presentation time.
- All speakers are requested to be at their posters during the session. In order to ensure a high-quality presentation, all poster materials must be in a printed form. Posters should be readable by the viewers at least one meter away.
- Each poster should be placed on the numbered board assigned to each presenter.
- The secretariat will not be held liable for any posters lost or damaged.
- Presenters will be provided with simple means to affix their posters, such as scotch tape, etc.

Post-Deadline Papers

A limited number of papers will be accepted for presentation of significant result obtained after the deadline. Authors are requested to submit the papers through ISOM Web site (<http://www.isom.jp/>).

The two page summary preparation and a 35-word abstract instruction, and submission procedures are obtained at the ISOM website.

In prior to the paper submission, a delegated author has to fill in the paper submission form including the 35-word abstracts on the Web. Authors are reminded that their papers do not include local fonts. If you use Greek letters and specially designed letters in MSWord, go to the menu bar and insert the objective letters from 'Symbol font.' The pdf-styled 2-page summary is only accepted to the appointed e-mail address as an attached file along with the instruction.

Submission Web Site is open from July 1 to July 27

Authors will be notified at the latest by the end of August whether the paper is accepted or not.

The best four post-deadline papers are allowed as oral presentation in the final session. Other post-deadline papers (but limited numbers) will be presented in the poster session.

Publication of Symposium Papers

In addition to the technical digest available at the symposium, the symposium papers will be published in a special issue of the **Japanese Journal of Applied Physics (JJAP) in May 2005**.

The author must download the author's kits of Application Form for publication in JJAP, Summary Information, and Notes for Contributors for Special Issues from the ISOM web site. The deadline for the submission of manuscripts is **November 15, 2004**.

Authors who will be presenting by themselves are allowed and strongly recommended to submit their papers for publication in the special issue of the Japanese Journal of Applied Physics (JJAP).

Exhibition

Technical Exhibition is organized. The optical drives, media, components and application software from leading companies and laboratories will be presented.

- Time & Date: 09:00~18:00 October 12~14
 09:00~12:00 October 15
- Place: Crystal Ballroom Lobby, Hotel Lotte Jeju

* Companies interested in participating as an exhibitor should contact the secretariat for more details.

For information concerning symposium arrangements and registration, please contact:

Secretariat

INTERCOM Convention Services, Inc.
10th Fl. Samick Lavied'or Bldg.,
720-2 Yeoksam 2-dong, Gangnam-gu,
Seoul 135-920, Korea
Tel: +82-2-3452-1444, 566-6339
Fax: +82-2-3452-7292, 565-2434
E-mail: isom2004@intercom.co.kr

Tutorial

Tutorial Seminar is offered to expand your knowledge with technical information on current state of research and developments in optical memories.

The tutorial seminars have limited seating and registration will be processed on a first come first served basis. If you are interested in tutorial seminar, please indicate on the registration form to participate.

Time & Date: 13:30~17:00, October 11
Place: Charlotte Room, Hotel Lotte Jeju
Fee: US\$ 100 (Tutorial I & II)
Language: English

Tutorial – I

Optical Disk Lenses

Tadashi Kojima, Konica Minolta Opto, Inc., Japan

Progress of the optical disk lenses over 25 years will be presented. In particular, the contribution of aspherical plastic lenses and diffractive lenses to the CD, DVD and next generation of DVD will be shown.

Tutorial – II

Introduction to Wavefront Measurement Techniques for Optical Data Storage System

Seung-Han Park, Yonsei University, Korea

Precise wave front measurement and analysis techniques are required for the development of modern optical data storage systems. In this presentation, basic principles and applications of various wave front measurement techniques will be discussed.

The registration fee for the tutorials includes admission to the tutorial and material. (Pre-registered students can receive free tutorial upon request, which does not include the materials.)

Travel Information

Climate in Jeju Island

Located in the temperate zone, the Korean peninsula has four distinct seasons. Jeju Island has a mild ocean climate throughout the year with the smallest annual temperature range in the country. The average temperature in October of Jeju Island is about 20°C.

Foreign Exchange & Credit Cards

Foreign currency and traveler's checks can be converted into Korean won at most banks and other authorized moneychangers. The exchange rate is subject to market fluctuations and is trading at approximately KRW 1,180 per US dollar as July 2004. Credit cards are acceptable at most hotels, department stores, and restaurants.

Tax and Tipping

Value Added Tax (VAT) is levied on most goods at a standard rate of 10%. In major tourist sites such as hotels or large restaurants, 10% VAT plus a 10% service charge is added to the bills.

Insurance

Participants are advised to obtain travel and health insurance before departing from their respective countries. The organizing committee has no insurance coverage for the participants and will not be responsible for any accident that may occur during the symposium.

Business Hours

Most private businesses open at 09:00 and close at 18:00 but some are opened until late evening. Bank business hours are between 09:30 and 16:30 on weekdays and closed during the weekends.

Electricity

The standard electricity supply is 220 volts AC/60 cycles. However, outlets for 110 and 220 volts are available at the hotels.

Time Zone

Nine hours ahead of Greenwich Mean Time (+9 GMT). Daylight Saving Time is not observed in Korea.

Visa

Any foreign visitor wishing to enter the Republic of Korea must have a valid passport and obtain a Korean visa before coming. However, those from the countries with a visa exemption agreement with Korea who want to visit Korea temporarily are permitted to enter without a visa according to visa-exemption agreements or in accordance with principles reciprocity or national interest.

For more information, contact the Korean Embassy or Consulate Office in your country or view the Ministry of Foreign Affairs and Trade website (www.mofat.go.kr).

Getting to Jeju Island

The following is detailed information regarding the transportation from Incheon International Airport to the meeting venue (Lotte Hotel Jeju) and hotels. We hope this information will be helpful. If you have further inquiries, please contact the secretariat of the ISOM2004 for assistance.

Lotte Hotel

For Participant Arriving at Incheon International Airport (IIA)

Participants who arrive at Incheon Int'l Airport (IIA) are requested to go through the immigration and customs clearance at the arrival terminal, and then:

- A. Transfer to recheck-in on the 1st floor. Passengers are to receive their boarding passes and board the domestic flight on the 3rd floor (Departure Level) of IIA for Jeju Island.
- B. Take a limousine bus and go to Gimpo Airport to take a local flight for Jeju Island. Most domestic flights depart from Gimpo Airport. The following is the detailed transportation information regarding the airport limousines that leave non-stop between IIA and Gimpo Airport.

You may get information regarding limousine buses and purchase the bus ticket at the Transportation Information Counter (near the Exit No. 2, 4, 9, 13) on the arrival floor (1st floor) of the passenger terminal.

- Interval: 5~10 min.
- Duration: 40 min.
(First Bus: 5:20 am / Last Bus: 21:30 pm)
- Fare: KRW 6,000
- Bus Stops: 5A, 4B, 11A, 11B

Direct Flight to Jeju Int'l Airport from Japan and China

Participants from Japan departing from Tokyo, Osaka, Nagoya and Fukuoka, and from China departing from Shanghai and Beijing can fly directly to Jeju International Airport.

From the Jeju Int'l Airport to Lotte Hotel Jeju

It takes about 50 minutes to arrive at the venue from the Jeju Int'l Airport by car or airport limousine bus.

Taxi

To take a taxi, please use the taxi stop in front of the passenger terminal of JIA.

The basic fare is KRW 1,600 (KRW 1,800 between midnight and 4 a.m.). From JIA to Lotte Hotel Jeju, it takes approximately 40 minutes, and the fare is usually around KRW 30,000.

Bus

You can arrive at the meeting venue, Lotte Hotel Jeju and other hotels if you use the limousine bus service. The following is the current route of the airport limousines that travel between Jeju International Airport and hotels in and near Jungmun Tourist Resort Complex, where the venue is located.

- Interval: 5~10 min.
- Duration: 50 min.
(First Bus: 5:20 am / Last Bus: 21:30 pm)
- Fare: KRW 3,500 (Airport – Jungmun)
- Itinerary
Airport - Holiday Inn Crown Plaza - Renaissance Hotel - Yeomiji Botanical Garden Entrance - Hotel Hana - Hyatt Regency Hotel - Hotel Shilla - **The Suites Hotel** - * **Lotte Hotel** - **Hankook Condo** - Yeomiji Botanical Garden - New Kyungnam Hotel - Seogwipo Pier - Paradise Hotel - Seogwipo KAL Hotel

Technical Program

October 12, 2004 (Tue)

Session Tu-A: Opening and Keynote Session

(08:30~09:10)

Presider: J. Tominaga (AIST, Japan)

Tu-A-01
(08:30~08:40)

Opening Remarks

T. Murakami

OITDA, Japan

Steering Committee, Chairperson

Tu-A-02
(08:40~09:10)

Keynote

Y.-P. Park

CISD, Korea

Organizing Committee, Chairperson

Session Tu-B : Media-I

(09:10~12:05)

Presiders: M. Takeda (Sony, Japan),
T. Kondo (JVC, Japan)

Tu-B-01
(09:10~09:35) (Invited)

Phase-Change Etching Technique and Its Applications

**Toshimichi Shintani, Yumiko Anzai, Hiroyuki*

Minemura, Harukazu Miyamoto, Junko Ushiyama

Research & Development Group, Hitachi, Ltd., Japan

We introduce a novel etching technique which etches only crystalline regions of phase-change films and enables nano-size fabrication using phase-change recording technique. Its possible applications to optical disc technology are discussed.

Tu-B-02
(09:35~09:55)

Electron Beam Recording beyond 200Gbit/in² Density for Next Generation Optical Disk Mastering

**Masahiro Katsumura, Megumi Sato, Kazunobu*

Hashimoto, Osamu Kasono, Yasuo Hosoda, Tetsuya

Iida, Kazumi Kuriyama

PIONEER Corporation, Japan

We studied a carbon substrate to decrease electron back-scattering in electron beam mastering. 80 nm pitch grooves and 200 Gbit/in² density pits were realized. We proved an advantage of the carbon substrate for high-density recording.

**Tu-B-03
(09:55~10:15)**

TeOx Film for Heat-Mode Type Inorganic Photoresist Mastering

**Eiichi Ito, Yuko Kawaguchi, Morio Tomiyama,
Shinya Abe, Eiji Ohno
Matsushita Electric Industrial Co., Ltd., Japan*

We discovered TeOx is useful as heat-mode type inorganic photoresist, demonstrated it can be used for BD-ROM mastering and analyzed the mechanism of its development.

Coffee Break (10:15~10:45)

**Tu-B-04
(10:45~11:05)**

Two-Dimensional Optical Storage Mastering: Adding a New Dimension to Liquid Immersion Mastering

**Marius I. Boamfa, Jaap H.M. Neijzen
Philips Research Laboratories Eindhoven, The Netherlands*

We present a novel concept of mastering of Two-Dimensional structures using a single writing spot. We describe its implementation for Liquid Immersion Mastering, from initial concept and feasibility analysis to read-out results on replicated discs.

**Tu-B-05
(11:05~11:25)**

BD-type Write-Once Disk with Full-Pollutant-Free Material and Starch Substrate

**Yasuo Hosoda, Takanobu Higuchi, Noriyoshi Shida,
Tetsuya Imai, Tetsuya Iida, Kazumi Kuriyama,
Fumihiko Yokogawa
Pioneer Corp., Japan*

We developed a full-pollutant-free inorganic write-once disk of Blu-ray Disk format. The bottom jitter using the limit equalizer was 6.3% at user capacity of 25 GB. In addition, we

developed a starch substrate.

Tu-B-06
(11:25~11:45)

Improvement of Replication Quality of High Density Optical Disc using MEMS Sensors and Heater

**Youngmin Kim, Yong Choi, Shinill Kang
Center for Information Storage Device (CISD),
Yonsei University, Korea*

A mold temperature control system using MEMS sensors and heaters was designed and constructed to raise the stamper surface temperature over the glass transition temperature during filling stage of the injection molding.

Tu-B-07
(11:45~12:05)

Anneal-less DWDD of 27 Gbit/in² Land/Groove Recording using a Deep Groove Substrate and a Blue Laser

**Tomoyuki Hiroki, Kyosuke Deguchi, Kuniyuki Morita,
Ryuichi Yokoyama, Masahito Konishi, Yasuyuki
Miyaoka, Osamu Koyama
Canon Inc., Japan*

We have developed an anneal-less DWDD disc that enables 27 Gbit/in² land-groove recording on a deep groove substrate using an NA0.65 objective lens and a blue LD.

Lunch (12:05~13:30)

Session Tu-C: Drive Technology-I

(13:30~15:35)

**Presiders: K. Tanaka (Teikyo-Heisei Univ., Japan),
D. Shin (Samsung, Korea)**

Tu-C-01 (Invited)
(13:30~13:55)

Mixed Analog / Digital PRML System for High Speed Optical Data Storage

**Junghyun Lee, Mixim Konakov, Jae-Wook Lee,
Eun-Jin Ryu, Eingsob Cho, Jungeun Lee,
Hyunsu Chae
i-Networking Lab., Samsung Advanced Institute of
Technology*

New mixed analog/digital PRML architecture for

the optical drive system is presented. In order to realize high speed, low power and low cost solution, new data and clock recovery circuits and proposed.

Tu-C-02
(13:55~14:15)

Write and Read Technology for a 50 GB/Layer at 100 Mbps

**Akemi Hirotsune⁽¹⁾, Junko Ushiyama⁽¹⁾,
Hiroyuki Minemura⁽¹⁾, Hiromi Kudo⁽¹⁾,
Harukazu Miyamoto⁽¹⁾, Reiji Tamura⁽²⁾,
Kazuyoshi Adachi⁽²⁾
⁽¹⁾Hitachi Ltd., Japan; ⁽²⁾Hitachi Maxell Ltd., Japan*

High-density write/read technology for 50 GB/layer at a data transfer rate of 100 Mbps was developed. Good bit error rates under 1×10^{-4} were obtained in a condition using a phase-change WO-disk and a 3-beam cross-talk-canceller.

Tu-C-03
(14:15~14:35)

Application of Turbo Codes to High-Density Optical Disc Storage using 17PP Code

**Toshiyuki Miyauchi⁽¹⁾, Yuji Shinohara⁽¹⁾,
Yasuhiro Iida⁽¹⁾, Tetsu Watanabe⁽²⁾, Yoshiyuki
Urakawa⁽²⁾, Hiroyuki Yamagishi⁽³⁾, Makoto Noda⁽³⁾
⁽¹⁾Semiconductor Solutions Network Company, Sony Corporation, Japan; ⁽²⁾Home Electronics Network Company, Sony Corporation, Japan; ⁽³⁾Micro Systems Network Company, Sony Corporation, Japan*

We describe an optimized trellis of the 17PP code. With the SISO decoders using this trellis, it is experimentally confirmed that the turbo-coded 17PP system effectively increases the user capacity of an optical disc.

Tu-C-04
(14:35~14:55)

Hybrid Equalized Partial Response Path-Feedback Maximum Likelihood for 35.4GB Blu-ray Disc ROM

**Satoru Higashino, Yoshiyuki Kajiwara, Shoei Kobayashi
Sony Corp., Japan*

We have developed the Hybrid Equalized PRML which can generate causality. The Viterbi decoder incorporates FDTS. The system has also robust PLL by decision directed timing error using FDTS decision.

Tu-C-05
(14:55~15:15)

New Equalizer Optimization Method for PRML System using Normal Equation with Sequenced Amplitude Margin

**Tetsuya Hayashi, Tetsuya Okumura, Jun Akiyama, Shigemi Maeda, Akira Takahashi
Sharp Corp., Japan*

We propose a new equalizer optimization method using normal equation with sequenced amplitude margin (NESAM) for PRML systems. NESAM can determine the optimum tap coefficients using less data amount than our conventional method.

Tu-C-06
(15:15~15:35)

Asymmetry Compensation by Nonlinear Adaptive Partial Response Equalizer for 31.3GB Blu-ray Disc ROM

**Yoshiyuki Kajiwara, Satoru Higashino, Tamotsu Yamagami
Sony Corp., Japan*

We have investigated Nonlinear Adaptive Partial Response filter for asymmetry compensation of 31.3GB Blu-ray Disc ROM. The adaptive Volterra filter equalizes nonlinear signal into linearized PR signal. The conventional Viterbi detector functions better.

Coffee Break (15:35~16:05)

Session Tu-D: High Density-I

(16:05~18:30)

**Presiders: J. Tominaga (AIST, Japan),
D. Tsai (National Taiwan Univ., Taiwan)**

Tu-D-01 (Invited)
(16:05~16:30)

High Density Holographic Storage

**Kevin Curtis, William L Wilson, Lisa Dhar
InPhase Technologies, US*

Ploytopic-angle multiplexing implemented in a phase conjugate architecture enables high-density storage. Using blue media, 80GB density, an operational prototype, and a roadmap to 1.6TB per disk are prepared.

Tu-D-02
(16:30~16:50)

Phase Change Super-RENS ROM

**Hyunki Kim, Inoh Hwang, Jooho Kim,
Changmin Park, Myongdo Ro, Insik Park
Samsung Electronics, Korea*

The super-resolution phenomenon and a typical super-RENS threshold phenomenon in the ROM type sample disc (phase change super-RENS ROM) was confirmed.

**Tu-D-03
(16:50~17:10)**

Signal Read-Out using Near-Field Optical Flying Head with a Protruded Aperture

**Masakazu Hirata⁽¹⁾, Manabu Oumi⁽¹⁾,
Kunio Nakajima⁽¹⁾, Toshifumi Ohkubo⁽²⁾
⁽¹⁾Seiko Instruments Inc., Japan; ⁽²⁾Toyo University,
Japan*

We fabricated the near-field optical head with a protruded aperture, which can reduce the effective spacing beyond the limit of the flying height, and demonstrated read-out signal from 150nm-wide L&S pattern.

**Tu-D-04
(17:10~17:30)**

Nano-Patterned Media for Near-Field Optical Data Storage

**Tsuyoshi Matsuyama^(1,2), Yoshimasa Kawata⁽¹⁾
⁽¹⁾Faculty of Engineering, Shizuoka University, Japan;
⁽²⁾Hosoe Technology Center, Pulstec Industrial
Co.,Ltd, Japan*

Nano-patterned media for near-field optical data storage was fabricated by using diblock copolymer. It was possible to produce nano-dots array with the diameter of about 35nm. The optimum fabrication condition was discussed.

**Tu-D-05
(17:30~17:50)**

Wavelength Margin Analysis in an Advanced Collinear Holography

*Hideyoshi Horima^(1,2), *Xiaodi Tan⁽¹⁾, Jun Li⁽¹⁾,
Kenji Suzuki⁽¹⁾
⁽¹⁾OPTWARE Corporation, Japan; ⁽²⁾Japan Science
and Technology Corporation-CREST, Japan*

The wavelength margin of an advanced collinear holography is analyzed and compares it of the conventional off-axis holography. Being the large wavelength margin, a laser diode as a light

source of the holography is possible.

Tu-D-06
(17:50~18:10)

**An Efficient 3D Error Correction Schemes
for Holographic Data Storage**

**Euseok Hwang, Pilsang Yoon, Haksun Kim,
Jaewoo Roh, Jooyoun Park
DAEWOO Electronics Corp., Korea*

A new volumetric error control scheme for holographic data storage has been developed and evaluated. It provides volumetrically coupled ECC blocks with concentrated parities, which improved overall error correcting performances significantly in volume recording system.

Tu-D-07
(18:10~18:30)

**Near-Field Optical Data Storage using a
Multi-Functional Cantilever Probe**

**Kang-Ho Park, Eun-Kyoung Kim, Ki-Bong Song,
Sung-Q Lee
ETRI, Korea*

We constructed a near-field probe recording system using a multi-functional cantilever probe with a nano-sized aperture, which is precisely controlled in a nanometer scale using AFM style gap control method.

October 13, 2004 (Wed)

Session We-E: High Density-II

(08:30~12:05)

**Presiders: K. Ueyanagi (Fuji Xerox, Japan),
J.-H. Kim (Samsung, Korea)**

**We-E-01 (Invited)
(08:30~08:55)**

**Recent Progress in Multi-Dimensional Bit
Optical Data Storage**

**Min Gu, James W. M. Chon
Swinburne University of Technology, Australia*

In this talk, progress of the development of quantum dot based spectral encoding technique will be presented, together with progress in its integration into existing 3-D technique to produce the multi-dimensional optical storage.

**We-E-02
(08:55~09:15)**

**Proposal for Multi-Layer Blu-ray Disc
Structure**

**Isao Ichimura, Gakuji Hashimoto, Kimihiro Saito,
Takeshi Yamasaki, Tomomi Yukumoto,
Tsutomu Maruyama, Kiyoshi Osato
Sony Corp., Japan*

Coherent inter-layer crosstalk in multi-layer disc structure been investigated with a scalar diffraction model. Feasibility of multi-layer Blu-ray ROM beyond 100 GB capacity is demonstrated by applying our proposal to a hexa-layer ROM disc.

**We-E-03
(09:15~09:35)**

**High Density Near Field Optical Disc
Recording**

**Masataka Shinoda, Kimihiro Saito,
Tsutomu Ishimoto, Takao Kondo, Ariyoshi Nakaoki,
Motohiro Furuki, Minoru Takeda, Yuji Akiyama,
Takashi Shimouma, Masanobu Yamamoto
Sony Corporation, Japan*

We have evaluated a high density near field optical disc recording system with 81.1 GB capacity. The jitters using limit equalizer were 8.5 % (1 track-write) and 10.5 % (3 tracks-writes).

We-E-04
(09:35~09:55)

Two-Photon Absorption Recording in Photochromic Diarylethenes using Laser Diode for Three-Dimensional Optical Memory

**Teruhiro Shiono, Tatsuo Itoh, Seiji Nishino
Matsushita Electric Ind. Co., Ltd., Japan*

We demonstrated two-photon absorption (TPA) recording in diarylethenes using LD without thermal influence. Lens effect of refractive pits suggested that multilayered media would be suitable for TPA recording in diarylethenes than bulk media.

Coffee Break (09:55~10:25)

We-E-05
(10:25~10:45)

Towards Cover-Layer Incident Read-Out of a Dual-Layer Disc with a NA=1.5 Solid Immersion Lens

**Coen A. Verschuren, Ferry Zijp,
Martin B. van der Mark, Juil I. Lee
Philips Research, The Netherlands*

We present first experimental results on a cover-layer incident near field system with a blue laser and a NA=1.5 Solid Immersion Lens. The feasibility of dual-layer media will be discussed.

We-E-06
(10:45~11:05)

Two-Dimensional Optical Storage (TwoDOS)

**Dominique Bruls, Alexander van der Lee,
Andre Immink, Wim Coene
Philips Research Eindhoven, The Netherlands*

TwoDOS delivers high datarates and offers additional benefits for robustness and storage capacity, by exploiting a two-dimensional information format. Increased data-rate, capacity and flexibility in the employed format is demonstrated.

We-E-07
(11:05~11:25)

Master and Slave Beam Servo Technique for Volumetric Bit-Wise Optical Data Storage

**Sang-Ki Park, Thomas Milster, Timothy Miller,
John Butz, Warren Bletscher*

A master and slave servo technique that maintains tracking and focus registration inside a volumetric disk is analyzed, and the misregistration of the slave beam due to disk tilt and beam skew is calculated.

We-E-08
(11:25~11:45)

Near Field Recording on First-Surface Write-Once Media with a NA=1.9 Solid Immersion Lens

**Coen A. Verschuren, Ferry Zijp, Juil I. Lee, Martin B. van der Mark, Paul Urbach
Philips Research, The Netherlands*

We present improved ROM read-out and first recording results in a single wavelength near field set-up with a blue laser and a NA=1.9 Solid Immersion Lens in a conventional focus and tracking actuator.

We-E-09
(11:45~12:05)

Improvement of Noise Characteristics in Super-RENS Disc

**Inoh Hwang, Jooho Kim, Hyunki Kim, Duseop Yoon, Changmin Park, Insik Park, Dongho Shin
Samsung Electronics, Korea*

We investigated the low frequency noise of super-RENS disc, and found it is related to the mark edge shape. We could improve it using the novel recording mechanism without volume change by the chemical reaction.

Lunch (12:05~13:30)

Session We-F: Basic Theory

(13:30~15:40)

**Presiders: K. Itoh (Ricoh, Japan),
Y. Kawata (Shizuoka Univ., Japan)**

We-F-01 (Invited)
(13:30~13:55)

Understanding the Mechanism for Large and Rapid Optical Changes of Phase-Change Materials by Extended Cubic Model

**Noboru Yamada⁽¹⁾, Toshiyuki Matsunaga⁽²⁾
⁽¹⁾Matsushita Electric Industrial Co., Ltd., Japan;
⁽²⁾Matsushita Technoresearch, Inc., Japan*

Rapid and large optical changes of recent phase-

change materials are tried to be explained by highly symmetrical crystal structure, large atomic vibrations at high temperature, and changes of conductive states between metal-like and semiconductor.

We-F-02 (Invited)
(13:55~14:20)

Phase-Change Recording Mechanism: a New Approach to an Old Issue

**Alexander Kolobov⁽¹⁾, Paul Fons⁽¹⁾, Anatoly Frenkel⁽²⁾, Alex Ankudinov⁽³⁾, Junji Tominaga⁽¹⁾, Tomoya Uruga⁽⁴⁾*
(¹) National Institute of Advanced Industrial Science and Technology, Japan; (²) Yeshiva University, USA; (³) University of Washington, USA; (⁴) SPring-8, Japan

Local structure of Ge-Sb-Te in laser-crystallized and re-amorphized states has been determined by X-ray absorption fine structure analysis. An atomic scale mechanism of phase-change recording in Ge-Sb-Te has been unveiled.

We-F-03
(14:20~14:40)

Study on the Structure of Crystalline and Amorphous Thin Films of GeSbTe Compounds using Grazing Incidence X-ray Scattering

**Masugu Sato⁽¹⁾, Toshiyuki Matsunaga⁽²⁾, Noboru Yamada⁽³⁾*
(¹) Japan Synchrotron Radiation Research Institute, Japan; (²) Matsushita Technoresearch, Inc., Japan; (³) Matsushita Electric Ind. Co., Ltd., Japan

We investigated the structures of amorphous and crystalline phases of Ge₂Sb₂Te₅ thin films by Grazing Incidence X-ray Scattering. The RDFs derived from the X-ray scattering intensities clearly indicated the medium-range order of the amorphous phase.

We-F-04
(14:40~15:00)

Readout Power Dependence of the Signal Distribution Observed in the Fourier Plane of Focus Spot

**Takashi Nakano⁽¹⁾, Emi Mashimo⁽²⁾, Takayuki Shima⁽¹⁾, Yuzo Yamakawa⁽¹⁾, Junji Tominaga⁽¹⁾*
(¹) National Institute of Advanced Industrial Science and Technology (AIST), JAPAN; (²) Tokyo Denki University, JAPAN

The optical properties of super-resolution signals in the Fourier-plane of focus showed readout-power dependence. The properties could be explained by a shift of a special-temperature region in a laser spot under a ferroelectric catastrophe model.

We-F-05
(15:00~15:20)

Signal Enhancement of Super-RENS Disk by Ag Metallic Nanostructure

**Kazuma Kurihara, Tomofumi Arai, Takashi Nakano, Junji Tominaga
National Institute of Advanced Industrial Science and Technology (AIST), Japan*

We investigated localized surface plasmon effect from a Ag metallic nanostructure fabricated on a 3rd generation super-RENS optical disk. We confirmed the signal enhancement more than 5dB at 60nm pits.

We-F-06
(15:20~15:40)

Mechanism of Properties of Noble ZnS-SiO₂ Protection Layer for Phase Change Optical Disk Media

**David V. Tsu, Takeo Ohta
Energy Conversion Devices, Inc., USA*

Infrared analysis is performed on as-deposited and annealed ZnS-SiO₂ dielectric. We find Si exists not in the SiO₂ oxide phase but as SiO_xS_y. We offer insight to its role in stability and low thermal conductivity

Coffee Break (15:40~16:00)

Session We-G: Poster Session-I

(16:00~18:00)

**Presiders: N. Yamada (Matsushita, Japan),
S. L. Kang (CISD, Korea)**

We-G-01

Phase-Change Properties of Recording Materials in GaSb System Investigated with Static Test System

**Rie Mori
Mitsubishi Materials Corp., Japan*

We investigated the mark-forming properties, nucleation behaviors and crystal growth rates of GaSb system, and found that adjusting the ratio

of Ga:Sb:In:Sn and Bi or Ge addition to GaSbInSn are effective in improving those properties.

We-G-02

Aerodynamic Stabilization for a Flexible Optical Disk by Triangular Arranged Stabilizers System

**Yasutomo Aman, Nobuaki Onagi, Shozo Murata,
Keisuke Uchida
Ricoh Company, Ltd., Japan*

We have developed a flexible optical disk system that can achieve small axial runout with simplified stabilizer control, and experimentally demonstrated the capability.

We-G-03

Cross-Talk Cancellation for 50-GB/layer Optical Recording

**Hiromi Kudo⁽¹⁾, Hiroyuki Minemura⁽¹⁾,
Harukazu Miyamoto⁽¹⁾, Akemi Hirotsune⁽¹⁾,
Reiji Tamura⁽²⁾, Kazuyoshi Adachi⁽²⁾
⁽¹⁾Hitachi,Ltd., Japan; ⁽²⁾Hitachi Maxell,Ltd., Japan*

A 3-beam cross-talk cancellation method has demonstrated the feasibility of 50GB/layer recording with a bER of less than 1×10^{-4} .

We-G-04

Optical Pickup for DVD-Multi Drive with 9.5 mm Height

**Hisayoshi Takamura, Taichi Mori,
Masaharu Fukakusa, Takashi Haruguchi,
Shogo Horinouchi
Panasonic Communications Corp, Japan*

This paper describes the development of an optical pickup for 9.5 mm height DVD-multi drives. We have realized an ultra-thin pickup while securing the required signal properties.

We-G-05

Aperture Control Function for DVD/CD Compatible Objective Lens

**Shuichi Takeuchi, Koichi Maruyama,
Kenzo Yamanaka
PENTAX Corp., JAPAN*

We improved the Aperture Control Function of objective lens for DVD/CD recording pickup, as the pickup system is more affected by undesirable light pass through the DVD exclusive area when playing the CD.

We-G-06**A New 8-State DC-Controllable Run-Length-Limited Code for Optical-Storage Channel**

**Makoto Noda, Hiroyuki Yamagishi
Sony Corp., Japan*

We have developed a rate-2/3 (1, 7) RLL code with repeated minimum transition-run constraint. The code can reduce the size of the SISO decoder's hardware to half, compared with that of the conventional 17PP code.

We-G-07**Fabrication of Multilayered Photochromic Memory Media using Pressure Sensitive Adhesives**

**Masahito Nakabayashi⁽¹⁾, Sou Miyata⁽¹⁾,
Masaharu Nakano⁽²⁾, Masao Miyamoto⁽²⁾,
Yoshimasa Kawata⁽²⁾
⁽¹⁾ LINTEC Corporation, Japan; ⁽²⁾ Shizuoka
University, Japan*

We present a novel fabrication method of multilayered photochromic memory media. The media were fabricated by laminating process using pressure sensitive adhesives which work as nonphotosensitive transparent layer.

We-G-08**Low-Density Parity-Check Coding for Holographic Data Storage**

**Hideki Hayashi
Samsung Yokohama Research Institute, Japan*

We applied a low-density parity-check code and its soft iterative decoding to holographic data storage. A high coding gain of 4.8 dB was obtained at a bit error rate of 1×10^{-5} by computer simulation.

We-G-09**Adaptive Equalization using the Expanded Maximum Likelihood Detector Output for Optical Recording Systems**

**Joohyun Lee, Jaejin Lee
Dept. of Electronic Engineering, Dongguk Univ.,
Korea*

To overcome the asymmetry of high-density optical recording channel, we propose an adaptive equalization scheme which is linked to the maximum likelihood detector.

The scheme well adapts to the asymmetric optical channel.

We-G-10

3-D FDTD Simulation for Volume Holographic Gratings

**Nobuhiro Kinoshita, Norihiko Ishii, Naoki Shimidzu, Koji Kamijo, Shoichi Nakamura
NHK, Japan*

We present 3-D FDTD simulation of diffracted waves for 10 μm thick volume holographic gratings angularly multiplexed, and also show reproduced images calculated using the simulation results at various reference beam angles.

We-G-11

Initialization-Free Blu-ray Optical Disk

**Xiangshui MIAO, Luping SHI, Pik Kee TAN, Wei XU, Jianming LI, Kian Guan LIM, Tow Chong CHONG
DATA STORAGE INSTITUTE, Singapore*

The Initialization-free Blu-ray disk was successfully fabricated. No obvious deterioration of writing/erasing properties was observed in the initialization-free Blu-ray disk compared with a conventional Blu-ray disk. Moreover, the erasability of the initialization-free disk was higher.

We-G-12

Broad-Stripe High-Power Laser Diode Focus Servo

**Taeyoung Choi, Tom Milster
Univ. of Arizona, USA*

A focus servo using a broad-stripe high-power laser diode for data erasure from a writable disk is characterized. The parameters affecting the servo performance are estimated from the FES signals obtained by image-processing.

We-G-13

Fabrication of Cylindrical Microlens of GaP by One-Step Wet Etching

**Jaekwang LEE, Ki-Bong Song, Doo-Hee Cho, Jeong-Dae Suh, Sang-Hyeob Kim, Sookyung Kim, Sang-Don Jung, Myung-Ae Chung
Electronic and Telecommunications Research Institute, Korea*

Microlense of GaP (100) have been fabricated by one-step wet etching. The focused spots formed

by fabricated lens have been measured as an elliptical shape.

We-G-14

Flying Stability of Optical Flying Head on a Wavy Plastic Disk

**Jin-Moo Park, Jin-Yong Kim
Digitalmedia Lab. DCT Gr., LG Electronics Inc.,
Korea*

We carried out a computational analysis of the OFH dynamics on the wavy surface of the disk and evaluated the flying stability through the variation gain.

We-G-15

Supersensitive Reflection-Mode Near-Field Scanning Optical Microscope Supported by Optical Heterodyne Detection Technique

**Masaru Saka⁽¹⁾, Shuji Mononobe^(1,2),
Keiichiro Yusu⁽³⁾, Toshiyasu Tadokoro⁽⁴⁾,
Toshiharu Saiki^(1,5)
⁽¹⁾Kanagawa Academy of Science and Technology
(KAST), Japan; ⁽²⁾JST-PRESTO, Japan; ⁽³⁾Toshiba
Corp., Japan; ⁽⁴⁾Techno-Synergy, Inc., Japan; ⁽⁵⁾Keio
Univ., Japan*

We proposed a novel supersensitive reflection-mode near-field scanning optical microscope supported by the optical heterodyne detection technique and successfully observed very low contrastive amorphous marks on the double-layer rewritable HD DVD medium.

We-G-16

Image Compensation for Sub-Pixel Misalignment in Holographic Data Storage

**Pilsang Yoor⁽¹⁾, Euseok Hwang⁽¹⁾, Byeongbok Kang⁽¹⁾,
Jooyoun Park⁽¹⁾, Gwitae Park⁽²⁾
⁽¹⁾Daewoo Electronics Co., Korea; ⁽²⁾Korea Univ.,
Korea*

We described a compensation algorithm that can compensate for misaligned retrieved data image in holographic data storage. Experimental results from a pixel matched holographic storage system, showing correctly recover the original data pattern.

We-G-17

Signal Processing Method of Holographic Memory using Image Distortion Correction and Soft Decision Viterbi Decoding Method

**Daisuke Sato, Kazumasa Nishimoto,
Yasutaka Katayanagi, Manabu Yamamoto
Tokyo University of Science, Japan*

We report the study of a two stage decoding method for bit error reduction that uses the distortion correction based on image processing and the soft decision Viterbi decoding to improve the signal quality.

October 14, 2004 (Thu)

Session Th-H: Media-II

(08:30~12:05)

**Presiders: R. Tamura (Hitachi Maxell, Japan),
D. Tsai (National Taiwan Univ., Taiwan)**

**Th-H-01 (Invited)
(08:30~08:55)**

Jitter Characteristics of Super-RENS Disk

**Jooho Kim⁽¹⁾, Inoh Hwang⁽¹⁾, Hyunki Kim⁽¹⁾,*

Insic Park⁽¹⁾, Junji Tominaga⁽²⁾

*⁽¹⁾Samsung Electronics, Korea; ⁽²⁾National Institute of
Advanced Industrial Science and Technology, Japan*

Jitter characteristics of a super-RENS write once disk with a single-side-50-GB-capacity will be reported together with a lower capacity Jitter and a pseudo random signal jitter. 100 GB CNR Characteristics will be also described.

**Th-H-02
(08:55~09:15)**

Energy Gap Induced Super Resolution (EG-SR) Optical Disc using ZnO Thin Film

**Nobuyuki Takamori, Masaki Yamamoto, Go Mori,*

Hideharu Tajima, Akira Takahashi

SHARP Corp., Japan

The optical constants change of ZnO thermally depends on its energy gap. By applying these performances, we obtained higher density ROM disc. We call this super-resolution effect Energy Gap induced Super Resolution (EG-SR).

**Th-H-03
(09:15~09:35)**

**Super-RENS Disk for Blue Laser System
Retrieving Signals from Polycarbonate
Substrate Side**

**Takayuki Shima⁽¹⁾, Takashi Nakano⁽¹⁾, Jooho Kim⁽²⁾,*

Junji Tominaga⁽¹⁾

*⁽¹⁾National Institute of Advanced Industrial Science
and Technology, Japan; ⁽²⁾Samsung Electronics Co.,
LTD, Korea*

We have prepared super-RENS disks for the blue-laser system (wavelength=405 nm, NA=0.65) retrieving signals from the PC-substrate side. We have obtained CNR values of 45 dB for 100-nm and 40 dB for 60-nm size marks.

**Th-H-04
(09:35~09:55)**

Investigation on Super-Resolution Near-Field Phase Change Blu-ray Type Optical Disks with a Sb₂Te₃ Mask Layer

**L. P. Shi, T. C. Chong, P. K. Tan, J. M. Li, X. Hu, X. S. Miao
Data Storage Institute, Singapore*

Different structures of super-resolution near-field phase-change Blu-ray type optical disks with a mask layer of Sb₂Te₃ were studied theoretically and experimentally. The recording marks as small as 16 nm was observed.

Coffee Break (09:55~10:25)

**Th-H-05
(10:25~10:45)**

Small Sized-Optical Disc for Small Form Factor Optical Drive

**Myong do Ro, Kyung geun Lee, Chang min Park, Hee sung Park, In sik Park
Samsung Electronics Co.,Ltd., Korea*

We investigated the possibility of making a narrow rim area and the optimum substrate's thickness. We confirmed that the rim area of 1 mm is possible in mobile optical storage.

**Th-H-06
(10:45~11:05)**

1.2mm -Thick Blu-ray / CD Dual Format Discs

**Shin Masuhara, Daisuke Ueda, Tomomi Yukumoto, Masanobu Yamamoto
SONY Corp., JAPAN*

We propose two types of 1.2mm-thick Blue-ray/CD dual format discs. One is for both-side reading, and another is for one-side reading using SiH semi-reflective film.

**Th-H-07
(11:05~11:25)**

Optimized Write Strategy for 4x Speed BD-RE

**Wook Yeon Hwang, Kyung Geun Lee, Chang Jin Yang, In Sik Park
Samsung Electronics, Korea*

We have studied optimized write strategy for 4x speed phase changing Blu-ray disc system for further practical implementation. This attempt

performed by a simulation and confirmed in 2x recording with commercialized 23GB disc.

**Th-H-08
(11:25~11:45)**

Optical Property of PtO_x Film at Elevated Temperature Investigated by using Ellipsometry

**Xuezhe Li⁽¹⁾, Chang Il Kim⁽¹⁾, Sung Hyuck An⁽²⁾,
Soo Ghee Oh⁽²⁾, Sang Youl Kim⁽¹⁾*

⁽¹⁾Dept. of Molecular Science and Technology, Ajou Univ., Korea; ⁽²⁾Dept. of Physics, Ajou Univ., Korea

The complex refractive index spectra of PtO_x films and its variation with temperature are investigated. The variation of the optical property at elevated temperature monitored by using in situ ellipsometer is also addressed.

**Th-H-09
(11:45~12:05)**

Optical Disc with Asymmetrical Structure

**Kyung-Chan Park, In-Seop Eom, Hyung-Jun Lim,
Je-Jong Lee, Ji-Deok Kim, Jin-Yong Kim
Digital Media Research Lab., LG Electronics Inc., Korea*

We introduce a new optical disc having a 0.1mm-thick cover layer and a structure with asymmetrically molded thinner substrate, and we have investigated and confirmed the performance of new disc having an asymmetrical thinner structure

Lunch (12:05~13:30)

Session Th-I: Components-I

(13:30~15:35)

**Presiders: O. Koyama (Canon, Japan),
Y. Yamanaka (NEC, Japan)**

**Th-I-01 (Invited)
(13:30~13:55)**

Coupled-Field-Analysis and Dynamic Improvement of an Ultra-Slim-Height Optical Pickup Actuator

*Dong-Ju Lee⁽¹⁾, Gi-Won Jung⁽¹⁾, *No-Cheol Park⁽¹⁾,
Hyun-Seok Yang⁽¹⁾, Young-Pil Park⁽¹⁾,
Byung-Youn Song⁽²⁾, Won-Ik Cho⁽²⁾,
Pyong-Yong Seong⁽²⁾, Kyoung-Ho Lee⁽²⁾*

⁽¹⁾Center for Information Storage Device, Yonsei University, Korea; ⁽²⁾Toshiba Samsung Storage Technology Corporation, Korea

We propose coupled-field-analysis that can precisely analyze the characteristics of actuators. The effectiveness of the proposed method is confirmed by applying it to improving the performances of an ultra-slim-height pickup actuator with some optimization methods.

Th-I-02
(13:55~14:15)

Fabrication and Characterization of Sub-100 μm Diameter Gallium Phosphide Solid Immersion Lens Arrays

**Matthew Lang⁽¹⁾, Tom D. Milster⁽¹⁾, Takahisa Minamitan⁽²⁾, Gregg Borek⁽²⁾, David Brown⁽²⁾*

⁽¹⁾University of Arizona, USA; ⁽²⁾MEMS Optical Inc., USA

Fabrication and testing of sub-100 μm gallium phosphide solid immersion lenses is described. We report suitable sphericity (< 160 nm deviation) to a marginal ray angle of 42 degrees for NA up to 2.2 inside the material.

Th-I-03
(14:15~14:35)

Correction of Substrate Vertical Birefringence Using a Patterned Wave Plate

**Ryuichi Katayama⁽¹⁾, Yuichi Komatsu⁽²⁾*

⁽¹⁾Media and Information Res. Labs., NEC Corp., Japan; ⁽²⁾R&D Technical Support Center, NEC Corp., Japan

The vertical birefringence in polycarbonate substrates of optical disks is corrected by a newly designed patterned wave plate placed in an optical head with polarizing optics, in order to improve the read/write characteristics.

Th-I-04
(14:35~14:55)

High Response Twin-Objective Actuator with Radial Tilt Function for Blu-ray Disc Recorder

**SeokJung Kim, TaeYoun Heor, TaeKyung Kim, YoungMan Ahn, ChongSam Chung*
Samsung Electronics Co., Ltd., Korea

We have developed BD optical pick-up with twin-objective actuator to be compatible with CD and DVD in the 10x speed BD Recorder. This actuator has high AC sensitivities and good 2nd resonance characteristics.

Th-I-05
(14:55~15:15)

A Laser Light Source Generating Ultra-Violet and Green Light for Holographic Memory System

**Ken'ichi Kasazumi⁽¹⁾, Akihiro Morikawa⁽¹⁾,
Tomoya Sugita⁽¹⁾, Kiminori Mizuuchi⁽¹⁾,
Kazuhisa Yamamoto⁽¹⁾, Nicolaie Pavel⁽²⁾,
Takunori Taira⁽²⁾*

⁽¹⁾Matsushita Electric Industrial Co., Ltd., Japan;

⁽²⁾Institute for Molecular Science, Japan

Solid-state laser source generating UV, green and IR light, which will realize higher capacity of holographic memory system was developed. A uniform grating was confirmed to be recorded on a holographic media.

Th-I-06
(15:15~15:35)

BD Pickup Head for Dual Layer Disc

**Tae Kyung Kim⁽¹⁾, Young Man Ahn⁽¹⁾,
Seok Jung Kim⁽¹⁾, Tae Youn Heor⁽²⁾,
Chong Sam Chung⁽¹⁾, In Sik Park⁽¹⁾*

⁽¹⁾Media Solution Team, Digital Media Research Center, Digital Media Business, Samsung Electronics Co., Ltd, Korea; ⁽²⁾R&D 2-Group, Digital Video System Division, Digital Media Business, Samsung Electronics Co., Ltd., Korea

We have developed compact BD pickup head for dual layer disc. By using single cell LCP with pol-DOE, we could get the jitter value of 6% and stabilize the focus and tracking signal.

Coffee Break (15:35~16:00)

Session Th-J: Poster Session-II

(16:00~18:00)

**Presiders: T. Iida (Pioneer, Japan),
Y.-J. Kim (LG, Korea)**

Th-J-01

Super-Resolution Near-Field Structure with Organic Dye sandwiched by Phase-Change Materials

**Wei-Chih Hsu⁽¹⁾, Nan-Ru Huang⁽²⁾, Song-Yeu Tsai⁽¹⁾,
Hao-Hsien Chiang⁽¹⁾, Ta-Chia Liu⁽²⁾*

⁽¹⁾Materials Research Laboratories, Industrial Technology Research Institute, Taiwan, R.O.C.;

⁽²⁾Nan Ya Plastics Corporation, Taiwan, R.O.C.

The readout properties of super-resolution near-field structure (Super-RENS) with organic dye sandwiched by phase-change materials were studied and demonstrated that discs with thin dye layer show good carrier-to-noise ratio (CNR).

Th-J-02

Radial Tilt and Tangential Tilt Servo using Four-Axis Actuator

**Toshiyuki Kawasaki, Goichi Akanuma, Ikuo Maeda, Tomofumi Kitazawa, Shunichi Andoh
RICOH Co. Ltd., Japan*

An object lens tilt actuator for blue-laser optical disc system has been developed. A radial tilt and tangential tilt servo were constructed and the disc tilt compensation effect was estimated.

Th-J-03

A Coupled Analysis Study of a Stabilized Flexible Optical Disk System

*Keisuke Uchida⁽¹⁾, Aman Yasutomo⁽²⁾,
*Onagi Nobuaki⁽²⁾
⁽¹⁾Environmental R&D Center, RICOH COMPANY LTD., Japan; ⁽²⁾Manufacturing Technology R&D Center, RICOH COMPANY LTD., Japan*

We applied a coupled fluid-structural analysis for flexible optical disk. The coupled analysis result was compared with the result of experiment. We obtained good agreement between them.

Th-J-04

New Spherical Aberration Compensator for Blu-ray Disc

**Hironori Nakahara, Daisuke Matsubara,
Toshiya Matozaki, Nobuo Takeshita, Toru Yoshihara
Mitsubishi Electric Corp., Japan*

Liquid Crystal Plate type new Spherical Aberration Compensator for Blu-ray Disc optical system is discussed. It is numerically proved that the compensator can reduce the aberration caused by decentering.

Th-J-05

Signal Qualification Method for Optical Disc

**Hyunsoo Park⁽¹⁾, Juhan Bae⁽¹⁾, Jaeseong Shim⁽¹⁾,
Jaewook Lee⁽²⁾, Junghyun Lee⁽²⁾, Eunjin Ryu⁽²⁾,
Eingseob Cho⁽²⁾, Konakov Maxim⁽²⁾
⁽¹⁾Media Solution Team, Digital Media Research Center, Digital Media Business, Samsung Electronics Co., Ltd., Korea; ⁽²⁾i-Networking Lab., Samsung Advanced Institute of Technology, Korea*

A new method that is able to offer the more precise measurement of the signal quality than the jitter for high density optical disc is proposed. (LPSNR-Level Peak Signal to Noise Ratio)

Th-J-06

Evaluation of Multiplex Hologram by Variable Pitch Spiral Method

**Shin Satoh, Satoshi Hattori, Hiroshi Sasaki
Toagosei, Japan*

Variable Pitch Spiral method was proposed for evaluation of multiplex hologram. One of our typical media was evaluated by this method and gave multiplexing number of 49, equal to 23GB/Disc, keeping the BER under 10^{-3} .

Th-J-07

Optimal Number of Control Bits in the Guided Scrambling Method for Holographic Data Storage

**Na Young Kim, Joohyun Lee, Jaejin Lee
Dept. of Electronic Engineering, Dongguk Univ.,
Korea*

We have searched the optimal numbers of each page size considering various condition of guided scrambling used in the holographic storage systems. We found that $6 \sim 10$ control bits are enough strength ≥ 4 .

Th-J-08

Thermal Deformation Analysis of Blu-ray Optical Disks

**Hong Xin Yang^(1,2), Lu Ping Sh⁽¹⁾, Jian Ming Lf⁽¹⁾,
Kian Guan Kim⁽¹⁾, Tow Chong Chong^(1,2)
⁽¹⁾Data Storage Institute, Singapore; ⁽²⁾National
University of Singapore, Singapore*

Three-dimensional thermomechanical finite-element analysis was conducted on blu-ray optical disks. The thermal deformation was investigated during the writing process. The result shows that the thermal deformation may cause tilt aberration.

Th-J-09

High-Speed Data Position Detection Processing of Holographic Memory

**Yuichi Sugiyama, Naoya Oue, Manabu Yamamoto
Tokyo University of Science, Japan*

This paper discusses the signal processing to

correct image distortion by using data position detection markers and the parallel signal processing method used to increase the marker detection speed to achieve high speed data transfer.

Th-J-10

Simulation of the Heat Interference in the Dye Recordable DVD at Different Speeds with the Different Write Strategies

**Gongming Wei⁽¹⁾, Frank Tang⁽²⁾, Jochen Hellmig⁽³⁾
(¹)Philips Research East Asia, P.R.China; (²)Philips Intellectual Property and Standards Eindhoven, the Netherlands; (³)Philips Research Eindhoven, the Netherlands*

The thermal simulation on the heat interferences within a mark and among the marks is used to tentatively explain why the different write strategies should be used for writing a same disc at different speeds.

Th-J-11

High-Deposition-Rate Dielectric-Thin-Film for HD DVD Rewritable Media

**Eiji Kariyada, Shuichi Ohkubo, Hideki Tanabe, Tatsunori Ide
NEC Corporation, Japan*

We have developed SiNiON film for use in HD DVD media. The deposition rate for the SiNiON is four times faster than that for SiO₂ and is almost the same as that for ZnS-SiO₂.

Th-J-12

Optical Response of Zinc Oxide Nano Composites Thin Film for Near-Field Optical Recording

**Tsung Sheng Kao, Yuan Hsing Fu, Pei Hsin Chang, Wei Chih Lin, Din Ping Tsai
National Taiwan University, Taiwan; Center for Nanostorage Research, Taiwan*

We use sputtered ZnO nano thin film as a near-field active layer in super-RENS disk. Ultra high density optical storage of ZnO-type super-RENS disk and its optical response have been studied by a pump-probe experiments.

Th-J-13

Flexible Disk Film Characteristics

**Shozo Murata, Nobuaki Onagi, Yasutomo Aman
Ricoh Co., Ltd., Japan*

We produced a disk with low-rigidity film and are currently involved in the research and development of new optical disk systems. Our disk causes a small axial runout of the disk.

Th-J-14

Ultra Small Pick-Up Actuator Design for CF type II Optical Disk Drive

*Woosung Yang⁽¹⁾, *Seung-Yop Lee⁽²⁾,
Taeseong Kwon⁽¹⁾, Seong-su Lee⁽¹⁾, Sookyung Kim⁽³⁾
⁽¹⁾Nanostorage Co., Ltd, Korea; ⁽²⁾Sogang Univ,
Korea; ⁽³⁾ETRI, Korea*

Two types of ultra small pick-up actuators, applicable to CF type II form factor, are proposed. Mechanical feasibility and dynamic characteristics of the miniaturized actuators are investigated.

Th-J-15

A Method for Compensating Focal Point Error due to the Variation of Cover Layer Thickness in Small Form Factor Optical Drive

**Sam-Nyol Hong⁽¹⁾, Jin-Moo Park⁽¹⁾, Jung-Kyu Lee⁽¹⁾,
Gun-Soon Park⁽¹⁾, Man-Hyung Lee⁽¹⁾, In-Ho Choi⁽¹⁾,
Jin-Yong Kim⁽¹⁾, Sang-Cheon Kim⁽²⁾,
See-Hyung Lee⁽²⁾
⁽¹⁾Digital Media Research Lab., LG Electronics, Korea;
⁽²⁾Devices & Materials Lab., LG Electronics Institute
of Technology, Korea*

We propose a focus mechanism that adjusts the focal point error results from the variation of cover layer thickness, while the OFH follows the waviness of the disc surface in miniature optical drives.

Th-J-16

Signal Process of Multi-Level Run-Length-Limited using PRML Technique

**Sun-How Jiang, Ji-Wen Kuo, Chang-Po Ma,
Feng-Hsiang Lo
Industrial Technology Research Institute, Taiwan*

We introduce PRML technology to increase the accuracy of reading multi-level signal from a ML-RLL recorded disc. The reason is that the traditional slicer detection is no longer suitable for detecting multi-level signal.

Th-J-17

A New 9-Level (1, 3) Run-Length-Limited Code for Multilevel Optical Recording

Channels

**Joohyun Lee, Myungjin Lee, Jaejin Lee
Dept. of Electronic Engineering, Dongguk Univ.,
Korea*

We present an $M=9$ (1,3) RLL code for multilevel recording system. The code achieves very high density ratio and coding efficiency ($\epsilon=96.1\%$). In addition, the structure of the encoder and decoder is very simple.

Banquet

(19:00~21:00)

October 15, 2004 (Fri)

Session Fr-K: Drive Technology-II

(08:30~10:15)

**Presiders: H. Miyamoto (Hitachi, Japan),
J.-Y. Kim (LG, Korea)**

Fr-K-01 (Invited)

(08:30~08:55)

**Progress on Small Form Factor Optical Disc
Drive Engine Technology**

**Jin-Yong Kim, In-Ho Choi, Man-Hyung Lee
LG Electronics, Digital Media Research Lab., Korea*

We will present the recent development status on small form factor optical disc drive engine. Swing-arm type and sledge type head technologies will be compared and discussed. Especially progress on sledge type head technology will be given.

Fr-K-02

(08:55~09:15)

**Development of an Air Gap Servo System
for a High Data Rate Near Field Optical
Recording**

**J.I. Lee, M.A.H van der Aa, C.A. Verschuren,
F. Zijp, M.B. van der Mark
Philips Research Eindhoven, The Netherlands*

This paper presents a design method of an air gap servo system ensuring smooth servo start-up without lens-disc collision and providing high data transfer rate in near field optical recording.

Fr-K-03

(09:15~09:35)

**High Gain Servo Controller with Complex
Zeros for Optical Disk Drives**

**Yoshiyuki Urakawa, Tetsu Watanabe
Sony Corporation, Japan*

We propose high gain servo controller with complex zeros for optical disk drives. It has the same structure with the conventional controller. The servo system will be robust to shocks, vibrations, and rotational errors.

Fr-K-04

(09:35~09:55)

Optical Disk Recorder (ODR) for Satellite

Use

**Kunimaro Tanaka⁽¹⁾, Osamu Itoh⁽²⁾, Hitoshi Iwaf⁽²⁾, Masahiro Kasuya⁽³⁾*

⁽¹⁾Teikyo Heisei Univ, Japan; ⁽²⁾Mitsubishi Electric Corp., Japan; ⁽³⁾Japan Aerospace Exploration Agency, Japan

The first optical disk recorder for satellite use was developed. There are four platters and it's data transfer rate is 60 Mbps. Explanation about the recorder and obtained data will be presented.

Fr-K-05 (09:55~10:15)

Precision Position and Gap Control for High Density Optical Head using Bimorph PZT

**Chul-JIn Kim⁽¹⁾, Eo-Jin Hong⁽¹⁾, Young-Gi Kwar⁽¹⁾, Tae-Wook Park⁽¹⁾, No-Chul Park⁽¹⁾, Hyun-Seok Yang⁽¹⁾, Young-Pil Park⁽¹⁾, Sung-Q Lee⁽²⁾, Eun-Kyung Kim⁽²⁾, Kang-Ho Park⁽²⁾*

⁽¹⁾Center for Information Storage Device, Yonsei University, Korea; ⁽²⁾Basic Research Laboratory, Electronics and Telecommunications Research Institute, Korea

This paper proposed a dual actuator using bimorph PZT for information storage device based on probe array NSOM. The gap between the media and the optical head should be maintained within the optical tolerance.

Coffee Break (10:15~10:45)

Session Fr-L: System & Applications

(10:45~11:45)

**Presiders: H. Miyamoto (Hitachi, Japan),
J.-Y. Kim (LG, Korea)**

Fr-L-01 (10:45~11:05)

Disc Management for Blu-ray Disc Recordable

**Jungwan Ko, Bob IJtsma, Chris Steenbergen, David Hanes, Marco Winter, Motoshi Ito, Noboru Yashima, Shigemi Maeda, Shoen Kobayashi, Takeshi Kohda, Taku Hoshizawa, Toshiki Aoi, Yongcheol Park
Blu-ray Disc Founders, Korea*

Blu-ray Disc Founders have studied defect management scheme for the Blu-ray Disc Recordable format. Our results show that it is possible to provide an error free recording

environment for a high capacity write-once medium.

Fr-L-02
(11:05~11:25)

Optical ROM Card System Based on the Talbot Effect

**Thomas de Hoog, Aukje Kastelijin, Rob Hendriks, Rene Verberne, Christopher Busch
Philips Research Labs, The Netherlands*

We present our progress in developing an optical storage system for portable devices, consisting of a removable ROM card and a robust reader. We show the basic principle, and explain the position control concept.

Fr-L-03
(11:25~11:45)

The Pit-Shifted ROM Disc Format for the R/RE Disc Compatibility

**Jung-Bae Park, Jin-Yong Kim, San-Woon Suh, Won-Bae Joo
Digital Media Research Lab. LG Electronics Inc., Korea*

We proposed the Pit-Shifted ROM Disc Format and provided experimental results showing the compatibility of the information area for ROM and R/RE Disc can be preserved as well as the illegal RF-copy can be prevented.

Lunch (11:45~13:30)

Session Fr-M: Components-II

(13:30~15:10)

**Presiders: T. Milster (Univ. of Arizona, USA),
Y. Honguh (Toshiba, Japan)**

Fr-M-01
(13:30~13:50)

BD, DVD and CD Compatible Objective Lens Assembly

**Katsuhiro Koike, Hajime Koyanagi, Makoto Sato, Masakazu Ogasawara, Ikuya Kikuchi
Corporate Research and Development Laboratories, Pioneer Corporation, Japan*

We developed a BD, DVD and CD compatible objective lens assembly with a Phase Shift Element. The concept of the optical design of the Phase Shift Element and the experimental results are described.

Fr-M-02
(13:50~14:10)

Pickup for SFO* Drive with 2.3mm Height Actuator

**Young Min Cheong, Jin Won Lee, Kwang Kim, Sung Soo Kim, Jong Chul Choi, Chong Sam Chung, In Sik Park
Media Solution Team, Digital Media Research Center,
Digital Media Network Business, Samsung
Electronics Co., Ltd., Korea*

We propose the optical pickup with the new type actuator using the horizontally arranged magnetic circuit, apply to 5mm height SFO Drive and get the good readout signal.

Fr-M-03
(14:10~14:30)

Design of Slider and Suspension for 4 x 1 Probe Array Type NSOM

**Eo-Jin Hong⁽¹⁾, Woo-Seok Oh⁽¹⁾, No-Cheol Park⁽¹⁾, Hyun-Seok Yang⁽¹⁾, Young-Pil Park⁽¹⁾, Sung-Q Lee⁽²⁾, Eun-Kyung Kim⁽²⁾, Kang-Ho Park⁽²⁾
⁽¹⁾Center for Information Storage Device, Yonsei University, Korea; ⁽²⁾Electronics and Telecommunications Research Institute, Korea*

In order for near-field to be successfully implemented in the system, a suitable slider and suspension are needed to be properly designed. The optical slider and the suspension for probe array are designed and analyses.

Fr-M-04
(14:30~14:50)

Maximum Magnetic Field of Thin Film Coils in Magneto-Optical Heads

**Ruud J.M. Vullers, Victor Zieren, Harry van Esch
Philips Research, The Netherlands*

We investigated the maximum current at which coils, integrated in magneto-optical recording heads, can be operated before breakdown, effectively determining the maximum magnetic field. We show that coil failure is related to heating effects.

Fr-M-05
(14:50~15:10)

Feedback Noise Issues in Micro Optical Pick-Ups

**Bernard W., Jr. Bell, Scott D. Wilson
DPHI, Inc. "DataPlay", USA*

Conditions for optimizing laser feedback noise in an optical pick-up based on peaks in the coherence function are presented for red laser based micro optical pick-ups having short feedback optical path lengths.

Coffee Break (15:10~15:40)

Session PD

(15:40~17:00)

Post-deadline Papers (15:40~16:40)

The best 4 post-deadline papers are orally presented.

Awards & Closing (16:40~17:00)

Awards, Announcement of ISOM/ODS 2005 and Closing Remarks

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	Th-H-01	Kim, H.	Tu-D-06
Hwang, W. Y.	Th-H-07	Kim, H. K.	Tu-D-02
			We-E-09
			Th-H-01
			Th-H-09
		Kim, J. D.	Th-H-09
		Kim, J. H.	Tu-D-02
			We-E-09
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			Th-H-03
		Kim, J. Y.	We-G-14
			Th-H-09
			Th-J-15
			Fr-K-01
			Fr-L-03
		Kim, K.	Th-J-08
			Fr-M-02
		Kim, N. Y.	Th-J-07
		Kim, S. C.	Th-J-15
		Kim, S. H.	We-G-13
		Kim, S. J.	Th-I-06
			Th-I-04
		Kim, S. K.	We-G-13
			Th-J-14
		Kim, S. S.	Fr-M-02
		Kim, S. Y.	Th-H-08
		Kim, T. K.	Th-I-06
			Th-I-04
		Kim, Y. M.	Tu-B-06
		Kinoshita, N.	We-G-10
		Kitazawa, T.	Th-J-02
		Ko, J. W.	Fr-L-01
		Kobayashi, S.	Tu-C-04
			Fr-L-01
		Kohda, T.	Fr-L-01
		Koike, K.	Fr-M-01
		Kolobov, A.	We-F-02
		Komatsu, Y.	Th-I-03
		Konakov, M.	Tu-C-01
		Kondo, T.	We-E-03
		Konishi, M.	Tu-B-07
		Koyama, O.	Tu-B-07
		Koyanagi, H.	Fr-M-01
		Kudo, H.	Tu-C-02
			We-G-03

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Ichimura, I.	We-E-02		
Ide, T.	Th-J-11		
Iida, T.	Tu-B-02		
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Iida, Y.	Tu-C-03		
Ijtsma, B.	Fr-L-01		
Imai, T.	Tu-B-05		
Immink, A.	We-E-06		
Ishij, N.	We-G-10		
Ishimoto, T.	We-E-03		
Ito, E.	Tu-B-03		
Ito, M.	Fr-L-01		
Itoh, O.	Fr-K-04		
Itoh, T.	We-E-04		
Iwai, H.	Fr-K-04		

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Jiang, S. H.	Th-J-16		
Joo, W. B.	Fr-L-03		
Jung, G. W.	Th-I-01		
Jung, S. D.	We-G-13		

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Kamijo, K.	We-G-10		
Kang, B. B.	We-G-16		
Kang, S. I.	Tu-B-06		
Kao, T. S.	Th-J-12		
Kariyada, E.	Th-J-11		
Kasazumi, K.	Th-I-05		
Kasono, O.	Tu-B-02		
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Kasuya, M.	Fr-K-04		
Katayama, R.	Th-I-03		
Katayanagi, Y.	We-G-17		
Katsumura, M.	Tu-B-02		

Kuo, J. W.	Th-J-16	Ma, C. P.	Th-J-16
Kurihara, K.	We-F-05	Maeda, I.	Th-J-02
Kuriyama, K.	Tu-B-02	Maeda, S.	Tu-C-05
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Kwan, Y. G.	Fr-K-05	Maruyama, K.	We-G-05
Kwon, T. S.	Th-J-14	Maruyama, T.	We-E-02

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Lee, J. H.	We-G-09		We-F-03
	Th-J-07	Maxim, K.	Tu-D-04
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Lee, J. J.	We-G-09		We-E-07
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Lee, J. J.	Th-H-09		Th-I-02
LEE, J. K.	We-G-13		Tu-B-01
Lee, J. K.	Th-J-15		Tu-C-02
Lee, J. W.	Tu-C-01		We-G-03
	Th-J-05	Miyamoto, M.	We-G-07
Lee, J. W.	Fr-M-02	Miyaoka, Y.	Tu-B-07
Lee, K. G.	Th-H-05	Miyata, S.	We-G-07
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Lee, K. H.	Th-I-01	Mizuuchi, K.	Th-I-05
Lee, L.	Tu-C-01	Mononobe, S.	We-G-15
Lee, M. H.	Th-J-15	Mori, G.	Th-H-02
	Fr-K-01	Mori, R.	We-G-01
Lee, M. J.	Th-J-17	Mori, T.	We-G-04
Lee, S. H.	Th-J-15	Morikawa, A.	Th-I-05
Lee, S. Q.	Tu-D-07	Morita, K.	Tu-B-07
	Fr-K-05	Murata, S.	We-G-02
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Lee, S. S.	Th-J-14		
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Li, J. M.	Th-H-04		
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Lim, H. J.	Th-H-09		
LIM, K.	We-G-11		
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Nakajima, K.	Tu-D-03
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Oh, W. S. Fr-M-03
Ohkubo, S. Th-J-11
Ohkubo, T. Tu-D-03
Ohno, E. Tu-B-03
Ohta, T. We-F-06
Okumura, T. Tu-C-05
Onagi, N. We-G-02
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Osato, K. We-E-02
Oue, N. Th-J-09
Oum, M. Tu-D-03

P

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Park, G. S. Th-J-15
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Park, J. B. Fr-L-03
Park, J. M. We-G-14
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Park, K. H. Tu-D-07
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Park, N. C. Th-I-01
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Park, T. W. Fr-L-01
Park, Y. C. Th-I-01
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Roh, J. W. Tu-D-06
Ryu, E. J. Th-J-05

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Sato, D. We-G-17
Sato, M. Fr-M-01
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Sato, S. Th-J-06
Seong, P. Y. Th-I-01
Shi, L. P. Th-H-04
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Shida, N. Tu-B-05
Shim, J. S. Th-J-05
Shima, T. We-F-04
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Shimouma, T. We-E-03
Shin, D. We-E-09
Shinoda, M. We-E-03
Shinohara, Y. Tu-C-03
Shintani, T. Tu-B-01
Shion, T. We-E-04
Song, B. Y. Th-I-01
Song, K. B. Tu-D-07
We-G-13
Steenbergen, C. Fr-L-01
Sugita, T. Th-I-05
Sugiyama, Y. Th-J-09
Suh, J. D. We-G-13
Suh, S. W. Fr-L-03
Suzuki, K. Tu-D-05

T

Tadokoro, T. We-G-15
Taira, T. Th-I-05
Tajima, H. Th-H-02

Takahashi, A. Tu-C-05
 Th-H-02
 Takamori, N. Th-H-02
 Takamura, H. We-G-04
 Takeda, M. We-E-03
 Takeshita, N. Th-J-04
 Takeuchi, S. We-G-05
 Tamura, R. Tu-C-02
 We-G-03
 Tan, P. K. Th-H-04
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 Tan, X. Tu-D-05
 Tanabe, H. Th-J-11
 Tanaka, K. Fr-K-04
 Tang, F. Th-J-10
 Tominaga, J. We-F-02
 We-F-04
 We-F-05
 Th-H-01
 Th-H-03
 Tomiyama, M. Tu-B-03
 Tsai, D. P. Th-J-12
 Tsai, S. Y. Th-J-01
 Tsu, D. V. We-F-06

U

Uchida, K. We-G-02
 Th-J-03
 Ueda, D. Th-H-06
 Urakawa, Y. Tu-C-03
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 Urbach, P. We-E-08
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 Verschuren, C. A. Fr-K-02
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 Yamagishi, H. Tu-C-03
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 Yamakawa, Y. We-F-04
 Yamamoto, K. Th-I-05
 Yamamoto, M. We-G-17
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 Th-H-02
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 Th-H-06
 Yamanaka, K. We-G-05
 Yamasaki, T. We-E-02
 Yang, C. J. Th-H-07
 Yang, H. X. Th-J-08
 Yang, H. S. Th-I-01
 Fr-K-05
 Fr-M-03
 Yang, W. S. Th-J-14
 Yashima, N. Fr-L-01
 Yasutomo, A. Th-J-03
 Yokogawa, F. Tu-B-05
 Yokoyama, R. Tu-B-07
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 Yukumoto, K. O. We-E-02
 Yukumoto, T. Th-H-06
 Yusu, K. We-G-15

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Zieren, V. Fr-M-04
 Zijp, F. Fr-K-02
 We-E-05
 We-E-08

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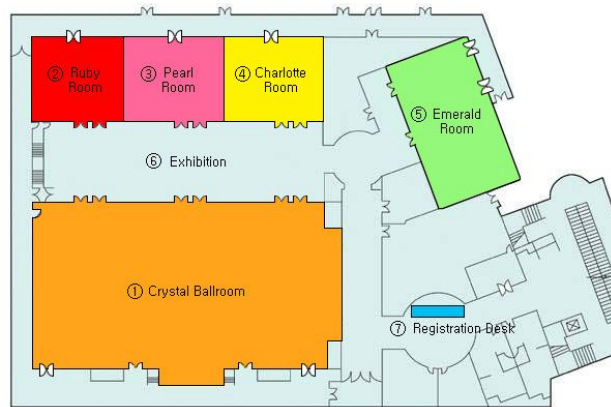
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Min, S. -K. (Daewoo)
Paek, M. -C. (ETRI)

Floor Plan

Lotte Hotel Jeju, 6th Floor



Technical Sessions	① Crystal Ballroom
Poster Sessions	④ Charlotte Room ⑤ Emerald Room
Tutorial I & II	⑤ Emerald Room
Exhibition	⑥ Crystal Ballroom Lobby
Welcome Reception	① Crystal Ballroom
Banquet	① Crystal Ballroom
Preview Room	③ Pearl Room
Internet Lounge	③ Pearl Room
Secretariat	② Ruby Room
Registration Desk	⑦ Lobby